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U.S. Department of Energy
Oak Ridge Field Office
P.O. Box 2001
Oak Ridge, TN 37831-8723

Attention: Lester K. Price, Director
Former Sites Restoration Division

Subject: Publication of the Environmental Monitoring Plans

Dear Mr. Price:

Enclosed are five copies of environmental monitoring plans (EMPs) for each of the following sites:

- Colonie Interim Storage Site
- Hazelwood Interim Storage Site
- Wayne Interim Storage Site
- Niagara Falls Storage Site
- Middlesex Sampling Plant
- Maywood Interim Storage Site
- New Brunswick Laboratory Site

Two sets are for distribution to SAIC, one copy of each EMP is for the appropriate site managers, one set is for the FSRD library, and one set is for DOE-Headquarters. This distribution is based on a telecon with Steve Oldham on November 14 (CCN 082865). Also enclosed is the resolution package for DOE-Headquarters' comments on the EMPs for SLAPS and CISS. Per direction from Mr. Oldham as confirmed with Libby Gilley of our office on December 2, the SLAPS EMP will be finalized as a surveillance plan and provided to you at a later date.

These plans and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that the information submitted was properly gathered and evaluated. To the best of my knowledge and belief, they are true, accurate, and complete.



Bechtel National, Inc.

L. K. Price

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If you have any questions, please call me at 576-1699 or
J. D. Fletcher at 576-5207.



Very truly yours,



G. K. Hovey
Program Manager - FUSRAP

GKH:bjb:LR_0417

Enclosures

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M. A. Southern 

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**Comment Resolutions for DOE-Headquarters'
Generic Comments on Environmental Monitoring Plans
Based on the Draft (9/26/91) SLAPS Plan**

General

1. The plan does not maintain a balanced approach to the potential radioactive versus chemical contaminants (and, also, physical conditions, such as meteorology and location and magnitude of populations). Although the entire plan should be examined and edited to restore the balance, here are a couple of examples:

- Page 1, Section 1.1 Make a better transition between the first and second paragraph. While "potential contaminant" is neutral, the reference to only the radiological regulatory guide (DOE 1991) is unbalanced. Instead refer to Order 5400.1 initially; then refer to the regulatory guide as a supplemental guidance for the radiological aspects.

Response: An introductory sentence was added to page 3, first complete paragraph, stating that in support of DOE Orders 5400.1 and 5400.5, this EMP will address chemical and radiological contaminants. However, at the present time Manhattan Engineer District (MED) and Atomic Energy Commission (AEC) chemicals are not a concern at SLAPS.

- Page 17, Section 5.1 In a paragraph near the bottom of the page, the "chemical indicator parameters" in groundwater are discussed, (and water level is discussed in 5.4.2), they are not addressed in the Appendix B, which summarizes the environmental monitoring.

Response: Geological parameters were added to Appendix B. After 1991, indicator parameters will not be monitored.

2. The plan does not systematically and consistently identify and provide sampling rationale for the radiological "potential contaminant release pathways" (Section 1.1). Particularly Chapter 5 (Environmental Surveillance--starts on page 15) and Chapter 8 (Dose Calculations--starts on page 58) need to use consistent terminology and to ensure that all pathways are accounted for. Once the terms are chosen, make a complete list of the pathways. Use the list both to introduce and revisit through out the plan. Ensure a formal analysis of all pathways in one section of the plan. Some examples can illustrate this concern about being systematic and consistent:

Response: Consistency of terms has been checked. All pathways have been accounted for.

- Page 15, Section 5.1 The discussion "to identify the potential migration pathways" does not use the same terminology as the related Figure 5-1. The four "pathways" listed in the text are closest, but not identical, to the four pathways listed under "environmental transport medium" in the figure.

Response: Figure 5-1 has been modified.

- Page 16, Figure 5-1 This figure of the exposure pathway analysis for the site does not account for all pathways. It should present all the pathways and identify those applicable for the site. When the figure is complete, the "invalid exposure mechanisms" of page 17 would be easier to identify.

Response: Figure 5-1 has been modified.

- Page 58, Section 8.2 The discussion begins by listing five "environmental media." However, by the next page, the discussion has reduced them to only two. In the subsequent paragraphs the discussion refers to some previously listed as well as others not listed (e.g., foodchain). Then before accounting for all pathways, the text says that "the combined effect from all pathways" will be summed for the next total dose.

Also, it would seem appropriate in Chapter 8 to be able to refer to principal receptors depicted in Figure 5-1.

Response: This section has been modified to list four "environmental media," and the negation of some possible pathways is explained before the statement is made that "the combined effect from all pathways" will be summed.

- Page 12, Appendix A. Item e, "critical pathway analysis," which is cross referenced to Section 5.1, emphasizes the need to make this pathway analysis rather formal and complete. The ASERs have rightly indicated that the plan would contain the full analysis.

Response: Two additions have been made to Section 5.1 to make the pathway analysis more complete, and Figure 5-1 has been modified.

3. The plan properly gives a great deal of attention to sampling and laboratory analysis with respect to quality assurance (QA). However, attention to other functions is still needed whenever QA is addressed. In addition, there are four areas (DOE 1991 page 10-4) that need better coverage in Chapter 10:

- Data management and calculations (particularly post-laboratory evaluation and interpretation of data)

- Transport and pathway modeling
- Dose calculations (e.g. software QA, input currency, input accuracy)
- Review and reporting results

Response: Section 10.7 (Data Management) was added to the EMP, and Section 8.0 has been revised to reflect better coverage of the topics above.

4. Refer to the sources of all figures and tables. In the text, reference all sources of information that will be used for making assessments (e.g. populations, locations of public water intakes).

Response: References have been added to the figures and tables that were taken or adapted from other documents. References were not added to the figures and tables that were generated for the EMPs.

5. This plan is to keep a record of changes in environmental monitoring as well as present practices (Item t on page 14 and Item f on page 16, Appendix A). Make sure the plan identifies changes already made over the years. Establish what procedures will be followed to establish comparability, where possible, if a sampling location (nearby or background) will be moved. Likewise, identify changes in sampling or analytical methods and associated comparability analyses (e.g., new technique for direct gamma radiation).

Response: The current EMP does not include pre-1991 historical data nor procedures because this information may be found in the ASERs.

- Page 23, Subsection 5.2.4 Supposing that the presently-used TETLD method replaced an earlier method used at the site, then the text and/or related tables (Appendix B?) should capture the fact. Of course, the results of any comparability analyses should be presented.

Response: If a method is replaced, the text will be modified during the annual review of the EMP.

6. The frequency of sampling is described well for all samples and measurements. However, more information about sampling time is needed. Describe each as a grab or instantaneous sample, an integrated sample (continuous or discontinuous), or as a composite sample. Describe the averaging or integration time for non-grab samples or measurements.

Response: Sampling time information has been added to the text.

7. The traditional field sampling is obvious and also summarized in the table of Appendix B. However, other measurements and needed data and their sources are not thoroughly addressed. Some examples:

- Population and land use data (page 3)-- needed for pathway analysis and dose estimation. For example, population out beyond 1 km might be based on the decade census data, but within 1 km, on an annual walk-by and a conversation with the city planner.

Response: Population data are based on decade census.

- Offsite groundwater wells accessible to the public (page 59).

Response: Information about groundwater wells accessible to the public may be found in the ASER.

- Joint frequency distributions of wind and atmospheric stability (page 14).

Response: Section 4.0 concerning meteorology has been rewritten to address this comment and specific comment No. 1 (below).

Specific

1. Page 14, Chapter 4.0 The discussion of meteorology needs to address all the issues identified in Order 5400.1 and the regulatory guide DOE 1991.
 - Identify exactly what parameters are required and for what use.
 - Specify whether the data need to be concurrent to the year or long term (climatological).
 - Describe what sampling time is needed (e.g., instantaneous grab, 15-minute average, one-hour average).
 - Specify whether the data need to be statistical information or sequential individual observations. For example, is the average wind speed needed, or the speed every hour of the year, or the frequency distribution in conjunction with one or more other parameters?
 - Given the specific requirements of the data (first four bullets, here) either demonstrate that available offsite data are representative or specify an onsite monitoring program.

Response: Section 4.0 has been rewritten to address these concerns.

2. Page 28, Subsection 5.3.3 Clarify that the detector is to be left out for the entire quarter to determine an integrated average over the quarter.

Response: The last sentence in the section was deleted and two sentences were added: "Sampling will be conducted quarterly. The detectors will remain at the sampling locations for the entire quarter to determine integrated average radon concentrations over the quarter."

3. Page 28, Subsection 5.3.5 Consider also using a "ship" or "field blank" detector as part of QA for the radon surveillance program as is being done for the gamma-radiation program.

Response: The procedures for radon detectors is different than those for TETLDs. Therefore, the only insurance for the radon detectors is to seal them in Tedlar bags and check them if the bag has been damaged. A "ship" or "field blank" would yield no useful QA information.

4. Page 54, Subsection 7.1.4 Some clarification on data evaluation is needed.

- The middle paragraph on page 55 begins with "Analytical results..." and seems to be introducing the review of individual data points before being collected into a statistic (e.g., an average). Make the last sentence, "As each data..." the next-to-last sentence, and add some examples of unusual results to the sentence.

Response: Unusual results will be discussed in the ASERs as they occur.

- In this same paragraph, the third sentence, "Outliers will be excluded..." refers to abnormally high or low values. Include in the discussion the methods of identification and treatment of other suspect data points besides "outliers," such as temporal irregularities, unexpected rates of change from previous values, and disparity with values at neighbor locations.

Response: The following sentence was added: "If, by a process of probability plotting, time plotting or control charting, outliers and temporal irregularities cannot be identified, both results (i.e., possible outliers and the exclusion of possible outliers) will be reported if a significant difference between the two results is found."

- The next paragraph, "Standard deviations...", appears to address the portion of evaluation dealing with statistically-combined data. Insert a lead sentence to the paragraph that explains this and transitions from the individual data points.

Response: The following sentence was added: "Annual averages will be determined for all locations from the individual data points."

- The last sentence of the last paragraph on page 55 explains that the standard deviations will be based on "data from the past five years." Insert "historic" before "data" so that it is clear that current-year data should not be used in calculating the standard deviation.

Response: The word 'historic' has been inserted.

- The last paragraph of the section begins with "Current annual values..." Add to the discussion some other suspect characteristics besides outliers, such as runs and periodicities. Discuss the use of moving averages as a tool in assessment.

Response: The following sentences were added: "Seasonal variations (periodicities) and contaminant concentration averages will be examined when needed. If necessary, running averages will be conducted using data from previous years for comparative purposes."

5. Page 57, Section 7.2 In the discussion of QC samples, explain how the results of the QC samples will be used. Explain what would happen to all the sample data that might be associated with an unexpected result in a QC sample.

Response: The following sentence was added to paragraph 3: "If a QC sample is contaminated, all the samples associated with that QC sample will be reviewed by an independent reviewer to determine whether the sample results can be used with appropriate annotation."

6. Page 57, Section 7.2 In this discussion of QC samples include the "ship" or "field blank," such as used for TETLDs (page 24) or radon detectors.

Response: The following sentence was added as the last paragraph: "A "ship" dosimeter will accompany radiation dosimeters during transport to and from monitoring locations to measure any exposure incurred before or after the monitoring period."

7. Page 58, Section 8.1 This discussion of performance standards for public dose calculations needs to be reorganized. Focus on the (1) how and (2) why. For example, explain that one of the reasons for performing "dose calculation" [(chapter title) estimates is that usually offsite concentrations are too low to measure (DOE 1991, Section 8.0)] in order to demonstrate compliance with performance standards. Actually, this Section 8.1 might better be integrated into the introduction (Section 8.0) to the chapter. Delete reference to specific models at this point. However, do specify the comparative performance standards that will be used.

Response: This section was revised.

8. Page 58, Section 8.2 Retitle the section to "Pathways." The discussion of pathways in this section should correspond to Chapter 5. If appropriate, refer to Chapter 5 for complete pathway analysis, and just summarize the results (but do not account for all pathways).

Response: The section title has been modified to read "Pathways," and minor modifications have been made to ensure that this section more readily follows information presented in Section 5.0.

The 1st paragraph was modified to include potential pathways at SLAPS and to include the sentence: "As stated in Section 5.0, the potential pathways at SLAPS are radioactive particulate transport via the atmospheric pathway, surface water and sediment, groundwater and direct exposure to external gamma radiation (Table 5.1)." Radiological input data, dose calculations and modeling, assumptions, and comparisons with DOE guidelines are concisely reported in the ASER. A sentence was added to paragraph 5: "If future information indicates that livestock or foodstuffs are cultivated in the area, these exposure routes will be reconsidered."

9. Page 59, Section 8.3 This discussion of the dose calculation method needs text for Section 8.3 prior to 8.3.1. Begin with a tie to the previous section, the concept of summing doses over all pathways (pull in the sentence from the very end of 8.3.2), and introduction of the models to be used. Include a table that summarizes all pathways, those applicable for the site, the model to be applied for each, and the performance standard to apply to each (alone or in combination with other pathways). This table would, in turn, have direct applicability to the summary table of calculated doses that are required in the ASER. Include sufficient detail to be able to differentiate, for example, radon gas versus particulate in the air pathway because of differing comparative standards.

Response: The following sentences were added to the introductory paragraph: "Dose calculation methods are presented for the credible exposure routes: direct exposure from gamma radiation and inhalation of radioactive particulates. Dose calculation methodologies will be added for other exposure routes if the data indicate a potential for exposure."

With the changes made in Table 5-1 and the information provided in Section 8.3, the intent of the request for a table summarizing pathways, models, and performance standards has been met.

10. Page 59, Subsections 8.3.1, etc. These subsections address the calculation method for a specific pathway. If a computer program, rather than a hand calculation, is being employed for the chosen model, make sure the text addresses all aspects of the program (Item b, page 18, Appendix A from the reg guide). As last year's ASER's implied and Section 8.1 states, evaluate and document the appropriateness of all values (including default) used in the calculations. Add a table or an appendix, if a text description is not ideal. Be sure to address special site-specific complications, such as intervening contaminated material from the source between the site source and the offsite receptor [e.g. the relatively-high contamination in the ditches between the SLAPS and the receptor on the ball field (page 59)].

Response: The following information was added as the final paragraph of Subsection 8.3.2: "Atmospheric particulate release rates, used in the AIRDOS model, are determined by using an unlimited wind erosion model (EPA 1985) for the site and soil concentration values obtained during characterization efforts. Other input parameters required by the model are size of the site, mixing height, and meteorological information. Default values are usually used for meteorological input parameters."

11. Page 59, Section 8.2 For this industrial setting, address the potential for employee food gardens on adjacent or nearby properties in the pathway analysis.

Response: A sentence has been added to clarify this.

12. Page 70, Section 10.5 Rather than part of a lower-level sampling procedure, the "document evaluations of the parameters and modeling used in selecting locations" are supposed to be part of the environmental monitoring plan. Reword the first paragraph to reflect this.

Response: The sentence "These procedures will include documented evaluations of the parameters" has been deleted.

Readability

1. Page 43, Figure 5-9 This figure of offsite surface water locations also includes the background locations. One might consider a key or table inset to identify the start and end dates at each location.

Response: We feel this information is unnecessary because it has been provided in the ASERs.

2. Various types of sample locations are described in the text for each part of the monitoring program. However, in order to get a physical picture, the reader has to try and locate each individual sampling station in the related figure. It would be useful to differentiate the types of sampling location (background, up-gradient, down-gradient, etc.).

Response: This comment will be taken under consideration for incorporation in the 1991 ASERs. The text in the EMP provides information concerning the types of sampling locations.

3. Page 17, Section 5.1. A short paragraph in the middle of the page states that before now, there was no formal plan (I suspect we had substantial parts, however). Consider the following substitution. Instead of keeping it a one-sentence paragraph, make it the lead in of the next paragraph that describes when the site monitoring program was initiated in 1981.

Response: Text has been revised to state: "Although this EMP was prepared in 1991, the environmental monitoring program at SLAPS has been evolving for some time."

4. Page 20, Table 5 This table gives the initial, observed, exposure rates used to choose the gamma monitoring locations. It would be more useful to isopleth those values over the monitoring locations depicted in Figure 5-2.

Response: We do not have enough information for isopleths.

5. Page 58, Section 8.0 The second sentence describes the three components of the site-specific evaluation for the site. However, a subsequent sentence is needed to tell where the reader can find discussions of these three components. The components do not relate to the organization of the chapter. Include a discussion of how the chapter is organized.

Response: This section was rewritten.

6. Page 70, Section 10.5 A variety of terms are used to describe the documentation for the control of field sampling and monitoring activities (procedures, guides, detailed plan). Select a uniform description if there is only one form, or differentiate the documentation if there are no more than one form of documentation.

Response: The text has been modified to reflect the use of one term.

**Comment Resolutions for Supplemental DOE-Headquarters'
Generic Comments on Environmental Monitoring Plans
Based on the Draft (9/27/91) Colonie Plan**

General

1. Chapter 2 on liquid effluent monitoring should have better consistency with the rest of the report. Expand the discussion to address the following issues:
 - The holding and testing of liquids at CISS for batch release to the Albany Company treatment plant to satisfy the requirements of Order 5400.1.
 - The matter of stormwater discharge, which is addressed elsewhere in the report (e.g., page 37).

Response : Section 2.0 on liquid effluent monitoring has been revised to address the issue of all liquids generated within the building and disposal to the Albany County Sewer District through a commercial water hauler.

The discussion of stormwater discharge has been revised in Subsection 5.5.2, Sampling Location Rationale on page 40.

2. The anticipated airborne effluents described in Chapter 3 are not tied to the pathway exposure assessments in the rest of the plan. Include a description of how the effluent data will be used and reported (e.g., comparative standards, dose assessments) apart from the realtime, onsite use. Apply the same concepts to liquid effluents described in Chapter 2.

Response: Section 3.0 has been revised to reflect sampling to be conducted during remedial actions planned for the site in the coming year.

3. The components of the sections in Chapter 7 should be consistent in all monitoring plans as well as with higher-level plans for FUSRAP such as those for environmental protection implementation and for quality assurance. Some examples of components are "completeness", "method blank", and Table 7-1, in Sections 7.1 and 7.2, which was not included for SLAPS.

Response: Section 7.0 has been revised to achieve consistency throughout all EMPs. Section 7.2 contains site-specific information, based on the sampling regime described in Section 5.0.

Specific

1. Page 61, Subsection 8.2.3 This discussion in the CISS plan discusses the use of AIRDOS to estimate doses to airborne particulates at the site. However, the previous page states that under normal conditions "atmospheric particulates do not constitute a viable pathway." Furthermore on page 27 in Section 5.3, it is stated that monitoring will be performed for airborne particulates because wind erosion is "unlikely". But in Section 5.1 (page 17), surface soils are identified as an applicable ("potential") source at CISS, although the text is silent with regard to the air pathway. The plan should account for any apparent conflicts.

Response: Subsection 8.2.3 has been revised to reflect consistency with Subsections 5.1 and 5.3.

2. Page 63, Subsection 8.3.3 In the discussion of groundwater, state the basis and value for the estimated dilution factor, D.

Response: Subsection 8.3.3 has been deleted.

3. Page 68, Section 9.2 Bulletize topics for TSCA and NESHAPs discussions to be consistent with other EMPs. With respect to NESHAPs, use subbullets for each of the following:

- Subpart H
- Subpart M
- Subpart Q

Response: Text in Section 9.2 has been expanded to include additional discussion of TSCA and NESHAPs (although NESHAPs topics were not bulletized).

4. Page 28, Subsection 5.4.2 In the last paragraph the "current understanding of the groundwater flow conditions" is discussed. Provide the reference where a detailed analysis and description may be found.

Response: This information is based on the CISS remedial investigation report and previous ASERs.

5. Page 37, Subsection 5.5.2 At the top of the page, change "fiscal year" information to "calendar year" information.

Response: The term "fiscal year" was left in place because site planning is conducted on a fiscal cycle.

6. Page 37, Subsection 5.5.2 In the discussion of stormwater discharge (bottom of page) state the results of the evaluation, such as what monitoring might be conducted.

Response: The text has been revised to state that analytical parameters and sampling methods will be in accordance with EPA guidelines and DOE Order 5400.1.

Readability

1. Page 20, Section 5.1 The last sentence of this section states that the following section will establish the plan for monitoring "these" pathways. Describe what the grouping "these" represents and list the components of the grouping in the order that they appear in the following sections.

Response: Because the text preceding the last paragraph expands on the pathways, the sentence was revised to state: "The following sections establish the plan for monitoring the aforementioned pathways."