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Date: November 29, 2001  
Refer to: ESH-18/WQ&H:01-396

Mr. John Young  
LANL Corrective Action Project Leader  
New Mexico Environment Department  
Hazardous Waste Bureau  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, New Mexico 87505-6303



**SUBJECT: HYDROGEOLOGIC CHARACTERIZATION PROGRAM SAMPLING STRATEGY**

Dear Mr. Young:

During the past months, a number of meetings have been held between yourself, Michael Dale, New Mexico Environment Department (NMED) Oversight Bureau (OB) and various Los Alamos National Laboratory (Laboratory) and Department of Energy (DOE) staff regarding the development and use of a proposed sampling strategy for the performance of characterization sampling pursuant to the Hydrogeologic Workplan. During a meeting held with you and Michael Dale on September 20, 2001, a revised draft of the proposed sampling strategy was again discussed, and you made a number of recommendations toward improving the sampling strategy. It was agreed that the Laboratory would incorporate your recommendations in what was believed to represent the final draft.

During the Groundwater Characterization Program Quarterly Meeting held October 16-18, 2001 the final draft of the sampling strategy was presented to you and other attendees. Mr. Patrick Longmire made the presentation on behalf of the Laboratory, and provided a thorough description of the attributes of the sampling strategy and their rationale. There were no significant comments made during the Quarterly Meeting regarding the sampling strategy.

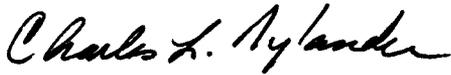
Therefore, the Laboratory and DOE intend to immediately implement the sampling strategy (document enclosed) for purposes of groundwater characterization pursuant to the Hydrogeologic Workplan. Should you have any objections to our use of this sampling strategy for performing groundwater characterization please notify us of any specific issues. Otherwise, we will continue to perform groundwater characterization sampling according to the logic and methodology illustrated in the enclosed strategy.



November 29, 2001

Please contact Charlie Nylander, ESH-18 at 665-4681 should you have any questions regarding the sampling strategy. We greatly appreciate the efforts that you and Michael Dale provided toward improving the sampling strategy.

Sincerely,



Charles L. Nylander, Program Manager  
Groundwater Characterization Program  
Los Alamos National Laboratory

Sincerely,



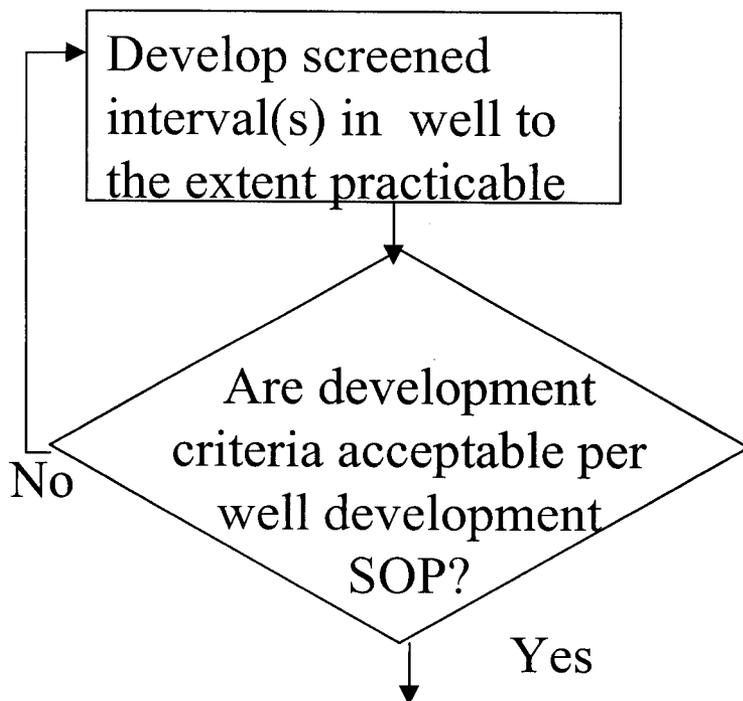
Mat Johansen, Project Manager  
Department of Energy  
Los Alamos Area Office

CN/tml

Enclosures: a/s

Cy: J. Vozella, DOE/LAAO, w/enc., MS A316  
M. Baker, LANL, E/ET, w/enc., MS J594,  
J. Canepa, LANL, E/ER, w/enc., MS M992  
D. McInroy, LANL, E/ER, w/enc., MS M992  
J. McCann, LANL, E/ER, w/enc., MS M992  
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S. Rae, LANL, ESH-18, w/enc., MS K497  
WQ&H File, w/enc., MS K497  
IM-5, w/enc., MS A150

# Hydrogeologic Characterization Sampling Strategy (1 of 3)



## Notes:

1. pH, redox potential, alkalinity, temperature, specific conductance, turbidity, dissolved oxygen
2. If screened interval yield insufficient sample volume, prioritize analysis by COCs
3. Six months is based on quarterly sampling at R wells with an additional 3 months provided for equilibration

Collect water from each well screen after well is completed. Analyze for field parameters<sup>1</sup>, COCs<sup>2</sup>, major ions, Fe, Mn, TOC, 3H(LL), TKN, and EZMud titration

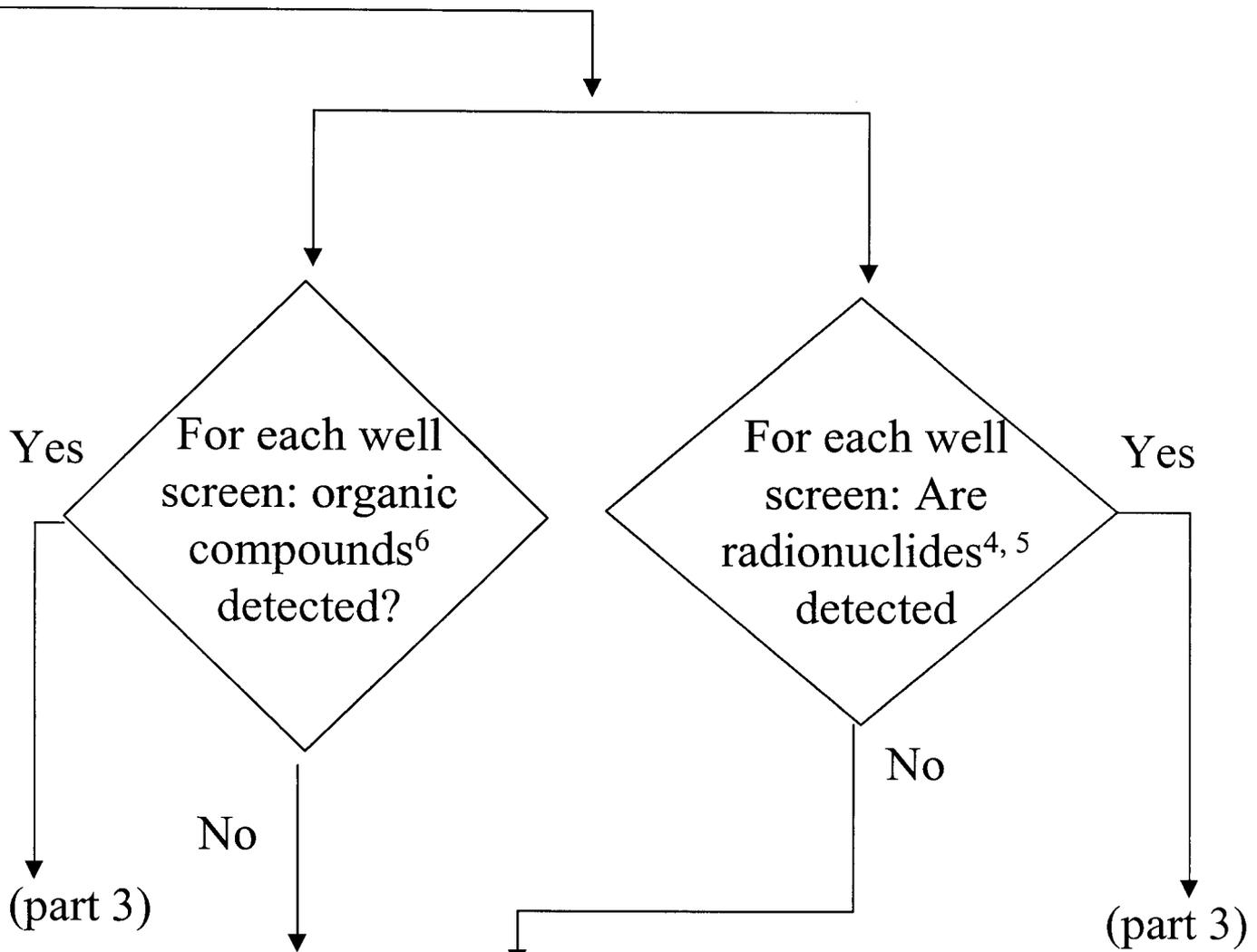
**MULTIPLE COMPLETION WELLS:** 6 month equilibration period<sup>3</sup>

**SINGLE COMPLETION WELLS:** 3 month period

Collect initial characterization sample from each well screen and analyze for full suite

# Hydrogeologic Characterization Sampling Strategy (2 of 3)

(from part 1)



Delete non-detected analytical suites from analyte list for second and third characterization sampling, unless it is a contaminant of concern at that well

## Notes:

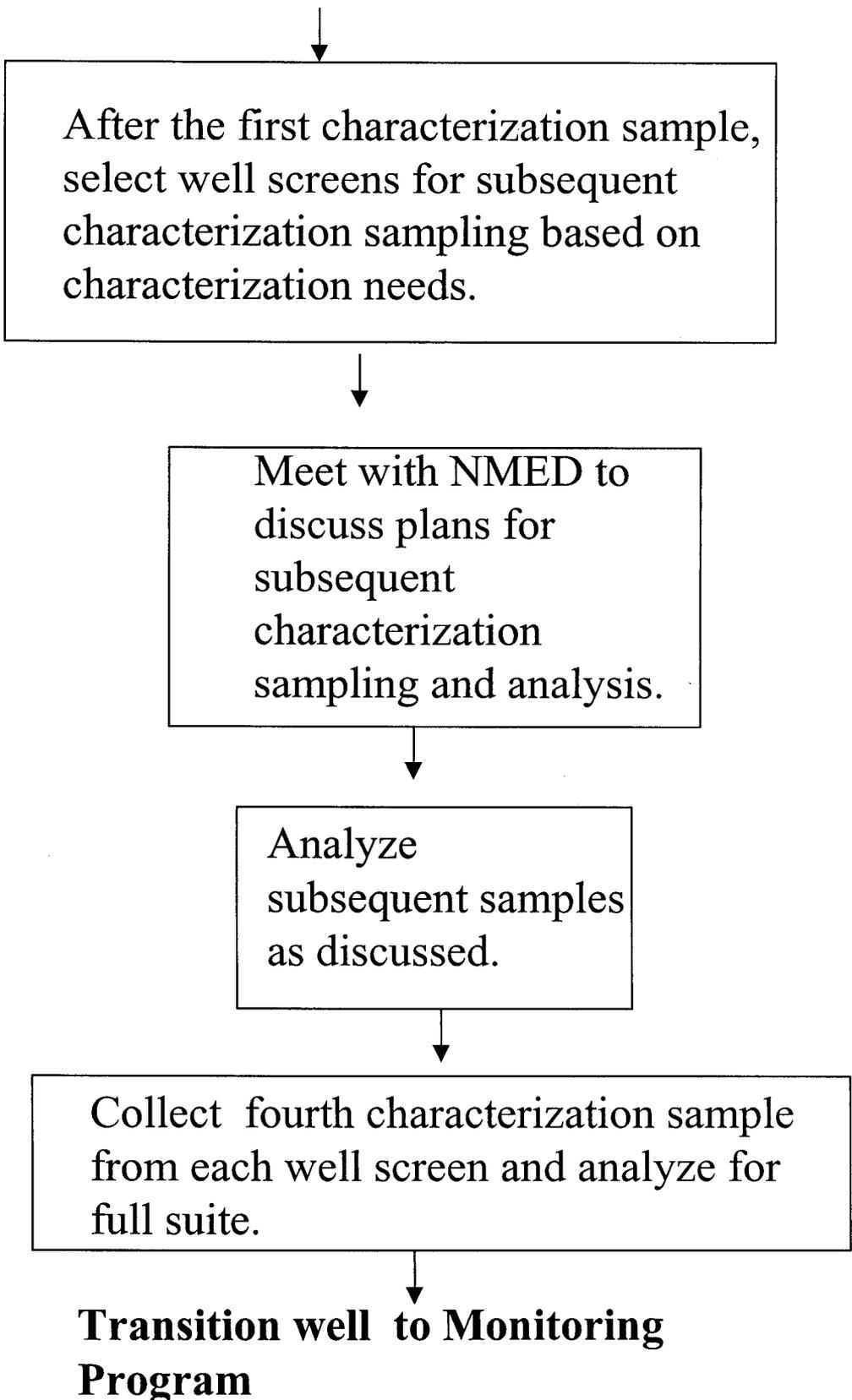
4. Radionuclides: Am-241, Pu-239/240, Sr-90, U-234/235/238, and selected isotopes from gamma spectroscopy

5. Mortandad Canyon alluvium and perched zones: liquid scintillation for high-level H3; low-level tritium in the regional aquifer

6. VOAs, semi-VOAs, PCBs, pesticides, HE, other

# Hydrogeologic Characterization Sampling Strategy (3 of 3)

(from part 2)



# Full Suite Analysis

- **Radionuclides** (non filtered)
  - Low-level tritium (non filtered)
  - Strontium-90
  - Uranium and plutonium isotopes
  - Americium-241
  - Gross alpha, beta, gamma
  - Gamma spectroscopy

# Full Suite Analysis

- **Metals (non-filtered)**
  - ICPOES analysis: Al, Ba, B, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, SiO<sub>2</sub>, Ag, Sr, Na, V, and Zn.
  - ICPMS analysis: Sb, Be, Cd, Tl, and U.
  - CVAA analysis: Hg
- **General Inorganics (filtered and non-filtered)**
  - Alkalinity (HCO<sub>3</sub><sup>-</sup> and CO<sub>3</sub><sup>2-</sup>), Br<sup>-</sup>, PO<sub>4</sub><sup>3-</sup>, HN<sub>4</sub><sup>+</sup>, Cl<sup>-</sup>, F<sup>-</sup>, TKN, NO<sub>3</sub><sup>-</sup>, NO<sub>2</sub><sup>-</sup>, C<sub>2</sub>O<sub>4</sub><sup>2-</sup>, ClO<sub>4</sub><sup>-</sup>, and SO<sub>4</sub><sup>2-</sup>

# Full Suite Analysis

- **Organic Compounds** (non-filtered)
  - Volatiles
  - Semivolatiles (PCBs [only in Sandia Canyon and around Area G], PAHs, pesticides)
  - Select Appendix VIII and IX constituents
  - High explosive compounds and degradation products
  - Total Organic Carbon
  - Dissolved Organic Carbon fractionation