New Mexico Environment Department
DOE Oversight Bureau Review of
CMS Plan for Potential Release Site 16-021(c)

flumes being put in — work w/ WMP to install gaging stations
1 @ mouth of CDV
1 @ MDA P
1 @ MDA P & 1 @ of flow

General Comments:

Any?

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Section 2 or within the conceptual model section:

The plan needs a detailed (see Mortandad Canyon Workplan) west to east cross-section that extends from the perennial stream west of SR501 in Canon de Valle to its confluence with Water Canyon. A fold-out type illustration should show: 1) lithologic units (projected from drilling logs from SHB-3 and other penetrations in the area; 2) springs; 3) normal surface-water flows east and west of SR501; 4) thickness of alluvium; 5) projections of potential active and inactive sources; 6) wells; 7) faults; 8) proposed sampling stations or flow stations; and ....?

Section 2.3.2 Extent of Contamination, page 20

Water encountered in boreholes may be migrating downward along the annulus and leaking or draining into fracture conduits which are not connected to the upper saturated zones. Hence, the water may not be intermittent. The use of a borehole camera would be very useful to assess seasonal saturation; neutron logging through the casing might also be beneficial. Down-hole leakage, and the subsequent absence (apparent) of water, is not uncommon in such structure/lithologic environments, especially given the scale of such fracture systems at TA-16.

Section 2.3.3 Spring & Well Dynamics, page 20

We strongly recommend that LANL visually illustrate (e.g, plots) the relationship between flow, hydrochemical/contaminant concentrations (e.g., Br, Cl, Na, Ba, RDX and TDS) and precipitation through time at each of the springs, and at any surface-water stations (if enough data exist).

Section 2.4 COPC Screening, page 21

LANL should make sure that all surface-water samples are analyzed using the methods prescribed by the Clean Water Act (e.g, 40 CFR/136). ✓ w/ SWQB to see which method — A state can prescribe better methods?

Section 3.1.2 Four Component Conceptual Model, page 22

The components should include: 1) recharge and contaminant pathways, be it saturated or unsaturated, to the spring discharge points which is assumed to the first step in contaminant transport to the springs (e.g. periodic or continued infiltration from point sources that lie at the surface and/or subsurface-vadose zone contamination that is in contact with the flow regime), 2) the perennial surface water and the associated springs which support flow, 3) recharge and contaminant transport to the canyon-bottom alluvium from ground-water sources (e.g., springs) and the infiltration of perennial surface water, and intermittent storm-water runoff and local runoff from snow-melt events, 4) the seepage/flux of alluvial ground water to the subsurface, 5) transport of solid contaminants via storm water runoff within the drainage basin, 6) contaminant transport via the solid and liquid phases within the biological community, and 7) hydrologic and hydrochemical interactions between the alluvial aquifer and the vadose zone (e.g, head variations causing dissolution of contaminants within the unsaturated zone)-----**probably more - need to brain-storm with Kim.**

Section 3.4.3.1 Soils and Alluvium, page 32

Should the soil/sediment within Canon de Valle be considered as POC?

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- QUESTION: VALUE OF TRACER STUDY
- EVAL OTHER CONNECTIVITY STUDIES ISOTOPIC WTR ANALYSES
- XPL STORMWTR EVENTS IN CDV + MAJR TRIBS
- CLARIFY "HI BASE FLOW" + "LO B.F."

Section 6.1 Objectives and Scope. page 55

LANL should be more specific on how the different types of surface water (perennial flow, storm water, snow melt) fits into their five-component objective system.

Section 6.0 PHASE III RFI INVESTIGATIONS

WHAT ABOUT RECHARGE?

Sections 6.3.1 Connectivity, page 59

LANL's Br inventory study may not be advantageous because no matter what they come up with it still doesn't answer the question: is the 260 outfall connected to the perched zone which supplies discharge at Burning Ground and SWSC Springs. They could possibly flush the 260 outfall area with a large volume of water in order to move the tracer, but I don't think the regulators would concur with such a release. ??

Has the tracer been detected in the surface water and/or the alluvial ground-water system in the Canon de Valle watershed?

DOE OB hypothesis's that the contaminants which are present within the spring waters may be from either the 90's line pond, the alluvial system within the Steam Plant drainage and/or a release area(s) which has contaminated the subsurface at a point which is in contact with the perched zone(s) that supply flow to Burning Ground and SWSC Springs. Hence, in terms of source term delineation, we suggest that the 90's line pond and the Steam Plant drainage alluvial ground water been incorporated into the connectivity and residence determination (transport pathway analyses) sections of the CMS. Barium concentrations at Burning Ground and SWSC Springs have not varied through the period before and after the 260 outfall was shut off; this may be a good indicator that the 260 outfall may not be a viable source for contaminant transport to the perched zone which supports flow at Burning Ground and SWSC Springs.

DOE OB also hypothesis's that recharge to the perched zone(s) is probably from an apparent perennial reach which exists west of the Pajarito Fault Zone. Multiple field observations in this area show that rapid surface-water infiltration occurs near the Tschicoma Formation and the Tshirege Member contact. This potential recharge water needs to be incorporated into LANL's CMS (e.g., isotopic and chemical signatures which can be correlated to the TA-16 Springs).

Due to the assumption that Canon de Valle surface water and subsequent alluvial system is predominantly recharged by discharges from Burning Ground and SWSC Springs, we recommend that all sampling be conducted simultaneously. That is, springs, surface water and alluvial ground water samples be collected ~~a~~ at the same time.

USE SAME METHOD, XPL'G PARAMETERS, ETC FOR COMPARABILITY

- PUT PROBES IN SW, TOO (p. 75) 6.3.4.2 ¶ 2
- Ba FIELD KIT (HOCH) ADD TO DATA SET ¶ 3 AID IN BIASING

Specific Comments:

1. Executive Summary, paragraph 1, Page ES-1

Line 3: Informal canyon names should be followed with notation showing that they indeed informal in content.

2. Executive Summary, paragraph 2, Page ES-1

Line 8: Perennial surface water in Canon de Valle has also been impacted.

3. Executive Summary, paragraph 3, Page ES-1

Line 4: Need a period after Martin Spring Canyon.

4. Executive Summary, paragraph 3, Page ES-1

Line 8: Contaminants in the source also effect ephemeral and perennial surface waters within the Canon de Valle basin.

5. Executive Summary, paragraph 5, Page ES-1

Line 1 under "This CMS Plan p[illegible]les": Should the technologies include alluvial [illegible]ers?

6. Executive Summary, paragraph 2, Page ES-2

Line 4: Sampling of the local surface waters should be included.

- FINGERPRINT OTHER WTR SOURCES
- SUPPLEMENT W/ H3 + Ar^{36} (OTHER ENV. ISOTOPES)
  δD + δN
- 90's LINE + RECHARGE -> RUN TABLE 66 ANALYSES
  AGE-DATE MODERN WTR
- CHAR SPRINGS, ALLUVIAL SYSTEM W/ ENV. ISOTOPES FOR CONNECTIVITY
  W/ R-WELLS
- P75 5 PIEZOMETERS - CONSTRUCTION OF 3 3/4 IN PRE-PACK SCREEN
  GOOD IDEA
  PROBABLY WORK W/
  PNEUMATIC HAMMER
- ALLUVIAL SYSTEM - hydraulic Conductivity / K, Velocity
  characteristics
  recharge rate
- CONSISTENT PURGING: USE BLADDER PUMPS
- DO ~~WAR~~ MARTIN SPR CNYN LIKE CDV
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