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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

GROUND WATER
JAN 21 2016
BUREAU

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*



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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*

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.

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)
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Michael T. Brandt, ADESH, (E-File)
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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)
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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



SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

ENCLOSURE 1
NEW MEXICO

ENVIRONMENT DEPARTMENT

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RYAN FLYNN
Cabinet Secretary

BUTCH TONGATE
Deputy Secretary

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

October 8, 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, 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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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)

ORIGINAL



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Cabinet Secretary

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CERTIFIED MAIL – RETURN RECEIPT REQUESTED

October 29, 2015

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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. Kielling, 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 analytical results summary table

ENV-DO-16-006

LA-UR-15-29664

U1501760

Date: JAN 20 2016

Sample	Collection Date	Fld 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.



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.

