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August 6, 1996

Mr. Clayton L. Pittiglio
Low-Level Waste and Decommissioning Projects Branch
Division of Waste Management
Office of Nuclear Material Safety and Safeguards
Washington DC 20555
TWF7F27

Dear Mr. Pittiglio:

Enclosed is the response to your February 22, 1996 "Comments on the Final Status Report for Elkem Metals Building 78 Site in Marietta, Ohio". Most of these issues have been discussed with you and your staff in both telephone conversations and on site meetings. During the on site meeting of June 7, 1996, it was decided that a plan for closure of the site be developed to address issues of your February 22nd comments and others which arose during subsequent telephone conversations. The response to comments references sections of the Closure Plan for the Union Carbide Corporation Elkem Metals building 78 SDMP Site, Marietta, Ohio which is also enclosed.

Following your review of the response to comments and the Closure Plan, we desire a conference call be established as soon as possible to discuss any questions so that UCC field efforts can begin as scheduled in September.

If you have any questions, please contact me at (970) 434-5611.

Sincerely,
Norris Environmental

Sean T. Norris
Sean T. Norris,
Project Manager/RSO

Enclosure: As stated 2 copies

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Union Carbide Corporation Response to NRC Comments of
February 22, 1996 on Final Status Report for Elkem Metals Building 78

The following responses to NRC comments dated February 22, 1996 are presented in conjunction with the accompanying Closure Plan for Union Carbide Corporations Elkem Metals Building 78 SDMP Site in Marietta, Ohio. Responses herein are discussed in greater detail in the Closure Plan. The need for and development of a plan to close this site was the result of an on-site meeting and site walk with NRC, UCC, Elkem Metals and Eveready Battery Company on June 7th, 1996 and subsequent telephone conversations involving technical questions for implementation. Details of implementing the responses below are contained in the Closure Plan. As stated above, many items in the plan are a result of the site meeting agreements and technical conversations conducted via telephone. Some of the technical issues discussed in the comments below have been resolved via these conversations. NRC comments are presented below in italics verbatim, followed by the UCC response with reference to the section in the Closure Plan which provides greater detail to the discussion.

General Comments

One issue is the licensee's commitment to following the guidance in NUREG/CR-5849. According to the Safety Evaluation Related to Approving the Project Plans for Remedial Action, the licensee "has committed to [using] the recommended criteria in NUREG/CR-5849." Furthermore, NRC's original comments regarding the Project Plans stated, "the section should be revised to include a commitment to use Draft NUREG/CR-5849. ..." In the response letter the licensee concurred. As stated in NUREG/CR-5849, "... surface activity, soil activity and exposure rate guideline values are average values ... To enable comparison of the survey data with those guidelines, the mean of measurements in each of the survey units is calculated using all measurements within that area ..." NUREG/CR-5849 further states that if the average values within a survey unit satisfies the criteria, "the results are further evaluated to determine whether the data for each survey unit provides a 95% confidence level that the true mean activity meets the guidelines."

Response to General Comments

Union Carbide Corporation has committed to NUREG/CR-5849 and the statistical evaluation of the data as recommended in the guidance document as discussed below and throughout the Closure Plan.

NRC General Comment #1

Although statistical evaluations were not performed on any of the survey data, the licensee claims that a more conservative approach was taken since 100% of the grid areas were covered by scanning and a direct measurement (scaler mode) was taken within each grid at the location with the highest observable scan reading. Performing a direct measurement at the location yielding the highest reading from the scan survey does not preclude statistical evaluation of the data. Whether or not the survey data within a survey unit will satisfy the 95% confidence level also depends on the spread or variance of the data. Although all of the survey data, including survey data biased high, may fall within the average criteria value, the upper bound of the 95% confidence level may not. NRC recommends that the licensee group the existing data for indoor areas into survey units and perform the necessary statistical analysis, following NUREG/CR-5849, to ensure that the true mean activity level meets the guidelines.

Response to General Comment #1

The grouping of data into survey units has been done and is presented in the Final Status Report. Survey units will be further grouped into separate areas and the 95% confidence interval will be calculated and expressed in the report. For example, the survey data for the interior floors and lower walls will be grouped as floors, and as lower walls for survey units and the confidence interval calculated for that unit. Similar grouping of the structures, equipment, etc. will be made for determining the 95% confidence interval for the site data. Section 4.1 of the Closure Plan discusses this issue.

NRC General Comment #2

NRC agrees with the licensee that sufficient data exists such that unaffected vs. affected designation can be made and an evaluation of unaffected areas should be conducted. Please note that for unaffected indoor/structural and outdoor areas a minimum of 10% of the areas should be scanned and 30 randomly selected location should be measured for total and removable activity (indoor/structural) and soil activity (outdoors). The same statistical requirements apply for unaffected areas as described above

General Comment #2

The designation of affected and unaffected areas and associated surveys is presented in the Closure Plan. Using existing data supplemented with data generated from upcoming field activities, evaluation of the affected and unaffected areas will be made and presented in the Final Status Report for the site. Indoor areas will be relatively simple as the data exist for affected and unaffected areas, and a clear designation is all that is required. The outside soils areas will be more complicated due to the NORM issues spread ubiquitously across the site and the possibility of NORM materials occurring in unaffected area samples. The designation of affected and unaffected interior/structural and outdoor soils is discussed in Section 3 of the Closure Plan. The associated verification surveys and sampling are discussed in Section 4.

Specific Comments

NRC Specific Comment #1.

The license states that background data from the 1994 Norris study was used to calculate net values. However, it is not clear how the net values reported in the data tables were calculated. The report should clearly state the value, not values or range of values, used to calculate the net values for surface activity, exposure rates and soil activity. Furthermore, it appears the total radium less background values reported for grid samples N3E5 through N5F4 were calculated by IT Corporation using 4.5 pCi/g from the 1983 ARIX study as the background value for Radium-226 in lieu of the 1.48 pCi/g background value from the 1994 Norris study. These values should be recalculated using the background data from the Norris 1994 study. For each guideline comparison, provide an example illustrating the calculation for each net data value (i.e., an example illustrating the calculation of total thorium in soil samples less background.)

Specific Comment #1

Background data from the Norris 1994 study is presented in Appendix B of the final report. The net values reported in discussions were calculated by averaging the results of 7 background soils samples, then subtracting that average background concentration from the verification sample analyses to arrive at a net concentration for verification sample concentrations. For the purpose of clarity, the background data of Norris 1994 will be presented separately from the Table 5.2-1 of the Final Status Report, where it is currently illustrated. The background values from previous studies is none the less important in that it demonstrates the variability of background concentrations across the site which could be due to the presence of NORM materials. In areas of question, where it is difficult to determine the status of materials on site, this site background data is important in considering cleanup requirements.

The IT soil sample radium data was calculated by subtracting the value of 4.5 pCi/g rather than the 1.48 pCi/g Norris 1994 value. This oversight will be corrected and changes made to the report as required.

Sample calculations for soil concentrations less background similar to the following:

Gross value - background value = true value (remaining concentration)

will be presented for each guideline criteria comparison. Substitution of the relevant radionuclide into the formula results in the net value for that nuclide. For example, net thorium in soils was calculated by:

Sample concentration (Th-228 + Th-232) - Background (Th-228 + Th-232) = Net total thorium

NRC Specific Comment #5.

This comment focuses on the fact that the licensee's beta/gamma average for a specific 5' x 5' (>4 m²) area of the floor and lower walls exceeds the guideline criteria. To calculate an average that meets the criteria, the licensee increased the area to 10m x 10m. As stated in the NRC comment, "...averaging the beta measurements over a 10' x 10' area is not acceptable procedures for satisfying the average beta criteria..." The licensee argues that although NUREG/CR-5849 states that measurements should not be averaged over more than 1 square meter, the approved remediation/survey plans 'never stated that the measurements criteria would be 'in compliance with' the guidance document.' This is not a valid argument. The beta/gamma criteria that the licensee committed to is defined and limited by an area not to exceed 1 m². NUREG-5849 simply provides guidance to ensure compliance that is presented in both the plans for remediation and the final status report.

Specific Comment #5

The floor area at grid block Q12 which exceeds release criteria for 1 m² will be subjected to further remediation and resurveyed for release. The new survey data will be used to represent the grid in the final report. This is discussed in section 4.2 of the Closure Plan.

NRC Specific Comment #6

When submitting the characterization data obtained by S. T. Norris in 1993 to supplement the final status survey data of the roof areas, please provide information regarding the

instrumentation used, the calculated MDA for each instrument and the survey strategy for the roof area. The survey strategy should be sensitive to the unaffected vs. affected area classification of the roof.

Specific Comment #6

The characterization of the roof of Building 78 was conducted in a random pattern across the entire roof area such that more than thirty measurements were collected from unaffected and affected areas. The survey identified areas of elevated beta gamma radiation and an effort to identify the boundaries of the apparently affected areas was made. Characterization of the roof is discussed in Section 3.2 of the accompanying Closure Plan.

NRC Specific Comment #8.

The information given in the Final Status Report concerning the buried pipe found in the south wall of the processing pit is still questionable. Furthermore, the building renovation scenario used to estimate dose is not appropriate; the source term used for building renovation scenarios does is different from the source term of the buried pipe. NRC requests that the licensee provide assurance that the buried pipe is unusable and will not result in future radiation hazard if exhumed.

Specific Comment #8

Using the dose assessment model RESRAD5.61, an assessment of the pipe has been made and based on the computer model and the scenarios discussed in section 4.5 of the Closure Plan, no further action is warranted on the pipe. If access to the pipe in the wall of the pit is of concern, considerations such as backfilling the pit and cover to eliminate access the end of the pipe can be discussed.

NRC Specific Comment #12.

It is not clear from the Final Status Report that the "Deposit 2" area, mentioned in the project Plans for Remedial Action, was remediated, verified, backfilled and approved for release by NRC during decommissioning. Where is this stated in the Final Status Report?

Specific Comment #12

As discussed in the accompanying plan, the original project for which Project Plans for Remedial Action (Umetco, 1993) were prepared encompassed Building 78 and a soil deposit on the rail siding immediately to the north of the building designated as Deposit 1. A second soil deposit designated in the project plans as Deposit 2 did not exceed NRC's criteria, but was slated for additional investigation as per the project plans. This deposit was located to the north of Building 78 beyond the haul road in what was the tailings pond area which was excavated and removed during the 1983 decommissioning. Deposit 2 was subsequently investigated during characterization work in 1993, and determined not to be the result of UCC activities based on the characterization tantalum surrogate criteria and was therefore removed from the project. Characterization survey and soil sample data will be included in a discussion for Deposit 2 in the Final Report to clarify the discussion. A discussion of the tantalum surrogate criteria is presented in Section 2 of the Closure Plan.

NRC Specific Comment #14.

Upon second review of the soil survey data, NRC concludes that the final survey methodology for open land areas does not comply with the approved plans for remediation nor with NUREG/CR-5849 and the resulting survey data is not acceptable. The approved Project Plans for Remedial Action at Elkem Metals states, "...contact and 1-meter gamma radiation measurements will ... be made at locations equidistant between the center and each of the four corners of each grid block. Systematic soil samples will be collected at the same points (four per grid block)..." The only survey areas that complied with the approved plan where grid blocks N3E5 through N5E4 that were surveyed by IT Corporation. The remaining survey areas do not follow the approved plan of four contact and 1-meter gamma radiation measurements and four systematic soil sample per grid block. Although the remediation plans that were submitted in 1992 were specified for Deposit 1 and 2 excavation areas, the remediation plans should be consistent for all additional areas that were remediated and received final surveys. The obscure shape of the remaining areas and the limited number of survey measurements taken per area prevent statistical evaluation of the survey data.

Furthermore, unaffected areas should also be surveyed. NUREG/CR-5849 defines unaffected areas as "All areas not classified as affected. These areas (of the site) are not expected to contain residual radioactivity based on a knowledge of the site history and previous survey information." The areas surrounding the remediated/affected areas fall under this definition of unaffected areas. These areas should receive the minimum final survey attention that is specified in NUREG/CR-5849.

Specific Comment #14

Detailed discussion of the soil sampling required to eliminate the gaps in the data for the affected soils areas is in section 4.6 of the Closure Plan. Efforts will be conducted so that existing data is not rendered useless. The additional sampling discussed in the plan will augment the soils data to better describe the soil concentrations on the site. Furthermore, unaffected areas will be surveyed and sampled at the density described in NUREG/CR-5849 with a minimum of 30 random survey and sampling points across the unaffected areas discussed in the Closure Plan.

NRC Specific Comment #15.

NRC affirms that soil samples need to be collected from the area located southwest of the concrete ore pad. NRC is also concerned about the discovery of a "small deposit recently located to the east of the above discussed area." The quality of the characterization survey is questionable given that additional areas requiring soil excavation were discovered after the final survey. The staff is currently evaluating the need for a site visit to review final survey information and possibly conduct confirmatory inspections before additional survey and remediation resources are expended.

Specific Comment #15

Soil samples have been collected from the area southwest of the concrete ore pad and the data from these samples will be incorporated into the final status data along with additional verification samples to be collected as presented in the Closure Plan. The concerns of NRC regarding the discovery of

additional deposits (which have been removed and containerized) has been noted and discussed in both phone conversations and an on site meeting with NRC. The additional verification survey and soil sampling presented in Section 4.6 and 4.7 of the Closure Plan should provide data to resolve any further concerns.

NRC Specific Comment #16.

If survey data can not be located for the two areas within grid blocks N000/N010-E040/E050 from a review of the data base, additional sampling will be required to verify that these areas have been remediated.

Specific Comment #16

As illustrated in the Closure Plan, these areas are slated for soil sampling to document and verify the remaining soil conditions.