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**DISAPPROVAL OF THE SIDE WIDE QUALITY
ASSURANCE PROJECT PLAN**

01/06/92

**USEPA/DOE-FO
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LETTER**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

2617

JAN 06 1992

REPLY TO THE ATTENTION OF:

HRE-8J

Mr. Jack R. Craig
United States Department of Energy
Feed Materials Production Center
P.O. Box 398705
Cincinnati, Ohio 45239-8705

RE: Disapproval of the Site Wide
Quality Assurance Project Plan

Dear Mr. Craig:

The United States Environmental Protection Agency (U.S. EPA) has completed its review of the Site Wide Quality Assurance Project Plan (QAPjP). The Site Wide QAPjP was submitted to replace the existing Remedial Investigation/Feasibility Study QAPjP. Also enclosed with the Site Wide QAPjP were the United States Department of Energy's (U.S. DOE) responses to the U.S. EPA and the Ohio Environmental Protection Agency's comments on modification to the existing RI/FS QAPjP.

U.S. EPA will be submitting comments specifically on the data validation portion of the RI/FS QAPjP within the next two weeks. However, U.S. EPA hereby disapproves the Site Wide QAPjP pending incorporation of the attached comments. As discussed in the December 11, 1991 meeting, U.S. DOE will submit the laboratory analytical procedures with the revised Site Wide QAPjP.

Please contact me at (312/FTS) 886-0992 if you have any questions.

Sincerely,

James A. Saric
Remedial Project Manager

Enclosure

cc: Graham Mitchell, OEPA-SWDO
Pat Whitfield, U.S. DOE-HDQ

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USEPA REGION V QUALITY ASSURANCE SECTION COMMENTS ON THE INITIAL DRAFT QUALITY ASSURANCE PROJECT PLAN FOR THE REMEDIAL INVESTIGATION/FEASIBILITY STUDY AT THE DEPARTMENT OF ENERGY - FEED MATERIALS PRODUCTION CENTER (FERNALD, OHIO) SUPERFUND SITE

GENERAL COMMENT.

As noted during previous meetings with the Department of Energy and its contractors, the site-wide QAPjP should present all options, procedures etc which may be utilized by the operable units. Although the individual operable unit plans will focus on the specific options or procedures actually exercised, all options and procedures which are presently available must be included in the site-wide QAPjP. If additional or alternate procedures become available at a later date, these should be incorporated into an Addendum to the site-wide QAPjP. If additional procedures are highly specific to a single operable unit, these should be included in the individual operable unit QAPjP.

If additional phases of either the site-wide or operable units becomes necessary, QAPjP Addenda will be required.

TITLE/SIGNATURE PAGE.

Signature spaces must be included for all project management and quality assurance management entities as described in section 3.0 comments below.

TABLE OF CONTENTS.

The Table of Contents will require revision to include changes indicated for comments on other QAPjP sections, Appendices, Tables, Figures etc.

1.0 INTRODUCTION

The Introduction should specify the overall project objectives and the project status/phase encompassed by the QAPjP. The Introduction should clearly describe how this site-wide QAPjP will be used with respect to individual operable unit plans and that the operable units will be addressed as Addenda to the site-wide QAPjP.

2.0 BACKGROUND AND INTENDED DATA USE

a) The section should be retitled "Project Description" and should incorporate the following subelements:

- o Site Description
- o Site History
- o Project Objectives
 - i. Specific Objectives
 - ii. Intended Data Usages
 - iii. Data Quality Objectives
- o Target Parameters
- o Sample Network Design & Rationale
- o Project Schedule

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- b) The Site Description section should provide more detailed maps and descriptions of the facility and individual operable units, natural/man-made features, topography and local geology & hydrogeology.
- c) The Site History section should focus on the general history of the facility through its CERCLA NPL status as well as its past and current data collection activities. Provide further detail regarding the individual operable units as well as expected types of contamination and summarized analytical data from past investigations (if available).
- d) The Project Objectives section shall clearly relate project tasks to Specific Objectives, specify the Intended Data Usages of each type of field and laboratory analysis/measurement and, finally, introduce the discussion of Data Quality Objectives (the latter which is detailed in Appendix C). The Target
- e) Parameters section shall specify all field and laboratory analytical parameters/measurements as well as required detection limits for each matrix. If different types of analyses may be necessary for individual operable units and this information is currently available, please present this information.
- f) The Sample Network Design and Rationale is best detailed in the individual operable plans. This section in the site-wide QAPjP can provide an overview of the sample networks planned for each operable unit (i.e. matrices, field & lab parameters etc) as well as the specifics of any site-wide investigations (i.e. air monitoring at the fence line, definition of background in the surrounding geographic area).
- g) The Project Schedule section should provide a bar chart of the timeframes of individual operable unit and site-wide investigations. The individual operable unit plans can detail the timeframes of sampling, field/lab analysis, data validation, data assessment and interim/final reports.

3.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

- a) The Project Organization and Responsibilities section should be reorganized to include the following subsections: Project Management, Quality Assurance Management, Laboratory Responsibilities and Field Responsibilities.
- b) The Project Management subsection should specify the individual responsibilities of USEPA, Ohio EPA, Department of Energy and its specifically named (not "prime") contractors.
- c) Quality Assurance Management subsection shall specify the QA responsibilities of the USEPA, Ohio EPA, D.O.E. and its engineering and laboratory contractors. USEPA has the following responsibilities: the USEPA Region V Regional Quality Assurance Manager is responsible for approval of the QAPjP, the USEPA Region V Quality Assurance Section is responsible for QAPjP review & recommends approval/disapproval of the QAPjP, the USEPA Region V Central Regional Laboratory (CRL) is responsible for external laboratory audits & co-

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- responsible for external field audits and the USEPA Region V Central District Office (CDO) has co-responsibility with the CRL for external field audits.
- d) Laboratory responsibilities shall name the laboratories, facility locations and individual analytical responsibilities of each laboratory. This should include all laboratories which are expected to be used for the project. If additional labs are added or if labs are deleted, addenda to the site-wide QAPjP should be provided as necessary.
 - e) Field responsibilities for all contractors, subcontractors etc should be explicitly defined with title and affiliation for each responsibility.
 - f) The complete Project Organization as described in this section should be summarized into Figures A-3 and A-4. The hierarchies should be defined. The USEPA entities (USEPA RPM, USEPA Regional QA Manager, USEPA Region V Quality Assurance Section, Central Regional Laboratory and Central District Office) as well as those applicable to Ohio EPA must be incorporated.

4.0 QUALITY ASSURANCE OBJECTIVES

- a) Revise the title to read "Quality Assurance Objectives for Measurement Data in Terms of Precision, Accuracy, Completeness, Representativeness and Comparability".
- b) The section should be rewritten to focus on:
 - o defining precision, accuracy, completeness, representativeness and comparability
 - o specifying the QC procedures used to quantitatively measure precision, accuracy and completeness and to ensure that the qualitative objectives of representativeness and comparability are achieved **for all field and lab measurements.**
 - o explicitly stating all field and laboratory QC limits, applicable to the project.
- c) The information presented in section 4.4 is extraneous to the QA objectives of precision, accuracy, completeness, representativeness and comparability and should be deleted. Document control relative to custody or evidence should be detailed in section 7.0 (Sample Custody).

5.0 FIELD ACTIVITIES

This section should be deleted since the QAPjP is concerned with the collection of RI/FS data. The information in this text should be incorporated into the appropriate section on sampling procedures (6.0) if the procedure is relevant to sample collection (i.e. monitoring well development, decontamination of sampling equipment). If the procedure is relevant to health & safety of project workers, the procedures should be incorporated into the Health & Safety Plan for the project.

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6.0 SAMPLING REQUIREMENTS

All of the sampling procedures included in this section and the Appendices are more in the realm of a general approach as opposed to a detailed, stepwise procedure. The procedures should be in a "cookbook" format for each sample matrix and applicable to the respective analysis procedures. Each sampling procedure must also explicitly detail the collection of all field QC samples for chemical & radiochemical analyses. The order of analytical sample fraction collection must be identified (i.e. "Volatiles, followed by semivolatiles, radiochemicals..."). All requirements for collection of samples based upon concentration (high concentration versus low) and parameters (chemical versus radiological) expected at Fernald must be comprehensive.

7.0 SAMPLE CUSTODY

It is required that all explicit, stepwise field custody, laboratory custody and final evidence file procedures be provided. Field custody shall detail the initiation and maintenance of custody from the point of sample generation through field transfers, in-field analyses and/or shipment to an off-site laboratory. All procedures for completing custody documents (tags, labels, forms, logs, etc.), copies of all forms and the chronological sequence should be provided as part of the procedure.

Laboratory custody section shall detail the continuation of custody from the point of sample receipt through in-house transfers, sample preparation/analysis and final disposal. All custody forms/logs and associated instructions for complete must be provided in the procedure.

The section on the final evidence file must detail the contents of the file. who (affiliation, title) shall function as file custodian how long files shall be maintained and that USEPA shall be offered all files prior to disposal.

8.0 CALIBRATION PROCEDURES AND FREQUENCY

Since no analytical procedures were provided, no comments can be provided at this time. As noted below under analytical procedures, the requirements for initial and continuing calibrations (concentrations, frequency and conditions which trigger recalibration) must be stated for all field, chemical and radiochemical analyses. This section should summarize the calibration information and provide reference to attached analytical procedures which detail the calibration procedures.

9.0 ANALYTICAL PROCEDURES

As noted during the recent meeting, no analytical procedures were provided for review. All field and laboratory analytical/measurement procedures must be provided as an attachment to the QAPjP. If an SW-846 method is proposed for analysis, all lab

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specific information (i.e. detection limits, QC limits), calibration concentrations, sample preparation, sample/extract cleanup procedures, method options exercised, etc must be detailed in additional cover pages. All non-standard methods (i.e. radiological) must include complete standard operating procedures.

10.0 INTERNAL QUALITY CONTROL CHECKS AND FREQUENCY

In addition to the information presented in the text, the internal QC checks for field measurements/analyses must be incorporated.

11.0 DATA REDUCTION, VALIDATION AND REPORTING

Data reduction, data validation and data reporting procedures must be defined for both field and laboratory data. Data reduction procedures can be addressed by referencing the sections of the field or lab analytical/measurement procedure which address the reduction of raw data to final results.

Data validation procedures for all field and laboratory analyses/measurements must be included. Validation of radiological data is missing completely. The validation procedures must incorporate both the field and lab quality control built into the sampling and analysis procedures. Since the analytical procedures were not available for review, further comments on the validation procedures will be provided in the next revision (when the analytical SOPs are expected).

Data reporting should be addressed by providing a complete list of all data deliverables which document the complete analysis or measurement. Provide examples of all forms used to report data. An example of a data deliverables package is the CLP SOW data deliverables. In order to validate analytical data, a complete data package would be necessary.

12.0 PERFORMANCE AND SYSTEMS AUDITS

It is necessary to separately detail field and laboratory audit procedures. Internal audits are those conducted by the Department of Energy and its contractors while external audits are those conducted by the USEPA Region V.

Provide the detailed checklists of all items examined and procedures used during internal field and laboratory audits. Specify who (title, affiliation) shall conduct the field & lab audits and how results of the audits shall be reported.

External field audits are the responsibility of the USEPA Region V Central Regional Laboratory (CRL) and Central District Office (CDO). External laboratory audits are the responsibility of the USEPA Region V CRL.

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13.0 PREVENTATIVE MAINTENANCE

Provide detailed preventative maintenance (PM) procedures for all field and laboratory equipment used to generate measurements and analyses for the remedial investigation. These may be incorporated as sections of the field or lab analytical/measurement procedures. The PM procedures shall specify the frequency of all PM activities.

14.0 SPECIFIC ROUTINE PROCEDURES USED TO ASSESS DATA PRECISION, ACCURACY AND COMPLETENESS

The only major correction to this section should be the equation used to calculate completeness in section 14.5. The numerator (V) and denominator (T) should be defined as:

V = number of **required** measurements judged valid

T = total number of **required** measurements

This definition will avoid a calculation of completeness which would incorrectly elevate the % completeness.

15.0 CORRECTIVE ACTIONS

It is necessary that this section be rewritten to detail the hierarchy for identifying, developing, approving and implementing corrective action. The section should identify the stages at which corrective action can likely occur: during field activities, during laboratory analysis and during data validation and/or data assessment. Provide examples of typical corrective actions at each of these stages. Additionally note the types of corrective action which may require approval by the highest levels of project management (i.e. including the D.O.E and USEPA).

16.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT

- a) The section should specifically state that field audit results will be included as part of the QA reports to management.
- b) Identify all project management and QA management personnel who shall receive and review the QA reports.

APPENDICES.

Comments relevant to the Appendices were noted in section 1.0 through 16.0 comments above.

RADIATION SECTION COMMENTS ON
THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
"SITE- WIDE QUALITY ASSURANCE PROJECT PLAN"
DATED OCTOBER 5, 1991

General

As requested, the Radiation Section has reviewed the draft "Site-Wide Quality Assurance Project Plan" (QAPjP) for the Fernald Environmental Management Project (FEMP) prepared by Westinghouse Environmental Management Company (WEMCO) with support from the United States Department of Energy (DOE).

In general, WEMCO followed current Agency guidance in the development of this QAPjP, but there are number of issues that will need clarification before it can be referenced to direct environmental sampling and analysis to support the ultimate remediation of the site.

The mission of this project as presented by WEMCO was to establish one QA plan for all sampling done at FEMP. A more appropriate statement would be to establish a multi-dimensional QA program to direct all sampling and analysis activities for FEMP.

This site-wide QAPjP is a hybrid version fitting somewhere between a Quality Assurance Program Plan and a project plan. By definition a QAPjP would need to include the level of detail that you describe in Project-Specific Plans (PSP's) (section 6.1) for this document to direct all environmental sampling and analysis. Considering the magnitude of the projects in each Operable Unit a document of this size would not be useable. Therefore, this QAPjP has to clearly define it's objectives in relation to PSP's.

Specific issues also need to be addressed for PSP's. In section 6.0, it is not clear who will be reviewing and approving PSP's. Indicating that PSP's will be approved as specified by individual project requirements is not adequate. The format that these documents will be written is not indicated. A mechanism should be included to verify how sub-contractors and/or analytical labs will be required to follow all QA specifications.

From this document it is not clear what projects are currently in progress at the site. Will the QA specifications proposed in this QAPjP differ from what is being required at present? The process of how the QAPjP will be implemented should be discussed. Will it affect sampling activities, analytical methods, data management systems, and how quickly implementation will take place at all levels?

This QAPjP should contain methods how background determinations will be made. It is essential to provide the criteria used to justify where background determinations will be made and how this data will be calculated to define the scope of this project.

Specific comments

Title Page--Signature provisions should be included for;

1. the Regional Quality Assurance Manager
2. prime contractor

Sub-contractors as appropriate (i.e., laboratories, sampling sub-contractors, drillers, etc.) should be required to follow all QA specifications in PSP's.

Section 1 Page 1--Include all projects that will be collecting environmental samples. There is no mention of operations in support of NESHAPS obligations or RCRA closures.

Section 2.2.4--The section does include a discussion of the important site contaminants or target compounds for each operable unit, but fails to include required detection limits.

General-- Section 2 should include;

1. a description of individual project specific plans for each operable unit and how the development relates to the site-wide quality assurance project plan.
2. a description of dates anticipated for start, (or what has been done up-to-date), milestones, and completion of the project and sampling activities. A milestone table or a bar chart consisting of project tasks and timelines is appropriate.
3. a succinct description of monitoring (sampling) network design and rationale for each analytical category i.e. inorganic, organic, radiologic, biological and geotechnical.
4. diagrams or site maps of sampling locations.

Section 2 Page 1,-- An comprehensive list of chemicals and radionuclides that were used or handled during the life of the plant should be included in this section.

Section 2.2.4 Page 7, --In OU-5, volatile-organic contamination along Paddys Run Road is suspected to be from a source other than FMPC. What data does DOE have to support this assumption?

Section 2.4 Page 10-13,--The type and frequency of quality control checks for each Analytical Support Level (ASL) should be clarified for all analytical categories. Table A-1 presents a comparison of ASL methods by analytical category, but a discussion is needed to justify the rationale behind the proposed sampling matrices and quality assurance objectives.

Table A-1 Appendix A--All QA objectives should be specified in this table. Referencing the method is not adequate. QA objectives for ASL E should be determined before this analytical method is used. Criteria for determining ASL E QA objectives should be discussed.

Section 2 Page 11--The radionuclide examples for analytical support levels C and D, states that these levels will require a full set of QA/QC samples per batch. This example should define what a full set will entail.

Section 4.1.1 Page 3-4--An example should be added to clarify when trip blanks would be indicated for ASL B and E.

For the trip blank analysis method, describe the guidelines used to determine whether conditions encountered during sample container shipment and handling have affected sample quality. Describe the analytical procedure required for trip blanks.

For the field blank analysis method, describe the guidelines used to determine whether sample collection process or conditions have effected sample quality. Describe the analytical procedure required for field blanks.

For the equipment rinsate sample analysis, describe the guidelines used to determine the effectiveness of the decontamination process?

The criteria used to accept the quality of sample preservatives need to be provided.

Section 4.2.2 Page 7--The statistical control bounds have been defined as ± 3 standard deviations from the mean. Results outside of these limits are considered out of control. The mechanism for determining whether an outlier will be accepted or rejected should be described in this section or a reference provided. The reader will assume that environmental measurements outside the statistical control bounds will be invalidated.

Quality assurance objectives should be discussed for field activities i.e sampling, measurements and screening including the project required acceptance limits and the means to achieve these QA objectives.

Section 5.0 General--This section should include policies and guidelines for radiological field screening surveys.

Section 5.2.8 Page 14--Radiation surveys conducted in support of decontamination and decommissioning of facilities and equipment should include all standard operating procedures and acceptance criteria or their should be a reference to the PSP's.

Section 6.0 General--This section should include procedures for conducting surface radiation field measurements. There is no reference to the sampling and analysis plan dated November 1991. Specific locations for surface radiation measurements should be included in this section.

Section 6.1.2--Although this sub-section is titled "Preparation and Implementation of PSP's", it does not discuss how PSP's will be implemented. The review process for PSP's should be described. Have all the PSP's been written? There are intermittent references to procedures identified in PSP's, giving the reader an assumption that they have been written. A list should be provided with the title of each PSP and what part of the project it will be directing.

Section 8.3 Page 2--All appropriate requirements specified for field measurement and testing equipment should be added as an attachment to PSP's once identified by FEMP. These requirements should include:

1. list of all field measurement and test equipment used for a specific project
2. manufacturer
3. required calibration frequency
4. number and title of applicable calibration procedure

Section 12 Page 1--Specific criteria that laboratories will be audited against should be discussed. Key individuals that will be performing audits should be identified. Will external field and laboratory audits be performed? If so, who will be performing these audits?

TECHNICAL REVIEW COMMENTS
SITE-WIDE QUALITY ASSURANCE PROJECT PLAN (QAPP)
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT (FEMP)
FERNALD, OHIO

GENERAL COMMENTS

1. The October 31, 1991 revision of the FEMP QAPP is a significant improvement over the previous revision (DOE 1990) submitted by DOE. The sections on site background, data quality objective (DQO) development, and analytical support levels (ASLs) have been expanded. The overall technical approach appears adequate. However, additional details should be added to the QAPP.
2. Risk-based detection limits, precision, and completeness control limits and analytical methods should be summarized in a table for all media. Sample collection methods, holding times, and storage procedures should also be summarized in a table. Equations for deriving risk-based detection limits should be provided in the text and these detection limits should be calculated for all media. Standard equations should be developed in the site-wide QAPP then used for the individual operable units. Site-wide QA/QC criteria should be provided rather than deferring to QAPPs for the individual operable units.
3. Table A-3 presents generic National Pollutant Discharge Elimination System (NPDES), Resource Conservation and Recovery Act (RCRA), and EPA Contract Laboratory Program (CLP) analytical methods. The text should identify the specific methods that will be used in the RI/FS. Complete references should be provided for the methods listed in the table. Radiological methods should be included in the table. Several of the CLP methods are followed by the letter "M." The text should explain the meaning of this qualifier. Any modifications to CLP methods to achieve risk-based detection limits for the remedial investigation and feasibility study (RI/FS) should be described, and the methods should be

prepared in the format of special analytical services (SAS) requests, and be included as attachments to the QAPP.

4. Several routine environmental monitoring tasks, associated with lower level ASLs, are listed in Appendix C. The DQO summary forms are unclear as to whether data from these routine monitoring activities will be used in the RI/FS and the baseline risk assessment. Data generated from some of the routine activities, such as monitoring domestic wells, should be included in the baseline risk assessment, and it is recommended that these data be associated with higher ASLs (D or E).
5. The QAPP presents several data qualifiers and terms such as FEMP required detection limit without adequate definitions. All data qualifiers, detection limits, and quantitation limits should be discussed and defined in the text.
6. Several sections of the QAPP, such as 10.3.5 and 10.3.6, are written as instructions for analysts. The purpose of the QAPP is to ensure that EPA requirements for quality assurance and quality control (QA/QC) (EPA 1983, 1987, 1990c) are met. Therefore, the wording of the QAPP should focus on meeting QA/QC criteria and performance standards rather than focusing on instructions for analysts. Instructions for analysts should be included in the individual laboratory standard operating procedures (SOPs).

SPECIFIC COMMENTS 

7. Section 1.2, pages 4 and 5: The following QA/QC references should be included in this section: *Data Quality Objectives for Remedial Response Activities*, EPA/540/G-87/003, March 1987; and *Guidance for Data Useability in Risk Assessment*, Interim Final, EPA/540/G-90/008, October 1990.
8. Section 2.4, pages 9 through 13: This section describes the ASLs used at FEMP. Additional information should be provided in these descriptions. The examples provided for each level should be expanded to address the scope of each level including tasks such as routine monitoring, health and safety, treatability studies, etc.
9. Section 3.3, page 5: This section describes QA management. The terms "DFQAPjP" and "DFQAPjO" are inadequately defined and discussed. Also, these positions should be included in Figure A-3 (FEMP Management Structure).
10. Section 4.1.1, page 3, third bullet: The text states that cross-contamination is a concern for ASLs A through E analyses. However, rinsate samples are only specified for ASLs C and D. Rinsate samples should also be specified for ASL E.
11. Section 4.1.1, page 4, third bullet: The text states that split samples will be used to determine accuracy of the analytical laboratory and sample collection techniques. Accuracy is generally defined as the degree of agreement between a measurement and a true value. It is unclear how split samples, shipped to different laboratories, will address this criterium. The way the text is currently written, it appears that split samples are being used to monitor interlaboratory precision and not accuracy. This discrepancy should be resolved.
12. Section 4.1.2, page 5, second paragraph: The text should be rewritten to state, "Frequency of QC sample collection and analysis: . . ."

13. Section 4.1.2, page 5, third bullet: The text should state that matrix spikes are used to monitor accuracy.
14. Section 4.1.2, page 6, second bullet: The text states that during a blind study the analyst knows which samples are QC samples, and that during double blind studies the analyst does not know which samples are QC samples. These definitions are incorrect. During a blind study the analyst does not know which samples are QC samples. During a double blind study neither the analyst nor the individual analyzing the data know which samples are QC samples. The text should be modified to reflect this change.
15. Sections 4.2.1 and 4.2.2, pages 6 and 7: These sections propose statistical approaches for evaluating analytical precision and accuracy. Reliance on control charts for nonradiological parameters will result in different accuracy and precision control limits for different laboratories. This will inhibit comparison of data on a site-wide basis, and could also impair data validation. Also, it has not been demonstrated that the analytical laboratories bidding for this work have adequate data at all concentration ranges for all analytes to complete useful control charts. Precision and accuracy control limits for nonradiological parameters should be based on those found in the CLP Statements of Work (EPA 1990a,b) to ensure interlaboratory consistency and data comparability.

Overall, reliance on precision and accuracy control charts is recommended primarily for only radiological parameters.

16. Section 6.3.1, page 11: Surface soils should be defined with respect to depth below ground surface.
17. Section 6.5.2, page 19: This section should include a bullet that addresses quantifying risks to ecological receptors.
18. Section 6.5.2.1, page 19: The text states soil and sediment data will be compared with applicable or relevant and appropriate requirements

- (ARARs) for flora and fauna. The text should be revised to state that ARARs do not exist for soil and sediment and that an approach for assessing toxicity in these media will be addressed in the operable unit specific work plans and sampling and analysis plans.
19. Section 6.5.2.1, page 20: The text inappropriately references EPA's *Human Health Evaluation Manual* (EPA 1989a) for the biological sampling. The correct reference is EPA's *Environmental Evaluation Manual* (EPA 1989b).
 20. Section 6.6.3, page 22: Sampling for asbestos should cite the relevant Occupational Safety and Health Administration (OSHA) requirements.
 21. Section 10.2.1, page 2: The text should explain how "FEMP-Required Detection Limits" (RDLs) are derived.
 22. Sections 10.2.6 and 10.2.7, pages 3 and 4: These sections mention the laboratory data qualifiers L, E, W, S, and +. These qualifiers should be defined.
 23. Section 10.3.1, page 5: The text should explain how "Required Quantitation Limits" (RQLs) are derived, and the relationship of the RQLs to the RDLs.
 24. Section 10.3, pages 5 through 10: This section describes quality control for organic analytes. It is currently written as instructions for analysts, and addresses control limits in vague, undefined terms. The text should be revised to provide specific QA/QC criteria. References to EPA (1990a) should be provided where appropriate.
 25. Section 10.4, page 9: This section should summarize specific QA/QC requirements for radiological parameters.
 26. Section 11, pages 1 through 5: This section should provide a summary of all data qualifiers. The text should specify samples that will be validated according to EPA (1988a,b) requirements.

27. Section 12, page 1: This section should state that QA audit results will be made available to EPA, and that EPA has the option of conducting their own QA/QC audits.
28. Section 14.2, page 1: Analytical control limits for accuracy should incorporate EPA (1990a,b) requirements.
29. Section 14.3, page 2: Analytical control limits for precision should incorporate EPA (1990a,b) requirements.
30. Section 14.6, page 4: This section should provide a technical approach for developing method detection limits and quantitation limits.
31. Section 15.2, page 4: The text references "U.S. Environmental Protection Agency, 1991." However, no references are included with Chapter 15.
32. Appendix A should be revised to include radiological parameters.
33. Table A-1 should address QA/QC requirements for ASL C.
34. Table A-3 lists NPDES, RCRA, and CLP methods. This table should be revised to identify methods used for RI/FS activities, methods used for routine environmental monitoring activities, methods used for waste management, etc. As discussed in the general comments, a DQO summary table should be developed. This table should identify proposed analytical methods and associated accuracy, precision, and completeness. Detection limits should be adequate to address data needs of the baseline risk assessment.
35. Table A-3 presents generic NPDES, RCRA, and EPA CLP analytical methods. The text should identify the specific methods that will be used in the RI/FS. Complete references should be provided for the methods listed in the table. Radiological methods should be included in the table. Several of the CLP methods are followed by the letter "M." The text

should explain the meaning of this qualifier. Any modifications to CLP methods to achieve risk-based detection limits for the RI/FS should be described, and the methods should be prepared in the format of a special analytical services (SAS) request, and be included as attachments to the QAPP.

36. Appendix B should include examples of chain-of-custody forms, sample labels, sample custody forms, sample analysis request/packing lists, sample tracking forms, summary sampling logs, sample geologic logs, and well completion log forms.
37. In Appendix C the logic flow for the DQO process should be revised. Risk assessment exposure assumptions and data needs are currently scattered throughout the logic process. Simplified exposure assumptions should be integrated into the problem definition. Data needs should be addressed in the logic statement. As currently written, the logic process will result in repeating the same information for all areas of concern. Issues such as risk-based detection limits should be developed on a site-wide basis and summarized in a table. Other risk assessment issues, such as slope factors, reference doses, exposure assumptions, acceptable risk levels, etc., should also be addressed as site-wide issues and be summarized in a table. The domain of the decision should be limited to issues such as area and hot spots. Receptors and land use should be part of the problem definition.

Alternative actions are identified prior to identifying receptors, exposure pathways, and uncertainties. Alternative actions should be the last part of the logic process so that all available information and uncertainties can be addressed.

38. Section C.2, page 3: This section should include additional guidance for project scoping and developing DQOs. For example, the importance of summarizing available information, developing site-specific conceptual site models, and identifying data gaps should be discussed.

39. Section C.2.1, page 3: Problems should be stated in terms of testing a hypothesis. The descriptions of the areas of concern should emphasize identifying potential sources and exposure pathways. Waste sources, quantities, mobility, and toxicity should be summarized. Problem identification should also include describing receptors and exposure pathways and completing a conceptual site model and identifying specific data gaps. If appropriate, potential indicator chemicals or risk drivers should be identified. Receptors, exposure pathways, and land use scenarios should be addressed in this section.
40. Section C.2.2, page 4: The list of alternative actions should be one of the last parts of the logic process to be addressed.
41. Section C.2.3, page 4: Specific equations for determining risk-based action levels should be presented in this section.
42. Section C.2.5, page 5: Standard, site-wide exposure assumptions should be addressed early in the logic process, and not at this relatively late stage. If appropriate, indicator chemicals or risk drivers should be identified in this section. Existing contamination should be compared to ARARs and risk-based concentrations.
43. Section C.2.7, page 7: This section should focus on summarizing and prioritizing the data gaps developed in Section C.2.1 to develop a focused sampling and analysis program. Sampling needs should be prioritized to ensure that all critical data are collected and analyzed in a timely manner.
44. DQO Summary Form, page 13: Section 1 (or 3) of this form should include entries for routine monitoring, regulatory compliance, and health and safety. The way the form is currently written it appears that all activities are necessary for RI/FS or remedial design and remedial action (RD/RA). However, based on a review of the completed forms, it appears that many of the activities underway at FEMP are outside of the CERCLA process.

Section 4 of the form should include imminent health risks as well as regulatory requirements.

45. DQO Summary Form, page 14: The second page of the form appears identical to the first page. An appropriate second page should be provided.
46. DQO Logic Flow Process, Sampling Residences Serviced by Private Groundwater Supply Wells - Metals: Overall, this example does not show adequate technical rationale for DQO development. Technical issues, such as contaminants of concern and action levels are not addressed. Section 1 addresses the problem only as related to DOE Orders. Potential threats to public health and exposure pathways are not addressed. Problems should be stated as a hypothesis to be tested.

Section 2 reaches a decision before all available information is presented. This is inappropriate. Decision making should be based on making the most use of the available data and information.

Section 3 should present specific action levels based on ARARs and health-based concentrations for contaminants of concern. If available, background data should also be discussed.

Most of the information presented in Section 4 (such as physical site characteristics and exposure information) should be incorporated into a conceptual site model, and be presented at the beginning of the logic process. The frequency of analysis should be discussed as part of the study design.

Sections 6 and 7 state that risk assessments will be done "at the programmatic level." It appears that use of data collected during routine monitoring of domestic wells will not be used in RI/FS risk assessments. However, no technical rationale for excluding these data is presented, and Section 3 states that these analyses will provide data for early detection of groundwater contamination. Based on this statement, critical samples from the domestic wells should be analyzed

for contaminants of concern at an ASL appropriate for supporting the baseline risk assessment.

47. DQO Summary Form AR-006, page 1, Section 3: Higher ASLs should be considered for critical data that will be used to support the RI/FS.
48. DQO Summary Form GW-001, page 2, Section 5: The category "ABN" should be included to meet the criteria listed in Section 9.
49. DQO Summary Form GW-002: Section 3 should include ASL level E to meet risk-based detection limits and to address any nonconventional parameters. Section 4 includes "CEC." This does not appear to be an appropriate parameter for groundwater.
50. DQO Summary Form GW-004: The parameters that will be analyzed during this activity are inconsistent in this form. Section 3 states total coliform bacteria and volatile organic compounds (VOCs) will be analyzed while Section 6 states uranium, VOCs, coliforms, and chlorine residual will be monitored. This discrepancy should be addressed.
51. DQO Summary Form GW-006: Data from this activity should be used in the risk assessment. Section 3 should be revised to reflect this change.
52. DQO Summary Form GW-007: Data from this activity should be used in the risk assessment. Section 3 should be revised to reflect this change.
53. DQO Summary Form MS-005: ASL C should be considered for critical data of the treatability studies.
54. DQO Summary Form SD-002: Sediment sampling will provide critical data for the human health and ecological risk assessments and for fate and transport calculations. ASL level E may be required to obtain risk-based detection limits, and for non-HSL parameters.
55. DQO Summary Form SL-002: Uranium analysis should be included in Section 6.A.2.

56. DQO Summary Form SW-002: Risk assessment should be identified as an appropriate data use in Section 3.
57. In Appendix D the quality control limits used to validate matrix spike/matrix spike duplicates and surrogate recoveries should be listed in this section.

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- DOE, 1990. Draft Quality Assurance Project Plan for the Feed Materials Production Center, Fernald, Ohio. November 7, 1990.
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- EPA, 1988a. Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses. U.S. Environmental Protection Agency. Hazardous Site Evaluation Division. February 1, 1988.
- EPA, 1988b. Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses. U.S. Environmental Protection Agency. Hazardous Site Evaluation Division. July 1, 1988.
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- EPA, 1990a. Contract Laboratory Program Statement of Work for Organics Analysis. Multi-Media, Multi-Concentration. U.S. Environmental Protection Agency. Document Number OLM01.0. March 1990.
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- EPA, 1990c. Guidance for Data Useability in Risk Assessment. Interim Final. U.S. Environmental Protection Agency. EPA/540/G-90/008. October 1990.
- EPA, 1991. Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions. Memorandum Prepared by Don R. Clay, Assistant Administrator, U.S. Environmental Protection Agency. OSWER Directive 9355.0-30. April 22, 1991.