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STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

1315 W. 4th Avenue • Kennewick, Washington 99336-6018 • (509) 735-7581

October 23, 1997

Bryan Foley, Groundwater Project  
U.S. Department of Energy  
P.O. Box 550, MSIN: H4-83  
Richland, WA 99352



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Dear Mr. Foley:

Re: Comments on "Evaluation of the Soil-Gas Survey at the Non-Radioactive Dangerous Waste Landfill" BHI-01115 Rev. 0 48170

The Washington State Department of Ecology's (Ecology) comments on the above document are attached to this letter and were communicated electronically to you on October 21, 1997. Ecology does not agree with the interpretation of the soil gas data as described in the report.

The objective of the soil gas survey was to collect enough data to: (1) assess vertical and lateral distribution of Volatile Organic Analysis (VOC) contamination; (2) assess potential impacts to groundwater; and (3) determine if the contaminants are moving. The small amount of data collected limits the conclusions that can be drawn from this survey. Ecology does infer, from the limited data, that carbon tetrachloride and chloroform at certain locations are increasing in concentration with depth, indicating that migration is vertically downward through the vadose zone to depths near to the phreatic water.

U.S. Department of Energy should respond to Ecology's comments and revise the document by November 25, 1997. If you would like to meet to discuss Ecology's comments, please contact me at (509) 736-5704.

Your letter dated October 20, 1997, to Mr. E. R. Skinnarland relating to the groundwater portion

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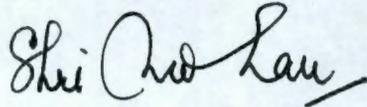


Mr. Bryan Foley  
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of the NRDWL Notice of Deficiency is directly related to the results of the soil-gas survey.  
Response to the letter has been postponed pending a revised version of the soil-gas survey report.

Sincerely,

A handwritten signature in black ink, appearing to read "Shri Mohan". The signature is fluid and cursive, with a horizontal line underlining the name.

Shri Mohan, Sub-Project Manager  
Nuclear Waste Program

SM:LC:ch  
Enclosure

cc: Vern Dronen, BHI  
Gregory Mitchem, BHI

bcc: Laura Cusack, Ecology  
Jack Donnelly, Ecology  
Moses Jaraysi, Ecology  
Stan Leja, Ecology  
Ron Skinnarland, Ecology  
Jerry Yokel, Ecology

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**Comments on**  
**“Evaluation of the Soil-Gas Survey at the Non-Radioactive Dangerous Waste**  
**Landfill”**  
**BHI-01115 Rev. 0**

**General Comments:**

The objective of the soil gas survey was to collect enough data to both, assess vertical and lateral distribution of Volatile Organic Compound (VOC) contamination and potential impacts to groundwater and determine if contaminants are moving. The small amount of data collected however limits the conclusions that can be drawn from this survey. Ecology does conclude that carbon tetrachloride and chloroform, at certain locations, are increasing in concentration with depth, indicating that migration is vertically downward through the vadose zone.

No attempt has been made to convert soil gas data into soil or groundwater concentrations. Other than verifying earlier soil gas results, this survey has not provided the data to define contaminant conditions at NRDWL.

The viability of this approach rested on the collection of soil gas at more vertical and lateral locations. The inability of the Geoprobe to sample any of the 36.6 m target depths and two of the 27.4 meter target depths has compromised the results of this survey. Additional data must be collected before statements regarding the potential risk from this site can be made.

This entire document does not contain recommendations and does not answer if the purpose stated in Section 1.2. Conclusions arrived at does not meet concurrence of Ecology.

**Page ES-1**

The Executive Summary should indicate the number of sampling locations planned according to the DQO in addition to the locations actually sampled. Last sentence of the Executive Summary implies that 200 Area Strategy has been approved and the priorities of the sites can not be changed. According to the 200 Area Strategy, the priorities of the sites can be modified based on threat to contamination of groundwater and the risks. Modify the text.

Detecting Carbon Tetrachloride and Chloroform is significant since the other chemicals (TCA, TCE, DCA) are probably break down products of these compounds. The last statement indicates that the potential risk at NRDWL is low. The information is only indicative with the available data and the risk conclusions cannot be made unless the following four basic concepts of a risk assessment have been established: (1) complete hazard identification, (2) dose response evaluation, (3) exposure assessment, (4) risk characterization/uncertainty analysis.

Until these concepts have been established only then can a comparison with other 200 Area waste sites be made. The sentence “Evaluation of the 1997 . . . current priorities for the closure.” should be deleted and the text should be modified appropriately.

**Page 1, Section 1.1**

The 200 Area Soil Remediation strategy is still in the process of approval, thus referring to the strategy is not appropriate in this document. The complete paragraph should be modified to reflect the factual position.

**Page 1, Section 1.2, Line 5**

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Change "vertical extent" to "vertical and lateral extent".

**Page 3, Paragraph 1, Line 1**

Remove "cost effective" and replace with "within the limited USDOE allocated budget for the FY1997".

**Page 3, Last Sentence**

The sentence is confusing. According to this paragraph only one attempt was made to drive the probe to a target depth at each location. The first sentence of the next paragraph on page 4 indicates that at eight locations where refusal was initially encountered, probes were successfully installed during later attempts. Therefore, more than one attempt was made at some locations. Please explain.

According to the Sampling and Analysis Plan (SAP) only one attempt was required to be made to reach the desired depth at each location; however, there was an option to adjust the horizontal position of the pre-selected sampling location. Explain why horizontal position was not adjusted.

The sentence "As described in the Sampling . . . depths at that location." should be deleted or modified to reflect the correct intent of the SAP.

**Page 4, Paragraph 3**

See comments on page 13, Table 3, and modify this accordingly.

**Page 6, Paragraphs 1 and 2**

These two paragraphs describe comparison of 1993 and 1997 data in the shallow wells, and refers to Table 5. The title of the table indicates the data of 1993. If the table includes data of 1993 and 1997, the title should be appropriately corrected and the two sections should show the year of the data.

**Page 6, Paragraph 3 and Figure 11**

The last sentence refers to Figure 11 as the data of 1993. Please label the figure appropriately in the title to reflect the year 1993.

**Page 6, Paragraph 4**

The comparative interpretation of Table 6 should be correctly described. The description should say: "In the shallow probes TCA, DCA, PCE, and TCE have decreased in 1997 as compared to 1993, however, Carbon Tetrachloride and Chloroform have increased. In the deep probes all the chemicals have increased in 1997 compared to 1993."

**Page 6, Last Paragraph**

Comparison of shallow soil gas data and deeper soil gas data indicates that contaminants have migrated significantly. The movement has been downward, not laterally. The statement that contaminants have not migrated significantly is true only for lateral migration, not vertical. This paragraph should reflect that vertical migration is apparently taking place.

Ecology does not agree with the conclusion as stated in third sentence of the paragraph, starting "However, limited comparison . . . not migrated significantly." The survey results are merely indicative of how it can be interpreted that the contaminants have not moved significantly.

Remove this sentence.

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**Page 7, Last Paragraph**

The conclusion that the potential risk from NRDWL compared to potential risks from other waste sites in the 200 Areas is low, is premature. Additional data must be collected before such a conclusion can be reached.

Ecology objects to the sentence "This potential risk is low... Waste Site Grouping report (DOE-RL 1997)". Prove this paragraph by showing a specific study according to which the risk comparison has been made and what data has been used. This sentence should be removed from the paragraph. See previous comments on page ES-1.

**Page 13, Table 3**

Probe number S-4 and its replicate show a 41 ppmv value for Carbon Tetrachloride with good precision and above the instrument calibration range. Assuming this is a defensible data value and the gas is acting "ideally" then if you take this 41 ppmv value and convert it to the groundwater value using the 0.0151 vapor concentration value the groundwater value would be 271 ppb. This value is significantly above the MCL of 5 ppb. Then if this number is converted by the MTCA 100 times rule to 27.1 mg/kg this value is significantly above the MTCA B method value of .034 mg/kg for soil.

If similar logic is used to look at the chloroform values at the same probe the 22 ppmv value will convert to 956ug/l and to 95.6mg/kg which is again significantly above the MTCA method B value of 0.72mg/kg.

The other values reported at the deeper D-3 probe site (which are even higher for chloroform) if converted as above, would fall above the MCL and MTCA method B value. Ecology's conclusion is that the data indicates a possible migration of the contaminants Carbon Tetrachloride and Chloroform from a depth of 1.8 m to 23.2 m through the vadose beneath the chemical trenches 33 and 34.

**Figure 1**

The figure shows many sampling locations, which include locations of 1993 survey as also of the 1997 survey. Clearly demarcate the locations of 1993 and 1997 probe locations.

**Figure 2**

See comments on Figure 1 and modify.

**Figure 3**

Turn by 90 degrees to see the figure upright.

**Figures 5 through 9**

Draw shades of levels of chemicals in various graphs, where possible.

*cmts-sg.doc*