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Title: Discharge Permit DP-1793 Annual Monitoring Report for 2015

Author(s): Beers, Robert Stephen

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Date: FEB 22 2016
Symbol: EPC-DO-16-041
LA-UR: 16-20743
Locates Action No.: U1501760

**GROUNDWATER
FEB 22 2016
BUREAU**

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

Dear Ms. Hunter:

Subject: Discharge Permit DP-1793 Annual Monitoring Report for 2015

This letter and enclosures from the U.S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS) are the Annual Monitoring Report for Discharge Permit DP-1793 for 2015. Discharge Permit DP-1793 was issued by the New Mexico Environment Department (NMED) on July 27, 2015, for the land application of groundwater associated with aquifer and pumping tests, well development and rehabilitation, groundwater tracer studies, and groundwater remediation activities. Before a discharge from an individual project or activity begins, DOE/LANS are required to submit a comprehensive work plan to NMED for its review and approval. In calendar year 2015, DOE/LANS submitted the following work plans.

1. **Work Plan #1**, August 12, 2015, *Work Plan for the Treatment and Land Application of Groundwater from Wells in Mortandad and Sandia Canyon* (ENV-DO-15-0221). A copy of the cover letter is provided in Enclosure 1. Work Plan #1 was rejected by the NMED on August 18, 2015, on the grounds that it failed to meet the requirements of Discharge Permit DP-1793. A copy of the rejection letter is also provided in Enclosure 1. No discharge was



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

Dear Ms. Hunter:

Subject: Discharge Permit DP-1793 Annual Monitoring Report for 2015

This letter and enclosures from the U.S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS) are the Annual Monitoring Report for Discharge Permit DP-1793 for 2015. Discharge Permit DP-1793 was issued by the New Mexico Environment Department (NMED) on July 27, 2015, for the land application of groundwater associated with aquifer and pumping tests, well development and rehabilitation, groundwater tracer studies, and groundwater remediation activities. Before a discharge from an individual project or activity begins, DOE/LANS are required to submit a comprehensive work plan to NMED for its review and approval. In calendar year 2015, DOE/LANS submitted the following work plans.

1. **Work Plan #1**, August 12, 2015, *Work Plan for the Treatment and Land Application of Groundwater from Wells in Mortandad and Sandia Canyon* (ENV-DO-15-0221). A copy of the cover letter is provided in Enclosure 1. Work Plan #1 was rejected by the NMED on August 18, 2015, on the grounds that it failed to meet the requirements of Discharge Permit DP-1793. A copy of the rejection letter is also provided in Enclosure 1. No discharge was

conducted under Work Plan #1.

2. **Work Plan #2**, September 3, 2015, *Multiple Activities Work Plan for the Treatment and Land Application of Groundwater from Mortandad and Sandia Canyons, DP1793, WP#2* (ENV-DO-15-0245). A copy of the cover letter is provided in Enclosure 1. Work Plan #2 was approved by NMED, with conditions, on October 8, 2015. Subsequently, on October 29, 2015, the approval letter was reissued with modified conditions. Copies of both the October 8 and October 29, 2015, approval letters are provided in Enclosure 1.

Work Plan #2 was implemented by DOE/LANS for a period of 20 days from October 20, 2015, to November 23, 2015. As required by Discharge Permit DP-1793, a discharge report was submitted to NMED on January 20, 2016 (ENV-DO-16-006). A complete copy of the Work Plan #2 Discharge Report is provided in Enclosure 2.

Condition No. 9 of Discharge Permit DP-1793, included verbatim below, requires DOE/LANS to submit an annual report.

Condition No. 9

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.

Annual monitoring reports shall be performed during the following period:

- *January 1st through December 31st report due by March 1st.*

In 2015, all discharges conducted under Discharge Permit DP-1793 were made pursuant to the above-referenced Work Plan #2 (Enclosure 2). Accordingly, all the information required in the 2015 Annual Report per Condition No. 9 of Discharge Permit DP-1793, as cited above, is contained within the Work Plan #2 Discharge Permit Report (Enclosure 2).

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

Sincerely,



John P. McCann
Acting Division Leader
Environmental Protection & Compliance Division
Los Alamos National Security, LLC

Sincerely,



David S. Rhodes
Supervisor, Soil & Groundwater Remediation
Environmental Management
Los Alamos Field Office
U.S. Department of Energy

Enclosures:

- (1) 2015 work plans and NMED response letters, DP-1793
- (2) Work Plan #2 Discharge Report, DP-1793

Cy: James Hogan, NMED/SWQB, Santa Fe, NM, (E-File)
John E. Kieling, NMED/HWB, Santa Fe, NM, (E-File)
Steven M. Yanicak, NMED/DOE/OB, (E-File)
Jordan Arnsward, NA-LA, (E-File)
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Kirsten M. Laskey, EM-LA, (E-File)
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Enrique Torres, ADEM, (E-File)
Bruce Robinson, ADEM-PDO, (E-File)
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Stephani F. Swickley, ADEM-PDO, (E-File)
Danny Katzman, ADEM-PDO, (E-File)
Alan S. MacGregor, ER-ES, (E-File)
Gerald F. Fordham, ES-EPD, (E-File)
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ENCLOSURE 1

2015 work plans and NMED response letters, DP-1793

EPC-DO-16-041

LA-UR-16-20743

U1501760

Date: FEB 22 2016



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Date: AUG 12 2015

Symbol: ENV-DO-15-0221

LA-UR: 15-23554

Locates Action No.: N/A

Ms. Michelle Hunter, Bureau Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2261
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Dear Ms. Hunter:

Subject: Work Plan for the Treatment and Land Application of Groundwater From Wells in Mortandad and Sandia Canyons, DP-1793

In July 2015 the New Mexico Environment Department (NMED) issued a Discharge Permit (DP-1793) to the U.S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS) for the land application of treated groundwater from covered activities. Pursuant to Condition No. 3 of the above-referenced Discharge Permit, DOE/LANS are required to submit a detailed, project-specific work plan for approval by NMED before any activities are undertaken.

DOE/LANS propose to pump wells and piezometers in Mortandad and Sandia Canyons as part of the chromium plume monitoring, and also for a Chromium Plume Control Interim Measure and Chromium Plume-Center Characterization to evaluate (1) the potential to mitigate chromium migration within the aquifer through hydraulic control, and (2) the characteristics of both the aquifer and the pumping induced capture zone. Produced groundwater will be treated and discharged in accordance with the enclosed work plan and supporting information:

- ✓ Enclosure 1: Work Plan for the Treatment and Land Application of Groundwater From Wells in Mortandad and Sandia Canyons
- ✓ Enclosure 2: Topographical map showing required features and approved land application areas
- ✓ Enclosure 3: Fact Sheet for Well CrEX-1
- ✓ Enclosure 4: Water quality data from Well CrEX-1
- ✓ Enclosure 5: Ion Exchange (IX) Treatment System Schematic and IX Technical Specifications
- ✓ Enclosure 6: Map of project components: wells, treatment, piping, storage, and irrigation areas

Ms. Michelle Hunter
ENV-DO-15-0221

- 2 -

Aquifer testing at CrEX-1 is scheduled to begin in September 2015, contingent on NMED approval of the enclosed work plan (Enclosure 1) and receipt of extension approval from the New Mexico Office of the State Engineer for the Pollution Control well permit for well CrEX-1. CrEX-3 will be constructed in Fiscal Year (FY) 2016. New monitoring wells and piezometers will be installed and developed in FY2015/2016. Technical staff from DOE/LANS are available at your convenience to brief you on the details of the project and answer questions.

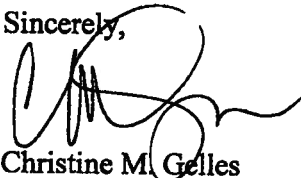
Please contact Robert S. Beers by telephone at (505) 667-7969 or by email at bbeers@lanl.gov if you have questions regarding this work plan.

Sincerely,



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

Sincerely,



Christine M. Gelles
Acting Manager
Environmental Management
Los Alamos Field Office
U.S. Department of Energy

AMD:CMG:MTS:RSB/lm

Enclosures:

- (1) Work Plan for the Treatment and Land Application of Groundwater from Wells in Mortandad and Sandia Canyons
- (2) Topographical map showing required features and approved land application areas
- (3) Fact Sheet for Well CrEX-1
- (4) Water quality data from Well CrEX-1
- (5) Ion Exchange (IX) Treatment System Schematic and IX Technical Specifications
- (6) Map of project components: wells, treatment, piping, storage, and irrigation areas

Cy: James Hogan, NMED/SWQB, Santa Fe, NM, (E-File)
John E. Kieling, NMED/HWB, Santa Fe, NM, (E-File)
Stephen M. Yanicak, NMED/DOE/OB, (E-File)
Cheryl L. Rodriguez, EM-LA, (E-File)
Gene E. Turner, NA-LA, (E-File)
Kirsten Laskey, NA-LA, (E-File)
Jordan Arnsward, LASO-NS-PI, (E-File)
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Amy E. De Palma, PADOPS, (E-File)
Michael T. Brandt, ADESH, (E-File)
Raeanna Sharp-Geiger, ADESH, (E-File)
Alison M. Dorries, ENV-DO, (E-File)
Randall M. Erickson, ADEP, (E-File)

Ms. Michelle Hunter
ENV-DO-15-0221

- 3 -

Cy (continued):

Raymond Martinez, Pueblo of San Ildefonso, (E-File)
Enrique Torres, ADEP, (E-File)
Bruce Robinson, ER, (E-File)
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Danny Katzman, ER, (E-File)
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RYAN FLYNN
Cabinet Secretary

BUTCH TONGATE
Deputy Secretary

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

August 18, 2015

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

Christine M. Gelles
Acting Manager
Environmental Management
Los Alamos Field Office
U.S. Department of Energy
P.O. Box 1663, K490
Los Alamos, New Mexico 87545



RE: Discharge Permit DP-1793, Rejection of Workplan for Treatment and Land Application of Groundwater - Los Alamos National Laboratory

Dear Ms. Dorries and Ms. Gelles:

On July 27, 2015 the New Mexico Environment Department (NMED) issued Discharge Permit DP-1793 to Los Alamos National Laboratory for the land application of treated groundwater derived from aquifer testing, well development, tracer studies and other activities associated with groundwater remediation activities at the laboratory. On August 13, 2015 the NMED Ground Water Quality Bureau (GWQB) received a workplan as required by Condition 3 of DP-1793, for activities regulated under this Discharge Permit.

The workplan proposes treatment and land application of groundwater derived from wells and piezometers, include aquifer testing, purging and sampling of groundwater, aquifer tracer studies and well back flushing of proposed injection wells, with the discharges to be conducted over a five year period (term of the Discharge Permit).

Allison Dorries and Christine Gelles
August 18, 2015
Page 2 of 3

The workplan, as submitted, fails to meet the requirements of Condition 3, which states:

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...

The August 12, 2015 workplan provides only general information on the proposed discharges, including generalized locations of discharge, estimated annual volume of discharge from fourteen (14) one-time well and piezometer actions for the period of 2015 and 2016 and discharges from twenty-two (22) ongoing well and piezometer activities over the term of the permit (5 years).

Discharge Permit DP-1793 clearly requires that each **individual** activity (aquifer testing, tracer study, well purging and sampling, etc.) must be described in a workplan that provides specific information related to that discharge including:

- 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.

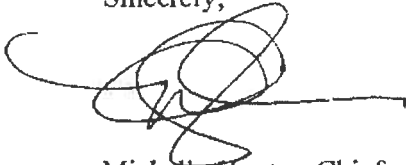
The work plan submitted is hereby rejected. Los Alamos National Laboratory must submit a revised workplan fulfilling the requirements of Condition #3 of DP-1793 and post on the electronic public reading room (EPRR, Condition #12) within 7 days. The Department will

Allison Dorries and Christine Gelles
August 18, 2015
Page 3 of 3

accept public comments for a period of 30 days following posting to the EPRR prior to approving the workplan.

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

Sincerely,

A handwritten signature in black ink, appearing to be 'Michelle Hunter', with a long horizontal line extending to the right.

Michelle Hunter, Chief
Ground Water Quality Bureau

MH:SMH

CC: James Hogan, NMED/SWQB (E-file)
John E. Kielling, NMED/HWB (E-file)
Stephen Yanicak, NMED/DOE/OB (E-file)
Gene Turner, NA-LA (E-file)
Bob Beers, EM-LA (E-file)
Joni Arcnds, CCNS (E-file)



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Date: SEP 03 2015

Symbol: ENV-DO-15-0245

LA-UR: 15-26789

Locates Action No.: N/A

Ms. Michelle Hunter, Bureau Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2261
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Dear Ms. Hunter:

Subject: Multiple Activities Work Plan for the Treatment and Land Application of Groundwater from Mortandad and Sandia Canyons, DP-1793 WP#2

On July 27, 2015, the New Mexico Environment Department (NMED) issued a Discharge Permit (DP-1793) to the U.S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS) for the land application of treated groundwater from covered activities. Pursuant to the requirements of Discharge Permit DP-1793, on August 13, 2015, DOE/LANS submitted a work plan for the treatment and land application of groundwater produced from Chromium Project activities (ENV-DO-14-0221). On August 18, 2015, NMED informed DOE/LANS [written communication, Ms. Hunter (NMED) to Ms. Dorries (LANS) and Ms. Gelles (DOE)] that the workplan, as submitted, failed to meet the requirements of Condition No. 3 of the above-referenced Discharge Permit and was therefore rejected. Subsequently, on August 21, 2015, NMED and DOE/LANS staff met to discuss modifications to the August 13th work plan that would be incorporated into a new submittal. The enclosed Work Plan incorporates NMED's recommendations.

This Multiple Activities Work Plan (Work Plan) is for the proposed discharge of treated regional aquifer groundwater from three activities conducted under the Chromium Project:

- ✓ pumping at extraction well CrEX-1,
- ✓ new monitoring well and piezometer development and aquifer testing, and
- ✓ routine monitoring well purging during sampling.

Ms. Michelle Hunter
ENV-DO-15-0245

- 2 -

The activities listed above are conducted for chromium plume monitoring as specified in the 2013 Interim Measures Work Plan for the Evaluation of Chromium Mass Removal; NMED's February 19, 2014 Approval with Modifications letter for Phase II Investigation Report for Sandia Canyon; and NMED-approved annual Interim Facility-Wide Groundwater Monitoring Plans. Produced groundwater will be treated and discharged in accordance with the enclosed Work Plan and supporting information:

- ✓ Enclosure 1: Multiple Activities Work Plan for the Treatment and Land Application of Groundwater From Mortandad and Sandia Canyons
- ✓ Enclosure 2: Interim Measures Work Plan for the Evaluation of Chromium Mass Removal
- ✓ Enclosure 3: Topographical map showing required features and approved land application areas
- ✓ Enclosure 4: Table 3.4-1, Interim Monitoring Plan for Chromium Investigation Monitoring Group
- ✓ Enclosure 5: Well and Piezometer Fact Sheets
- ✓ Enclosure 6: Water quality data from Well CrEX-1
- ✓ Enclosure 7: Ion Exchange (IX) Treatment System Schematic and IX Technical Specifications
- ✓ Enclosure 8: Map of project components: wells, treatment, piping, storage, and irrigation areas
- ✓ Enclosure 9: Land application sites signage

Pumping at extraction well CrEX-1 is scheduled to begin in October 2015, contingent on NMED approval of the enclosed Work Plan (Enclosure 1), and continue until December 31, 2015, or until field conditions prohibit land application, whichever comes first. Technical staff from DOE/LANS are available at your convenience to brief you on the details of the project and answer questions.

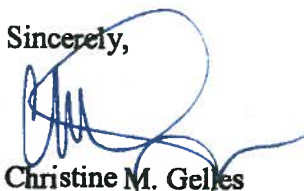
Please contact Robert S. Beers by telephone at (505) 667-7969 or by email at bbeers@lanl.gov if you have questions regarding this work plan.

Sincerely,



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

Sincerely,



Christine M. Gelles
Acting Manager
Environmental Management
Los Alamos Field Office
U.S. Department of Energy

AMD:CMG:MTS:RSB/lm

Enclosures:

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5. Enclosure 5: Well and Piezometer Fact Sheets

Ms. Michelle Hunter
ENV-DO-15-0245

- 3 -

6. Enclosure 6: Water quality data from Well CrEX-1
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9. Enclosure 9: Land application sites signage

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CERTIFIED MAIL – RETURN RECEIPT REQUESTED

October 8, 2015

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Douglas E. Hintze, Manager
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U.S. Department of Energy
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RE: Discharge Permit DP-1793, Approval of Workplan #2 for Treatment and Land Application of Groundwater - Los Alamos National Laboratory

Dear Ms. Dorries and Mr. Hintze:

On September 3, 2015 the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) received a workplan for land application of treated groundwater from Mortandad and Sandia Canyons, as required by Condition #3 of DP-1793, for activities regulated under this Discharge Permit.

The workplan proposes treatment and land application of groundwater derived from pumping at an extraction well (CrEX-1), new monitor well and piezometer development, and routine purging and sampling of groundwater. The proposed discharge will be completed prior to December 31, 2015, or at such time as conditions specified within the permit can no longer be met.

The workplan, as submitted, is approved with the following modifications:

- Spray application of treated groundwater will be suspended a minimum of 100 feet from boundaries of Solid Waste Management Units (SWMU), NPDES Outfalls, Areas of Concern (AOC) identified in the 2005 NMED Order on Consent, drinking water wells,

Allison Dorries and Douglas E. Hintze

October 8, 2015

Page 2 of 3

surface impoundments and surface drainage areas, or other areas that are not appropriate as identified in Condition #4 of the permit.

- Analysis of groundwater and treated groundwater shall be for dissolved chromium rather than total chromium as specified in the workplan; and
- Monitoring Wells MCO-12, MCA-9 and MCO-9 will be added to the list of monitoring wells to be sampled under the Facility-Wide Groundwater Monitoring Program as listed in Enclosure 4.

Within 60 days of cessation of the discharge, DOE/LANS will submit a Discharge Report documenting the total volume of water discharged, estimated average application rate, analytical reports for the samples collected under the water quality sampling plan, a map identifying the locations of discharge, and photographs including documentation of signs denoting the beginning and end of each land-application unit.

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

Sincerely,



Michelle Hunter, Chief
Ground Water Quality Bureau

MH:SMH

CC: James Hogan, NMED/SWQB (E-file)
John E. Kieling, NMED/HWB (E-file)
Stephen Yanicak, NMED/DOE/OB (E-file)
Gene Turner, NA-LA (E-file)
Bob Beers, EM-LA (E-file)



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RYAN FLYNN
Cabinet Secretary

BUTCH TONGATE
Deputy Secretary

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

October 29, 2015

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

Douglas E. Hintze, Manager
Environmental Management
Los Alamos Field Office
U.S. Department of Energy
P.O. Box 1663, K490
Los Alamos, New Mexico 87545

RE: Discharge Permit DP-1793, Modification of Approval Conditions related to Workplan #2, DP-1793

Dear Ms. Dorries and Mr. Hintze:

On September 3, 2015, the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) received a workplan for land application of treated groundwater from Mortandad and Sandia Canyons, as required by Condition #3 of DP-1793, for activities regulated under this Discharge Permit.

The workplan, as submitted, was approved on October 14, 2015 with the following modification:

- Spray application of treated groundwater will be suspended a minimum of 100 feet from boundaries of Solid Waste Management Units (SWMU), NPDES Outfalls, Areas of Concern (AOC) identified in the 2005 NMED Order on Consent, drinking water wells, surface impoundments and surface drainage areas, or other areas that are not appropriate as identified in Condition #4 of the permit.

Following a site inspection performed by GWQB staff to observe the spray application process, this condition is hereby modified:

- Spray application of treated groundwater will be suspended a minimum of 20 feet from boundaries of Solid Waste Management Units (SWMU), NPDES Outfalls, Areas of

Allison Dorries and Douglas E. Hintze

October 29, 2015

Page 2 of 2

Concern (AOC) identified in the 2005 NMED Order on Consent, drinking water wells, surface impoundments and surface drainage areas, or other areas that are not appropriate as identified in Condition #4 of the permit.

DOE/LANS has demonstrated sufficient control over the spray application process to ensure that the revised distance of 20 feet is an adequately protective buffer to prevent over spray into the SWMU, NPDES Outfalls, AOCs, drinking water wells, surface impoundments and other areas that are not appropriate. Other conditions stipulated in the workplan approval letter from NMED to DOE/LANS dated October 14, 2015 remain in place.

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

Sincerely,



Michelle Hunter, Chief
Ground Water Quality Bureau

MH:SMH

CC: James Hogan, NMED/SWQB (E-file)
John E. Kieling, NMED/HWB (E-file)
Stephen Yanicak, NMED/DOE/OB (E-file)
Gene Turner, NA-LA (E-file)
Bob Beers, EM-LA (E-file)

ENCLOSURE 2

Work Plan #2 Discharge Report, DP-1793

EPC-DO-16-041

LA-UR-16-20743

U1501760

Date: FEB 22 2016



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

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

Date: JAN 20 2016
Symbol: ENV-DO-16-006
LA-UR: 15-29664
Locates Action No.: U1501760

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

Dear Ms. Hunter:

**Subject: Work Plan #2 Discharge Report, Land Application of Treated Groundwater
from Aquifer Testing at Pilot Pumping Well CrEX-1, DP-1793**

The U.S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS) are in receipt of your October 8 and October 29, 2015, letters (**Enclosure 1**) granting approval of Work Plan #2—under Discharge Permit DP-1793—for the discharge of treated groundwater from aquifer testing at pilot pumping well CrEX-1. Condition No.8 of Discharge Permit DP-1793 and the above-referenced October 8, 2015, approval letter require that DOE/LANS submit a discharge report to the New Mexico Environment Department (NMED) within 60 days of the final cessation of discharge. The following information is required in the discharge report:

- 1. The total volume of groundwater discharged;*
- 2. The estimated average application rate for the period of discharge;*
- 3. Analytical results from samples collected under the water quality sampling plan;*
- 4. Analytical reports for the samples collected under the water quality sampling plan;*
- 5. A map identifying the locations of discharge; and*

Ms. Michelle Hunter
ENV-DO-16-006

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6. *Photographs including documentation of signs denoting the beginning and end of each land application unit.*

Each of the above requirements is addressed in this letter and the enclosures.

Requirement No. 1: *The total volume of groundwater discharged.*

Table 1 below provides the total volume of groundwater discharge in 2015 under Work Plan #2.

Table 1. Volume of treated groundwater discharged under Work Plan #2 in 2015.

Well	Discharge Start Date	Discharge End Date	# of Days of Active Discharge	Total Volume (gal.)
Legacy water**	10/20/2015	10/29/2015	4	233,487
CrEX-1	11/2/2015	11/23/2015	16	1,549,505
Total Volume of Discharge				1,782,992

**Legacy water is treated groundwater from Chromium Project wells for the following activities: development, aquifer testing, and well purging during sampling.

Requirement No. 2: *An estimated average application rate for the period of discharge.*

The average land application rate over the 20 days of active discharge was approximately 89,150 gallons per day.

Requirement No. 3: *Analytical results from samples collected under the water quality sampling plan.*

Analytical results from samples collected under Work Plan #2 are summarized in **Enclosure 2**. No results for nitrate-nitrogen (NO₃-N) or chromium (Cr) exceeded the land application limits of 9 mg/L and 45 µg/L, respectively.

Requirement No. 4: *Analytical reports for the samples collected under the water quality sampling plan.*

Enclosure 3 (CD) provides copies of the complete analytical reports from GEL Laboratories LLC.

Requirement No. 5: *A map identifying the locations of discharge.*

Enclosure 4 provides a map showing the seven approved land application zones in Mortandad Canyon. Three of the seven zones—1, 5 and 7—received discharges of treated groundwater under Work Plan #2. The remaining four zones—2, 3, 4 and 6—were not used.

Requirement No. 6: *Photographs including documentation of signs denoting the beginning and end of each land application unit.*

Enclosure 5 provides photographs of the signage at land application zones 1 and 5, the two truck application zones used under Work Plan #2. No signs were posted at Zone 7, the other zone receiving treated groundwater, because application was by fixed irrigation sprinklers.

Ms. Michelle Hunter
ENV-DO-16-006

- 3 -

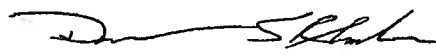
Please contact Robert S. Beers by telephone at (505) 667-7969 or by email at bbeers@lanl.gov if you have questions regarding this information.

Sincerely,



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

Sincerely,



David S. Rhodes
Supervisor, Soil & Groundwater Remediation
Environmental Management
Los Alamos Field Office
U.S. Department of Energy

JPM:DSR:RSB/lm

Enclosures:

- (1) NMED letters dated October 8 and October 29, 2015, approving Work Plan #2
- (2) Work Plan #2 analytical results summary table
- (3) CD containing analytical reports from GEL Laboratories LLC (Upon request)
- (4) Map showing land application zones receiving treated groundwater under Work Plan #2
- (5) Photographs of land application zone signs

Cy: James Hogan, NMED/SWQB, Santa Fe, NM, (E-File)
John E. Kieling, NMED/HWB, Santa Fe, NM, (E-File)
Steven M. Yanicak, NMED/DOE/OB, (E-File)
Jordan Arnsward, LASO-NS-PI, (E-File)
Cheryl L. Rodriguez, EM-LA, (E-File)
Brian T. Hennessey, EM-LA, (E-File)
Kirsten M. Laskey, EM-LA, (E-File)
Craig S. Leasure, PADOPS, (E-File)
Amy E. De Palma, PADOPS, (E-File)
Michael T. Brandt, ADESH, (E-File)
Raeanna Sharp-Geiger, ADESH, (E-File)
Randall Mark Erickson, ADEP, (E-File)
Enrique Torres, ADEP, (E-File)
Bruce Robinson, ADEP-PDO, (E-File)
Alison M. Dorries, ENV-DO, (E-File)
Stephani F. Swickley, ADEP-PDO, (E-File)
Danny Katzman, ADEP-PDO, (E-File)
Alan S. MacGregor, ER-ES, (E-File)
Gerald F. Fordham, ES-EPD, (E-File)
Michael T. Saladen, ENV-CP, (E-File)
Robert S. Beers, ENV-CP, (E-File)
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env-correspondence@lanl.gov, (E-File)
emla.docs@em.doe.gov, (E-File)

ENCLOSURE 1

**NMED letters dated October 8 and October 29, 2015,
approving Work Plan #2**

ENV-DO-16-006

LA-UR-15-29664

U1501760

Date: JAN 20 2016

EPC-DO-16-041
ENV-DO-16-008



SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

ENCLOSURE 2
ENCLOSURE 1

**NEW MEXICO
ENVIRONMENT DEPARTMENT**

Harold Runnels Building
1190 South St. Francis Drive (87505)
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Phone (505) 827-2900 Fax (505) 827-2965
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LA-UR-16-20743
LA-UR-15-29664



RYAN FLYNN
Cabinet Secretary

BUTCH TONGATE
Deputy Secretary

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

October 8, 2015

Allison Dorries, Division Leader
Environmental Protection Division
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Los Alamos, New Mexico 87545

Douglas E. Hintze, Manager
Environmental Management
Los Alamos Field Office
U.S. Department of Energy
P.O. Box 1663, K490
Los Alamos, New Mexico 87545

RE: Discharge Permit DP-1793, Approval of Workplan #2 for Treatment and Land Application of Groundwater - Los Alamos National Laboratory

Dear Ms. Dorries and Mr. Hintze:

On September 3, 2015 the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) received a workplan for land application of treated groundwater from Mortandad and Sandia Canyons, as required by Condition #3 of DP-1793, for activities regulated under this Discharge Permit.

The workplan proposes treatment and land application of groundwater derived from pumping at an extraction well (CrEX-1), new monitor well and piezometer development, and routine purging and sampling of groundwater. The proposed discharge will be completed prior to December 31, 2015, or at such time as conditions specified within the permit can no longer be met.

The workplan, as submitted, is approved with the following modifications:

- Spray application of treated groundwater will be suspended a minimum of 100 feet from boundaries of Solid Waste Management Units (SWMU), NPDES Outfalls, Areas of Concern (AOC) identified in the 2005 NMED Order on Consent, drinking water wells,

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October 8, 2015

Page 2 of 3

surface impoundments and surface drainage areas, or other areas that are not appropriate as identified in Condition #4 of the permit.

- Analysis of groundwater and treated groundwater shall be for dissolved chromium rather than total chromium as specified in the workplan; and
- Monitoring Wells MCO-12, MCA-9 and MCO-9 will be added to the list of monitoring wells to be sampled under the Facility-Wide Groundwater Monitoring Program as listed in Enclosure 4.

Within 60 days of cessation of the discharge, DOE/LANS will submit a Discharge Report documenting the total volume of water discharged, estimated average application rate, analytical reports for the samples collected under the water quality sampling plan, a map identifying the locations of discharge, and photographs including documentation of signs denoting the beginning and end of each land-application unit.

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

Sincerely,



Michelle Hunter, Chief
Ground Water Quality Bureau

MH:SMH

CC: James Hogan, NMED/SWQB (E-file)
John E. Kielsing, NMED/HWB (E-file)
Stephen Yanicak, NMED/DOE/OB (E-file)
Gene Turner, NA-LA (E-file)
Bob Beers, EM-LA (E-file)

CR000010



SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

**NEW MEXICO
ENVIRONMENT DEPARTMENT**

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Allison Dorries and Douglas E. Hintze
October 29, 2015
Page 2 of 2

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Gene Turner, NA-LA (E-file)
Bob Beers, EM-LA (E-file)

ENCLOSURE 2

Work Plan #2 analytical results summary table

ENV-DO-16-006

LA-UR-15-29664

U1501760

Date: **JAN 20 2016**

Sample	Collection Date	Fid Prep	Method	Analyte	Detect Flag	Result	Units	Lab Qualifier Code	Validation Qualifier Code	Validation Reason Code	Lab	MDL	PQL
VSCTU6-16-106550	11/02/15	F	SW-846:6020	Cr	N	2	ug/L	U	U	U_LAB	GELC	2	10
VSCTU6-16-106550	11/02/15	F	EPA:353.2	NO3+NO2-N	Y	1.94	mg/L		NQ	NQ	GELC	0.085	0.25
VSCTU6-16-106542	11/05/15	F	SW-846:6020	Cr	N	2	ug/L	U	U	U_LAB	GELC	2	10
VSCTU6-16-106542	11/05/15	F	EPA:353.2	NO3+NO2-N	Y	2	mg/L		NQ	NQ	GELC	0.085	0.25
VSCTU6-16-106549	11/09/15	F	SW-846:6020	Cr	N	2	ug/L	U	U	U_LAB	GELC	2	10
VSCTU6-16-106549	11/09/15	F	EPA:353.2	NO3+NO2-N	Y	3.89	mg/L		NQ	NQ	GELC	0.085	0.25
VSCTU6-16-106546	11/12/15	F	SW-846:6020	Cr	N	2	ug/L	U	U	U_LAB	GELC	2	10
VSCTU6-16-106546	11/12/15	F	EPA:353.2	NO3+NO2-N	Y	2.8	mg/L		NQ	NQ	GELC	0.085	0.25
VSCTU6-16-106545	11/16/15	F	SW-846:6020	Cr	N	2	ug/L	U	U	U_LAB	GELC	2	10
VSCTU6-16-106545	11/16/15	F	EPA:353.2	NO3+NO2-N	Y	2.51	mg/L		NQ	NQ	GELC	0.085	0.25
VSCTU6-16-106548	11/18/15	F	SW-846:6020	Cr	N	2	ug/L	U	U	U_LAB	GELC	2	10
VSCTU6-16-106548	11/18/15	F	EPA:353.2	NO3+NO2-N	Y	2.56	mg/L		NQ	NQ	GELC	0.17	0.5

Notes:

F means the sample was filtered

Y means the analyte was not detected

N means the analyte was detected.

U means that the analyte is classified as not detected.

NQ means that no validation qualifier flag is associated with this result, and the analyte is classified as detected.

U_LAB means the analytical laboratory qualified the analyte as not detected.



ENCLOSURE 3

**CD containing analytical reports from
GEL Laboratories LLC**

ENV-DO-16-006

LA-UR-15-29664

U1501760

Date: JAN 20 2016

ENCLOSURE 4

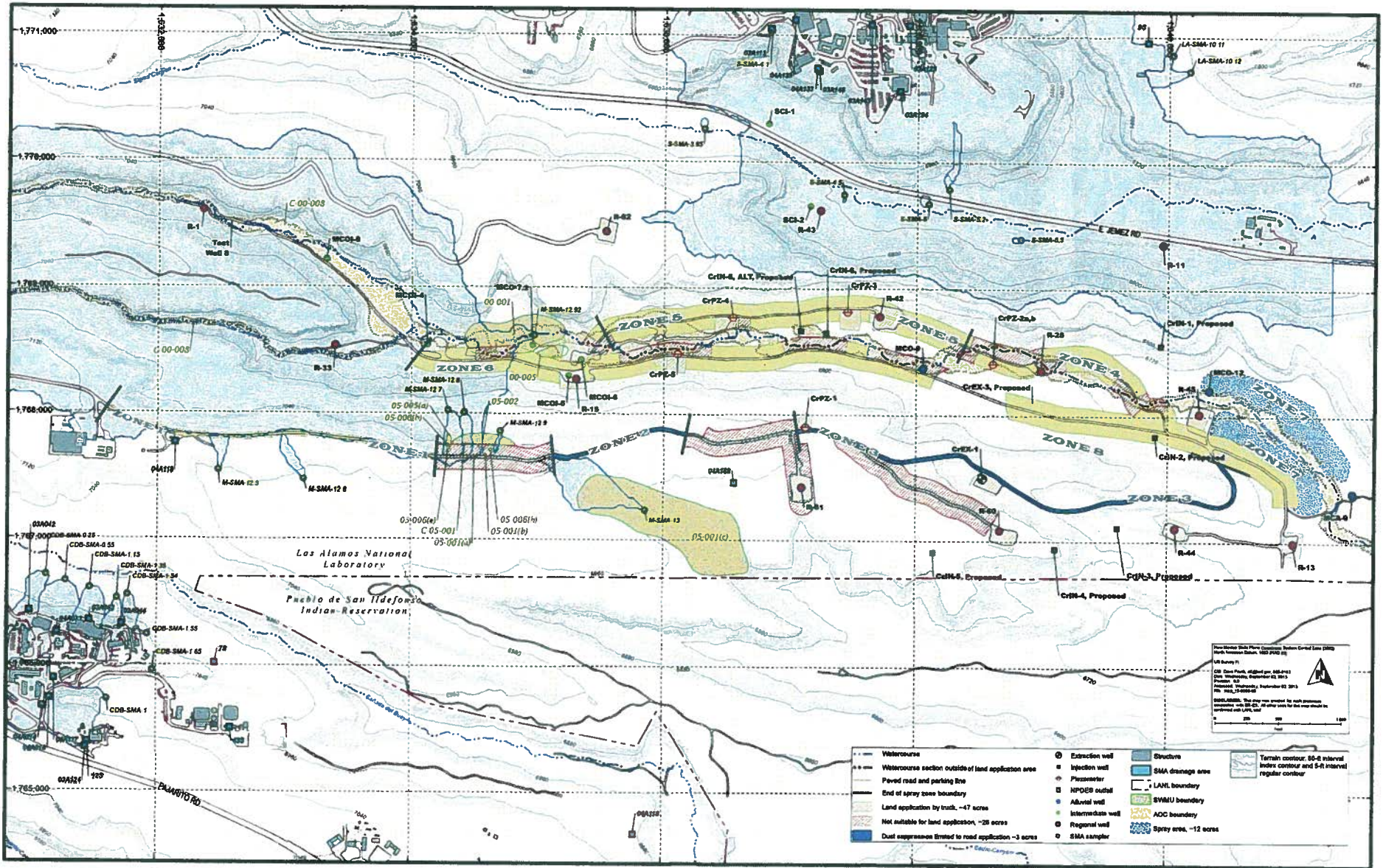
**Map showing land application zones receiving
treated groundwater under Work Plan #2**

ENV-DO-16-006

LA-UR-15-29664

U1501760

Date: JAN 20 2016



ENCLOSURE 5

Photographs of land application zones signs

ENV-DO-16-006

LA-UR-15-29664

U1501760

Date: JAN 20 2016

Photograph 1. Signage identifying the beginning of Zone 1, an approved land application area.



Photograph 2. Signage identifying the end of Zone 1 and the beginning of 'no spray' area.



ENV-DO-16-006

ENCLOSURE 5

LA-UR-15-29664

Photograph 3. Signage identifying the beginning of Zone 5, an approved land application area.



Photograph 4. Signage identifying the end of Zone 5 and the beginning of a 'no spray' area.

