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Title:	NMED Correspondence Related to Notice of Intent for Chromium Project
Author(s):	Martinez, Ellena Isabel
Intended for:	Incoming Correspondence from NMED related to Chromium Project (total of 5) requested by EM Transition Team for N3B.
Issued:	2018-02-14

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February 20, 2017

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Cheryl L. Rodriguez
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Environmental Management
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3747 West Jemez Road
Los Alamos, NM 87544

RE: Response to Notice of Intent to Discharge; DP-1835; Los Alamos National Laboratory

Dear Mr. Bretzke and Ms. Rodriguez,

On January 19, 2017, the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) received a Notice of Intent to Discharge (NOI) from the U.S. Department of Energy and Los Alamos National Security (DOE/LANS) requesting to discharge multiple nonreactive tracers to the regional aquifer surrounding Mortandad Canyon using six Underground Injection Control (UIC) wells that are permitted by NMED groundwater discharge permit DP-1835. The NOI satisfies the requirements of 20.6.2.1201.A NMAC of the Ground and Surface Water Protection Regulations (20.6.2 NMAC).

The proposed discharge is located approximately three miles southeast of Los Alamos in Sections 24 and 25, Township 19N, Range 06E, Los Alamos County, NM. Groundwater most likely to be affected lies in a regional aquifer from 900-1100 feet below ground surface and has a total dissolved solids concentration of approximately 150 milligrams per liter.

The NOI describes the tracer study as a means of evaluating the fate and transport of treated water that is injected to the regional aquifer via six UIC wells (CrIN 1-6) near the periphery of the hexavalent chromium (CrVI) plume beneath Mortandad Canyon. The information gained from the study is designed to support the assessment of the impacts of treated-water injection on movement of the Cr(VI) plume and of potential remedial alternatives for the Cr(VI) contaminated groundwater plume.

The tracers to be injected include six different naphthalene sulfonates, to be injected into CrIN 1-6 as follows:

CrIN-1: Disodium 2,7-Naphthalenedisulfonate (Na-2,7 NDS)

CrIN-2: Disodium 2,6-Naphthalenedisulfonate (Na-2,6 NDS)
CrIN-3: Trisodium 1,3,6-Napthalenetrisulfonate (Na-1,3,6 NTS)
CrIN-4: Disodium 1,5-Naphthalenedisulfonate (Na-1,5 NDS)
CrIN-5: Disodium 1,6-Naphthalenedisulfonate (Na-1,6 NDS)
CrIN-6: Sodium 1-Napthalenesulfonate

Two methods of injection using a solution containing 50 kilograms (kg) of tracer are proposed for each well. Half of the tracer (25 kg) may be mixed with 3,000 gallons of potable water and delivered into a scheduled injection stream of treated groundwater as permitted in DP-1835 over a five to seven-hour period. This procedure would then be repeated on a consecutive second day. Alternatively, 5 kg of tracer may be added to each of ten 3,000-gallon tanks for a total of 30,000 gallons of tracer solution that may be injected independently of other injection flow over a period of up to five days.

The permittees request that the types and masses of tracers that may be utilized per each injection well remain flexible enough to allow for one or more of the naphthalene sulfonate tracers to be substituted with a different naphthalene sulfonate. This need for flexibility is due to the availability of the tracers and any tracer listed that is designated for a given CrIN well may be interchanged with a tracer that is designated for another CrIN well, pending final NMED approval. The permittees are not allowed to introduce any new tracers and will submit a final work plan prior to each injection for each CrIN well.

The information provided indicates it is unlikely that the discharge will adversely affect groundwater quality, and NMED has determined that an amendment or modification to DP-1835 is not required so long as the discharge is conducted as described. You are not relieved of liability should this operation result in actual pollution of ground or surface waters. Further, this decision by NMED does not relieve you of your responsibility to comply with any other applicable federal, state, and/or local laws and regulations, zoning requirements, plumbing codes, and nuisance ordinances.

If at some time in the future you intend to change the amount, character, or location of your discharge, or if observation or monitoring shows that the discharge is not as described in your NOI, you must file a revised NOI with the Ground Water Quality Bureau. If you have any questions, please contact Greg Huey of the GWQB Pollution Prevention Section at (505) 827-6891.

Sincerely,

Michelle Hunter, Chief
Ground Water Quality Bureau

MH:gmh

cc: John Kieling, NMED/HWB
Shelly Lemon, NMED/SWQB

Susan Lucas Kamat, NMED/DOEOB
Bob Beers, DOE/LANS (bbeers@LANL.gov)
Danny Katzman, DOE/LANS (katzman@LANL.gov)

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CERTIFIED MAIL – RETURN RECEIPT REQUESTED

March 31, 2017

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RE: Response to Notice of Intent to Discharge; DP-1835; Los Alamos National Laboratory

Dear Mr. Bretzke and Ms. Rodriguez,

On March 16, 2017, the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) received a Notice of Intent to Discharge (NOI) from the U.S. Department of Energy and Los Alamos National Security (DOE/LANS). DOE/LANS requests authorization to discharge nonreactive tracers to the regional aquifer surrounding Mortandad Canyon using existing piezometer CrPZ-1 (permitted groundwater monitoring point for discharge permit DP-1835). The NOI satisfies the requirements of 20.6.2.1201.A NMAC of the Ground and Surface Water Protection Regulations (20.6.2 NMAC).

The proposed discharge is located approximately three miles southeast of Los Alamos in Sections 24 and 25, Township 19N, Range 06E, Los Alamos County, NM. Groundwater most likely to be affected lies in a regional aquifer from 900-1100 feet below ground surface and has a total dissolved solids concentration of approximately 150 milligrams per liter.

The NOI describes the tracer study as a means of evaluating groundwater flow velocities near the periphery of the hexavalent chromium (CrVI) plume beneath Mortandad Canyon, and assessing potential remedial alternatives for the Cr(VI) contaminated groundwater plume.

The tracers to be injected will be Disodium 2,6-Naphthalenedisulfonate (Na-2,6 NDS) and/or Disodium 1,5-Naphthalenedisulfonate (Na-1,5 NDS). A series of four injections is planned, each using a solution containing two grams of tracer mixed with 50 gallons of potable water. After concentrations of each previous injections have declined sufficiently, the subsequent injection will be initiated until the series is complete.

The permittees are not allowed to introduce any new tracers and will submit a final work plan upon completion of the study.

The information provided indicates it is unlikely that the discharge will adversely affect groundwater quality, and NMED has determined that an amendment or modification to DP-1835 is not required so long as the discharge is conducted as described. You are not relieved of liability should this operation result in actual pollution of ground or surface waters. Further, this decision by NMED does not relieve you of your responsibility to comply with any other applicable federal, state, or local laws, regulations, zoning requirements, plumbing codes, and nuisance ordinances.

If at some time in the future you intend to change the amount, character, or location of your discharge, or if observation or monitoring shows that the discharge is not as described in your NOI, you must file a revised NOI with the Ground Water Quality Bureau. If you have any questions, please contact Stephen Pullen of the GWQB Pollution Prevention Section at (505) 827-2962.

Sincerely,

Michelle Hunter, Chief
Ground Water Quality Bureau

MH:gmh

cc: John Kieling, NMED/HWB
Shelly Lemon, NMED/SWQB
Susan Lucas Kamat, NMED/DOEOB
Bob Beers, DOE/LANS (bbeers@LANL.gov)
Danny Katzman, DOE/LANS (katzman@LANL.gov)

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July 18, 2017

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Arturo Q. Duran, Permitting Manager
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Los Alamos, NM 87544

RE: Response to Notice of Intent to Discharge; Discharge Permit Not Required for Los Alamos National Laboratory Pilot Scale Sodium Dithionite Amendment Study in Regional Aquifer Monitoring Well R-42, AI:856 PRD20170003

Dear Mr. Bretzke and Mr. Duran:

On May 22, 2017, the New Mexico Environment Department (NMED) Ground Water Quality Bureau received a Notice of Intent to Discharge (NOI) from the U.S. Department of Energy and Los Alamos National Security (DOE/LANS) for a pilot study involving the injection of sodium dithionite, sodium sulfate, and sodium bromide into a regional aquifer groundwater monitoring well. The proposed discharge is located at regional groundwater monitoring well, R-42, located in Los Alamos National Laboratory (LANL) Technical Area 05 (TA-05) in Section 24, Township 19N, Range 6E, Los Alamos County. Groundwater beneath the site is at a depth of approximately 900 feet.

The NOI satisfies the requirements of Subsection B of 20.6.2.1201 NMAC, Ground and Surface Water Protection regulations, (20.6.2 NMAC).

The proposed discharge is briefly described as follows.

> A sodium dithionite and sodium sulfate solution with a sodium bromide tracer will be injected into the regional aquifer beneath Mortandad Canyon via monitoring well R-42 during a pilot amendment study designed to evaluate the potential use of sodium dithionite as a chemical reductant to reduce hexavalent chromium (Cr(VI)) to trivalent chromium (Cr(III)).

Approximately 9,000 gallons of untreated groundwater from monitoring well R-42 containing the following compounds will injected back into monitoring well R-42 via tremie during a single deployment.

Compound	Quantity	Purpose
Sodium Dithionite	300 kg	Chemical reductant
Sodium Sulfite	250 kg	Stabilization of sodium dithionite prior to and during injection
Sodium Bromide	5 kg	Tracer to quantify the recovery of the injected water

Following the injection of the amendments, 1,000-1,500 gallons of potable water from the Los Alamos County Water Supply System will be used as chase water.

Phase 1 continuous pumping of monitoring well R-42 will commence 2-3 days following the injection activities. During Phase 1 pumping, it is expected that 40,000 gallons of groundwater will be pumped and byproducts from the degradation of sodium dithionite will be recovered. Groundwater recovered during Phase 1 pumping will be collected in storage tanks and sampled for iron, manganese, sulfate, Cr(VI), nitrate, arsenic, and total dissolved solids. If analytical results exceed standards listed in 20.6.2.3103 NMAC, water will be shipped offsite for disposal at a permitted facility.

Following Phase 1 pumping, it is expected that the concentrations of iron, manganese, arsenic, sulfate, Cr(VI), and TDS will be below the standards listed in 20.6.3103 NMAC and Phase 2 pumping of monitoring well R-42 will begin. Phase 2 pumping will be continuous and is intended to closely monitor the treatment effects of the amendments and to determine when concentrations of nitrate and Cr(VI) return to pre-treatment concentrations. Phase 2 pumping is expected to last months to a year.

Groundwater pumped from monitoring well R-42 meeting the standards listed in 20.6.3103 NMAC will be managed under the Land Application Decision Tree approved by NMED on December 2, 2016.

Based on the information provided in your Notice of Intent, NMED has determined that a Discharge Permit is not required as long as the discharge is as described and the following requirements are met.

- No amendments outside of those described in this letter shall be injected into monitoring well R-42 during this pilot study.
- Copies of quarterly reports prepared for the NMED Hazardous Waste Bureau and a final report shall be submitted to the GWQB following completion of the pilot study. The reports should include monitoring results and interpretation of the results.

- Prior to and during the pilot study, groundwater sampling for iron, manganese, and arsenic shall be performed in the treated water from extraction wells CrEX-1, CrEX-2, and CrEX-3. Results shall be included in quarterly monitoring reports required by Discharge Permit, DP-1835.

A Discharge Permit is not required at this time because the information provided indicates it is unlikely that the discharge will adversely affect ground water quality.

Although a Discharge Permit is not being required for this pilot study at this time, you are not relieved of liability should your operation result in actual pollution of surface or ground waters. Further, this decision by NMED does not relieve you of your responsibility to comply with any other applicable federal, state, and/or local laws and regulations, zoning requirements, plumbing codes, and nuisance ordinances.

If at some time in the future you intend to change the amount, character or location of your discharge, or if observation or monitoring shows that the discharge is not as described in your Notice of Intent, you must file a revised Notice of Intent with the Ground Water Quality Bureau.

If you have any questions, please contact Steve Pullen at (505) 827-2962.

Sincerely,

Michelle Hunter, Chief
Ground Water Quality Bureau

MH:KH

cc: Steve Pullen, NMED/GWQB
Shelly Lemon, NMED/SWQB
John E. Kieling, NMEDHWB
Susan Lucas Kamat, NMED/DOEOB
Stephen M. Yanicak, NMED/DOEOB
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June 27, 2017

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Los Alamos, NM 87544

RE: Response to Notice of Intent to Discharge; Discharge Permit Not Required for Los Alamos National Laboratory Pilot Scale Molasses Amendment Study in Regional Aquifer Monitoring Well R-28, AI:856 PRD20170003

Dear Mr. Bretzke and Mr. Duran:

On May 22, 2017, the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) received a Notice of Intent to Discharge (NOI) from the U.S. Department of Energy and Los Alamos National Security (DOE/LANS) for a pilot study involving the injection of a molasses solution containing sodium bromide into a regional aquifer groundwater monitoring well. The proposed discharge is located at regional groundwater monitoring well, R-28, located in Los Alamos National Laboratory (LANL) Technical Area 05 (TA-05) in Section 24, Township 19N, Range 6E, Los Alamos County. Groundwater beneath the site is at a depth of approximately 900 feet.

The NOI satisfies the requirements of Subsection B of 20.6.2.1201 NMAC, Ground and Surface Water Protection regulations (20.6.2 NMAC).

The proposed discharge is briefly described as follows.

> A molasses solution with a conservative, innocuous sodium bromide tracer will be injected into the regional aquifer beneath Mortandad Canyon via monitoring well R-28 during a pilot amendment study designed to evaluate the potential use of molasses as a biostimulant to reduce hexavalent chromium to trivalent chromium.
>
> Five thousand gallons of solution containing 20% food-grade molasses in untreated groundwater from R-28, 10 kilograms of sodium bromide, and 25,000 gallons of untreated

If you have any questions, please contact Kathryn Hayden at (505) 827-1046.

Sincerely,

Michelle Hunter, Chief
Ground Water Quality Bureau

MH:KH

cc: Steve Pullen, NMED/GWQB
Shelly Lemon, NMED/SWQB
John E. Kieling, NMEDHWB
Susan Lucas Kamat, NMED/DOEOB
Stephen M. Yanicak, NMED/DOEOB
Bob Beers, DOE/LANS (bbeers@LANL.gov)
Stephani F. Swickley, DOE/LANS (sfuller@LANL.gov)

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Sent Via Electronic Mail

June 30, 2017

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aduran@doeal.gov

RE: Response to Notice of Intent to Discharge; Discharge Permit Not Required for Los Alamos National Laboratory to Land Apply Drilling Water from Regional Aquifer Wells and Piezometers; AI:856, PRD20170005

Dear Mr. Bretzke and Mr. Duran:

On May 31, 2017, the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) received a Notice of Intent to Discharge (NOI) from the U.S. Department of Energy and Los Alamos National Security (DOE/LANS) to land apply drilling water from the construction of regional aquifer wells and piezometers at Los Alamos National Laboratory (LANL). The location of the proposed discharge is the mesa-top dirt road in Technical Area (TA)-60 in Township 19N, Range 6E, Section 22, Los Alamos County. Groundwater beneath the site is approximately 1150 feet below ground surface.

The NOI satisfies the requirements of Subsection B of 20.6.2.1201 NMAC, of the Ground and Surface Water Protection regulations (20.6.2 NMAC).

The proposed discharge is briefly described as follows.

A one-time discharge of approximately 450,000 gallons of water from well drilling activities, composed of potable water, groundwater from the regional aquifer, foaming agents used to enhance the removal of drill cutting, and a borehole stabilizer will occur on the mesa-top dirt road in TA-60. The drilling water is associated with a network of 14

groundwater wells in Mortandad Canyon, including extraction wells (CrEX-1, CrEX-2, CrEX-3), injection wells (CrIN-1, CrIN-2, CrIN-3, CrIN-4, CrIN-5, CrIN-6), and piezometers (CrPZ-1, CrPZ-2, CrPZ-3, CrPZ-4, CrPZ-5). The drilling water has been accumulated in synthetically-lined drilling pits for varying lengths of time awaiting unsuccessful evaporation.

Incorporated into the drilling water are the foaming agents Baroid QUIK-FOAM® High Performance Foaming Agent and Baroid AQF-2™ Foaming Agent, and the borehole stabilizer Baroid EZ-MUD® Liquid Polymer Emulsion. These agents are used in air drilling to enhance the removal of drill cuttings from the borehole and to stabilize the borehole.

Chemical analysis of the accumulated drilling water shows that three groundwater contaminants exceed their respective 20.6.2.3103 NMAC Ground and Surface Water Protection regulations standards, including; total dissolved solids (TDS), iron, and manganese. Chromium and nitrate concentrations in the drilling water measure below their respective standards.

According to DOE/LANS, iron and manganese are naturally occurring constituents of the fine-grained materials of the geologic formation that remain in suspension in the drilling water. Organic material in the drilling foam may be stimulating microbial activity causing oxygen reducing conditions in the water. Reducing conditions are known to liberate naturally occurring constitutes including iron and manganese, and are known to lower concentrations of other constituents including chromium and nitrate.

The drilling water will be land-applied to a dirt road on the TA-60 mesa-top as a dust suppressant usingwater trucks with sprayers. Application will be restricted to the road bed and will not include the road shoulders. DOE/LANS will ensure land application is managed such that no runoff or ponding will occur; there will be no land application during precipitation events; watercourses, areas of concern (AOCs), solid waste management units (SWMUs), and cultural sites will be avoided; and there will be no application to land with slopes greater than 5%.

Based on the information provided in your NOI, NMED has determined that a Discharge Permit is not required as long as the discharge occurs as is described in the NOI and the following requirement is met.

DOE/LANS shall evaluate the discharge's impact to soils by collecting and analyzing three representative samples of the soil both before and after the land application of the drilling water. Samples shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-certified analytical laboratory for those constituents in Table 1 of the NOI and the semi-volatile organic compounds listed in U.S. Environmental Protection Agency Method 8270. DOE/LANS shall provide a letter report to NMED describing this evaluation within ninety days of the final land application date.

A Discharge Permit is not required at this time because the information provided indicates it is unlikely that the discharge will adversely affect ground water quality.

State surface water quality standards in 20.6.4 NMAC, including general criteria for toxic pollutants, must be met at all times and violations of these standards are enforced by the New Mexico Environment Department under authority of the New Mexico Water Quality Act. Upon NMED's recommendation, DOE/LANS selected an on-site land application site, *i.e.*, a dirt road on Sigma Mesa, as protective of surface water as possible. The potential of stormwater runoff carrying discharge constituents to a surface water coarse was not described in the NOI.

Although a Discharge Permit is not being required for this one-time discharge at this time, you are not relieved of liability should your operation result in actual pollution of surface or ground waters. Further, this decision by NMED does not relieve you of your responsibility to comply with any other applicable federal, state, and/or local laws and regulations, zoning requirements, plumbing codes, and nuisance ordinances.

If at some time in the future you intend to change the amount, character or location of your discharge, or if observation or monitoring shows that the discharge is not as described in your Notice of Intent, you must file a revised Notice of Intent with the Ground Water Quality Bureau.

If you have any questions, please contact Steve Pullen at (505) 827-2962.

Sincerely,

Michelle Hunter, Chief
Ground Water Quality Bureau

MH:SP

cc: Kathryn Hayden, NMED/GWQB
Shelly Lemon, NMED/SWQB
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