92-958

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098558

December 23, 1992

Mr. Dan Wall
United States Environmental Protection Agency
Region VII
726 Minnesota Avenue
Kansas City, Kansas 66101

Dear Mr. Wall:

LETTER REPORT ON THE SCOPE FOR THE SAMPLING OF EXISTING COLDWATER CREEK SEDIMENT CORES

The concept of performing additional analysis of Coldwater Creek existing sediment samples has been discussed previously with you. To this end, we are implementing additional sampling and analysis of existing cores as described in the document: "Scope for the Sampling of Existing Coldwater Creek Sediment Cores."

The selection of specific archived cores is based on sediment transport modeling of Coldwater Creek coupled to the need for data to refine contaminant distribution profile estimates. The sampling objectives, sample selection methodology, and resultant 23 sediment sample selections are presented. This new data will also enable refinement of cost estimating in the FS/EIS.

A copy of this document is enclosed for your information. Please feel free to contact me at (615) 576-9634 with any questions or comments you may have concerning this activity.

Sincerely,

David G. Adler, Missouri Site Manager
Former Sites Restoration Division

Enclosure

cc: David Bedan
Herb Hickman

LETTER REPORT ON THE SCOPE FOR THE SAMPLING OF EXISTING COLDWATER CREEK SEDIMENT CORES

Purpose and Scope

The scope of this task is to analyze an additional 23 sediment samples from the existing (i.e., archived) sediment cores previously collected along Coldwater Creek during the 1986 through 1990 survey tasks. The purpose of analyzing the additional samples is to determine if radiological contaminants exist at depths below 15 cm (6 in) in depositional areas along the creek. This determination is not required to select the remedial action for Coldwater Creek in the Feasibility Study/Environmental Impact Statement (SAIC 1992). Sufficient data exists for this remedial action selection process. The sampling is being done to refine the estimate of the volume of contaminated sediment that may be removed from the creek. The samples will be analyzed for total uranium, Th-230, Th-232, and Ra-226. The lab will analyze for total uranium to obtain lower minimum detectable activities and established ratios to the total uranium result will be used to obtain U-238 concentrations. The original stream locations of the sediment cores to be sampled are shown in Figure 1.

Site Description

Coldwater Creek is a 31 km (19 mi) long stream that drains a 122 km^2 (47 mi^2) area into the Missouri River (Figure 1). The creek is an average of 9 m (30 ft) wide with a flow depth of less than 1.5 m (5 ft). Flow velocities are relatively low with an average rate of 76 cfs. The banks of the creek are steep and void of vegetation for the first 0.6 to 0.9 m (2 to 3 ft) above the water surface during average flow conditions (U.S. Army Corps of Engineers (COE) 1987, BNI 1991).

The creek flows under the Lambert-St. Louis Airport in a 1,830 m (6,000 feet) long box culvert. Approximately 72 percent of the watershed lies downstream of the airport and is composed of highly-developed commercial areas with limited open space. St. Louis Airport Site (SLAPS) and Hazelwood Interim Storage Site (HISS), which are located directly downstream of the airport culvert, are adjacent to the creek and responsible for contaminating the creek's sediment with low-level radionuclides. The contaminated sediment is typically found in the top 15 cm (0.5 ft) of the creek bed. The contamination has also been found as small isolated pockets within creek-bottom depressions and on the inside of meander loops at depths of up to 1.2 m (4 ft) (COE 1987, BNI 1991).

Summary of Existing Data

Between 1986 and 1990, sediment samples were collected from the sides and center (where accessible) of Coldwater Creek. In 1986 and 1987, the samples were collected between SLAPS

and Pershall Road (Section A). In 1989, sample collection continued downstream between Pershall Road and Bruce Drive which is a reach of 2.4 km (1.5 mi) (Section B). A second survey in 1989 extended the sampling an additional 7.7 km (4.8 mi) to Old Halls Ferry Road (Section C). In 1990, sediment sampling continued downstream between Old Halls Ferry Road and the mouth of the creek at the Missouri River (Section D). Sampling intervals varied from 15 to 150 m (50 to 500 ft) during the surveys. Most results of the surveys are included in the appendices to the Remedial Investigation Report for the St. Louis Site (BNI 1992).

Following the completion of the 1990 survey, Coldwater Creek sediment had been sampled to depth of 15 cm (0.5 ft) from SLAPS to the mouth of the creek and characterized. Along Section A, one sample was collected below 15 cm (0.5 ft). No additional sampling is proposed for Section A. The total depth of the contamination had also been characterized from Pershall Road to Bruce Drive during the 1989 survey (Section B). In this section, samples were collected to a depth of 0.9 or 1.2 m (3 or 4 ft). Along Sections C and D, sediment samples were collected to a depth of 0.9 m (3 ft) during the 1986 through 1990 surveys, but only the 0.0 to 15 cm (0.0 to 0.5 ft) interval was analyzed. The remainder of the samples were archived at the TMA/E lab in Albuquerque, NM.

Objectives

Two objectives defined for the new sampling of existing sediment cores are:

1) identify depositional areas along Coldwater Creek between SLAPS and the mouth in order to locate spots where the radionuclides may have accumulated over the last 45 years, and

2) locate sampling points within the identified depositional areas and obtain archived samples for the supplemental analyses needed to refine contaminant distribution profile estimates.

Implementation of Objective 1

In 1992, sediment transport modeling of Coldwater Creek was conducted to locate areas where the sediment has a propensity to accumulate and to determine the geomorphological impacts of sediment removal. The model was calibrated based on the current watershed and contamination conditions. Future creek conditions were simulated using single and likely combinations of storm events over a 25-year period. A complete description of this study is contained in a report currently being prepared entitled "Evaluation of Contaminated Sediment Transport in Coldwater Creek, St. Louis, Missouri" (SAIC 1992a).

To achieve objective 1, the results of the sediment transport modeling were used to select the locations where contamination is likely to be found at depth. To be conservative (i.e., not miss

any depositional areas), the single two-year storm event was used to identify all depositional areas along the reach of the creek between SLAPS and the mouth. The two-year storm event is the lowest intensity storm event that was analyzed during the modeling exercise, and therefore identifies the maximum number of depositional areas as shown in Figure 2.

Implementation of Objective 2

To refine the contaminant distribution profile estimates for Coldwater Creek, 23 sampling points were selected within the depositional areas between SLAPS and Old Halls Ferry Road, and at the only two locations downstream of Old Halls Ferry Road where contamination exceeded DOE guidelines. As discussed below, which bank selected was dependent upon the geomorphology of the creek at the sample location; the side of the creek that represented the inside of the meander loop; and/or where contamination was previously found in the surveys. The 23 selected sampling points are given in Table 1. Analysis of these 23 sediment samples will yield the analytical data needed to achieve the refined contaminant distribution profile estimates of objective 2. As shown in Figure 1, the sampling points are numbered from 1 to 23 starting at SLAPS and progressing downstream. The points are evenly spaced at approximately 300 m (1000 ft) intervals. One sample will be retrieved from the archive at each sampling point and analyzed for the Th-230, Th-232, Ra-226 and total uranium using the same procedures as described in the St. Louis Site Field Sampling Plan (BNI/SAIC, 1992).

During the 1986 through 1990 surveys, samples were collected, at 300 m (1000 ft) intervals, from the water's edge on both the left and right banks. The samples to be retrieved for this sampling effort were selected from those sample points based on professional judgement where a preference was given to depositional areas, particularly in meander loop segments (Figure 2), and known or logically suspected areas of contamination. The DOE Order 5400.5 guideline criteria for soil were also used to assist in this qualitative sample selection effort. Even though the 0.0 to 15 cm (0.0 to 0.5 ft) interval at many of the sampling points did not exceed DOE's cleanup criteria, a bias towards choosing a deeper interval (0.3 to 0.6 m [1.0 to 2.0 ft]) was used, when deemed appropriate based on the above engineering judgement, in an effort to confirm that clean sediment is not overlying contaminated sediment in these depositional areas.

TABLE 1. SELECTED SAMPLING POINTS FOR COLDWATER CREEK

Sampling Point	Depth	Bank*	Number	Archive Number
1	(1.0'-2.0')	R	SEC C- 8400	CWC0110RC
2	(1.0'-2.0')	R	SEC C- 9900	CWC0116RC
3	(1.0'-2.0')	R	SEC C- 10400	CWC0118RC
4	(1.0'-2.0')	R	SEC C- 11400	CWC0122RC
5	(1.0'-2.0')	L	SEC C- 13900	CWC0131LC
6	(1.0'-2.0')	L	SEC C- 14900	CWC0135LC
7	(1.0'-2.0')	L	SEC C- 15900	CWC0139LC
8	(1.0'-2.0')	R	SEC C- 16900	CWC0144RC
9	(1.0'-2.0')	L	SEC C- 17900	CWC0147LC
10	(1.0'-2.0')	R	SEC C- 18900	CWC0152RC
11	(1.0'-2.0')	R	SEC C- 19900	CWC0156RC
12	(1.0'-2.0')	R	SEC C- 20900	CWC0160RC
13	(1.0'-2.0')	R	SEC C- 21900	CWC0163RC
14	(1.0'-2.0')	L	SEC C- 22900	CWC0168LC
15	(1.0'-2.0')	R	SEC C- 23900	CWC0171RC
16	(1.0'-2.0')	R	SEC C- 24900	CWC0175RC
17	(1.0'-2.0')	L	SEC C- 25900	CWC0180LC
18	(1.0'-2.0')	R	SEC C- 26900	CWC0183RC
19	(1.0'-2.0')	R	SEC C- 27900	CWC0187RC
20	(1.0'-2.0')	R	SEC C- 28900	CWC0191RC
21	(1.0'-2.0')	L	SEC C- 29900	CWC0196LC
22	(1.0'-2.0')	R	SEC D- 33900	CWC0298RC
23	(1.0'-2.0')	L	SEC D- 51900	CWC0365LC

* - Left and right are based on facing downstream

REFERENCES

BNI (Bechtel National, Inc.) 1991. *Work Plan for the Remedial Investigation/Feasibility Study - Environmental Impact Statement (RI/FS-EIS) for the St. Louis Site*, DOE/OR/21949-271.1, St. Louis, MO. December.

BNI 1992. *Draft Remedial Investigation Report for the St. Louis Site*, DOE/OR 21949-280, St. Louis, MO. January.

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SAIC (Science Applications International Corporation) 1992. *First Draft FS-EIS for the Radioactive Contaminants at the St. Louis Site*, DOE/OR/21950-130, St. Louis, MO. October.

SAIC 1992a. *Evaluation of Contaminated Sediment Transport in Coldwater Creek, St. Louis, MO.* Appendix in Draft FS-EIS. August.

U.S. Army Corp of Engineers (COE) 1987. *Feasibility Report and Environmental Impact Statement*, May.

Administrative Record for the Formerly Utilized Sites Remedial Action Program (FUSRAP) North St. Louis County Sites

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for the St. Louis Site, Missouri

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