MESSAGE SCAN FOR JOHN YOUNG

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To broxton@lanl.gov:smtp
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To chris hanlonmeyer@edser:smtp
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To ildefonso@trail.com:smtp
To hill.kim@epamail.epa.gov:smtp
To John Young@edser:smtp
CC pratt allyn r@lanl.gov:smtp
CC sreneau@lanl.gov:smtp

From: (Steven Reneau) sreneau@lanl.gov:smtp
Postmark: Sep 09,97 7:26 AM Delivered: Sep 09,97 7:27 AM

Subject: Reach P-1 Update

Comments:
See document for message.

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Results from the 3rd P-1 sampling event have been received (except for particle size), including analyses of 31 samples for Pu and 6 samples for Am-241, Cs-137, and metals. Some selected highlights are summarized below. Spreadsheets with data summaries are available for interested parties.

"c2b" geomorphic unit: This unit has the highest measured Pu-239,240 concentrations in P-1, reaching up to 488 pCi/g in the 1st sampling event. We had previously analyzed samples from 2 stratigraphic sections, both of which showed highest values at about 64-90 cm deep, but with very variable Pu concentrations (25, 170, 240, 488 pCi/g). In the 3rd sampling event we collected 8 additional samples from this lower part of the c2b unit at 3 sections in order to characterize its variability. The values from 2 of the sections were relatively low (6.87 to 27.9 pCi/g), indicating that these areas should be re-designated as the younger unit "c2" with lower Pu concentrations and that the area with the highest values is smaller than previously recognized. The values from the 3rd section, midway between the 2 previously sampled sections, were 13.7 to 92.9 pCi/g, indicating a lower average Pu concentration than previously estimated.

"f1" and "f2" geomorphic units: Prior to this sampling event, we only had 1 sample from a P-1 floodplain, and 7 new samples were obtained in order to better characterize the distribution and concentration of Pu in these areas. The highest Pu-239,240 concentration, 32.7 pCi/g, was within the range measured for the "c2" geomorphic unit and suggests that the major floods depositing sediment on the floodplains occurred after the peak of Pu in this reach (represented by the buried "c2b" unit sediments). A sample at depth immediately below the sample with the 32.7 pCi/g Pu value yielded only 0.49 pCi/g, indicating that the thickness of the contaminated sediments there is well constrained to the upper ~13 cm. All sites where we had inferred deposition of post-1943 sediment did show Pu above background, although sometimes so low (0.83, 1.67 pCi/g) that either minimal post-1943 deposition occurred or the floods were mainly transporting sediment from "clean" sources (i.e., Pueblo Canyon upstream from Acid Canyon). One sample from an "f2" unit immediately downstream from Acid Canyon, inferred to have been above post-1942 flood levels, yielded a low concentration of 0.215 pCi/g, suggesting either minimal post-1942 flood deposition or dispersion of Pu by other processes (e.g., wind).

Pu-239,240 Inventory: The revised Pu-239,240 inventory is very similar to that estimated in June prior to this sampling event. Relatively small increases or decreases in the estimated average Pu concentrations for each unit tended to balance out, such that the estimated total inventory is within ~10% of the June estimate. Pu is spread between many different units, with the overbank sediments of unit "c2" containing the highest estimated percentage. Overbank sediments in the "c2b" and "f1" units are also important. In all of these units, overestimates of the Pu inventory are possible because of the abundance of boulders contained within the units. As much as ~20-30% of the Pu in reach P-1 may be buried beneath fill along the dirt road and sewer line, although the actual amount is difficult to estimate. The total estimated inventory of about 100 mCi/km is much higher than previously estimated by Graf (1995, 1996) based on his mapping and on prior surveillance data (only ~3 mCi/km), indicating that the upper reaches of Pueblo Canyon are more important storage areas for Pu

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than he had proposed, although still containing less Pu per km of channel than P-4 (_ and 160 mCi/km estimated in P-4 West and P-4 East). The difference between Graf's estimate and ours is largely because prior sediment samples in the FUSRAP investigations indicated average Pu concentrations of only about 3.5 pCi/g in overbank sediments in this part of Pueblo Canyon, much less than our data indicate (average "c2" and "c2b" concentrations in overbank sediments are 16.7 and 136.5 pCi/g in P-1).

Mercury: The initial sampling event revealed Hg above background in sediments collected both downstream and upstream of Acid Canyon, and additional analyses were obtained from a subset of samples in this sampling event in order to clarify the source of the Hg. The highest Hg concentrations this sampling event (0.32, 0.48 mg/kg) were measured in Pueblo Canyon upstream from Acid Canyon, higher than values we have obtained from Acid Canyon (up to 0.07 mg/kg), indicating that most of the Hg is not derived from discharges into Acid Canyon. A possible source for the Hg is the old sewage treatment plant upstream on the rim of Pueblo Canyon where Hg has been reported from sludge beds.