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To: R6DAL02.R6TOXIC2(HILL-KIM),RTPMAINHUB.INTERNET("pb...
Date: 2/20/98 10:05am
Subject: Presentation to SWQB on Sediment Results?

4/10479/27

Dear Steve,

During a SWAT meeting, there was discussion on the contribution to LA Canyon from TA-0, 1 and 21 sites. It may be that Hoditschek of SWQB would feel less concerned about some of these sites if she were informed of the results of sediment sampling in LA Canyon (of course she might not also). What do you think? I asked her if she would like a short presentation on the results and she said yes, if that is possible. Do you think this would be appropriate? Thanks Steve.

>>> Steven Reneau <sreneau@lanl.gov> 02/17/98 04:27pm >>>
Analytical results from our 2nd sediment sampling event in reaches P-2 and
P-3 have been received, along with a few additional samples collected in reach P-4. A total of 54 sediment samples were collected, mostly for plutonium analysis, but also including analysis for Cs-137, Am-241, PCBs, pesticides, and metals on a subset of samples. This was the last of our major sampling events in Los Alamos and Pueblo Canyons in 1997, although we just submitted a few additional samples from P-2 and P-3 that were collected from drill holes. We are presently digesting available data in preparation for reports on the surface investigations in the reaches that are due by the end of FY98. A few highlights of this most recent sampling event are presented below.

Plutonium

Pu-239,240 is the main contaminant of concern in Pueblo Canyon, and most of our analyses in Pueblo Canyon have been directed towards better defining lateral, vertical, and temporal variations in Pu activities. The new analyses support and strengthen our previous inferences that Pu activities and inventories are relatively low through much of the middle part of
Pueblo Canyon. This 2nd sampling event provided no Pu values in P-2 and
P-3 higher than we had previously obtained, and our estimated average Pu activity and Pu inventory in each sub-reach is similar to or lower than prior estimates. In P-4 West, we resampled the layer that had earlier provided an anomalously high value of 170 pCi/g (higher than anything else downstream of reach P-1), and this new sample yielded a lower activity of

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62.8 pCi/g, which is still higher than any other sample in P-4, P-3, or P-2 East. Notably, this layer is only 10 cm thick and the layers immediately above and below it yielded much lower activities of 17 and 0.5 pCi/g. Its unusually high activity is probably due to its age (late 1940s or 1950s) and grain size (dominated by silt and clay).

The combined data from Pueblo Canyon sediments indicate that the primary controls on lateral and vertical variations in Pu are a combination of 1) particle-size sorting (with the highest Pu within a geomorphic unit occurring in relatively fine-grained sediments), 2) downstream dilution (with the highest Pu occurring close to the source in Acid Canyon), 3) decreases over time (with the highest Pu apparently occurring in sediments deposited prior to 1965), and 4) irregular geographic patterns of sediment deposition. Relatively high Pu inventories and Pu activities are present in reach P-4 West where a large amount of sediment was deposited between
1943 and 1965, most of which has been subsequently isolated from the active channel due to lateral channel migration. In contrast, relatively little sediment from this time period is apparently present in reaches P-2 and P-3, and the bulk of the sediment there seems to date to the post-1965 period when Pu activities were much less than previously.

Am-241 and Cs-137.

In this sampling event, we obtained analyses for Am-241, Cs-137, and other radionuclides using gamma spectroscopy methods from 8 samples in P-2, 10 samples in P-3, and 1 sample in P-4 West in order to test correlations of these radionuclide with Pu-239,240 that were indicated by 1996 analyses.
Cs-137 was not detected above background levels in any of the samples (using an upper limit of background of 0.9 pCi/g). Am-241 was commonly above the background value of 0.04 pCi/g, with a maximum value of 2.08 pCi/g from the P-4 West layer with the unusually high Pu-239,240 activity.
These results are consistent with previous analyses from Pueblo Canyon sediments.

Metals

In this sampling event, we obtained analyses for the target analyte list (TAL) metals from 8 samples in P-2, 10 samples in P-3, and 1 sample in P-4
West. Consistent with previous analyses in Pueblo Canyon, we only found a few samples with metals slightly above background values. Four samples yielded Cu above the background value of 11.2 ppm, with

a maximum of 31.5 ppm. Two samples yielded Hg above the background value of 0.1 ppm, both with 0.15 ppm. Two samples yielded Pb above the background value of 19.7 ppm, with a maximum of 27.7 ppm.

PCBs and Pesticides

In this sampling event, we obtained analyses for PCBs and pesticides from 6 samples in P-2 and 8 samples in P-3. Consistent with previous analyses from P-1 and P-4, there are apparently only small amounts of these substances in the sediments of Pueblo Canyon. No pesticides were detected, and three samples had reported values of the PCB Aroclor 1260 slightly above the detection limit of about 0.04 ppm (0.041, 0.046, and 0.055 ppm).

As always, please feel free to contact me if you have any questions or if you would like more information, and all input is welcome.

Steve

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