

General



Environmental Protection Division  
Water Quality & RCRA (ENV-RCRA)  
P.O. Box 1663, Mail Stop K490  
Los Alamos, New Mexico 87545  
(505) 667-0666/FAX: (505) 667-5224

Date: October 9, 2007  
Refer To: ENV-RCRA-07-211

Mr. James Bearzi  
Hazardous Waste Bureau  
New Mexico Environment Department  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, NM 87505-6313

Mr. William C. Olson  
Ground Water Quality Bureau  
New Mexico Environment Department  
P.O. Box 26110  
Santa Fe, NM 87502-6110

**SUBJECT: NOTICE OF INTENT TO DISCHARGE AND RESPONSE TO  
COMMENTS: DECISION TREE FOR MANAGEMENT OF  
INVESTIGATION-DERIVED WASTE SOLIDS FROM DRILLING  
OPERATIONS**

Dear Mr. Bearzi and Mr. Olson:

This letter and its enclosures constitute a Notice of Intent to Discharge (NOI) pursuant to 20.6.2.1201 NMAC regarding Los Alamos National Laboratory's (LANL) proposed NOI decision tree for the management of investigation-derived waste (IDW) solids from drilling operations. In addition, this letter responds to comments sent by Jennifer Holman of your staff to Kelly VanDerpoel (LANL) concerning the NOI decision tree. The decision tree was originally submitted by LANL to NMED in a letter dated June 12, 2007 (ENV-RCRA: 07-139) and was received by NMED on June 20, 2007. Below is a list of enclosures contained within this letter.

- **Enclosure 1.** NOI Decision Tree for the Management of IDW Solids from the Construction of Wells and Boreholes.
- **Enclosure 2.** Ground Water Quality Bureau, Pollution Prevention Section, Notice of Intent to Discharge form.
- **Enclosure 3.** LANL's response to comments sent by Jennifer Holman (NMED) to Kelly VanDerpoel (LANL) on August 7 and 21, 2007 concerning the NOI decision tree.
- **Enclosure 4.** Copies of e-mails from Jennifer Holman to Kelly VanDerpoel (LANL) on August 7 and 21, 2007 concerning the NOI decision tree.
- **Enclosure 5.** A copy of ENV-RCRA-QP-113.1, *Developing DQOs for RCRA Characterization*, latest revision, found at the following link;  
<http://int.lanl.gov/orgs/env/rcra/docs/qa/ENV-RCRA-QP-113-R1.pdf>
- **Enclosure 6.** A copy of the Water Quality and RCRA Group's (ENV-RCRA) *Sampling and Analysis Plan*, latest revision, found at the following link;  
<http://int.lanl.gov/orgs/env/rcra/docs/qa/ENV-SWRC-QAPP-Sampling-R3.pdf>



This NOI is being submitted in response to a comment submitted by George Schuman, Ground Water Quality Bureau, concerning the “leaching from drill cuttings”. The Laboratory has reviewed the requirements specified in 20.6.2.3104 NMAC for discharge permit requirements, as applicable to leachate, and believes that the requirements do not apply to the IDW solids managed in accordance with the NOI decision tree, for the reasons described below.

- An exclusion from the discharge permit requirements is provided in 20.6.2.3105 (H) NMAC for leachate which results from the direct natural infiltration of precipitation through disturbed materials, unless the secretary determines that a hazard to public health may result. Because all free liquids will be removed from the IDW solids (NOI Decision Tree Box D6), the only water infiltration to the cuttings would be from precipitation. Although a definition of “disturbed material” is not available in 20.6.2.7 NMAC, it is reasonable to consider that the drill cuttings and disturbed native material from excavation of the drill pit constitute “disturbed material”.
- The evaluation process outlined in the NOI decision tree for IDW solids will not result in management of leachate as defined in the hazardous waste regulations. Leachate is defined in 20.4.1 NMAC 100, incorporating 40 CFR 260.10, as “any liquid, including suspended components in the liquid, that has percolated through or drained from hazardous waste”. The first level of screening for the drill cuttings is making a hazardous waste determination, as shown in Box D2. If the drill cuttings contain hazardous waste, they will not be land applied unless a “contained in” determination has been approved by NMED HWB, Box D5.
- Once the IDW solids have been determined not to contain hazardous waste, the second level of screening are the five criteria listed in Box D6. These criteria are intended to ensure that the cuttings do not contain other regulated wastes, and that any residual constituent concentrations in the cuttings meet residential SSLs, which is the most stringent standard for potential future land use. Additionally, any free liquids would be removed from the cuttings and managed under the approved NOI decision tree for drilling, development, rehabilitation, and purge water.
- Because the Laboratory makes every effort to perform drilling with minimal or no use of additives, only *de minimis* levels of insoluble additives would be expected to be present in the cuttings. The Laboratory typically mixes drilling additives with potable water for an application concentration of approximately 0.5% (e.g., 0.5 gal of QUIK-FOAM™ per 100 gal of potable water). Furthermore, the only additives that the Laboratory uses meet NSF/ANSI Standard 60, a standard for chemicals used in well-drilling products and for the treatment of drinking water. Drilling additives that meet this standard are approved for use in drinking water systems.

It is the Laboratory’s opinion that no discharge permit should be required for the land application of IDW solids meeting NOI decision tree criteria. The management of IDW solids under the NOI decision tree is both sufficiently rigorous in its characterization and conservative in its screening criteria that no leaching would be expected that would present a threat to groundwater quality.

October 9, 2007

We look forward to receiving your response to this NOI. If you have any questions or need additional information, please contact Bob Beers at (505) 667-7969 or Kelly VanDerpoel of my staff at (505) 667-2172.

Sincerely,



Anthony R. Grieggs  
Group Leader  
Water Quality & RCRA (ENV-RCRA) Group

ARG:KV/tag

Enclosures: a/s  
CDs are provided for NMED copies only

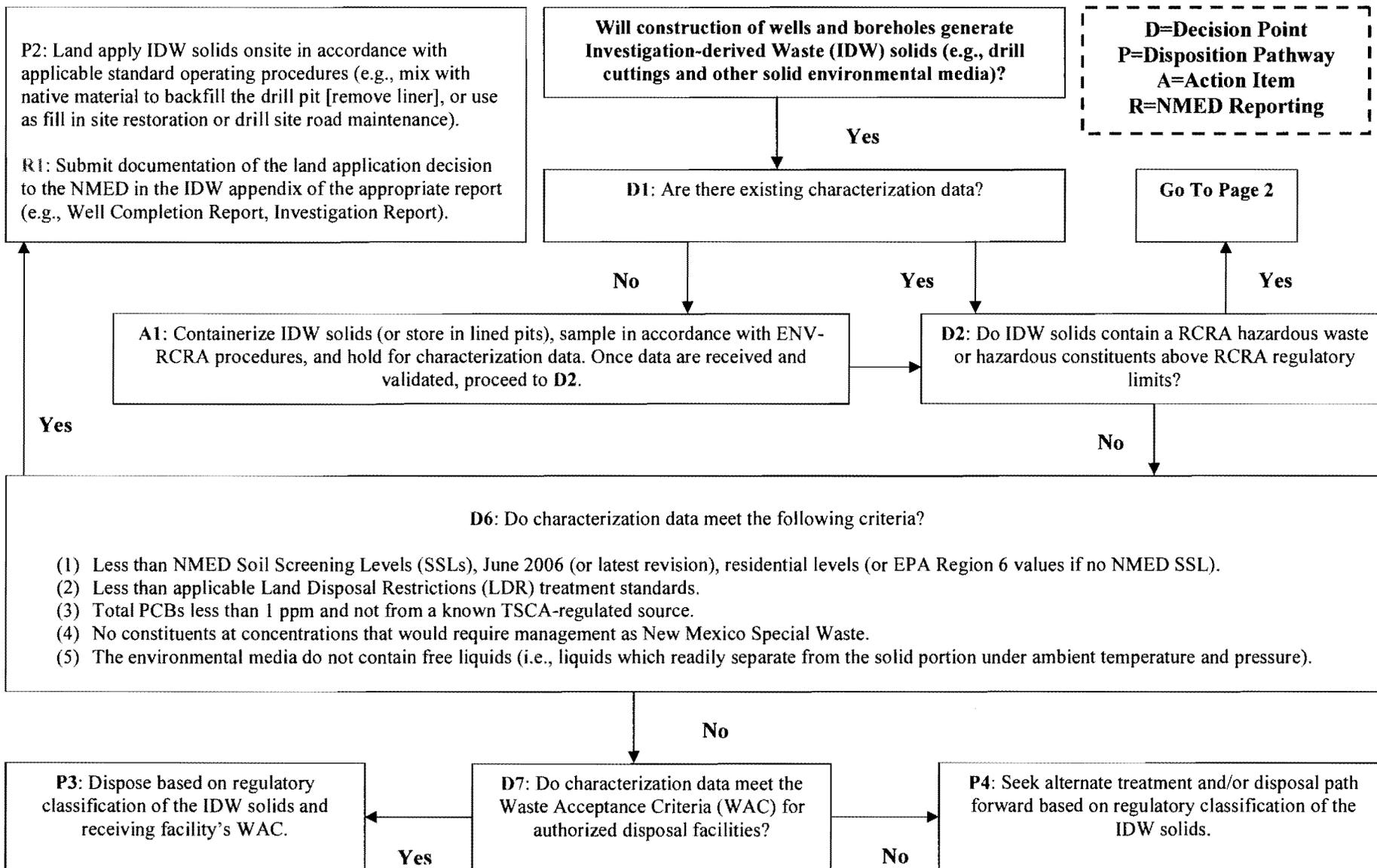
Cy: John Young, NMED/HWB, Santa Fe, NM, w/enc.  
David Cobrain, NMED/HWB, Santa Fe, NM, w/enc.  
Jennifer Holman, NMED/HWB, Santa Fe, NM, w/enc.  
George Schuman, NMED/GWQB, Santa Fe, NM, w/enc.  
Jake Knutson, NMED/GWQB, Santa Fe, NM, w/enc.  
Gene Turner, LASO/EO, w/enc., A316  
Michael B. Mallory, PADOPS, w/o enc., A102  
Richard S. Watkins, ADESHQ, w/o enc., K491  
Tori George, ENV-DO, w/enc., J978  
Mike Saladen, ENV-DO, w/enc., K490  
Kelly VanDerpoel, ENV-RCRA, w/enc., K490  
Bob Beers, ENV-RCRA, w/enc., K490  
Michael Alexander, ERSS-RS, w/enc., K497  
Mark Everett, ERSS-RS, w/enc., K497  
Matt Riggs, LWSP, w/enc., M992  
Tina Behr-Andres, LWSP, w/enc., M992  
Paul Huber, LWSP, w/enc., M992  
Water Stewardship Project File, w/enc., M992  
ENV-RCRA File, w/enc., K490  
IRM-RMMSO, w/enc., A150

# ENCLOSURE 1

*NOI Decision Tree*

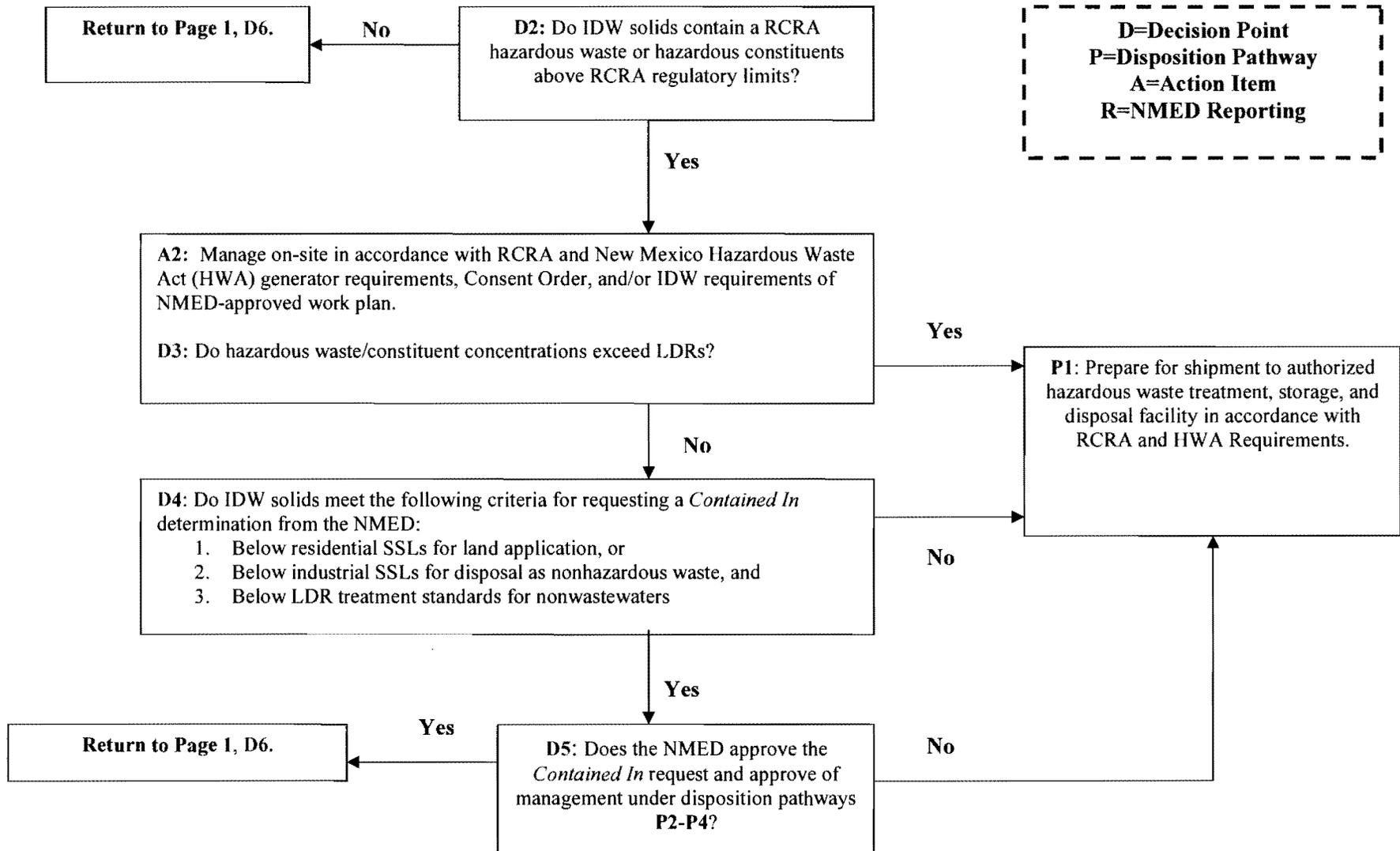
*Land Application of IDW Solids From Construction of Wells and Boreholes*

10/9/2007



ENCLOSURE 1

Land Application of IDW Solids From Construction of Wells and Boreholes





## ENCLOSURE 2

**1. Name and Address of person making discharge:**

Los Alamos National Laboratory  
Attn: Bob Beers  
P.O. Box 1663, Mail Stop K490  
Los Alamos, NM 87545

Phone: 505-667-7969 (office)  
505-667-7969 (fax)

**2. Location of discharge (give township, range, section, ¼ section, miles from closest town and street address, if applicable):**

Los Alamos National Laboratory  
Los Alamos, NM

**3. Type of operation generating the discharge:**

Land application of investigation-derived (IDW) solids from the construction of wells and boreholes. Free liquids will be removed from the solids and managed in accordance with the NMED-approved NOI Decision Tree for drilling, development, rehabilitation, and purge water. Solids will be mixed with native material to backfill the drill pit following removal of the pit liner, used as fill during drill site restoration, or used to maintain drill site access roads.

**4. Description of the source of the discharge:**

Wells and boreholes are routinely constructed as part of LANL's environmental investigation activities. Drill cuttings, drilling additives, and other solid environmental media that are produced during drilling are stored in lined pits or containers for management in accordance with the NOI Decision Tree (Enclosure 1). The Laboratory makes every effort to perform drilling with minimal or no use of drilling additives; therefore, only *de minimis* levels of insoluble additives would be expected to be present in the cuttings. The Laboratory typically mixes drilling additives with potable water for an application concentration of approximately 0.5% (eg, 0.5 gal of QUIK-FOAM™ per 100 gal of potable water). Furthermore, the only additives that the Laboratory uses meet NSF/ANSI Standard 60, which addresses chemicals used in well-drilling products and for the treatment of drinking water.

**5. Estimated concentration of contaminants in the discharge:**

IDW solids will be fully characterized in accordance with the NOI Decision Tree. Media not conforming to the NOI Decision Tree criteria for land application will be disposed of at an appropriate disposal facility.

**6. Means of the discharge (to a lagoon, watercourse, septic tank/leachfield, etc.):**

Media will be mixed with native material to backfill the drill pit following removal of the pit liner, used as fill during drill site restoration, or used to maintain drill site access roads.

**7. Estimated daily flow rate of the discharge:**

A typical 1000 ft borehole will produce approximately 40-60 cu yds of cuttings.

**8. Estimated depth to ground water:**

Variable depending upon the location of the drill site.

Signature: Anthony R. Grieggs

Title: Group Leader

Printed name: Anthony R. Grieggs

Date: 10/10/07

Providing additional information such as maps, plans and specifications, laboratory analyses, and/or a detailed description of the discharge will help NMED to process this NOI in a more timely manner. Please return this form to:

NMED Ground Water Quality Bureau  
P.O. Box 26110  
Santa Fe, New Mexico 87502

Telephone: 505-827-2900  
Fax: 505-827-2965

### ENCLOSURE 3

Enclosure 3 responds to comments sent via e-mail by Jennifer Holman (NMED-HWB) to Kelly VanDerpoel (LANL), on August 7 and 21, 2007 concerning the NOI decision tree. The e-mails are included as Enclosure 4. To facilitate NMED's review, the comments are provided verbatim with the Laboratory's response immediately below:

**1. Identify the criteria LANL is referring to when requesting a Contained In stated in box D4.**

Response: The Laboratory will use the most recent NMED Soil Screening Levels (SSLs) when requesting a contained-in determination. The Laboratory will first compare the hazardous waste constituent concentrations to residential SSLs. If residential SSLs can be met, approval for land application of the media will be requested. If residential SSLs cannot be met, constituent concentrations will then be compared to industrial SSLs and disposal at an authorized solid waste facility will be requested. If an NMED SSL has not been published for a given constituent, the Laboratory will use the most recent EPA Region 6 Medium-Specific Screening Levels (MSSLs) instead. In all cases, constituent concentrations will also be compared to LDR treatment standards for non-wastewaters. Box D4 of the decision tree has been modified to include these criteria. The revised NOI decision tree is included as Enclosure 2.

**2. The flow chart should include the WQCC surface and ground water protection regulations - NMAC 20.6.2. ( please review 20.6.2.7, 20.6.2.1201, and 20.6.2.1203) as a criteria in box D6, otherwise provide the rationale for their exclusion.**

Response: NMED Ground Water Quality Bureau concerns regarding compliance with the WQCC surface and ground water protection regulations are being addressed through this Notice of Intent to Discharge.

**3. Identify how the number of waste characterization samples/pit will be determined and how they will be collected.**

Response: The Laboratory will use the latest version of Visual Sampling Plan (VSP) (US EPA-G-5S, VSP Implementation), developed by Battelle/PNNL and sponsored by the US EPA Office of Environmental Information, to generate site-specific numbers and locations of drill pit samples. The decision parameters for each sampling event will follow the Data Quality Objectives (DQO) process outlined in ENV-RCRA-QP-113.1, Developing DQOs for RCRA Characterization, latest revision, included as Enclosure 5. Sample collection will follow the procedures outlined in the Water Quality and RCRA Group (ENV-RCRA) Sampling and Analysis Plan, latest revision, included as Enclosure 6. Box A1 of the decision tree has been modified to state that samples will be collected in accordance with these ENV-RCRA procedures.

**4. The flow chart must include language that ensures protection of surface water quality.**

Response: The Laboratory has a system of institutional controls to ensure that surface water quality is protected during well construction. The location and placement of a drill pit is strictly controlled through a multi-layer process of reviews, site planning, and contractor

***Notice of Intent to Discharge***  
***Land Application of IDW Solids from Construction of Wells and Boreholes***

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oversight. All drilling projects are evaluated in the early planning stages through the Laboratory's Project Requirements – Identification (PR-ID) and Excavation Permit (EX-ID) review processes. During PR-ID and EX-ID reviews, Subject-Matter-Experts (SMEs) identify and flag potential surface water concerns and identify what requirements for protection of surface water must be implemented. Any inappropriately placed drill pits would be flagged during the PR-ID and EX-ID review process.

Additionally, the Laboratory's NPDES Construction General Permit (CGP) Program requires the development of a Storm Water Pollution Prevention Plan (SWPPP) for each drilling project. The SWPPP includes a project site plan that identifies the location of all project activities, including the drill pit, and all contiguous surface water features, such as floodplains and watercourses. Excavation of the drill pit is closely supervised by the Laboratory's on-site project manager to ensure that the as-built drill pit is consistent with SWPPP's site plan. And finally, compliance with the NPDES CGP is demonstrated through periodic inspections that document the condition of the drill site and identify corrective actions required to keep pollutants from moving off the construction site and into a watercourse.

When use of the drill pit ceases and the drilling IDW solids have been determined to be suitable for land application (per Box D6 of the decision tree), the drilling media is mixed with native material in the bottom of the pit and then covered with several feet of native material only, compacted, graded, and re-vegetated. The location of the backfilled pit is marked so that it can still be located once vegetation has been re-established, allowing the Laboratory to ensure that no erosion or other site degradation is occurring.

**5. The process must also include language ensuring protection of groundwater quality (in these instances the first groundwater encountered will tend to be the alluvial aquifer) (see comment #2).**

Response: All drill pits are lined while in use to prevent potential contaminant migration into the subsurface. Drill pit contents will be fully characterized in accordance with both the approved NOI decision tree for waters and the IDW solids decision tree before removal of contents and liner. No IDW solids will be land applied that do not meet the criteria in Box D6.

As provided in the response to Comment 2, any liquid media associated with the drill pit will be addressed in the NOI decision tree for drilling, development, rehabilitation, and sampling purge water developed by the Laboratory jointly with the NMED GWQB and HWB, and approved by NMED on November 21, 2006.

Because protection of groundwater quality is addressed in both the NOI decision tree and in the criteria in Box D6 of the IDW solids decision tree, no changes to the IDW decision tree are proposed.

# **Enclosure 4**

**Kelly VanDerpoel**

**From:** Holman, Jennifer, NMENV [Jennifer.Holman@state.nm.us]  
**Sent:** Tuesday, August 07, 2007 1:52 PM  
**To:** Kelly VanDerpoel  
**Cc:** Young, John, NMENV; Cobrain, Dave, NMENV  
**Subject:** Decision Tree for Management of Investigation-Derived Waste Solids From Drilling Operations at Los Alamos National Labs  
**Follow Up Flag:** Follow up  
**Flag Status:** Red

Kelly,

John and I have reviewed the request for approval of the Decision Tree for Management of Investigation-Derived Waste Solids From Drilling Operations at Los Alamos National Labs dated June 12, 2007 and received June 20, 2007. In general, we have a few questions which need to be addressed before NMED can issue a formal Notice of Approval. Please review the following questions:

- 1) Identify the criteria LANL is referring to when requesting a *Contained In* stated in box D4,
- 2) The flow chart should include the WQCC surface and ground water protection regulations - NMAC 20.6.2. ( please review 20.6.2.7, 20.6.2.1201, and 20.6.2.1203) as a criteria in box D6, otherwise provide the rationale for their exclusion,
- 3) Identify how the number of waste characterization samples/pit will be determined and how they will be collected,
- 4) The flow chart must include language that ensures protection of surface water quality, and
- 5) The process must also include language ensuring protection of groundwater quality (in these instances the first groundwater encountered will tend to be the alluvial aquifer) (see comment #2).

The plastic liner should be removed from the pits prior to covering the pit and of course, if the cuttings/residual material is exposed in the future, removal actions may be required.

Please address these comments formally through a letter. If you should have any questions, please do not hesitate to contact me at 476-6043.

Sincerely,

Jennifer Holman  
**Environmental Specialist**  
**Permits Management Program**  
**New Mexico Environment Department-HWB**  
**2905 Rodeo Park Drive East, BLDG 1**  
**Santa Fe, NM 87505**

8/16/2007

**Phone: (505) 476-6043**

**Fax: (505) 476-6030**

**Email: [jennifer.holman@state.nm.us](mailto:jennifer.holman@state.nm.us)**

**MAIN HWB PHONE: (505) 476-6000**

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**From:** Holman, Jennifer, NMENV [mailto:Jennifer.Holman@state.nm.us]  
**Sent:** Tuesday, August 21, 2007 8:41 AM  
**To:** Kelly VanDerpoel  
**Cc:** Cobrain, Dave, NMENV; Young, John, NMENV  
**Subject:** Decision tree for IDW solids-follow-up

Good morning Kelly,

I just spoke to George Schuman from Groundwater regarding clarification for comment two from my email dated August 7, 2007. The comment was meant to address leaching from drill cuttings. Also, the regulation citation was incorrect. The WQCC surface and groundwater protection regulation should read-NMAC 20.6.2.3104, *Discharge Permit Required*.

If you have any questions, please contact me at 505-476-6043. Enjoy the rest of your day.

Jen

**Jennifer Holman**

**Environmental Specialist**

**Permits Management Program**

**New Mexico Environment Department-HWB**

**2905 Rodeo Park Drive East, BLDG 1**

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**MAIN HWB PHONE: (505) 476-6000**