



SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

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CERTIFIED MAIL – RETURN RECEIPT REQUESTED

July 27, 2015

Allison Dorries, Division Leader
Environmental Protection Division
Los Alamos National Security, LLC (LANS)
3747 West Jemez Road
Los Alamos, New Mexico 87545

Gene E. Turner
Environmental Permitting Manager
Environmental Projects Office
Department of Energy
P.O. Box 1663, K490
Los Alamos, New Mexico 87545

RE: Discharge Permit, DP-1793, Los Alamos National Laboratory

Dear Ms. Dorries, Mr. Turner:

The New Mexico Environment Department (NMED) issues the enclosed Discharge Permit, DP-1793, to the United States Department of Energy/Los Alamos National Security (DOE/LANS) (permittee) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

The Discharge Permit contains terms and conditions that shall be complied with by the permittee and are enforceable by NMED pursuant to Section 20.6.2.3104 NMAC, WQA, NMSA 1978 §74-6-5 and §74-6-10. Please be aware that this Discharge Permit may contain conditions that require the permittee to implement operational, monitoring or closure actions by a specified

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Ms. Allison Dorries,
Environmental Protection Division
Los Alamos National Security, LLC (LANS)
3747 West Jemez Road
Los Alamos, NM 87545

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Environmental Permitting Manager
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PS Form 3800, July 2014

Allison Dorries
Gene Turner
July 27, 2015
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deadline. Such conditions are listed at the beginning of the operational, monitoring and closure plans of this Discharge Permit.

Issuance of this Discharge Permit does not relieve the permittee of the responsibility to comply with the WQA, WQCC Regulations, and any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

Pursuant to Paragraph (4) of Subsection H of 20.6.2.3109 NMAC, the term of the Discharge Permit shall be five years from the effective date. The term of this Discharge Permit will end on July 27, 2020. Prior to discharging, written notification shall be given to NMED stating the date the discharge is to commence.

NMED requests that the permittee submit an application for renewal (or renewal and modification) at least 180 days prior to the date the Discharge Permit term ends.

An invoice for the Discharge Permit Fee of \$6,900 is being sent under separate cover. Payment of the Discharge Permit Fee must be received by NMED within 30 days of the date the Discharge Permit is issued.

If you have any questions, please contact Steven Huddleson at (505) 827-2936. Thank you for your cooperation during this Discharge Permit review.

Sincerely,



Michelle Hunter, Acting Chief
Ground Water Quality Bureau

MH:SMH

Encs: Discharge Permit DP-1793
Ground Water Discharge Permit Conditions for Synthetically Lined Lagoons – Liner
Material and Site Preparation, Revision 0.0, May 2007
Ground Water Discharge Permit Monitoring Well Construction and Abandonment
Conditions, Revision 1.1, March 2011

GROUND WATER DISCHARGE PERMIT
LANL Groundwater Projects, DP-1793

I. INTRODUCTION

The New Mexico Environment Department (NMED) issues this Discharge Permit (Discharge Permit), DP-1793, to the United States Department of Energy (DOE) and to Los Alamos National Security, LLC (LANS) (collectively the permittees) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

NMED's purpose in issuing this Discharge Permit, and in imposing the requirements and conditions specified herein, is to control the discharge of water contaminants from activities related to groundwater remediation projects (project) into ground and surface water, so as to protect ground and surface water for present and potential future use as domestic and agricultural water supply and other uses and protect public health. In issuing this Discharge Permit, NMED has determined that the requirements of Subsection C of 20.6.2.3109 NMAC have been or will be met. Pursuant to Section 20.6.2.3104 NMAC, it is the responsibility of the permittee to comply with the terms and conditions of this Discharge Permit; failure may result in an enforcement action(s) by NMED (20.6.2.1220 NMAC).

The activities which produce the discharge, the location of the discharge, and the quantity, quality and flow characteristics of the discharge are briefly described as follows.

Up to 350,000 gallons per day (gpd) of groundwater associated with aquifer and pumping tests, well development and rehabilitation, groundwater tracer studies, and groundwater remediation activities is to be discharged. Groundwater pumped during the covered activities will be discharged into a lined modular tank, a synthetically-lined lagoon, or other containment system prior to land application. Treatment systems will be appropriate to the potential contaminants and may include (but not limited to) Ion Exchange and/or Granular Activated Carbon. Treated water monitoring will ensure that contaminant concentrations do not exceed the 20.6.2.3103 NMAC standards or the limits in Table A-1 of the most recent version of NMED *Risk Assessment Guidance for Site Investigation and Remediation* (Table A-1) for 20.6.2.7.WW NMAC Toxic Pollutants. Under circumstances where multiple projects are overlapping then the maximum daily discharge volume could reach approximately 250 gpm or approximately 350,000 gallons per day as a batched discharge.

The groundwater to be treated and discharged may contain water contaminants which may be elevated above the standards of Section 20.6.2.3103 NMAC and/or toxic pollutants as defined in Subsection WW of 20.6.2.7 NMAC. Prior to discharge, all groundwater will be treated to achieve standards equal to less than (<) 90% of the numeric standards of 20.6.2.3103 NMAC and <90% of the numeric standards established for tap water in Table A-1 for constituents not listed in 20.6.2.3103.NMAC.

Projects conducted by the Los Alamos National Laboratory are located within the 55 sections referenced in this permit (Table and Figure provided as Attachment), approximately 1.5 miles to 7 miles south of Los Alamos, New Mexico. Discharge of treated effluent is through surface application to one of the 55 sections identified by the permittee (Table and Figure provided as

Attachment) in Sections 25 and 36 Township 19N, Range 05E, Sections 1, 2, 3, 4, 10, 11, 12, 13, 14, 24 and 25 Township 18N, Range 06E, Sections 13 through 36, Township 19N, Range 06E, Sections 5, 6, 7, 8, 16, 17, 18, 19, 20, 21, 29, and 30 Township 18N, Range 07E, and Sections 17, 18, 19, 20, 31 and 32 Township 19N, Range 07E, Los Alamos County. Ground water most likely to be affected ranges in depth between approximately 45 and 900 feet below ground surface and has a total dissolved solids concentration of between 270 and 300 milligrams per liter.

The application (i.e., Discharge Plan) consists of the materials submitted by the permittee originally in December 2011 (withdrawn and re-submitted on January 8, 2014), and materials contained in the administrative record prior to issuance of this Discharge Permit. The discharge shall be managed in accordance with all conditions and requirements of this Discharge Permit.

Pursuant to Section 20.6.2.3109 NMAC, NMED reserves the right to require a Discharge Permit Modification in the event NMED determines that the requirements of 20.6.2 NMAC are being or may be violated or the standards of Section 20.6.2.3103 NMAC are being or may be violated. This may include a determination that structural controls and/or management practices approved under this Discharge Permit are not protective of ground water quality, and that more stringent requirements to protect ground water quality may be required by NMED. The permittee may be required to implement abatement of water pollution and remediate ground water quality.

Issuance of this Discharge Permit does not relieve the permittee of the responsibility to comply with the WQA, WQCC Regulations, and any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

The following acronyms and abbreviations may be used in this Discharge Permit:

Abbreviation	Explanation	Abbreviation	Explanation
BOD ₅	biochemical oxygen demand (5-day)	NTU	nephelometric turbidity units
CFR	Code of Federal Regulations	Org	organisms
Cl	chloride	TDS	total dissolved solids
EPA	United States Environmental Protection Agency	TKN	total Kjeldahl nitrogen
gpd	gallons per day	total nitrogen	= TKN + NO ₃ -N
LADS	land application data sheet(s)	TRC	Total Residual Chlorine
mg/L	milligrams per liter	TSS	total suspended solids
mL	milliliters	UPC	Uniform Plumbing Code
NMAC	New Mexico Administrative Code	WQA	New Mexico Water Quality Act
NMED	New Mexico Environment Department	WQCC	Water Quality Control Commission
NMSA	New Mexico Statutes Annotated	WWTF	Wastewater Treatment Facility
NO ₃ -N	nitrate-nitrogen	Table A-1	Table A-1 of the NMED <i>Risk Assessment Guidance for Site Investigation and Remediation</i> (most recent version)

II. FINDINGS

In issuing this Discharge Permit, NMED finds:

1. The permittee would discharge effluent or leachate from the projects so that such effluent or leachate may move directly or indirectly into ground water within the meaning of Section 20.6.2.3104 NMAC.
2. The permittee is discharging effluent or leachate from the projects so that such effluent or leachate may move into ground water of the State of New Mexico which has an existing concentration of 10,000 mg/L or less of TDS within the meaning of Subsection A of 20.6.2.3101 NMAC.
3. The discharge from the projects are not subject to any of the exemptions of Section 20.6.2.3105 NMAC.

III. AUTHORIZATION TO DISCHARGE

Pursuant to 20.6.2.3104 NMAC, it is the responsibility of the permittee to ensure that discharges authorized by this Discharge Permit are consistent with the terms and conditions herein.

Up to 350,000 gallons per day gpd of treated groundwater derived from individual projects (including the Chromium Project), pumping tests, aquifer tests, well development and tracer studies conducted to characterize groundwater quality or aquifer properties may be discharged via land application to one of 55 sections identified in tabular format and Figure provided as Attachment to this permit.

[20.6.2.3104 NMAC, Subsection C of 20.6.2.3106 NMAC, Subsection C of 20.6.2.3109 NMAC]

IV. CONDITIONS

The following conditions shall be complied with by the permittee and are enforceable by NMED. The permittee is authorized to discharge water contaminants subject to the following conditions:

A. OPERATIONAL PLAN

#	Terms and Conditions
1.	The permittee shall implement the following operational plan to ensure compliance with Title 20, Chapter 6, Parts 1 and 2 NMAC. [Subsection C of 20.6.2.3109 NMAC]
2.	The permittee shall operate in a manner such that standards and requirements of Sections

#	Terms and Conditions
	<p>20.6.2.3101 and 20.6.2.3103 NMAC are not violated.</p> <p>[20.6.2.3101 NMAC, 20.6.2.3103 NMAC, Subsection C of 20.6.2.3109 NMAC]</p>
3.	<p>Prior to initiating discharge from an individual project, pumping test, aquifer test or tracer study, the permittee shall submit a workplan to NMED for approval. Included in the workplan will be:</p> <ul style="list-style-type: none"> • a detailed description of the proposed activity, including a statement of purpose; • a description of water conservation and reuse options considered; • a topographic map showing the proposed land application sites and the location of all monitoring wells, Site Monitoring Areas (SMA), Solid Waste Management Units (SWMU), National Pollution Discharge Elimination System (NPDES) outfalls, groundwater discharge permits, Areas of Concern (AOC) identified in the 2005 NMED Order on Consent, drinking water wells, surface impoundments and surface drainage features in the vicinity; • existing data showing the depth to and general groundwater quality at the proposed discharge location including concentrations of contaminants exceeding regulatory standards; • estimated groundwater flow direction; • a detailed description of the on-site treatment system to remove contaminants of concern from the effluent; • a schematic of treatment system and treatment unit specifications; • a detailed descriptions of the storage/containment systems associated with the treatment; • Safety Data Sheets for tracer constituents; • a maximum estimated daily discharge volume; • total estimated volume of the proposed discharge; • a proposed sampling plan to demonstrate treatment efficiency and compliance with regulatory standards; Proposed method(s) of land application, application rates and area of application; and • a project schedule including the date the discharge is to commence and anticipated duration. <p>Public comments on each work plan shall be accepted by NMED for a period not exceeding 30 days following posting of the workplan by the permittees to the EPRR (Condition 12). The workplan shall be enacted as approved by NMED including specific monitoring requirements that may be required.</p> <p>[20.6.2.3107.A NMAC]</p>
4.	<p>Land application of treated groundwater will be conducted in accordance with, but not limited to, the following criteria.</p>

#	Terms and Conditions
	<ol style="list-style-type: none"> 1. Land application is prohibited at the following locations: <ul style="list-style-type: none"> • Watercourses; • Water Bodies; • Wetlands; • Areas of Concern (AOCs) (with the exception of the following canyon-bottom AOCs : C-00-001; through C-00-019 and C-00-021); • Solid Waste Management Units (SWMUs); • Slopes greater than 2% if the site is poorly vegetated (<50% ground cover); and • Slopes greater than 5% if the site is well vegetated (>50% ground cover). 2. Land application cannot result in water flow from an approved land application site. 3. Land application cannot create ponds or pools or standing water. 4. Land application must be conducted in a manner that maximizes infiltration and evaporation. 5. Land application is restricted to daylight hours and for a maximum of 10 hrs/day. 6. Land application must be supervised. 7. Land application cannot extend off LANL property without written permission from the land owner. 8. Land Application will be terminated if leaks in the application system are detected. 9. Land application is prohibited while precipitation is occurring or when temperatures are below freezing. <p>[20.6.2.3107 NMAC]</p>

B. MONITORING, REPORTING, AND OTHER REQUIREMENTS

#	Terms and Conditions
5.	<p>The permittee shall conduct the monitoring, reporting, and other requirements listed below.</p> <p>[20.6.2.3107 NMAC]</p>
6.	<p>METHODOLOGY - Unless otherwise approved in writing by NMED, the permittee shall conduct sampling and analysis in accordance with the most recent edition of the following documents.</p> <ol style="list-style-type: none"> a) American Public Health Association, Standard Methods for the Examination of Water and Wastewater (18th, 19th or current) b) U.S. Environmental Protection Agency, Methods for Chemical Analysis of Water and Waste c) U.S. Geological Survey, Techniques for Water Resources Investigations of the U.S. Geological Survey

#	Terms and Conditions
	<p>d) American Society for Testing and Materials, Annual Book of ASTM Standards, Part 31. Water</p> <p>e) Federal Register, latest methods published for monitoring pursuant to Resources Conservation Recovery Act regulations</p> <p>f) U.S. Geological Survey, et al., National Handbook of Recommended Methods for Water Data Acquisition</p> <p>g) Methods of Soil Analysis: Part 1. Physical and Mineralogical Methods; Part 2. Microbiological and Biochemical Properties; and Part 3. Chemical Methods, American Society of Agronomy.</p> <p>[20.6.2.3107.B NMAC]</p>
7.	<p>Laboratory analysis requirements will be established prior to discharge (Condition #3) and unless approved otherwise by NMED, will be conducted by an independent environmental laboratory, certified under the National Environmental Laboratory Accreditation Program (NELAP).</p> <p>[Subsection A of 20.6.2.3107 NMAC and Subsection B of 20.6.2.3107 NMAC]</p>
8.	<p>Following completion of an approved workplan discharge, permittees will submit a report within 60 days of completing the discharge. Discharge reports shall include:</p> <ul style="list-style-type: none"> • The total volume of groundwater discharged; • an estimated average application rate for the period of discharge; • analytical results from samples collected under the water quality sampling plan or soil sampling, if required by NMED (Condition #3); and • a map depicting areas which received land applied groundwater. <p>[20.6.2.3107 NMAC]</p>
9.	<p>The permittee shall submit annual monitoring report to NMED by the 1st of March each year summarizing all discharges conducted under this permit during the prior calendar year. Included will be quantity, source, and date of each individual discharge, water quality tables listing analytical results from samples collected under the water quality sampling plan, a map(s) depicting discharge locations, and copies of laboratory analytical reports.</p> <p>Annual monitoring reports shall be performed during the following period:</p> <ul style="list-style-type: none"> • January 1st through December 31st report due by March 1st. <p>[20.6.2.3107 NMAC]</p>
10.	<p>Groundwater quality monitoring shall be conducted in accordance to the <i>Interim Facility-Wide Groundwater Monitoring Plan</i> (most recent version), which is conducted under the direction of the NMED Hazardous Waste Bureau. In some cases, NMED Groundwater</p>

#	Terms and Conditions
	<p>Quality Bureau may request additional analytes or wells be added to the sampling regime in cases where specific locations, constituents or monitoring may not be included in the Interim Facility Wide Groundwater Monitoring Plan.</p> <p>[20.6.2.3107 NMAC]</p>
11.	<p>Sampling of surficial soils may be required by NMED at areas of land application of treated groundwater. At NMED's direction, soil samples collected shall be submitted for analysis in accordance with Condition #6 of this permit by a NELAP certified independent environmental laboratory, and results compared to the Residential Soil screening levels of Table A-1.</p> <p>[20.6.2.3107 NMAC]</p>
12.	<p>ELECTRONIC POSTING – MANDATORY Commencing on the Effective Date of this Discharge Permit the permittees shall, within seven calendar days of submittal to NMED, post on LANL's Electronic Public Reading Room located at http://epr.lanl.gov/oppie/service (or as updated) the following submittals to NMED.</p> <ol style="list-style-type: none"> 1. Condition 3 – Submittal of workplan for individual discharge to NMED. 2. Condition 8 – Discharge (Workplan Completion) Report to NMED. 3. Condition 13 - Notification of groundwater exceedance and submittal of Corrective Action Plan to NMED. 4. Condition 14 – Soil Sampling exceedance workplan. 5. Condition 17 – Release (“spill”) notification, corrective action report/plan and any abatement proposal. <p>ELECTRONIC POSTING – VOLUNTARY Commencing on the effective date of this Discharge Permit, permittees voluntarily agree to post on LANL's Electronic Public Reading Room located at http://epr.lanl.gov/oppie/service (or as updated) within seven calendar days after submission to NMED, the information listed below. Because permittees have voluntarily agreed to post the below-information, such posting shall not be subject to civil or criminal enforcement actions.</p> <ol style="list-style-type: none"> 1. Condition 3 – NMED Response to Workplan Submittals. 2. Condition 9 – Annual monitoring report – due March 1. 3. Condition 15 – Improperly constructed groundwater well notification. 4. Condition 16 – Groundwater well not hydrologically downgradient notification. 5. Condition 18 – Notification of failure of discharge plan. 6. Condition 19 – Closure and post-closure activities – all documents submitted to the

#	Terms and Conditions
	<p>NMED by the permittees under this Condition.</p> <p>7. Condition 23 – Modifications and/or amendments – all documents submitted to the NMED by the permittees under this Condition.</p> <p>8. Condition 24 – Plans and specifications – all documents submitted to the NMED by the permittees under this Condition.</p> <p>9. Condition 28 – Right to appeal – all documents submitted to the Water Quality Control Commission by the permittees under this Condition.</p> <p>10. Condition 29 – Transfer of discharge permit – all documents submitted to the NMED by the permittees under this Condition.</p> <p>[20.6.2.3107.A NMAC]</p>

C. CONTINGENCY PLAN

#	Terms and Conditions
13.	<p>In the event that ground water monitoring (Condition #10) in the vicinity of a discharge conducted under this permit indicates that a ground water quality standard identified in Section 20.6.2.3103 NMAC is exceeded; the total nitrogen concentration in ground water is greater than 10 mg/L; or a toxic pollutant (defined in Subsection WW of 20.6.2.7 NMAC) is present in a ground water sample, and in any subsequent ground water sample, that are attributable to a discharge conducted under this permit, the permittee shall enact the following contingency plan.</p> <p>Within 30 days of receipt of the data confirming the exceedance, the permittee shall propose measures to ensure that the exceedance of the standard or the presence of a toxic pollutant will be mitigated by submitting a corrective action plan to NMED for approval. The corrective action plan shall include a description of the proposed actions to control the source and an associated completion schedule. The plan shall be enacted as approved by NMED.</p> <p>Once invoked (whether during the term of this Discharge Permit; or after the term of this Discharge Permit and prior to the completion of the Discharge Permit closure plan requirements), this condition shall apply until the permittee has fulfilled the requirements of this condition and ground water monitoring confirms for a minimum of two years of consecutive ground water sampling events that the standards of Section 20.6.2.3103 NMAC are not exceeded and toxic pollutants are not present in ground water.</p> <p>The permittee may be required to abate water pollution pursuant to Sections 20.6.2.4000</p>

#	Terms and Conditions
	<p>through 20.6.2.4115 NMAC, should the corrective action plan not result in compliance with the standards and requirements set forth in Section 20.6.2.4103 NMAC within 180 days of confirmed ground water contamination.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]</p>
14.	<p>In the event that soil sampling (Condition #11) indicates that inorganic constituents exceed the Residential Soil Screening levels of Table A-1, permittee will submit to NMED for approval within 120 days of receipt of laboratory analysis reports, a workplan for comprehensive investigation of the nature and extent of impact and a corrective action/remedial plan to address exceedances. The workplan will propose sampling methodology, scheduling and proposed analytical methodology to characterize the nature of impact and a corrective action/remediation plan.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]</p>
15.	<p>In the event that information available to NMED indicates that a well(s) included in a project workplan submitted under this Discharge Permit is not constructed in a manner consistent with its intended use; contains insufficient water to effectively monitor ground water quality; or is not completed in a manner that is protective of ground water quality, the permittee shall, at the request of NMED, submit a drilling workplan and project schedule for NMED approval within 120 days following notification. The permittee shall survey the new monitoring well(s) within 30 days following well construction.</p> <p>Replacement well location(s) shall be approved by NMED prior to installation and completed in accordance with the attachment titled <i>Ground Water Quality Bureau Monitoring Well Construction and Abandonment Conditions</i>, Revision 1.1, March 2011, or permittee may propose specific construction details for approval by NMED. The permittee shall submit construction and lithologic logs, survey data and a ground water potentiometric surface map to NMED within 60 days following well completion.</p> <p>Upon completion of the replacement monitoring well(s), the monitoring well(s) requiring replacement shall be properly plugged and abandoned. Well plugging, abandonment and documentation of the abandonment procedures shall be completed in accordance with the attachment titled <i>Ground Water Quality Bureau, Monitoring Well Construction and Abandonment Conditions</i>, Revision 1.1, March 2011, and all applicable local, state, and federal regulations. The well abandonment documentation shall be submitted to NMED within 60 days of completion of well plugging activities.</p> <p>[Subsection A of 20.6.2.3107 NMAC]</p>
16.	<p>In the event that ground water flow information obtained pursuant to this Discharge Permit indicates that a monitoring well(s) included in a project workplan submitted under this</p>

#	Terms and Conditions
	<p>permit is not located hydrologically downgradient of the discharge location(s) it is intended to monitor, the permittee shall submit a drilling workplan and project schedule for NMED approval within 120 days following notification from NMED. The permittee shall survey the new monitoring well(s) within 30 days following well construction.</p> <p>New well location(s) shall be approved by NMED prior to installation and completed in accordance with the attachment titled <i>Ground Water Quality Bureau, Monitoring Well Construction and Abandonment Conditions</i>, Revision 1.1, March 2011, or permittee may propose specific construction details for approval by NMED. The permittee shall submit construction and lithologic logs, survey data and a ground water elevation contour map within 90 days following well completion.</p> <p>[Subsection A of 20.6.2.3107 NMAC]</p>
17.	<p>In the event that a release (commonly known as a “spill”) occurs that is not authorized under this Discharge Permit, the permittee shall take measures to mitigate damage from the unauthorized discharge and initiate the notifications and corrective actions required in Section 20.6.2.1203 NMAC and summarized below.</p> <p>Within <u>24 hours</u> following discovery of the unauthorized discharge, the permittee shall verbally notify NMED and provide the following information:</p> <ol style="list-style-type: none"> a) The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility; b) The name and address of the facility; c) The date, time, location, and duration of the unauthorized discharge; d) The source and cause of unauthorized discharge; e) A description of the unauthorized discharge, including its estimated chemical composition; f) The estimated volume of the unauthorized discharge; and g) Any actions taken to mitigate immediate damage from the unauthorized discharge. <p>Within <u>one week</u> following discovery of the unauthorized discharge, the permittee shall submit written notification to NMED with the information listed above and any pertinent updates.</p> <p>Within <u>15 days</u> following discovery of the unauthorized discharge, the permittee shall submit a corrective action report/plan to NMED describing any corrective actions taken and/or to be taken relative to the unauthorized discharge that includes the following:</p> <ol style="list-style-type: none"> a) A description of proposed actions to mitigate damage from the unauthorized discharge; b) A description of proposed actions to prevent future unauthorized discharges of this nature; and c) A schedule for completion of proposed actions.

#	Terms and Conditions
	<p>In the event that the unauthorized discharge causes or may with reasonable probability cause water pollution in excess of the standards and requirements of Section 20.6.2.4103 NMAC, and the water pollution will not be abated within 180 days after notice is required to be given pursuant to Paragraph (1) of Subsection A of 20.6.2.1203 NMAC, the permittee may be required to abate water pollution pursuant to Sections 20.6.2.4000 through 20.6.2.4115 NMAC.</p> <p>Nothing in this condition shall be construed as relieving the permittee of the obligation to comply with all requirements of Section 20.6.2.1203 NMAC.</p> <p>[20.6.2.1203 NMAC]</p>
18.	<p>In the event that NMED or the permittee identifies any failures of the discharge plan or this Discharge Permit not specifically noted herein, NMED may require the permittee to submit a corrective action plan and a schedule for completion of corrective actions to address the failure(s). Additionally, NMED may require a Discharge Permit modification to achieve compliance with 20.6.2 NMAC.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]</p>

D. CLOSURE PLAN

#	Terms and Conditions
19.	<p>Upon cessation of the activity pursuant to the Discharge Permit, the permittee shall perform the following closure measures:</p> <ul style="list-style-type: none"> a) Cap or plug all lines to prevent the flow of wastewater to treatment or disposal systems; b) Empty, clean and remove tanks; c) Empty lagoons, remove liners, backfill and re-grade to surface topography; d) Appropriately dispose of liquids and solids; e) Regrade and cover stockpiles; f) Continue groundwater monitoring for at least two years, or as appropriate; g) Enact contingency plans if groundwater standards or Residential Soil screening criteria are exceeded including any abatement required by NMED pursuant to actions related to this Discharge Permit; h) Remove any compounds and equipment pertaining to the remediation activities; i) Appropriately dispose of all treatment resins and media in accordance with all applicable local, state and federal regulations; and j) When all post-closure requirements have been met, the permittee may request to terminate the Discharge Permit.

	<p>Should individual components utilized under this Discharge Permit be required for completion of Consent Order activities under other regulatory oversight, permittee may request a variance from specific closure activities required under this condition.</p> <p>[20.6.2.3107 (A)11 NMAC]</p>
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E. GENERAL TERMS AND CONDITIONS

#	Terms and Conditions
20.	<p>RECORD KEEPING - The permittee shall maintain a written record of:</p> <ul style="list-style-type: none"> • information and data used to complete the application for this Discharge Permit; • any releases (commonly known as “spills”) not authorized under this Discharge Permit and reports submitted pursuant to 20.6.2.1203 NMAC; • the operation, maintenance, and repair of all facilities/equipment used to treat, store or dispose of wastewater; • facility record drawings (plans and specifications) showing the actual construction of the facility and bear the seal and signature of a licensed New Mexico professional engineer; • copies of monitoring reports completed and/or submitted to NMED pursuant to this Discharge Permit; • the volume of wastewater or other wastes discharged pursuant to this Discharge Permit; • ground water quality and wastewater quality data collected pursuant to this Discharge Permit; • copies of construction records (well log) for all ground water monitoring wells required to be sampled pursuant to this Discharge Permit; • the maintenance, repair, replacement or calibration of any monitoring equipment or flow measurement devices required by this Discharge Permit; and • data and information related to field measurements, sampling, and analysis conducted pursuant to this Discharge Permit, including: <ul style="list-style-type: none"> ○ the dates, location and times of sampling or field measurements; ○ the name and job title of the individuals who performed each sample collection or field measurement; ○ the sample analysis date of each sample ○ the name and address of the laboratory, and the name of the signatory authority for the laboratory analysis; ○ the analytical technique or method used to analyze each sample or collect each field measurement; ○ the results of each analysis or field measurement, including raw data; ○ the results of any split, spiked, duplicate or repeat sample; and ○ a copy of the laboratory analysis chain-of-custody as well as a description of

#	Terms and Conditions
	<p>the quality assurance and quality control procedures used.</p> <p>The written record shall be maintained by the permittee at a location accessible during a facility inspection by NMED for a period of at least five years from the date of application, report, collection or measurement and shall be made available to the department upon request.</p> <p>[Subsections A and D of 20.6.2.3107 NMAC]</p>
21.	<p>INSPECTION and ENTRY – The permittee shall allow inspection by NMED of the facility and its operations which are subject to this Discharge Permit and the WQCC regulations. NMED may upon presentation of proper credentials, enter at reasonable times upon or through any premises in which a water contaminant source is located or in which are located any records regarding this discharge permit or related discharges required to be maintained by regulations of the federal government or the WQCC.</p> <p>The permittee shall allow NMED to have access to and reproduce for their use any copy of the records, and to perform assessments, sampling or monitoring during an inspection for the purpose of evaluating compliance with this Discharge Permit and the WQCC regulations.</p> <p>Nothing in this Discharge Permit shall be construed as limiting in any way the inspection and entry authority of NMED under the WQA, the WQCC Regulations, or any other local, state or federal regulations.</p> <p>[Subsection D of 20.6.2.3107 NMAC, NMSA 1978, §§ 74-6-9.B and 74-6-9.E]</p>
22.	<p>DUTY to PROVIDE INFORMATION - The permittee shall, upon NMED's request, allow for NMED's inspection/duplication of records required by this Discharge Permit and/or furnish to NMED copies of such records.</p> <p>[Subsection D of 20.6.2.3107 NMAC]</p>
23.	<p>MODIFICATIONS and/or AMENDMENTS – In the event the permittee proposes a change to the facility or the facility's discharge that would result in a change in the volume discharged; the location of the discharge; or in the amount or character of water contaminants received, treated or discharged by the facility, the permittee shall notify NMED prior to implementing such changes. The permittee shall obtain approval (which may require modification of this Discharge Permit) by NMED prior to implementing such changes.</p> <p>[Subsection C of 20.6.2.3107 NMAC, Subsections E and G of 20.6.2.3109 NMAC]</p>
24.	<p>PLANS and SPECIFICATIONS – In the event the permittee is proposing to construct a</p>

#	Terms and Conditions
	<p>wastewater system or change a process unit of an existing system such that the quantity or quality of the discharge will change substantially from that authorized by this Discharge Permit, the permittee shall submit construction plans and specifications to NMED for the proposed system or process unit prior to the commencement of construction.</p> <p>In the event the permittee implements changes to the wastewater system authorized by this Discharge Permit which result in only a minor effect on the character of the discharge, the permittee shall report such changes (including the submission of record drawings, where applicable) in the annual report due to NMED by March 1st of each year .</p> <p>[Subsections A and C of 20.6.2.1202 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]</p>
25.	<p>CIVIL PENALTIES - Any violation of the requirements and conditions of this Discharge Permit, including any failure to allow properly credentialed NMED staff to enter and inspect records or facilities, or any refusal or failure to provide NMED with records or information required to be maintained by this Discharge Permit or related regulation may subject the permittee to a civil enforcement action. Pursuant to WQA 74-6-10(A) and (B), such action may include a compliance order requiring compliance immediately or in a specified time, assessing a civil penalty, modifying or terminating the Discharge Permit, or any combination of the foregoing; or an action in district court seeking injunctive relief, civil penalties, or both. Pursuant to WQA 74-6-10(C) and 74-6-10.1, civil penalties of up to \$15,000 per day of noncompliance may be assessed for each violation of the WQA 74-6-5, the WQCC Regulations, or this Discharge Permit, and civil penalties of up to \$10,000 per day of noncompliance may be assessed for each violation of any other provision of the WQA, or any regulation, standard, or order adopted pursuant to such other provision. In any action to enforce this Discharge Permit, the permittee waives any objection to the admissibility as evidence of any data generated pursuant to this Discharge Permit.</p> <p>[20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10 and 74-6-10.1]</p>
26.	<p>CRIMINAL PENALTIES – No person shall:</p> <ol style="list-style-type: none"> 1) make any false material statement, representation, certification or omission of material fact in an application, record, report, plan or other document filed, submitted or required to be maintained under the WQA; 2) falsify, tamper with or render inaccurate any monitoring device, method or record required to be maintained under the WQA; or 3) fail to monitor, sample or report as required by a permit issued pursuant to a state or federal law or regulation. <p>Any person who knowingly violates or knowingly causes or allows another person to violate the requirements of this condition is guilty of a fourth degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who is convicted of a second or subsequent violation of the requirements of this condition is</p>

#	Terms and Conditions
	<p>guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition or knowingly causes another person to violate the requirements of this condition and thereby causes a substantial adverse environmental impact is guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition and knows at the time of the violation that he is creating a substantial danger of death or serious bodily injury to any other person is guilty of a second degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15.</p> <p>[20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10.2.A through 74-6-10.2.F]</p>
27.	<p>COMPLIANCE with OTHER LAWS - Nothing in this Discharge Permit shall be construed in any way as relieving the permittee of the obligation to comply with all applicable federal, state, and local laws, regulations, permits or orders.</p> <p>[NMSA 1978, § 74-6-5.L]</p>
28.	<p>RIGHT to APPEAL - The permittee may file a petition for review before the WQCC on this Discharge Permit. Such petition shall be in writing to the WQCC within thirty days of the receipt of postal notice of this Discharge Permit and shall include a statement of the issues to be raised and the relief sought. Unless a timely petition for review is made, the decision of NMED shall be final and not subject to judicial review.</p> <p>[20.6.2.3112 NMAC, NMSA 1978, § 74-6-5.O]</p>
29.	<p>TRANSFER of DISCHARGE PERMIT - Prior to the transfer of any ownership, control, or possession of this facility or any portion thereof, the permittee shall:</p> <ol style="list-style-type: none"> 1) notify the proposed transferee in writing of the existence of this Discharge Permit; 2) include a copy of this Discharge Permit with the notice; and 3) deliver or send by certified mail to NMED a copy of the notification and proof that such notification has been received by the proposed transferee. <p>Until both ownership and possession of the facility have been transferred to the transferee, the permittee shall continue to be responsible for any discharge from the facility.</p> <p>[20.6.2.3111 NMAC]</p>
30.	<p>PERMIT FEES - Payment of permit fees is due at the time of Discharge Permit approval. Permit fees shall be paid in a single payment or shall be paid in equal installments on a yearly basis over the term of the Discharge Permit. Single payments shall be remitted to NMED no later than 30 days after the Discharge Permit effective date. Initial installment payments shall be remitted to NMED no later than 30 days after the Discharge Permit</p>

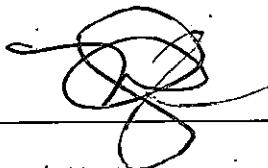
#	Terms and Conditions
	<p>effective date; subsequent installment payments shall be remitted to NMED no later than the anniversary of the Discharge Permit effective date.</p> <p>Permit fees are associated with <u>issuance</u> of this Discharge Permit. Nothing in this Discharge Permit shall be construed as relieving the permittee of the obligation to pay all permit fees assessed by NMED. A permittee that ceases discharging or does not commence discharging from the facility during the term of the Discharge Permit shall pay all permit fees assessed by NMED. An approved Discharge Permit shall be suspended or terminated if the facility fails to remit an installment payment by its due date.</p> <p>[Subsection F of 20.6.2.3114 NMAC, NMSA 1978, § 74-6-5.K]</p>

PERMIT TERM & SIGNATURE

EFFECTIVE DATE: July 27, 2015

TERM ENDS: July 27, 2020, or five years from the date the discharge commences, whichever comes first

[Subsection H of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.I]



Michellé Hunter
Acting Chief, Ground Water Quality Bureau
New Mexico Environment Department

Los Alamos National Laboratory; DP-1793

July 27, 2015

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ATTACHMENT

List of Sections (55) at Los Alamos National Laboratory Displaying a Public Notice Sign.

Count	Range	Township	Section
1	R05E	T19N	S25
2	R05E	T19N	S36
3	R06E	T18N	S1
4	R06E	T18N	S2
5	R06E	T18N	S3
6	R06E	T18N	S4
7	R06E	T18N	S10
8	R06E	T18N	S11
9	R06E	T18N	S12
10	R06E	T18N	S13
11	R06E	T18N	S14
12	R06E	T18N	S24
13	R06E	T18N	S25
14	R06E	T19N	S13
15	R06E	T19N	S14
16	R06E	T19N	S15
17	R06E	T19N	S16
18	R06E	T19N	S17
19	R06E	T19N	S18
20	R06E	T19N	S19
21	R06E	T19N	S20
22	R06E	T19N	S21
23	R06E	T19N	S22
24	R06E	T19N	S23
25	R06E	T19N	S24
26	R06E	T19N	S25
27	R06E	T19N	S26
28	R06E	T19N	S27
29	R06E	T19N	S28
30	R06E	T19N	S29
31	R06E	T19N	S30
32	R06E	T19N	S31
33	R06E	T19N	S32
34	R06E	T19N	S33
35	R06E	T19N	S34
36	R06E	T19N	S35
37	R06E	T19N	S36
38	R07E	T18N	S5
39	R07E	T18N	S6
40	R07E	T18N	S7
41	R07E	T18N	S8
42	R07E	T18N	S16
43	R07E	T18N	S17

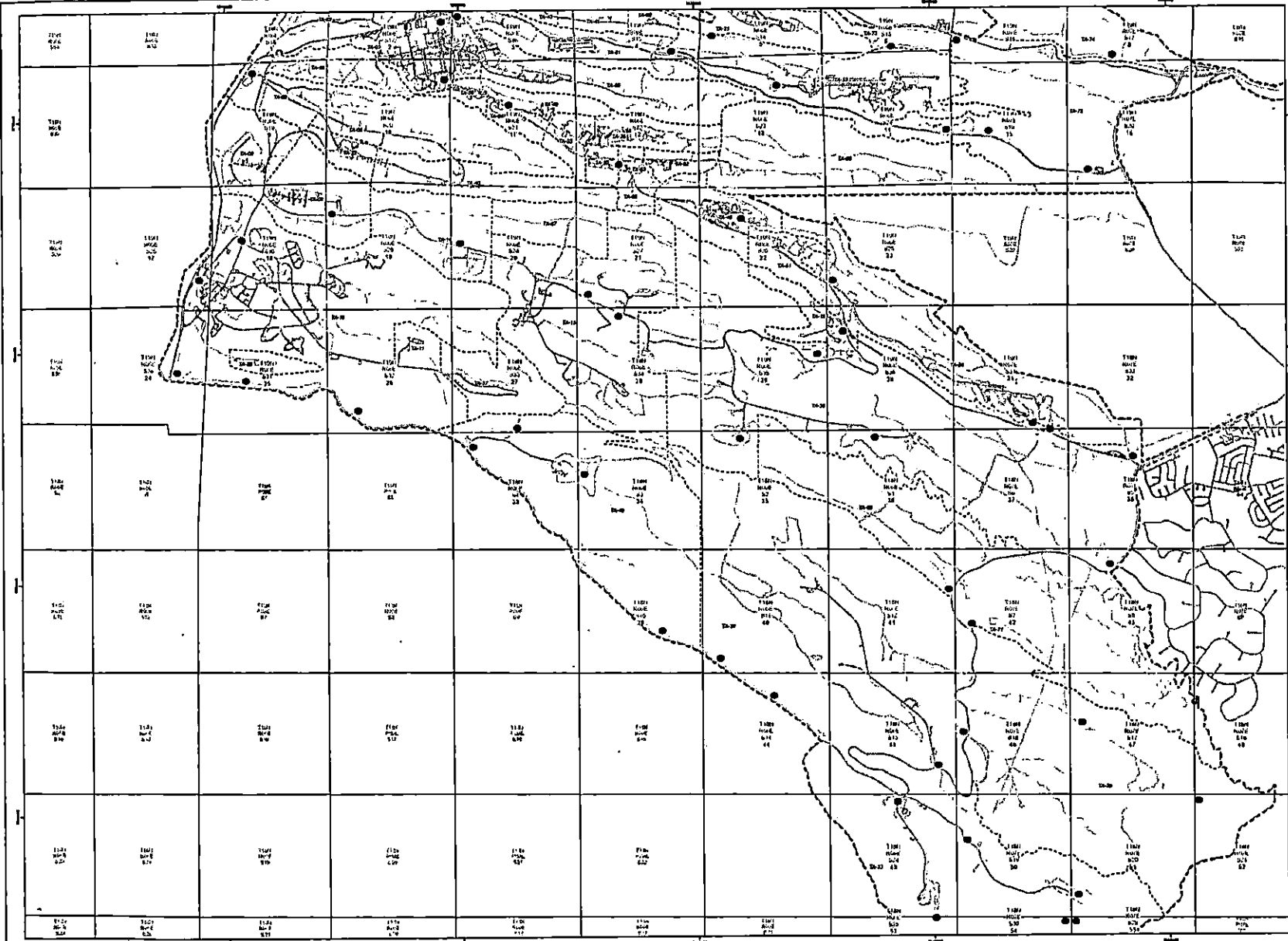
ENV-DO-13-0343

ENCLOSURE 3

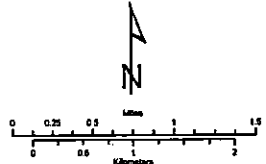
LAUR-13-29467

Count	Item	Item	Item
44	R07E	T18N	S18
45	R07B	T18N	S19
46	R07B	T18N	S20
47	R07B	T18N	S21
48	R07B	T18N	S29
49	R07B	T18N	S30
50	R07E	T19N	S17
51	R07B	T19N	S18
52	R07E	T19N	S19
53	R07E	T19N	S20
54	R07B	T19N	S31
55	R07B	T19N	S32

Los Alamos National Laboratory
Section, Township, Range



- Paved road
- - - Unpaved road
- - - TA boundary
- Township, Range and Section



New Mexico, State Plane Coordinates
 Central Zone (53 F)
 North American Datum 1983
 Grid Interval = 10000 Ft
 Created by Brad McCann
 ESRI/USGS GIS Team
 September 7, 2010
 Map #10-0057-05
 Modified by Dave Frank
 ESRI/USGS GIS Team
 August 21, 2012
 Map #10-0057-05A

Data Source:
 Public Land Survey System, County of Los Alamos, Information Services,
 as published 04 March 2007.
 Paved Road Area, Los Alamos National Laboratory, R&D Site Support Services,
 Planning, Licensing and Mapping Section, 08 January 2004, as published
 07 July 2010.
 Technical Area Boundaries, Los Alamos National Laboratory, Site Planning &
 Project Location Group, Infrastructure Planning Office, September 2007,
 as published 13 August 2010.
 Spot heights. Unpublished compiled dataset from structure and spot point
 feature classes and digitized at 33-0181



**New Mexico Environment Department Ground Water Quality Bureau
Discharge Permit Summary**

Facility Information

Facility Name
Discharge Permit Number

Los Alamos National Laboratory
DP-1793

Legally Responsible Party

Allison Dorries, Division Leader, ENV-DO, LANS, LLC
Los Alamos National Security, LLC
3747 West Jemez Road
Los Alamos, New Mexico 87545
(505) 667-7969

Gene E. Turner
Environmental Permitting Manager
Department of Energy
P.O. Box 1663, K490
Los Alamos, New Mexico 87545

Treatment, Disposal and Site Information

Primary Waste Type
Facility Type

Remediation, aquifer testing groundwater
Industrial

Treatment Methods

Type	Designation	Description & Comments
Influent Storage Tank	Frac tank, lined modular tanks, synthetically-lined lagoons	Groundwater from one of 61 regional wells and 38 intermediate wells to be treated prior to discharge
Treatment Unit	Raw water treatment units including ion exchange and/or granulated activated carbon	Discharge from aquifer testing, well development and well rehabilitation and tracer studies, or groundwater remediation will be stored in influent storage containment prior to treatment and discharge
Effluent Storage Tank	Frac tanks, lined modular tanks and synthetically-lined lagoons	Water from treatment unit stored in effluent treatment tanks prior to discharge by land application via water truck or spray irrigation systems.

Discharge Locations

Type	Designation	Description & Comments
Land Application	To be identified in workplan submitted prior to discharge	Discharge will be via land application at one of 55 locations identified in Attachment 1 to Discharge Permit.

Flow Metering Locations

Type	Designation	Description & Comments
Totalizing Flow Meter	Influent	Pumping rates, times and volumes will be monitored and recorded at the well head during all pumping/aquifer testing, well development/rehabilitation and tracer study activities,



New Mexico Environment Department Ground Water Quality Bureau
Discharge Permit Summary

Totalizing Flow meter	Effluent	Each surface discharge will be metered and recorded at the loading rack
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Ground Water Monitoring Locations

Type	Designation	Description & Comments
Monitoring Wells	Intermediate and Regional	61 regional and 28 intermediate zone monitoring wells are sampled under the <i>Interim Facility-Wide Groundwater Monitoring Plan</i> , under the direction of the NMED Hazardous Waste Bureau

Depth-to-Ground Water 45 to 900 feet below ground surface
Total Dissolved Solids (TDS) 270 to 300 mg/L

Permit Information

Application Received January 8, 2014
Public Notice Published PN-1 12-15-14
Discharge Permit Issued July 31, 2015
Discharge Permit Term Ends July 31, 2020
Permitted Discharge Volume 350,000 gallons per day

NMED Contact Information

Mailing Address Ground Water Quality Bureau
 P.O. Box 5469
 Santa Fe, New Mexico 87502-5469

GWQB Telephone Number (505) 827-2900

NMED Lead Staff Steve Huddleson
Lead Staff Telephone Number (505) 827-2936
Lead Staff Email steven.huddleson@state.nm.us

**NEW MEXICO ENVIRONMENT DEPARTMENT
GROUND WATER POLLUTION PREVENTION SECTION
SYNTHETICALLY LINED LAGOONS - LINER MATERIAL AND SITE PREPARATION
GUIDELINES**

Purpose: These guidelines represent minimum liner material and site preparation requirements for wastewater treatment, storage and evaporation lagoons. These requirements do not apply to lagoons storing hazardous wastes or high strength waste. The Ground Water Quality Bureau may impose additional requirements (e.g., double-lined lagoons with leak detection) for facilities discharging hazardous or high strength waste to lagoons through the development of specific Discharge Permit conditions for such facilities.

Liner Material Requirements:

1. The liner shall be chemically compatible with any material that will contact the liner.
2. The liner material shall be resistant to deterioration by sunlight if any portion of the liner will be exposed.
3. Synthetic liner material shall be of sufficient thickness to have adequate tensile strength and tear and puncture resistance. Under no circumstances shall a synthetic liner material less than 40 mils in thickness be accepted. Any liner material shall be certified by a licensed New Mexico professional engineer and approved by the New Mexico Environment Department (NMED) prior to its installation.

Lagoon Design and Site Preparation Requirements:

1. The system shall be certified by a licensed New Mexico professional engineer and approved by NMED prior to installation.
2. Inside slopes shall be a maximum of 3 (horizontal): 1 (vertical), and a minimum of 4 (horizontal); 1 (vertical).
3. Lagoon volume shall be designed to allow for a minimum of 24 inches of freeboard.
4. The liner shall be installed with sufficient liner material to accommodate shrinkage due to temperature changes. Folds in the liner are not acceptable.
5. To a depth of at least six inches below the liner, the sub-grade shall be free of sharp rocks, vegetation and stubble. In addition, liners shall be placed on a sub-grade of sand or fine soil. The surface in contact with the liner shall be smooth to allow for good contact between liner and sub-grade. The surface shall be dry during liner installation.
6. Sub-grade shall be compacted to a minimum of 90% of standard proctor density.
7. The minimum dike width shall be eight feet to allow vehicle traffic for maintenance.
8. The base of the pond shall be as uniform as possible and shall not vary more than three inches from the average finished elevation.
9. Synthetic liners shall be anchored in an anchor trench in the top of the berm. The trench shall be a minimum of 12 inches wide, 12 inches deep and shall be set back at least 24 inches from the inside edge of the berm.
10. If the lagoon is installed over areas of decomposing organic materials or shallow ground water, a liner vent system shall be installed.
11. Any opening in the liner through which a pipe or other fixture protrudes shall be properly sealed. Liner penetrations shall be detailed in the construction plans and record drawings.
12. A synthetic liner shall not be installed in temperatures below freezing.
13. The liner shall be installed or supervised by an individual that has the necessary training and experience as required by the liner manufacturer.
14. All manufacturer's installation and field seaming guidelines shall be followed.
15. All synthetic liner seams shall be field tested by the installer and verification of the adequacy of the seams shall be submitted to NMED along with the record drawings.

16. Concrete slabs installed on top of the synthetic liner for operational purposes shall be completed in accordance with manufacturer and installer recommendations to ensure liner integrity.
17. NMED shall be notified in advance when construction of the lagoon is to begin. NMED shall be notified upon completion of the liner installation and prior to any discharge to the lagoon to allow NMED the opportunity to inspect the liner installation.
18. Record drawings, final specifications and final lagoon capacity calculations shall be submitted to NMED within 30 days of completion of construction. These plans shall be certified by a licensed New Mexico professional engineer.

NEW MEXICO ENVIRONMENT DEPARTMENT
GROUND WATER QUALITY BUREAU
MONITORING WELL CONSTRUCTION AND ABANDONMENT GUIDELINES

Purpose: These guidelines identify minimum construction and abandonment details for installation of water table monitoring wells under ground water Discharge Permits issued by the NMED's Ground Water Quality Bureau (GWQB) and Abatement Plans approved by the GWQB. Proposed locations of monitoring wells required under Discharge Permits and Abatement Plans and requests to use alternate installation and/or construction methods for water table monitoring wells or other types of monitoring wells (e.g., deep monitoring wells for delineation of vertical extent of contaminants) must be submitted to the GWQB for approval prior to drilling and construction.

General Drilling Specifications:

1. All well drilling activities must be performed by an individual with a current and valid well driller license issued by the State of New Mexico in accordance with 19.27.4 NMAC. Use of drillers with environmental well drilling experience and expertise is highly recommended.
2. Drilling methods that allow for accurate determinations of water table locations must be employed. All drill bits, drill rods, and down-hole tools must be thoroughly cleaned immediately prior to the start of drilling. The borehole diameter must be drilled a minimum of 4 inches larger than the casing diameter to allow for the emplacement of sand and sealant.
3. After completion, the well should be allowed to stabilize for a minimum of 12 hours before development is initiated.
4. The well must be developed so that formation water flows freely through the screen and is not turbid, and all sediment and drilling disturbances are removed from the well.

Well Specifications (see attached monitoring well schematic):

5. Schedule 40 (or heavier) polyvinyl chloride (PVC) pipe, stainless steel pipe, carbon steel pipe, or pipe of an alternate appropriate material that has been approved for use by NMED must be used as casing. The casing must have an inside diameter not less than 2 inches. The casing material selected for use must be compatible with the anticipated chemistry of the ground water and appropriate for the contaminants of interest at the facility. The casing material and thickness selected for use must have sufficient collapse strength to withstand the pressure exerted by grouts used as annular seals and thermal properties sufficient to withstand the heat generated by the hydration of cement-based grouts. Casing sections may be joined using welded, threaded, or mechanically locking joints; the method selected must provide sufficient joint strength for the specific well installation. The casing must extend from the top of the screen to at least one foot above ground surface. The top of the casing must be fitted with a removable cap, and the exposed casing must be protected by a locking steel well shroud. The shroud must be large enough in diameter to allow easy access for removal of the cap. Alternatively, monitoring wells may be completed below grade. In this case, the casing must extend from the top of the screen to 6 to 12 inches below the ground surface; the monitoring wells must be sealed with locking, expandable well plugs; a flush-mount, watertight well vault that is rated to withstand traffic loads must be emplaced around the wellhead; and the cover must be secured with at least one bolt. The vault cover must indicate that the wellhead of a monitoring well is contained within the vault.
6. A 20-foot section (maximum) of continuous-slot, machine slotted, or other manufactured PVC or stainless steel well screen or well screen of an alternate appropriate material that has been approved for use by NMED must be installed across the water table. Screens created by cutting slots into solid casing with saws or other tools must not be used. The screen material selected for use must be compatible with the anticipated chemistry of the ground water and appropriate for the contaminants of interest at the facility. Screen sections may be joined using welded, threaded, or mechanically

locking joints; the method selected must provide sufficient joint strength for the specific well installation and must not introduce constituents that may reasonably be considered contaminants of interest at the facility. A cap must be attached to the bottom of the well screen; sumps (i.e., casing attached to the bottom of a well screen) should not be installed. The bottom of the screen must be installed no more than 15 feet below the water table; the top of the well screen must be positioned not less than 5 feet above the water table. The well screen slots must be appropriately sized for the formation materials and should be selected to retain 90 percent of the filter pack. A slot size of 0.010 inches is generally adequate for most installations.

7. Casing and well screen must be centered in the borehole by placing centralizers near the top and bottom of the well screen.
8. A filter pack must be installed around the screen by filling the annular space from the bottom of the screen to 2 feet above the top of the screen with clean silica sand. The filter pack must be properly sized to prevent fine particles in the formation from entering the well; clean medium to coarse silica sand is generally adequate as filter pack material for 0.010-inch slotted well screen. For wells deeper than 30 feet, the sand must be emplaced by a tremmie pipe. The well should be surged or bailed to settle the filter pack and additional sand added, if necessary, before the bentonite seal is emplaced.
9. A bentonite seal must be constructed immediately above the filter pack by emplacing bentonite chips or pellets (3/8-inch in size or smaller) in a manner that prevents bridging of the chips/pellets in the annular space. The bentonite seal must be 3 feet in thickness and hydrated with clean water. Adequate time should be allowed for expansion of the bentonite seal before installation of the annular space seal.
10. The annular space above the bentonite seal must be sealed with cement grout or a bentonite-based sealing material acceptable to the State Engineer pursuant to 19.27.4 NMAC. A tremmie pipe must be used when placing sealing materials at depths greater than 20 feet below the ground surface. Annular space seals must extend from the top of the bentonite seal to the ground surface (for wells completed above grade) or to a level 3 to 6 inches below the top of casing (for wells completed below grade).
11. For monitoring wells finished above grade, a concrete pad (2-foot minimum radius, 4-inch minimum thickness) must be poured around the shroud and wellhead. The concrete and surrounding soil must be sloped to direct rainfall and runoff away from the wellhead. The installation of steel posts around the well shroud and wellhead is recommended for monitoring wells finished above grade to protect the wellhead from damage by vehicles or equipment. For monitoring wells finished below grade, a concrete pad (2-foot minimum radius, 4-inch minimum thickness) must be poured around the well vault and wellhead. The concrete and surrounding soil must be sloped to direct rainfall and runoff away from the well vault.

Abandonment:

12. Approval for abandonment of monitoring wells used for ground water monitoring in accordance with Discharge Permit and Abatement Plan requirements must be obtained from NMED prior to abandonment.
13. Well abandonment must be accomplished by removing the well casing and placing neat cement grout, bentonite-based plugging material, or other sealing material approved by the State Engineer for wells that encounter water pursuant to 19.27.4 NMAC from the bottom of the borehole to the ground surface using a tremmie pipe. If the casing cannot be removed, neat cement grout, bentonite-based plugging material, or other sealing material approved by the State Engineer must be placed in the well using a tremmie pipe from the bottom of the well to the ground surface.
14. After abandonment, written notification describing the well abandonment must be submitted to the NMED. Written notification of well abandonment must consist of a copy of the well plugging record submitted to the State Engineer in accordance with 19.27.4 NMAC, or alternate documentation containing the information to be provided in a well plugging record required by the State Engineer as specified in 19.27.4 NMAC.

Deviation from Monitoring Well Construction and Abandonment Requirements: Requests to construct water table monitoring wells or other types of monitoring wells for ground water monitoring under ground water Discharge Permits or Abatement Plans in a manner that deviates from the specified requirements must be submitted in writing to the GWQB. Each request must state the rationale for the proposed deviation from these requirements and provide detailed evidence supporting the request. The GWQB will approve or deny requests to deviate from these requirements in writing.

MONITORING WELL SCHEMATIC

(Not to Scale)

