DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207-3199

REPLY TO
ATTENTION OF
CELRB-PE-EE

Planning, Program and Project Management Division

SUBJECT: Linde FUSRAP Project, December 6, 1999 Letter to Ms. Julie Peterson

Mr. Aubrey V. Godwin
Arizona Radiation Regulatory Agency
4814 South 40th Street
Phoenix, Arizona 85040-2940

Dear Mr. Godwin:

This letter is in response to your December 6, 1999 letter to Ms. Julie Peterson raising comments on a package Ms. Peterson sent to Mr. Edgar D. Bailey of the California Department of Health Services concerning radiological analytical results on the Linde Building 30 demolition project. I apologize for the extended delay in responding to your letter. The Corps of Engineers mistakenly viewed your comments for information only and therefore, did not provide a timely response.

Buffalo District has been in contact with the analytical laboratory requesting the information necessary to respond to your specific comments. The District has not yet received this information; therefore, this letter is an interim response to your December 6, 1999 letter. I anticipate providing a final response to your comments by October 16, 2000, after the requested information is received from the analytical laboratory.

Concern 1. The documents refer to New York and California certifications of the laboratories involved. These certifications only apply to water samples and are of no validity for solid samples. Some of the issues involved with solid samples which may not be important for water samples are; how were tracers utilized to ascertain the yield of the chemical processing, how did the laboratory correct for the thickness of the material in the planchet or filter, and what were the aliquots correction factors and how did they effect the detection limits. None of this information was provided.

Response 1. Buffalo District has requested from the analytical laboratory the information necessary to respond to this comment. Buffalo District will provide a complete response to this comment after receipt of this information.

Concern 2. The references to EPA 901.1 method for analyzing Radium 226 and 228 is inappropriate in that the method is for water samples only. The modification applied to determine these isotopes is not provided.

Response 2. Buffalo District has requested from the analytical laboratory the information necessary to respond to this comment. Buffalo District will provide a complete response to this comment after receipt of this information.

Concern 3. There is no information provided to indicate that the origin of these materials was solely from the FUSRAP program. Indeed based upon the analysis, the material could have been from any licensed program involving some refined uranium.

Response 3. Building 30 was built by the Manhattan Engineering District (MED) on land owned by Union Carbide during the 1940s. Building 30 was the primary building used to separate uranium from uranium ores and tailings for the MED project. The building was contaminated by residuals of ore processing to extract uranium in the 1940s in support of the Manhattan project. The contaminants in the building debris were thus remnants from the ore processing for the Manhattan project. To the Corps of Engineers' knowledge, no other activities involving the handling or processing of radiological materials was performed in Building 30.

Concern 4. The statistical validity of having only thirteen samples each for wood and concrete for the 84 railcars of material was not supplied. In addition the error is not stated as to one or two sigma. The combining of the samples that were too high (?) is not supported by any information.

Response 4. Core sampling of Building 30 was performed in order to determine a conservative estimate of contamination. Direct reading field instrumentation was used to confirm the presence of elevated levels of radioactivity in Building 30 surfaces prior to sampling. Twenty-six core samples, 13 wood samples and 13 masonry/concrete samples, of the building were collected prior to demolition of the structure. The purpose of these samples was: 1) to generate volumetric data which would reflect the average amount of radioactivity in the Building 30 materials, and 2) to determine if the debris generated from the demolition of Building 30 would meet the volumetric acceptance criteria of the waste disposal facility. Biased core samples were collected from areas of Building 30 *known to be contaminated* based on historical site information and on previously collected site characterization data. In addition, to ensure representativeness, random core samples were also collected. All core samples were sent off-site for laboratory analysis.

The United States Army Corps of Engineers (USACE) and the waste disposal facility reviewed the analytical laboratory's qualifications, the analytical methods utilized, the isotopic results, and the error associated with each result. The facility reviewed the data and the number of samples and determined that the building debris was sufficiently characterized. Upon direct comparison of the analytical results to the disposal facility's acceptance criteria, it was determined that these criteria were met.

The waste disposal facility then specifically discussed, via telephone, the proposed shipment of the Building 30 debris to the facility with appropriate officials from the California Department of Toxic Substances Control and the California Department of Health Services. These conversations were documented in a letter of understanding to all parties dated October 21, 1998, approximately 1 month prior to the start of the Building 30 debris shipments to the waste disposal facility.

Based upon review of the Building 30 material analytical results, comparison of these results to the disposal facility's acceptance criteria, and discussions with appropriate State of California agencies, the disposal facility determined that they could accept the material for disposal pursuant to their permit.

To confirm that the average specific activity of the radionuclides in the Linde Building 30 material sent to Safety-Kleen's Buttonwillow facility were within established limits for the facility, a conservative estimate of the average total specific activity in the material was calculated. Using the 26 concrete and wood samples taken by USACE and established statistical procedures, USACE calculated an upper bound on the total specific activity, 1770 pCi/g, below which there is 95% confidence the average total specific activity falls. This is less than the 2000 pCi/g criterion set for the Buttonwillow facility. In addition, the average total specific activity is skewed by the disproportionate number of samples taken from the relatively more contaminated concrete debris. Although the concrete represented only 10% of the volume of the debris, 50% of the 26 samples were taken from the concrete, thus skewing the results toward a higher average value. Accordingly, USACE believes the characterization of this material was adequate to demonstrate compliance with Buttonwillow's acceptance criteria.

Concern 5. Then gamma scan for radium 228 does not indicate the peak counted and the in-growth of the peak at the time of counting. Further, the radiums on the Quality Control Results both have a calculated result of 200 with no discussion of any significance of the value provided.

Response 5. Buffalo District has requested from the analytical laboratory the information necessary to respond to this comment. Buffalo District will provide a complete response to this comment after receipt of this information.

Concern 6. The matters of counting times and traceability were also missing.

Response 6. Buffalo District has requested from the analytical laboratory the information necessary to respond to this comment. Buffalo District will provide a complete response to this comment after receipt of this information.

Concern 7. I understand that some activities which took place in the Tonawanda, NY facility were not FUSRAP related. Indeed, some of the activities were licensed activities and could be LLRW act wastes but licensed for other activities. The information does not indicate how these were eliminated from the shipped wastes.

Response 7. Linde Building 30 was contaminated in the 1940's by residuals of ore processing conducted to extract primarily uranium from ore in support of the Manhattan project. To the Corps of Engineers' knowledge, no license has ever been issued for these activities or any later operations at this site. This building debris was thus contaminated with pre-1978 uranium mill tailings. The Nuclear Regulatory Commission (NRC) has taken the position that no license is required to possess or dispose of these materials since the tailings were created prior to the

passage of the Uranium Mill Tailings Radiation Control Act (UMTRCA) in 1978 and not pursuant to a license in effect at the time of UMTRCA's enactment or thereafter.

If you or your agency possess information regarding non-MED wastes at the Linde facility, including wastes generated by licensed activities, please provide this information to me for USACE review.

If you have any additional comments on this subject please contact Mr. Raymond Pilon, Linde Project Manager, at (716) 879-4246 or by writing to the above address.

Sincerely

for

George B. Brooks
Chief, Planning, Program & Project Mgmt. Div.