



Thomas C. Jorling
Commissioner

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

DEC - 4 1992

Mr. Dominick Orlando
U.S. Nuclear Regulatory Commission
Mail Stop 5-E4
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Re: Cintichem, Inc., Decommissioning
Cintichem's October 22, 1992 Response to NRC Questions
(Docket 70-687)

Dear Mr. Orlando:

The Department of Environmental Conservation (DEC) has reviewed the October 22, 1992, response of Cintichem, Inc., to the NRC's September 23, 1992 questions on Cintichem's proposed soil decontamination criteria. The results of that review are presented below, for your consideration in accordance with the March 12, 1991, Cooperation Agreement signed by NRC, Cintichem, and DEC. We have also included the status of the issues and questions we raised in our September 22, 1992 letter to you on Cintichem's July 1992 proposed soil decontamination criteria.

A. Soil Decontamination Criteria

1. While we agree with the proposed soil decontamination criteria for surface soils, we cannot concur with the use of separate, higher criteria for subsurface soils on a site that is to be released for unrestricted use. We stated this position in our September 22, 1992, letter, and it has not changed.

In the second paragraph of the response to question 3, it is stated that the rock cavities to which the subsurface criteria will apply are 30-35 feet below grade. However, in the fourth paragraph it is written, "these residual contaminants will be at least 1 meter below grade[,] but more likely they will be 3 to 5 meters below the surface." This seems to imply that once the buildings are removed and the rubble has been placed, there will be a depression in the site surface anywhere from about 5 to 9 meters in depth. Or, these two paragraphs may refer to grades at different locations. Cintichem should be requested to clarify this. In

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any case, one meter of cover is not sufficient to assure that these subsurface soils will not be brought to the surface by any of the variety of human activities possible under unrestricted use.

Cintichem argues that it is unlikely a dwelling would be built on the areas (under the reactor and hot lab buildings) to which the subsurface criteria will apply. That assumption (if it were true), combined with deed restrictions to prevent construction on or disturbance of those areas for 100 years, could justify using the higher, subsurface criteria. However, the post-decontamination scenario applied to this site is unrestricted use. That term cannot mean only that it is unlikely a person would receive exposures above the dose criteria, or even that it will be very difficult for someone to receive such an exposure. It must mean that the site can be used for any purpose whatsoever without concern about the possible exposures to radiation from the formerly licensed radioactive material left behind. The use of the subsurface criteria at a depth of only 1 meter below grade will not provide such assurance.

We also find inconsistency between the criterion to be applied to the bedrock beneath the buildings and that to be applied to the sand, bank-run gravel, and blast rock in the same place. In section 2.1 of the July, 1992, proposed soil criteria, Cintichem stated that the 5 $\mu\text{R/hr}$ criterion will apply to the bedrock. Thus, Cintichem is apparently committing to removing any bedrock that exceeds that level. However, the loose material (which would have to be somewhat easier to remove than the bedrock itself) is to remain if the concentrations of radionuclides are below the subsurface decontamination criteria. Some radionuclides at the concentration of the subsurface soil criteria could produce dose rates significantly greater than 5 $\mu\text{R/hr}$.

These problems could be resolved by applying the 5 $\mu\text{R/hr}$ criterion to all areas, whether below a layer of rubble or on the surface of the soil. This would result in some lower subsurface criteria, but would also provide a consistent criterion for the entire site, alleviating to some extent our concerns about the unrestricted use of the site.

2. We understand that the subsurface criteria would only be applied under the reactor and hot lab buildings and will not be applied to subsurface (for example, at depths greater than 6 inches from the surface) contamination in other areas of the site. We request that Cintichem confirm this.

3. The soil decontamination criteria include a value for curium-244. We request that Cintichem explain why a decontamination criterion for this radionuclide was developed.

B. Procedures for Determining Background Radiation Levels

In our September 22, 1992, letter, we asked for clarification of the methods to be used to determine background radiation levels and have not yet received a reply. We repeat those questions here.

1. Cintichem proposes to apply the established criterion for structures (5 μ R/hr above background) to bedrock surfaces. While this level may be acceptable, it is not clear how 5 μ R/hr can be determined when background variability is of the same order. Appendix I of the decommissioning plan describes a procedure for determining background levels for building surfaces. Cintichem should confirm that this is the method they will use to set the background level for bedrock, or they should identify whatever other method they intend to use.
2. Appendix I contains only one reference to determining outdoor background:

Outdoor background gamma exposure rates will be taken at an off-site location which will simulate a rock cliff type terrain (such as a highway cut-out).

Selection of background levels will have a major influence on the establishments of clean-up criteria. The July 1992 report does not describe how representative (but off-site) bedrock material will be found and how the variability in what appears to be similar bedrock materials will be determined. It is not clear whether more than one location (or road cut) will be surveyed or the size of the surface that will be surveyed. How will data sufficiency be established?

3. The proposed "hot spot" approach described in the July 1992 criteria report stated that "hot spots" must not exceed the 5 μ R/hr criterion. We were not able to find in the these submissions the procedures for determining background gamma radiation in soils. It does not appear to be addressed in Appendix I of the Decommissioning Plan. The procedure should be reference, if it has been submitted to the NRC previously, or it should be described in detail.

4. We will need the answers to these questions from our September 22, 1992 letter before we can finalize our review of the proposed soil decontamination criteria. In addition, we request that Cintichem identify the road cuts to be used for the outdoor background radiation measurements.

C. Surface Soil Criterion for Uranium

In our September 22, 1992, letter, we noted that the criterion for uranium-238 was considerably higher than the 35 pCi/g that the Department of Energy is applying at the NL Site in Colonie, New York. We note that in the revised Table 2, the surface criteria for all isotopes of uranium are less than 35 pCi/g. We find those criteria acceptable.

D. Elevated Areas (Hot Spots)

The procedure described in section 8.5.2 of NUREG-5849 requires that the average concentration of radionuclides in both the elevated area and the non-elevated area be known. It is not clear how many samples Cintichem proposes to obtain from a grid cell, how the shape of the hot spot will be determined, and if there will be sufficient data to calculate meaningful averages. There would presumably be some relationship between the size of the elevated area and the number of samples taken there, but we have not found any information on this in Cintichem's documents.

If you have any questions, please contact Barbara Youngberg or John Kadlecek of this Bureau at 518-457-2225.

Yours truly,



Paul J. Merges, Ph. D.
Director, Bureau of Radiation
Division of Hazardous
Substances Regulation

cc: J. McGovern, President/Plant Manager, Cintichem
A. Dorozynski, Supervisor, Town of Tuxedo