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ENVIRONMENTAL AFFAIRS

January 31, 2001

Mr. Stephen B. Myers
New Jersey Department of Environmental Protection
401 East State Street, 5th Floor
PO Box 432
Trenton, NJ 08625

VIACOM

Re: Responses- NJDEP Letter
ISRA Case No. E86070
NRC License No. SMB-1527
Viacom Inc.
Bloomfield Township, New Jersey

Dear Mr. Myers:

Viacom Inc. is providing responses to the New Jersey Department of Environmental Protection (NJDEP) letter dated January 2, 2001. The NJDEP letter provides comments on the report titled *Final Radiological Status Survey Report Building 7 and Sewer System* which was submitted to the U.S. Nuclear Regulatory Commission (NRC) in August 2000.

A summary of each NJDEP comment with a corresponding response follow:

1. **The NJDEP acknowledges that soil samples were analyzed by either alpha-spec or gamma-spec, both with extensive quality control procedures. Is there data correlating the results of samples from one location analyzed by both methods?**

Response: Six of nine background samples were the only "Final Survey Samples" taken in accordance with the Final Survey Plan, analyzed by both alpha and gamma spec. The results of samples are summarized in Section 3.7 and Table N-1 of Appendix N. However, before final survey activities commenced, eleven characterization samples were taken and analyzed for both alpha and gamma spec. The results of the characterization samples and the background samples are presented in new Table L-2. Note that the background soil activity for uranium is relatively low resulting in Minimum Detectable Activity (MDA) values reported for uranium when analyzed by gamma spec. Sample results above MDA correlate well, with an average difference of 17 percent.

2. **The NJDEP suggests that μ_α be calculated with the same number of significant figures in the input data on the following sets of tables and figures: Table C-1 and Figure C-1, Table D-1 and Figure D-1, Table H-4 (H-1?) and Figure H-1, Table I-1 and Figure I-1, and Table J-1 and Figure J-1. Viacom shall confirm that the μ_α calculations for each of these survey units are the same. If they are not Viacom shall explain.**

Response: The data shown on the above-referenced figures did not carry the same number of significant figures as the corresponding tables, which lead to rounding differences in the final result. The results presented in the tables are correct. The figures have been revised and are now consistent with the corresponding tables. In addition, the calculation of μ_α for individual grids has been replaced on applicable figures with the calculation of the average, consistent with the guidance given in NUREG/CR-5849. (The calculation of μ_α for individual grids is conservative and is only required for the entire survey unit, as is presented in the tables.) Figures that have been revised include A-1, B-1, C-1, D-1, E-1, F-1, G-2, G-3, G-4, H-1, I-1, and J-1. Also, Tables A-4 and B-4 have been revised to include the weighted average for elevated areas in the calculation of average and standard deviation used in the calculation of μ_α.

3. **Viacom shall inform the NJDEP if Figures G-2 and G-3 contain data that is prior to the final remediation and therefore not part of the final survey. Additionally, Viacom shall clarify if Figure G-4 should be labeled "final survey" and not "final excavation".**

Response: Figures G-2 and G-3 present data prior to the final survey. Additional remediation was performed based on the results presented on Figure G-2. Samples in areas that were remediated were replaced by new samples. Samples in areas that were not remediated were carried over. Figure G-3 presents these sample results. While waiting for the additional analytical analyses results, remediation was performed based on gross gamma scan results and samples were again taken in areas where additional remediation was performed. Figure G-4 presents these results together with samples from areas that were not remediated. Therefore, Figure G-4 represents the final survey (as left) of Survey Unit G. The title of Figure G-4 has been revised to "Final Survey Sample Locations Survey Unit G".

4. **Table G-5 shows the results of 59 soil concentration data points and calculations of average, standard deviation and μ_α for these data points in survey unit G. Nine of these data points (FS-122, FS-125, FS-127, FS-133, FS-143, FS-146, FS-157, FS-158 and FS-159) are not listed in Figure G-4. Viacom shall clarify why these data points are not on Figure G-4.**

Response: The noted sample points were samples taken in areas of Survey Unit G that were subsequently remediated (see response to Question 3 above) and, therefore, are not included in subsequent figures. Replacement samples were taken after remediation and are included in subsequent figures. Figure G-4 represents the "as left" final survey results for Survey Unit G. Table G-5 was conservative in that the table included the sample results (most greater than the acceptance criteria) of areas that were subsequently remediated. However, a calculation of μ_α that accurately reflects the "as left" condition of Survey Unit G should not include the nine sample results from areas that were subsequently remediated. Table G-5 has been revised to reflect the "as left" condition of Survey Unit G, consistent with Figure G-4.

5. **Table G-5a for weighted average is labeled as Grid 1. It contains data points from Grids 1, 2 and 3 therefore should Table G-5a be relabeled? Viacom shall explain why the weighted average for grids 1 and 2 were not done separately since they contained elevated results. Viacom shall explain why data point FS-148 is in Figure G-4 for grid 1 but not on Table G-5a. Viacom shall explain why data points FS-122, FS-127, FS-133, FS-143, FS-146, FS-157, FS-158 and FS-159 are included in Table G-5a and not included on Figure G-4.**

Response: Based on the final samples presented on Figure G-4 (and in the revised Table G-5), the only remaining elevated area is located in a 10 m^2 area of Grid 1. Table G-5a has been revised to include only Grid 1 data. The previous table was conservative in that it included sample results greater than the acceptance criteria that were subsequently remediated. The Grid 2 final survey results are less than the acceptance criteria and, therefore, do not require the weighted average calculation. Sample FS-148 is included in the revised Table G-5a and Samples FS-122, FS-127, FS-133, FS-143, FS-146, FS-157, FS-158 and FS-159 are not included, consistent with the elevated area presented on Figure G-4.

6. **Viacom shall inform the NJDEP which data points in Table G-5a are included in the 4 m^2 hot spot with an average of 1.01 Sum, and in the 8 m^2 hot spot with an average of 1.28 Sum.**

Response: See the response to Question 5 above. Table G-5a has been revised and includes a weighted average calculation for one 10 m^2 hot spot located in Grid 1, based on the final sample results presented on Figure G-4. Based on the final sample results after all additional remediation was completed, the hot spot was characterized by four sample results in a 10 m^2 area, with an average sum of fractions equal to 1.22.

7. **There is no hot spot weighted average for the backfill material used for Survey Unit A, see Table K-1a. It is stated in Appendix K that approximately 12 pCi/g of Thorium was observed in three of the 30 samples. Viacom shall clarify if this material was mixed before it was backfilled into Survey Unit A. Viacom shall also determine the average concentration of the total uranium and the total thorium represented by these 30 samples. That is, multiply each sample result by the volume of soil it represents. Total these figures and divide by the total volume of soil referenced on Table K-1a. The calculation of μ_α is meaningless in this application. μ_α assumes a near-homogeneous depth of contamination and does not take into consideration the volume of soil that is represented by each soil concentration result in Table K-1a.**

Response: The sand was mixed and used to form bedding beneath the new storm drainpipe. Samples of sand and backfill were taken systematically to be representative of the total volume, i.e., each sample represents an approximately equal volume of backfill material. Therefore, the averages presented in Table K-1a are representative of the total uranium and total thorium in the volume of backfill material used in Survey Unit A. A weighted average calculation is not required, i.e., will yield the same average. Table K-1a has been revised to include average, standard deviation and υ_α values for total thorium and total uranium.

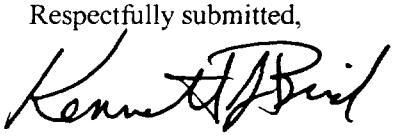
8. **Viacom shall correct or explain the radionuclide designations on pages 39-40 of Table P-1, "Final Soil Sample Locations and Laboratory Results", for samples FS-159, FS-160, FS-161, FS-162, FS-164, FS-166, FS-167, FS-168, FS-169, FS-170, FS-171 and FS-172.**

Response: The consecutive radionuclide numbers that appear are the result of the "autofill" feature in Microsoft Excel. The tables have been revised so that for each of the samples, the radionuclides listed are U-238, U-235, Th-234, Th-228, Ra-228, and Ra-226 if analyzed by gamma spec and as U-234, U-235, U-238, Th-228, Th-230, and Th-232 if analyzed by alpha spec. Table P-1 has been revised.

Changes to the *Final Radiological Status Survey Report Building 7 and Sewer System* report based upon the above responses are being provided to the NRC and NJDEP under separate cover.

Although not directed to respond to the above comments by the NRC, Viacom is providing these responses to expedite the termination of the NRC issued license. Because the *Final Radiological Status Survey Report Building 7 and Sewer System* report describes license termination activities performed under License No. SMB-1527, it would be appreciated if future comments were directed to the NRC for consideration. A copy of this letter is being provided to the NRC. If you have any questions regarding this letter, please contact me.

Respectfully submitted,



Kenneth J. Bird, CIH
Project Engineer/Consultant

Enclosures

pc: Mr. Mark Roberts, NRC
Mr. Richard Proctor, Township of Bloomfield, Health & Human Services
Mr. James Moran, Viacom
Mr. Andrew Lombardo, Earth Science Consultants, Inc.
Cummings/Riter Consultants, Inc.

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