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Office of Solid Waste and Emergency Response

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Addendum to State Participation in the Superfund Program Manual

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United States Environmental Protection Agency
Washington, DC 20460

EPA OSWER Directive Initiation Request

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Originator Information

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Approved for Review

Signature of Office Director:

Date: 2/4/86

Title

APPENDIX L, State-Lead Quality Assurance Project Plan Guidance

Summary of Directive

Provided to assist State staff members in developing, and Regional staff in reviewing, Quality Assurance Project Plans (QAPPs).
(Signed J. Montear, Feb 7, 1986)

OK Nancy Livingstone

Type of Directive *(Manual, Policy Directive, Announcement, etc.)*
Addendum to State Participation in the Superfund Program Manual

Status: ☐ Draft ☒ Final ☐ New ☒ Revision

Does this Directive Supersede Previous Directive(s)? ☒ Yes ☐ No Does It Supplement Previous Directive(s)? ☐ Yes ☒ No

If "Yes" to Either Question, What Directive *(number, title)*
earlier addendum, 9/12/84 9375.1-2-b

Review Plan
☐ AA-OSWER ☐ OUST ☐ OECM ☐ Other *(Specify)*
☒ OERR ☐ OWPE ☐ OGC
☐ OSW ☐ Regions ☐ OPPE

This Request Meets OSWER Directives System Format

Signature of Lead Office Directives Officer: Nancy Livingstone — Date: 2/7/86

Signature of OSWER Directives Officer: Sherry Fielding — Date: 2/7/86

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

FEB 7 1996

MEMORANDUM

SUBJECT: Addenda to the State Participation in the Superfund Program manual--Revisions to Appendix L, State Lead Quality Assurance Project Plan Guidance

FROM: Sam Morekas, Chief
State and Regional Coordination Branch

TO: Mailing List

Changes to Appendix L are editorial in nature. The version of Appendix L which you currently have should be discarded and be replaced with this attachment.

Attachment

CHANGES TO DATE

Date/ Addendum #	Topic	Instruction	Location/Page
6/22/84 #1	Site Closeout	. New pages	. Appendix F, Pages F-22 and 23
		. New page	. Appendix H, Page H-23
		. New pages	. Appendix P, Pages P-37-P-47
	Minority and Women's Business Reporting	. New page	. Appendix F, Page F-24
	Changes to IG Audit	. Change "... which must be sent within 120 days." to "... which must be sent within 90 days."	. Appendix C, Page C-12, first complete paragraph
		. Add, as the second sentence in the paragraph, "In addition, the Award Official will send the State a copy of the final audit report within 15 days of its receipt."	. Appendix C, Page C-12 first complete paragraph
		. Change "The response must be dispatched within 120 days..." to "The response must be dispatched within 90 days..."	. Appendix C, Page C-12 footnote
9/12/84 #2	Quality Assurance Project Plan	. New pages	. Appendix L, formerly reserved
9/28/84 #3	Revised Letter of Credit Procedures Provision	. Replacement pages	. Appendix F, Pages F-3 through F-6

CHANGES TO DATE (Continued)

Date/ Addendum #	Topic	Instruction	Location/Page
12/10/84 #4	Multi-Site Cooperative Agreements	. Replacement pages	. Table of Contents, Pages xiii through xvii
		. Replacement pages	. List of Exhibits, Pages xvii and xix
		. Replacement pages	. List of Acronyms, Pages a - through e
		. Replacement pages	. Chapter II, Pages II-1 through 6
		. New pages	. Chapter II, Page II-7 and Exhibit II-2
		. Replacement page	. Chapter III, Page III-17
		. New pages	. Chapter III, Pages III-18 through 27 and Exhibits III-10 and III-11
		. Replacement pages	. Chapter IV, Pages IV-5 through IV-7
		. New pages	. Chapter IV, Pages IV-8 through IV-11
		. Replacement page	. Chapter V, Page V-7 and . V-8
		. New page	. Chapter V, Page V-9
		. Replacement pages	. Appendix E, Pages E-1 through E-22
		. New page	. Appendix E, Page E-23
		. Change "...at quarterly intervals commencing at the start of the project." to "...within 30 days of the end of the Federal fiscal quarter."	. Appendix F, Page F-16, Section K, indented paragraph
		. New pages	. Appendix F, Pages F-25 and F-26
		. Replacement pages	. Appendix J, Pages J-1, J-2, and J-7
		. New pages	. Appendix J, Pages J-8 and J-9
		. Replacement pages	. Appendix N, Pages N-1 through N-6
		. Replacement pages	. Appendix P, Pages P-1, P-2, and P-47
		. New pages	. Appendix P, Pages P-48 through P-51

CHANGES TO DATE (Continued)

Date/ Addendum #	Topic	Instruction	Location/Page
1/4/85 #5	Advance Match	. New pages	. New Appendix S, Pages S-1 through S-9
1/11/85 #6	Site Safety Plan Guidance	. New pages	. Appendix M, formerly reserved
8/2/85 #7	Obtaining Equipment Under a CERCLA Cooperative Agreement	. New pages	. New Appendix T, Pages T-1 through T-15
9/17/85 #8	Intergovernmental Review Procedures	. Replacement page . Replacement pages	. Table of Contents, Pages xiii through xix . List of Exhibits, Pages xx and xxi . Appendix D, Pages D-1 through D-28
	State Cooperative Agreements for Pre-Remedial Activities	. New pages	. Appendix A, formerly reserved
12/18/85 #9	Action Memorandum Guidance	. Replacement pages . Replacement pages	. Table of Contents, Pages xiii through xix . Appendix B, Pages B-1 through B-9
12/20/85 #10	Model Statement of Work for a Remedial Investigation/ Feasibility Study	. Replacement pages	. Table of Contents, Pages xiii through xix . Appendix E, Pages E-1 through E-21
12/20/85 #11	Site Safety Plan Guidance	. Replacement pages . Replacement pages	. Table of Contents, Pages xiii through xix . Appendix M, Pages M-1 through M-28
1/31/86 #12	Quality Assurance Project Plan	. Replacement pages	. Table of Contents, Pages xiii through xix . Appendix L, Pages L-1 through L-12

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APPENDICES

APPENDIX L

STATE-LEAD QUALITY ASSURANCE PROJECT PLAN GUIDANCE

OSWER DIRECTIVE
9375.1-4-1

APPENDIX L
STATE-LEAD QUALITY ASSURANCE PROJECT PLAN GUIDANCE

PURPOSE

This appendix has been provided to assist State staff members in developing, and Regional staff in reviewing, Quality Assurance Project Plans (QAPPs)*. Its primary objectives are to:

- Highlight and make States aware of their quality assurance responsibilities in all phases of the QAPP preparation and implementation process
- Provide detailed supplemental instructions to States in addressing the 16 major elements of QAPPs as specified in EPA's "Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans"QAMS-005/80
- Ensure that all environmental sampling and analysis conducted as part of Superfund projects meets Superfund quality assurance requirements
- Speed up the documentation or development of acceptable QAPPs.

The detailed guidance that is found in this appendix is based on guidance developed by the Region V Quality Assurance Office.

BACKGROUND

Remedial investigation QAPPs are prepared to attain data quality goals for monitoring activities at a specific hazardous waste site. A QAPP describes, in specific, succinct terms, the 1) policy, 2) organization, 3) functional activities (sample collection, chemical analyses, etc.) and 4) quality assurance (QA) and quality control (QC) protocols necessary to achieve data quality goals dictated by intended usage(s) of the data.

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* For Federal-lead projects, Federal contractors and the U.S. Army Corps of Engineers prepare QAPPs using approved guidelines which are consistent with those in this appendix. This appendix is provided for use in preparing and reviewing QAPPs for State-lead projects only.

Quality assurance can be defined as the mechanism used to verify that an analytical process is operating within acceptable limits and is producing data of acceptable quality. The most important factor in determining the level of QA and QC required for a monitoring activity is the consequence of being wrong.

As part of EPA policy and regulation, QAPPs are prepared and approved prior to the initiation of an EPA-funded sampling program (see 40 CFR 30.503(f) and (g)). A QAPP organizes, in a logical format, the general guidelines to be followed in conducting environmental analysis. "Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans," QAMS-005/80, U.S. EPA, December 1980, is the current EPA guidance document for preparation of QAPPs. QAMS-005/80 specifies 16 elements that must be considered in a QAPP; this document should be followed by State personnel managing State-lead remedial activities.

Each of the 16 QAPP elements can be prepared individually or may be documented by reference, as appropriate. Each element should be tailored to the specific needs of a monitoring project or response activity. However, QAMS-005/80 does not provide detailed guidance on the development of all QAPP elements. Additional guidance on developing some of the 16 elements may be found in "Guidance for Preparation of Combined Work/Quality Assurance Project Plans for Water Monitoring," Office of Water Regulations, U.S. EPA, March 1983. Copies of the above document may be obtained from Regional QA/QC offices. Section II of the above document provides more detailed guidance on preparation of several of the 16 elements.

QA and QC roles in, and definitions for, a monitoring activity are discussed effectively in two of the references cited in the bibliography for this appendix. These articles are entitled "Principles of Environmental Analysis" and "Quality Assurance of Chemical Measurements;" copies of these articles may be obtained from the Regional QA/QC officer. They document that QA and QC are a recognized and integral part of a technically sound environmental monitoring program or response activity.

APPENDIX SUMMARY

This appendix contains guidance on QAPPs. It is to be used by State and Regional EPA staff members, with appropriate modifications, when preparing QAPPs for inclusion in Cooperative Agreement application packages or during Regional review of these plans.

ELEMENTS OF A STATE-LEAD REMEDIAL QAPP*

A. Approvals

State-lead remedial activities are extramural projects as defined by page 1 of Section 4 of QAMS-005/80. As such, the QAPP must be reviewed by a State Quality Assurance Officer and approved by the State Project Officer (SPO). Likewise, after it is submitted to EPA it should be reviewed by the Regional Quality Assurance Office and approved by the Remedial Project Manager (RPM). A Region may specify that a QAPP receive more levels of review authority and approval, however, should this be deemed necessary.

B. State-Lead Responsibilities

The State is responsible for preparing the QAPP. It may develop the QAPP itself or may use its contractor(s) to assist in this task. In either case, at least the following elements of the QAPP should be prepared prior to or during development of a sampling plan:

- Project Description
- Project Organization and Responsibility
- QA Objectives.

These elements are explained more fully below.

In developing the QAPP, the State must be aware of its responsibility to meet Superfund program QA requirements in all environmental sampling and/or analysis conducted as part of the project. These requirements, identified in Chapter III of this manual, are Agency policy and relate to the needs of litigative proceedings, cost-effectiveness, and timeliness.

The Contract Laboratory Program (CLP) can be used to conduct necessary environmental analysis or the State may use its own facilities for this purpose. In either case, the State should identify in its application those laboratory facilities that it intends to use. The Users Guide to the EPA Contract Laboratory Program (available from Regional Quality Assurance Offices) provides a breakdown

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* QAPPs should be prepared using the document control format (see the upper right-hand corner of each page of QAMS-005/80). This allows easy changes to be made without rewriting the entire document.

of the types of analytical services that the CLP provides; this guide can be used for purposes of comparison with State facilities. Regional project or QA staff can provide the State with CLP information.

The State also is responsible for ensuring that any laboratory analyzing samples has needed protocols specified in the approved QAPP.

C. Project Description

A precise project description defines the scope of the remaining QAPP elements. To ensure that it does this, the Project Description should contain the following items:

- A succinct description of the project, including a brief statement addressing the project's objectives (purposes); an overview of the project's scope or complexity; and background information from previous studies of the project area, if appropriate.

- Dates anticipated for start and completion of the project and sampling activities.

- A brief statement outlining intended data usage(s). These may include, but are not limited to, future enforcement actions, data for assessing remedial action alternatives, determination of hazardous waste characteristics for remedial and removal activities, protection of public health, definition of the extent of environmental contamination, etc. Future regulatory actions under such laws as the Resource Conservation and Recovery Act (RCRA), CERCLA, and the Safe Drinking Water Act may (or may not) dictate analytical methods and chain-of-custody protocols to be used.

- A brief description of the sampling network design and rationale.

- A discussion of the sample matrices and parameters to be measured and their frequency of collection, if appropriate. Parameters should include any field measurements (pH, conductance, etc.) and hydrogeological investigations (such as soil permeability, particle size analysis, etc.). Sample matrices and parameters are best listed in two groups:

- On-site sludges, barrels, liquids, contaminated soils, etc., which often are analyzed to determine treatment or disposal methods.

- Ambient monitoring of air, ground water, soils, surface water, river sediments, fish, etc., which measure the extent of environmental contamination and assess public health risks. Any specifications for filtered or unfiltered sample groundwater aliquots should be specified and included as part of a definition of parameters.

The latter two types of determinations discussed above usually dictate two types of sampling and analytical protocols. Quality assurance protocols can be expected to be different for each type of determination.

The remedial program office in the Region should review the QAPP Project Description to ensure that it is accurate and meets the needs of the proposed remedial activity prior to any further review by the Regional Quality Assurance Office.

D. Project Organization and Responsibility

This element of the QAPP should identify key organizations and individuals, as appropriate, responsible for:

. Overall QA/QC (State agency).

. Sampling operations and QC (State agency and/or contractor).

. Laboratory analyses and laboratory QC. All laboratories, including those subcontracting to a State contractor, must be identified. If the CLP is to be used, it also should be identified.

. Overall QA. The State or Federal organization responsible for overall QA review for the remedial activity must be specified. QA overview can be provided by the State agency (prime responsibility), the Regional Quality Assurance Office, and the contractor operating under the direction of the Regional Quality Assurance Office. If the CLP is to be used during a State-lead remedial activity, this QAPP element also should define responsibility for 1) final data review of

routine CLP services, 2) preparation and final data review of CLP and Special Analytical Services, and 3) review and confirmation of any tentatively identified organic compounds from gas chromatography/mass spectroscopy (GC/MS) library searches.

Performance (unknown reference samples) and systems audits (on-site laboratory evaluations). The State agency may have overall QA responsibility; however, this function may be performed by organizations other than the prime State agency, such as through an agreement with a State health department.

Regional review of the Project Organization and Responsibility element of a State-lead QAPP is the joint responsibility of the remedial program office and the Regional Quality Assurance Office.

E. Quality Assurance Objectives for Data Measurement in Terms of Precision, Accuracy, Completeness, Representativeness, and Comparability

Sound QA objectives require careful thought and input from analysts and the individuals who will use the resulting data. These objectives need to be established before monitoring is begun. Objective development should be the primary responsibility of the State agency and not that of the contractor actually conducting the remedial activity. Regional review of the QA Objectives element of a State-lead QAPP is a joint responsibility of the remedial program office and the Regional Quality Assurance Office.

1. Precision and Accuracy

For each matrix (or matrix group) and parameter, the State agency should define and provide objectives for:

- Level of QA effort
- Accuracy (sample spikes, surrogate spikes, reference samples, etc.)
- Precision (replicate sample analyses, etc.)
- Sensitivity or method detection limits.

These objectives should be established on the basis of individual project needs, if possible, but must be discussed with support laboratories so that they are realistic.

Quantitative limits also should be established for the above objectives. For example, mean spike recoveries for volatile halogenated organic compounds in water using purge and trap gas chromatography techniques should be 90-110% and range between 80 and 120% recovery. Results of reference sample analyses should be accurate within ± 20% of true values. Precision objectives should be that duplicate sample aliquot values differ no more than ± 10% at the 95% confidence level when concentrations measured are significantly larger than the method detection limit. Except for methylene chloride, method detection limit objectives realistically can be established at 0.2ug/l for this gas chromatography technique. On the other hand, screening of hazardous waste site liquids may require only 50 to 150% recovery of spike surrogate compounds during GC/MS determinations and method detection limits of 10 ug/l for volatile halogenated organic compounds.

Selection of analytical methods also requires familiarity with any regulatory requirements of intended data usage(s). Superfund programs presently have no analytical methods required by regulation; however, disposal of wastes during remedial and removal activities will require testing of materials pursuant to RCRA. In this case, RCRA regulations may dictate choices of analytical methods for Superfund projects.

2. Completeness, Representativeness, and Comparability

For most remedial activities the terms "completeness", "representativeness", and "comparability" are quality characteristics that should be considered during study planning. It is expected that laboratories will provide data meeting QC acceptance criteria for 90% or more of the determinations requested. At the same time, it is incumbent on planners to identify any sample types, such as controls, which require 100% completeness. If these sample types are identified in advance, apparent loss of data can be corrected by appropriate resamples. Representativeness generally is viewed as collection of representative samples (compositing if appropriate) or selection of representative sample aliquots during analysis. Comparability should be considered during planning so that inconsistencies between different agencies' data or between different analytical methods can be avoided.

F. Other Elements

Standard operating procedures (SOPs) or statements should be provided for the remaining elements of the QAPP (identified on pages 1 and 2 of Section 3 of QAMS-005/80). These elements are best prepared after drafts of the Project Description, Project Organization and Responsibility, and QA Objectives sections are available. Details of these elements should be consistent with the parameters and sample matrices identified in the Project Description and in the QA Objectives elements. If accurate SOPs are available in standard references (e.g. "Standard Methods for the Examination of Water and Wastewater") or existing State Agency or contractor manuals, they may be provided by reference if these documents are readily available.

The choice of when to reference a manual's test procedure and when to document a complete SOP should be made on a case-by-case basis. Few laboratories, other than the CLP, exactly follow all important details of a standard reference method. Usually standard reference methods provide or allow options such as the use of different gas chromatography columns for PCB determination. It may be appropriate to reference analytical methods in a State agency manual or "Standard Methods"; however, required sample preparation procedures (filtration, digestion, etc.) also should be referenced. For example, EPA's "Methods for Chemical Analysis of Water and Wastes" provides three different test procedures for most metal determinations and at least four sample preparation protocols for each metal. Different quality control audits are used for each combination of metal determination and sample preparation. For this reason, it is necessary to specify the exact combination used for each metal.

In addition to the three QAPP elements discussed above, QAPP preparers should pay special attention to the following elements:

- Sampling Procedures -- This element is properly detailed on pages 4 and 6 of Section 5, QAMS-005/80. Many of the details necessary to complete this section should be available within a remedial action sampling plan. Field measurements or hydrogeological investigations may be documented either in this element or in the Analytical Procedures portion of the QAPP, outlined below.

- Sample Custody -- U.S. EPA sample custody or chain-of-custody protocols are described in "NEIC Policies and Procedures," EPA-330/9-78-001-R, Revised February 1983. There are three parts to custody requirements: sample collection, laboratory handling, and final evidence files. Final evidence files include all originals of laboratory reports and are maintained under documented control in a secure area. A sample or evidence file is under custody if: 1) it is in one's possession, or 2) it is in one's view after being in one's possession, or 3) it was in one's possession and was locked up, or 4) it is in a designated secure area. The Regional remedial program office is responsible for determining the need for chain-of-custody at a State-lead remedial activity; the Regional Quality Asurance Office will review a QAPP chain-of-custody protocol for consistency with the NEIC's protocol requirements. A QAPP should provide examples of chain-of-custody records or forms used to record chain-of-custody for samplers, laboratories, and evidence files.

- Calibration Procedures and Analytical Procedures -- Calibration and analytical procedures often are combined as part of a specific analytical methodology. If the CLP is to be used, reference should be made to specific CLP Invitations for Bids. If special analytical services are to be used for the CLP, they should be part of the QAPP, included under this element.

- Internal Quality Control Checks -- This element should outline the protocols actually being followed for each test or determination (e.g. sample spikes, surrogate spikes, independently prepared reference samples or controls, blanks, etc.). The frequency of these audits should be specified. The compounds used for surrogate and sample spikes also should be specified, where appropriate (e.g. arsenic, mercury, priority pollutant organic compounds, etc.). The acceptance limits or control chart limits for these audits should be provided. Acceptance limits for quality control audits should be in place so that analyses can be validated prior to data reporting. If the CLP is being used, reference to specific Invitations for Bids will be sufficient to describe this element.

. Performance and System Audits -- Completion of these audits is the responsibility of the State. The State should provide QA oversight to its contractor laboratories prior to initiation of a project.

BIBLIOGRAPHY*

1. "Guidance for Preparation of Combined Work/Quality Assurance Project Plans for Water Monitoring," EPA/ Office of Water Regulations and Standards, March 1983.

2. "Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans," QAMS-005/80, U.S. EPA, December 1980.

3. "NEIC Policies and Procedures," EPA 330/9-78-001-R, revised February 1983.

4. "Preparation of State-Lead Remedial Investigation Quality Assurance Plans for Region V," EPA Region V Quality Assurance Office, April 4, 1984.

5. "Principles of Environmental Analysis," American Chemical Society, Committee on Environmental Improvement, Anal. Chem., 55, 2210 (1983).

6. "Quality Assurance of Chemical Measurements," Taylor, A.K., Anal. Chem., 53 1588 A (1981).

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* Documents cited are available from Regional Quality Assurance Offices.