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U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 10



Hanford Project Office
Federal Building, Rm. 178
P.O. Box 550, A7-70
Richland, Washington 99352

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REPLY TO
ATTN OF: A7-70

April 3, 1989

Elizabeth A. Bracken
Acting Director
Environmental Restoration Division
U.S. Department of Energy
P.O. Box 550, A6-50
Richland, Washington 99352



Dear Ms. Bracken:

Re: Comments on the Draft Site Characterization Plan for the
116-B-6-1 Crib, ISV Project

The referenced site characterization plan was submitted to this office on March 13, 1989. Although a formal cover letter was not attached, Ms. Margo Anthony, of your staff, requested that we provide comments by March 31, 1989, if possible. This request was made to accommodate the schedule of available drilling equipment for the bore holes within the crib. Since I could not complete this review by that date, I called Ms. Anthony on March 31, to explain that you could proceed with drilling the two proposed bore holes in the crib, since the comments that we had on the plan did not include comments on these particular bore holes.

You should note that the Treatability Investigation Work Plan for this project will be considered a Primary Document as defined in the draft Hanford Federal Facility Agreement and Consent Order / Action Plan. As such, the Environmental Protection Agency will take up to 45 calendar days for the initial review. It is my understanding that the Work Plan will be submitted by the Department of Energy in approximately three months.

The enclosed comments reflect the Environmental Protection Agency's comments on this site characterization plan. If you have any questions, please contact me at (509) 376-6623.

Sincerely,

Paul T. Day
Hanford Project Manager

Enclosure

cc: (with enclosure)

L. Goldstein, Ecology
S. James, EPA-ORD
Administrative Record

E. Pimentel, PRC
R. Anderson, EPA-Hdq.
M. Anthony, DOE

W. Staubitz, USGS
J. Barich, EPA-10
R. Freeberg, DOE

ENCLOSURE

1. Deficiency: Due to the lack of detailed historical information about the design of this crib, the local geology, and the materials that were placed in it, there is no reason to believe that all of the contamination migrated vertically from the bottom of the crib. The plan does not provide a mechanism to determine if contaminants migrated laterally. While the two proposed bore holes at the center and edge of the crib should establish the maximum vertical extent of the contamination, the question will remain about the lateral extent.

Contaminants leaching downward out of the bottom of the crib may have also migrated laterally beyond the crib area in the unsaturated zone. This seems especially probable in a semi-arid area where under natural conditions the unsaturated zone is likely to be at a low moisture content and would therefore draw moisture and associated contaminants laterally from the soils directly below the crib.

Recommendation: The plan should provide for the drilling of additional bore holes and the collection of additional soil samples. At least two additional bore holes should be drilled at distances of approximately 10 and 50 feet from the edge of the crib. Samples from these holes should be taken at similar depth and stratigraphy as the samples taken from within the crib and at any distinct changes in lithology (particularly at layers of lower permeability) noted during drilling.

The parameters to be analyzed could be restricted to those found in the crib, based on analyses of the bore hole samples taken within the boundary of the crib.

2. Deficiency: The plan does not provide for the collection of background soil data.

Recommendation: Additional bore holes should be provided at suitable locations to establish background concentrations for those constituents/parameters that were found within the crib. Generally, background soil data is not considered statistically representative without a minimum of five bore holes of this type.

The parameters to be analyzed could be restricted to those found in the crib, based on analyses of the bore hole samples taken within the boundary of the crib.

3. Deficiency: Based on the distance from the crib to the nearest groundwater monitoring well (B4-4, about 500 feet away), there is not sufficient information to properly place the single proposed new groundwater monitoring well.

Recommendation: At a minimum, one upgradient monitoring well should be placed to provide a comparison to data obtained from the proposed downgradient monitoring well.

In addition, at least one additional downgradient boring should be drilled and completed as either a piezometer or a monitoring well. If completed as a piezometer, it should be drilled prior to other wells in order to provide additional information on groundwater flow direction, necessary for proper placement of the other monitoring wells.

Provide a more detailed discussion on the rationale for groundwater monitoring as part of this demonstration project.

4. Deficiency: The crib lies only about 3,000 feet from the shores of the Columbia River. The water table aquifer material is generally coarse grained in the upper layers which are in contact with the river. Therefore, the river stage may affect the direction of groundwater flow under the crib on a seasonal basis, depending on river stage. It may be an oversimplification to assume that groundwater flow is always northward toward the river. The proposed placement of the one groundwater monitoring well directly north of the crib indicates that this assumption has been made, when in fact, the water table map in Figure 11 shows more of a northeasterly trend.

Recommendation: As stated in comment #3, there is presently insufficient information on groundwater flow direction for proper placement of a single monitoring well. The potential influence of the river on the groundwater flow direction in this area can be relatively easily demonstrated by providing groundwater elevation data from well B4-4 and comparing the amount of groundwater elevation fluctuation with wells nearer the river, such as B5-1, B4-1, and B3-1.

The wells mentioned above, along with any new wells/piezometers should be measured for water level elevations on at least a monthly basis over the first year to establish seasonal fluctuation in the gradient.

5. Deficiency: It is not known whether there are plans for testing for off-gas migration during the vitrification process. In order to prove such a technology for general application, it will be important to know the extent to which off-gas migration extends in a lateral direction.

Recommendation: The characterization plan should provide for soil gas probes around the perimeter of the hood which will serve as "background" points (i.e., the soil gas contains no contaminants which are found in the crib). These probes should be placed as part of the characterization process, with a dual purpose in mind. First, they will serve to define the extent of contamination (for certain constituents). Second, by collecting samples before, during and after the vitrification process, the potential effect for lateral migration of off-gases can be measured. During the vitrification process, additional probes should be available for quick placement and sampling further away from the hood if contaminants are detected at the background points.

The remainder of the comments are either miscellaneous in nature or reflect comments that were offered during our March 20, 1989 meeting that have not been covered in the above comments.

6. Is there adequate physical clearance between the crib and the loading dock or 111-B building to accommodate the large scale ISV off-gas collection hood which measures 12 meters by 12 meters?
7. Have the possible effects of subsidence in the vicinity of the crib on the adjacent structures (loading dock, 111-B building, and buried utilities) been considered?
8. It is not clear whether the augering proposed for the four electrodes will provide adequate clearance to accommodate the 30 cm diameter graphite collars. The bore hole locations for the four electrodes should also be determined prior to field work to ensure that they conform to the openings in the off-gas collection hood.

9. p. 8, figure 6
Describe the difference in soil types, if any, between the top six feet and the next eight feet. Identify the horizontal lines extending from both sides of the crib.
10. p. 9, table 2
Explain why the values in the counts per minute column are generally in multiples of 200. The value of 30 indicates that greater resolution is achievable.
11. p. 10, figure 7
The text refers to existing wells with a "199" prefix. The figure shows wells with a "1" prefix. The terms should be consistent to avoid confusion.
12. p. 11, table 3 and paragraph 1
The text says that the well 199-B3-2 penetrates deeper than 151 feet. Table 3 shows nothing at this particular depth. Was this well drilled to this depth, but screened higher? Table 3 might be clarified by providing an additional column of total depth or depth drilled.
13. p.15, figure 11
The 400 foot contour line at the lower left is not justified, (especially without a question mark). This figure also indicates a possible northeasterly groundwater flow direction which contradicts the placement of the proposed monitoring well due north of the crib as shown in figure 12.

Contour lines should be provided around wells 72-92 and 72-88. It appears that these elevations are being disregarded.
14. pp. 16-19, table 4
This table is confusing. As an example, tritium is shown to have a detection limit of 500 pCi/l and out of 118 samples taken, zero were found to be "below detection". While this is useful information, it does not tell us what the ranges of concentrations were, in comparison to the established standards. The table should include columns for minimum, maximum, and mean values detected and identification of the well(s) where such samples were taken.
15. p. 15, paragraph 5
The contractual detection limit (CDL) has no meaning outside of the local contractual arrangements. The term contract required quantitation limits (CRQL) has a specific meaning to EPA and the contract laboratories

under the Superfund program. The term CRQL should be used rather than CDL since the proposed "Hanford Federal Facility Agreement and Consent Order" (Agreement) requires that the collection, transport, and analyses of all samples conducted in connection with the Agreement follow EPA approved procedures and the following guidance documents:

- o "Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans" (QAM-055/80); and,
- o "Data Quality Objective Guidance" (EPA 1540/687/003 and 004).

Note: During the March 20, 1989 meeting, the term practical quantitation limit (PQL) was discussed and recommended to replace CDL in this characterization plan. Upon further investigation, it appears that the term PQL is a term used only in RCRA and is specified in EPA's guidance document SW-846. Since this ISV demonstration will be the basis for a Superfund treatability investigation, the Superfund terminology (CRQL) is preferred.

16. p. 20, last paragraph
In regard to soil gas monitoring, the layout of the proposed sampling points needs to be identified in a figure. The grid spacing for these points should be justified, based on known site specific geological conditions.
17. p. 21, paragraph 3
As was discussed in the March 20, 1989 meeting, the maximum screen length for the groundwater monitoring wells will be 15 feet, rather than 20 feet. Therefore, the screened interval will extend approximately 13 feet below the historic high water table.
18. p. 22, figure 12
There is no information provided on the buried pipes shown to the north and east of the crib. Depending on what these pipes contain(ed) and if they leaked, the impact on the proposed monitoring well could be significant. The pipe to the north is only about 10 feet from the crib. It would appear that the ISV process itself could have a potential impact on the pipe. The contents of these pipes needs to be fully investigated prior to implementation of the ISV project. At a minimum, a records search should be made. It may be necessary to carry out some field

work, with soil sampling or actual examination of the pipes, during the characterization phase.

19. p. 23, paragraph 1
The plan does not describe exactly what list will be used for analytical parameters. Due to the uncertainty of what may have been placed in the crib and the fact that this investigation should supplement further investigative work at the 100-BC-1 operable unit, it is recommended that the target compound list be specified. Reference for this list was provided to representatives of PNL on March 20, 1989.
20. p. 24, paragraph 6
The decision on exact placement of the well screen at any proposed monitoring well should be deferred until the degree of water level fluctuation at well B4-4 is established. Once this has been done, the top of the screen should be set approximately two to three feet above the historic high water table.
21. p. 25, paragraph 3
The identification of the only proposed monitoring well as "well 3" is confusing. This well should be renamed as "MW-1" or something similar, to avoid confusion with the bore hole designations.
22. p. 25, paragraph 3
Due to the lack of hydrogeological information available in the immediate vicinity of the crib, it is recommended that a reasonable amount of information be obtained from the proposed monitoring well. An important element that is lacking in the plan is a proposal for aquifer testing. Information on hydraulic conductivity and time of travel, for example, should be obtained by field testing.
23. p. 25, paragraph 5
"Sediment samples" should be changed to "soil samples", for consistency.
24. p. 27, table 5
This table is confusing and poorly organized. It should be completely revised to show specifically which samples will be taken at which locations and intervals. It should also show parameters that will be measured for each sample.
25. p. 30, paragraph 3 (Sampling Interval)
In addition to five foot intervals, geologic samples should also be collected at any changes in lithology.

26. p. 33, table 6
It is unclear why certain PNL methods, modified EPA methods, or US Testing methods are specified for procedures for which EPA has approved methods. The EPA approved methods should be listed or a demonstration of equivalency should be given.
27. p. 35 paragraph 3 (Soil Gas Measurements)
Due to the extreme temperatures involved with the ISV process, has the potential for volatilization of metals or radionuclides been considered during and shortly after the demonstration? This is not a site characterization issue, but might be considered in development of the Work Plan.
28. Appendix A, pp. A.6 and A.8
The figures provide very useful information. However, it is unclear why a cement plug was placed in these wells. Does it have to do with the geology? This should be discussed in text or in a foot note on these two pages.
29. General Comment
It would be helpful to the reader/reviewer if certain sections of the characterization plan were cross referenced. For example, general discussion on certain issues (e.g., soil gas monitoring) resulted in comments that had to be deleted or modified when the more detailed section was later found. It would speed the review process if the reader was alerted that a more complete discussion was to follow in Section "x".