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PROJECT FOR
PERFORMANCE OF
REMEDIAL RESPONSE ACTIVITIES AT
UNCONTROLLED HAZARDOUS
SUBSTANCE FACILITIES—ZONE 1

NUS CORPORATION
SUPERFUND DIVISION

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**TASK 6: QUALITY ASSURANCE PLAN FOR
THE REMEDIAL INVESTIGATION SITE OPERATIONS PLAN
TOMS RIVER CHEMICAL COMPANY
DOVER TOWNSHIP, OCEAN COUNTY, NEW JERSEY**

PREPARED UNDER

TECHNICAL DIRECTIVE DOCUMENT NO. 02-8408-04B

MARCH 4, 1985

**NUS CORPORATION
SUPERFUND DIVISION**

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6.0 TASK 6: QUALITY ASSURANCE PLAN

The Quality Assurance (QA) Plan employed by the site operations plan is based on the requirements and procedures detailed in the NUS Superfund Division (SFD) QA Manual. Since the Site Operations Plan (SOP) will generate extensive information, the QA Plan must provide comprehensive guidance to ensure the quality and integrity of investigative results is maintained.

The objectives of the QA Plan are:

1. Ensure compliance with EPA QA Requirements as specified in the Superfund Contract and,
2. Provide quality control (QC) guidelines and procedures necessary to effect collection of comprehensive, statistically valid data in a manner which complies with applicable federal regulations and legal requirements necessary for enforcement cases.

Task 6, the QA Plan is discussed in the following two sections. Section 6.1 provides applicable QA Manual requirements to be implemented in the course of the project. Section 6.2 provides specific QA procedures to be applied as required in the performance of project tasks.

6.1 Quality Assurance Requirements

As appropriate, portions or all of the following SFD Manual Quality Assurance Requirements (QAR) will be implemented during the project.

<u>Number</u>	<u>Subject</u>
QAR 1.0	Quality Assurance Organization
QAR 2.0	Quality Assurance Program
QAR 4.0	Data Acquisition

<u>Number</u>	<u>Subject</u>
QAR 5.0	Procurement Document Control
QAR 6.0	Instructions and Procedures
QAR 7.0	Document Control
QAR 8.0	Control of Purchased Items and Services
QAR 9.0	Identification and Control of Laboratory Samples
QAR 10.0	Control of Laboratory Analysis Procedures
QAR 11.0	Inspections
QAR 12.0	Control of Measuring and Test Equipment
QAR 13.0	Handling, Storage and Shipping of Hazardous Materials
QAR 14.0	Control of Non Conformances
QAR 15.0	Corrective Action
QAR 16.0	Quality Assurance Records
QAR 17.0	Audits and Surveillances

Each of the QARs listed above are provided in Appendix QA-1.

During the course of the project, the regional Quality Assurance Representative will monitor work and perform audits and surveillances to assess conformance to the above requirements. Audits and Surveillances activities are discussed further in Section 6.2.2.

6.2 Quality Assurance Procedures

Quality Assurance Procedures (QAPs) establish methods and assign responsibilities for performing activities related to the above QARs. The applicable SFD Manual QAPs are discussed below. Additionally, QAPs in areas of field documentation and records maintenance are further specified in region specific guidelines. As appropriate, these procedures will be implemented to ensure adequate quality control of all project activities.

6.2.1 Quality Control During Conduct of Project Tasks

In accordance with QAP 2.5, task specific work plans will be developed and used to control actual performance of all SOP tasks. This is to ensure specific activities are conducted in an organized efficient manner and in accordance with applicable QAPs.

The following QAP's will be implemented, as appropriate, for each task specific work plan.

<u>Number</u>	<u>Subject</u>
QAP 2.5	Work Plans
QAP 4.1	Field Data Collection
QAP 4.2	Data Reduction, Validation, and Reporting
QAP 5.1	Preparation of Procurement Documents
QAP 5.2	Subcontractor Quality Assurance Requirements
QAP 6.1	Preparation of Instructions and Procedures
QAP 7.1	Identification of Controlled Evidentiary Documents
QAP 7.2	Issuance and Distribution of Controlled Documents
QAP 7.3	Development, Documentation, Verification, and Retention of Software Programs
QAP 7.4	Technical Reports
QAP 7.5	Interim Document Review Procedure
QAP 8.1	Control of Procurement Activities
QAP 8.2	Evaluation and Selection of Subcontractors
QAP 9.1.F2	Chain of Custody
QAP 9.2.F2	Sample Control
QAP 10.1	Analysis Techniques
QAP 11.1	Offsite Reconnaissance
QAP 11.2	Onsite Inspections
QAP 12.1	Implementation of Measuring and Test Equipment Controls

<u>Number</u>	<u>Subject</u>
QAP 13.1	Packaging, Marking, Labeling, and Shipping of Samples from Hazardous-Waste Sites
QAP 14.1	Nonconformance Reporting, Evaluation, and Disposition
QAP 15.1	Implementation and Documentation of Corrective Actions
QAP 16.1	Storage and Retrieval of Quality Assurance Records
QAP 17.4	Preparation for Audit
QAP 17.5	Audit Follow-Up
QAP 17.6	Quality Notice

QAP 9.1.F2 and QAP 9.2.F2 are Region II specific modifications to SFD QA Manual QAP 9.1 and QAP 9.2. Each of the above referenced QAPs are provided in Appendix QA-1.

6.2.2 Documentation Requirements

All information assembled and generated as a result of the SOP tasks must be documented.

6.2.2.1 Field Documentation

In accordance with the above referenced QAP 11.1 and QAP 11.2 all information collected during field activities must be comprehensively documented. Appropriate, trained field personnel will be responsible for field documentation. The following Region II FIT QA Guidance further specifies procedures for field documentation are specified in: QAT-2-1.2, Written Documentation of Field Activities and QAT-2-1.3, Photo Documentation of Field Activities

Appendix QA-2 provides copies of this guidance.

Storage of all project records will be maintained in the Region II FIT office. The project file will be protected from intentional or accidental destruction or damage with access limited to authorized NUS and EPA personnel.

6.2.3 Audits, Surveillances, and Nonconformances Reporting

To ensure compliance with the QA plan, all project activities will be periodically monitored in accordance with QAP 17.4, QAP 17.5, and QAP 17.6. The Region II FIT QA Representative will conduct a minimum of two audits/surveillances during the duration of the project. These audits will be scheduled as follows: The first during Task 17, the first-round groundwater sampling and the second during Task 20, environmental sampling when approximately 70% of all environmental sampling activities have been completed. If nonconformances with QA requirements or procedures are discovered, audit follow up surveillances will be conducted to ensure corrective action to audit findings are adequate and complete.

All project work will be conducted as prescribed in the SOP and sampling task specific work plans. If there is deviation from operating guidelines or other approved procedures, nonconformance report will be filed in accordance with QAP 14.1

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APPENIDX QA

The following QA reference material is provided:

- o Appendix QA-1 SFD QA Manual QARs and QAPs
- o Appendix QA-2 Region II FIT QA Guidance

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Appendix QA-1

The following SFD QA Manual QARs and QAPs are provided:

<u>Number</u>	<u>Subject</u>
QAR 1.0	Quality Assurance Organization
QAR 2.0	Quality Assurance Program
QAP 2.5	Work Plans
QAR 4.0	Data Acquisition
QAP 4.1	Field Data Collection
QAP 4.2	Data Reduction, Validation, and Reporting
QAR 5.0	Procurement Document Control
QAP 5.1	Preparation of Procurement Documents
QAP 5.2	Subcontractor Quality Assurance Requirements
QAR 6.0	Instructions and Procedures
QAP 6.1	Preparation of Instructions and Procedures
QAR 7.0	Document Control
QAP 7.1	Identification of Controlled Evidentiary Documents
QAP 7.2	Issuance and Distribution of Controlled Documents
QAP 7.3	Development, Documentation, Verification, and Retention of Software Programs
QAP 7.4	Technical Reports
QAP 7.5	Interim Document Review Procedures
QAR 8.0	Control of Purchased Items and Services
QAP 8.1	Control of Procurement Activities
QAP 8.2	Evaluation and Selection of Subcontractors
QAR 9.0	Identification and Control of Laboratory Samples
QAP 9.1	Chain of Custody

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<u>Number</u>	<u>Subject</u>
QAP 9.2	Sample Control
QAR 10.0	Control of Laboratory Analysis Processes
QAP 10.1	Analysis Techniques
QAR 11.0	Inspections
QAP 11.1	Offsite Reconnaissance
QAP 11.2	Onsite Inspections
QAR 12.0	Control of Measuring and Test Equipment
QAP 12.1	Implementation of Measuring and Test Equipment Controls
QAR 13.0	Handling, Storage, and Shipping of Hazardous Materials
QAP 13.1	Packaging, Marking, Labeling, and Shipping of Samples from Hazardous-Waste Sites
QAR 14.0	Control of Nonconformances
QAP 14.1	Nonconformance Reporting, Evaluation, and Disposition
QAR 15.0	Corrective Action
QAP 15.11	Implementation and Documentation of Corrective Actions
QAR 16.0	Quality Assurance Records
QAP 16.1	Storage and Retrieval of Quality Assurance Records
QAR 17.0	Audits and Surveillances
QAP 17.4	Preparation for Audits
QAP 17.5	Audit Follow-Up
QAP 17.6	Quality Notice

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 NUS CORPORATION A Halliburton Company Superfund Division	QUALITY ASSURANCE MANUAL ISSUE B	Number	Page
		QAR 1.0	1 of 1
		Effective Date	Revision
		10/30/83	1
		Applicability	
		All Division Activity	
		Prepared	
		S. A. Byers	
		Approved	
		R. A. Burns	
Subject			
QUALITY ASSURANCE ORGANIZATION			

1.0 Requirements

1.1 The organizational structure, functional responsibilities, levels of authority, and lines of communication for activities affecting quality shall be documented.

1.2 Persons or organizations responsible for ensuring that an appropriate quality assurance program is established and for verifying that activities affecting quality have been correctly performed shall have sufficient authority, access to work areas, and organizational freedom to--

1. Identify quality problems.
2. Initiate, recommend, or provide solutions to quality-related problems through designated channels.
3. Verify implementation of solutions.
4. Ensure that further processing, delivery, installation, or use is controlled until proper disposition of a nonconformance, deficiency, or unsatisfactory condition has occurred.

1.3 Such persons or organizations shall have direct access to responsible management at a level where appropriate action can be effected.

1.4 Such persons or organizations shall report to an appropriate management level so that required authority and organizational freedom are provided, including sufficient independence from cost and schedule considerations.

2.0 Implementation

QAP 1.1, Division Quality Assurance Organization

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 NUS CORPORATION  A Halliburton Company Superfund Division	QUALITY ASSURANCE MANUAL ISSUE B	Number QAR 2.0	Page 1 of 1
		Effective Date 10/30/83	Revision 1
		Applicability All Division Activity	
		Prepared S. A. Piers	
		Approved R. A. Burns	
Subject QUALITY ASSURANCE PROGRAM			
1.0 <u>Requirements</u> 1.1 A quality assurance program shall be established that includes consideration of the technical aspects of the activities to be performed. 1.2 The program shall be based on the NUS Corporate Quality Assurance Policy Manual and the requirements of the U.S. Environmental Protection Agency (EPA) contract. 1.3 The program shall identify the activities to which the program developed shall apply. 1.4 The program shall provide assurance that activities affecting quality are documented within a document control system and accomplished in accordance with written instructions, procedures, or drawings. 1.5 The program shall provide for indoctrination and training of personnel performing activities affecting quality, as necessary, to ensure that suitable proficiency is achieved and maintained. 1.6 The program shall provide for the accomplishment of activities affecting quality under suitable controlled conditions. 1.7 The program shall provide for the regular review by management of the status and adequacy of that part of the quality assurance program for which it has designated responsibility. 2.0 <u>Implementation</u> 2.1 QAP 2.1, Quality Assurance Program Structure 2.2 QAP 2.2, Quality Assurance Program Concepts 2.3 QAP 2.3, Quality Assurance Training 2.4 QAP 2.4, Preparation and Control of the Division Quality Assurance Manual 2.5 QAP 2.5, Work Plans			

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 NUS CORPORATION A Halliburton Company Superfund Division	QUALITY ASSURANCE MANUAL ISSUE B	Number	QAP 2.5	Page	1 of 5
		Effective Date		Revision	
		10/30/83		1	
		Applicability			
Subject WORK PLANS		All Division Activity			
		Prepared			
		S. A. Byers			
		Approved			
		R. A. Burns			

1.0 Purpose

This procedure establishes controls for the preparation and use of Work Plans.

2.0 Applicability

This procedure is applicable to all tasks or assignments received from the EPA that require action by NUS.

3.0 Definitions

Work Plan--A document that describes how the work required by a Technical Directive Document (TDD) or Work Authorization (WA) will be conducted.

4.0 Discussion

The Work Plan is the basic control document for any work conducted for the overall project. A Work Plan will be prepared for most TDD/WA's. This procedure outlines specific activities that do not require a Work Plan. The level of detail in the Work Plan may vary depending upon the complexity of the task or assignment. The contents shall be consistent with this procedure, although the format may be determined by each division office.

Generic Work Plans, supported by the specific TDD/WA, may be all that is required for repetitive projects.

5.0 Responsibilities

5.1 The Manager of the Remedial Planning Office and the FIT Operation Manager shall be responsible for supervising, as necessary, the preparation of Work Plans within their areas of responsibility and for reviewing completed Work Plans.

5.2 Technical personnel designated as Project Managers for specific tasks or assignments shall be responsible for preparing Work Plans that outline the basic framework for the performance of their tasks.

5.3 The cognizant Quality Assurance Representatives are responsible for reviewing and approving Work Plans to ensure that the appropriate quality requirements have been included, that the Work Plans are consistent with this procedure, and that the Work Plans contain enough details to allow implementation.

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5.4 Work Plans will normally be approved by the cognizant Regional Project Managers and the Manager of the Remedial Planning Office.

5.5 After approval by the cognizant Regional Project Manager, Work Plans shall be distributed to or discussed with the personnel involved in the project work. A copy of the approved Work Plan will be included in the project file.

6.0 Procedure

6.1 Content

The Work Plan shall provide a basic outline for performing the required work and shall include the information shown in Attachment A.

6.2 Quality Assurance Requirements

6.2.1 The procedures of the project Quality Assurance Manual applicable to the work involved shall be specified in the Work Plan. If procedures besides those in the manual are to be used, they must be referenced.

6.2.2 The quality assurance section of the Work Plan should clearly describe if any in-process reviews are required and what final technical reviews will be exercised for that task or assignment. Responsibilities for these reviews should be defined, including the identity of the reviewer and the stage of the work during which the review will be conducted. For field activities lasting over three months, the quality assurance section will identify maximum intervals at which field data will be reviewed for validity and for compliance with the Work Plan requirements.

6.3 Quality Control Requirements

The Work Plan must include provisions for quality control for environmentally related data. This is primarily applicable to sampling activities. Each quality control element contained in the Quality Assurance Project Plan must be considered. If a specific element is not required, no reference is required. The elements to be considered are detailed in Attachment A.

6.4 Documents To Be Generated

6.4.1 The Work Plan must identify, for complex tasks such as Remedial Investigations, sufficient documents to furnish evidence of activities affecting quality. Such records shall substantiate that the required quality verification has been performed during the conduct of the task. They shall also provide all information required to support legal proceedings.

6.4.2 The following is intended to provide guidance in determining what documents are considered to be quality assurance records. The list

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will be updated as required. The records will be maintained as quality assurance records.

1. Preliminary data reviewed
2. Data collected during site investigation
3. Chain-of-custody records
4. Project logbooks, laboratory notes, and similar documents
5. Results of sample analysis
6. Results of design of remedial action
7. Reports
8. Audits
9. Nonconformance reports
10. Work Plans
11. Calibration records
12. Designated procedures or instructions
13. Qualifications of analyst
14. Qualifications of sampling personnel
15. Training records

6.4.3 After the documents related to a project are not in active use, all documents accumulated shall be transferred to the status of quality assurance records.

6.5 Approvals

6.5.1 The Work Plan shall be reviewed and approved, prior to issuance, by the following individuals:

1. The cognizant Regional Project Manager or the Manager of the Remedial Planning Office, as appropriate.
2. The cognizant Quality Assurance Representative.

6.5.2 The Work Plan must be signed and dated to document the approval.

6.6 Distribution

6.6.1 Each Work Plan must be given a unique number designation.

6.6.2 Work Plans will be marked with the revision level and date of issue. Revision levels will be numeric (i.e., Rev. 0, Rev. 1, Rev. 2). Draft Work Plans shall be clearly marked as such. If a "draft" is used for project work, it must be reviewed and approved as outlined above.

6.6.3 The Work Plan should, as a minimum, be distributed to all personnel involved in the work covered by the Work Plan. If the Work Plan is not distributed to each individual project participant, it shall be discussed in detail with the participants, and a copy of the Work Plan must be available for use.

Distribution to the participants will be documented by a memo or project note. Discussions with the participants will be documented

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by an attendance list. The distribution memo or attendance list will be placed in the project file, along with the copy of the Work Plan.

Work Plans issued to outside the Superfund Projects will be controlled by using Document Transmittal Forms.

6.7 Revision and Distribution Control

6.7.1 A Work Plan may be subject to revision during the life of the task. Any changes that affect the established quality provisions or applicability of imposed standards shall be reflected in a revision to the Work Plan, if accomplished prior to initiating project activity. The revision to a Work Plan may be completely revised and reissued or an addendum may be issued.

6.7.2 Revisions to Work Plans shall be subjected to the same level of review and approval as the original document. Revised Work Plans shall be distributed to all holders of the original document, or discussed with all project personnel.

6.7.3 Revisions made after work is initiated may be marked on a controlled copy of the Work Plan. The marked copy shall be reviewed by the cognizant manager and the QA Representative, then placed in the project files.

6.8 Work Plan Format

Preprinted Work Plans may be used for routine assignments of a nontechnical nature. Standardized format or generic Work Plans may also be used. (See Attachments B and C.)

6.9 Specific activities have been identified that do not require the preparation of any Work Plan. These activities are as follows:

1. Meeting attendance.
2. Review other contractor's work - for activities less than 40 man hours.
3. Responsible party searches.
4. When the TDD/WA requires less than 10 NUS personnel working specifically at the direction of EPA personnel.
5. Serving as technical advisor to EPA.
6. When the TDD/WA specifies using EPA prepared procedures or methods.

6.10 Emergency or Short Notification Work

During the course of the project situations arise that require work to be performed with short notice from EPA. If the period of time from notification until commencement of work is less than 48 hours, no Work Plan is required. The activities conducted must be documented by a memo to the project file after completion of the work.

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7-8 <u>Records</u> Work Plan		

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Attachment A

Preparation of Work Plans

A Work Plan must be prepared for each Technical Directive Document (TDD) or Work Authorization (WA). The Work Plan must be approved by the cognizant manager (e.g., Field Investigation Team Regional Project Manager) and the responsible Quality Assurance Representative, as a minimum. It is the manager's responsibility to ensure that the Work Plans are correctly prepared and adhered to. | 1

Except in case of emergencies, the Work Plan must be completed before project activity begins.

As the project activity proceeds, portions of the Work Plan that may affect quality must be marked to indicate any changes to the initial plan. The Work Plan, marked with any changes, becomes a part of the TDD/WA file. | 1

Work Plan Checklist

The Work Plan Checklist provided with this attachment should be used to ensure the completeness of each Work Plan prepared for the Superfund Division. When preparing a Work Plan, personnel should carefully consider each item on the list to determine whether it is applicable to the assignment covered by the plan. If an item is not applicable to a particular assignment, that item need not be included in the Work Plan.

Those items on the checklist marked with an "M" are mandatory and must be included in any Work Plan to which they apply. Items marked with a "Q" affect quality; if any of these items on an existing Work Plan are revised, the revisions must be clearly noted on the updated Work Plan and properly distributed (the same distribution as for the initial Work Plan).

A brief description of the items on the Work Plan Checklist is provided below.

1. SDD/TDD/WA Number
2. U.S. Environmental Protection Agency (EPA) Site Identification or the site name. | 1
3. Description of Assignment. Briefly describe the assignment received from the EPA. Provide enough detail to completely explain the scope of the work involved but avoid an overly detailed explanation. If the description and scope are adequately addressed by the SDD/TDD/WA, they may be referenced to avoid duplication, but the form must be attached to the Work Plan.
4. Technical Approach. Outline the methods that NUS will use to complete the EPA-assigned work.
5. Task Breakdown of Assignment. List the individual tasks to be performed by NUS Corporation (NUS) in executing the project. The breakdown needs to include all major aspects of the work, but not excessive details.

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Attachment A. Continued

Preparation of Work Plans

6. Account Number
7. Estimated Technical Hours
8. Estimated Subcontract Cost
9. Priority of Work
10. Project Manager Identification
11. Project Personnel Requirements. List the personnel assigned to carry out the project. If the number of personnel required varies during the activities (e.g., startup, onsite activity, project close-out), the Work Plan should describe the schedule for staffing the project.
12. Personnel Assignments. Describe the specific duties of each person assigned to the project.
13. Schedule for Activities. Provide a schedule for carrying out the project tasks. This would include the dates that approvals within NUS, and from EPA, must be obtained.
14. Milestones. Indicate critical points during the project schedule. This would include significant dates for completion of deliverables, procurements, and so on.
15. Background Data. Describe what background data are available relative to the project. Examples of this would be reports of earlier sampling activities, technical data published, and so on.
16. Data Assessment Summary. Describe the conclusions that have been reached regarding the project according to the background data.
17. Required Resources List. Describe equipment, material, or subcontracts required to complete the work. The list is to be detailed enough to allow planning for obtaining required resources, but not excessively detailed. Only major items need to be addressed--in particular, the items that are not readily available, or where a limited number are available (e.g., how many trucks or vans).
18. Cost and Budget Management. For large projects describe procedures to be employed to control the project costs. This would be procedures in addition to (or different from) the routine project financial procedures.
19. Procurement Planning. Describe the procurement actions required, who is responsible for their initiation, when the procurement documents must be issued, and when the material or services are required to be available.

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Attachment A, Continued

Preparation of Work Plans

20. **Special Training Requirements.** List any training that must be provided to conduct the project, beyond the routine training related to the REM/FIT Project.
21. **Interface Requirements.** List all organizations, outside of the office assigned to the work, that are involved with the project. This does not have to include routine support functions like the Health and Safety Manager or Quality Assurance and Security Manager. The person to be contacted in each organization should be listed.
22. **Access Requirements Planning.** If unusual actions are necessary for gaining access to a site, these should be discussed. Examples would include when warrants are necessary, special transportation, or if access is available only during limited times.
23. **Documents To Be Generated.** The Work Plan must list all documents that will be generated by the project and become part of the technical file. Examples include sampling plans, sampling analysis results, the Work Plan, etc. The purpose of listing the documents is to ensure that all documents are generated and placed in the files.
24. **Management Reports.** List any reports scheduled to be prepared during the project to be submitted to the cognizant office manager, or to the Zone Project Management Office. The person responsible for submitting the report should be identified.
25. **Report/Product Requirements.** Describe in detail the final output of the project.
26. **Report/Product Review.** Designate the person or persons involved in reviewing the final report or work product. The personnel named must be independent of the project work and must be technically qualified to determine if the work results are correct and adequate. The cognizant manager or his assistant shall normally be included in the review process.
27. **Quality Control Requirements.** Detail the quality control actions to be taken related to project performance. Requirements should be specified for such activities as calibration of monitoring equipment used for data collection and checkout of surveying equipment. For projects involving environmentally related measurements, such as field or laboratory activities, a specific list of quality control elements must be addressed. These are discussed later in this attachment.
28. **Quality Assurance Requirements.** List the quality assurance procedures that control the work activity. A reference to the Quality Assurance Manual sections that are applicable is sufficient. If other procedures are to be used they must be referenced in the Work

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Attachment A, Continued

Preparation of Work Plans

Plan, and reviewed by the Quality Assurance and Security Manager prior to use.

The personnel assigned to the project must have been trained in the procedures, and the procedures must be available for use at the work location.

29. Community Relations Assistance Requirements. Describe any assistance to be provided by NUS to the EPA community relations personnel.
30. Emergency Planning Considerations. Provide information related to possible emergency conditions. The information should be provided in detail, or a reference made to the Health and Safety Plan.
31. Health and Safety Requirements. Attach a separate Health and Safety Plan to the Work Plan.

Quality Control for Environmentally Related Measurements

For all field and laboratory investigations that generate data, specific quality control elements must be addressed under the quality control section (see Item 27 above) of the Work Plan. If laboratory analysis is supplied by the EPA Contract Laboratory Program, some elements do not need to be addressed. The contract laboratory to be used must be designated in the body of the Work Plan, if known at the time of Work Plan preparation. The Work Plan needs to contain only the applicable elements.

The elements to be addressed are as follows:

1. Sampling Procedures. Either completely describe the techniques to be employed in the sampling activity or reference the appropriate sampling procedures.
2. Sample Custody. Either completely describe the techniques to be employed in the control of sample custody, or reference the chain-of-custody procedures.
3. Calibration Procedures and Frequency. For field activities, list all equipment requiring calibration and the calibration techniques to be employed, if field calibration will be required. (The office records related to calibration should include a listing of all equipment requiring calibration, the calibration procedures to be employed, the frequency of recalibration, the calibration standards to be used and their source(s), including traceability procedures.) For the contract laboratories, this is included in the EPA contract.

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Attachment A. Continued

Preparation of Work Plans

4. **Data Acquisition.** Methods used to generate data must be detailed. This is applicable to field investigation techniques such as resistivity surveys, well logging, and the use of magnetometer surveys, as well as laboratory applications. Any data generated through literature searches or design studies would also be controlled by this Work Plan element.
5. **Data Reduction, Validation, and Reporting.** The techniques to be employed relative to data generated must be explained. Not only must laboratory data be considered but also data generated by such activities as resistivity studies and magnetometer surveys. For laboratory data, the EPA contract will control the activity.
6. **Internal Quality Control Checks and Frequency.** For field activities, describe what use will be made of replicate samples, spiked samples, split samples, and blanks. Equipment tests, such as zero adjustment and repeating the same readings, should be addressed. The laboratory portion of this is addressed by the EPA contract with the laboratories.
7. **Performance and System Audits.** This element would be applicable only to field activities involving the installation of monitoring systems, and laboratory activities. For the laboratory application, the EPA contract will specify the requirements.
8. **Preventive Maintenance.** For monitoring systems only, address the preventive maintenance tasks to minimize downtime and any critical spare parts.
9. **Data Precision, Accuracy, and Completeness.** This is not applicable to field sampling. For the use of monitoring systems, address the topic. For laboratory activities, the EPA contract with the laboratory will control.
10. **Corrective Action.** For measurement systems and laboratory activities, specify predetermined limits for data acceptability beyond which corrective action must be taken. This is not applicable to field sampling.
11. **Quality Assurance Reports to Management.** Describe a method for providing the Quality Assurance and Security Manager with a periodic assessment of the quality of data obtained from monitoring systems. For laboratories, the EPA Quality Assurance Program controls this activity. This is not routinely applicable to field sampling or to field activities such as site investigations. For lengthy field activities (over 1 month), reports must be generated.

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Subject WORK PLANS	Number QAP 2.5	Page A-6
	Revision 1	Effective Date 10/30/83

Attachment A. Continued

Preparation of Work Plans

WORK PLAN CHECKLIST

Check if Applicable	Item	Notes*
☐	1. SDD/TDD/WA number	M
☐	2. EPA site identification	M, Q
☐	3. Description of assignment	M, Q
☐	4. Technical approach	M, Q
☐	5. Task breakdown of assignment	M
☐	6. Account number	M
☐	7. Estimated technical hours	M
☐	8. Estimated subcontract cost	M
☐	9. Priority of work	M
☐	10. Project Manager identification	M
☐	11. Project personnel requirements	M
☐	12. Personnel assignments	M
☐	13. Schedule for activities	M
☐	14. Milestones	
☐	15. Background data	
☐	16. Data assessment summary	
☐	17. Required resources list	
☐	18. Cost and budget management	
☐	19. Procurement planning	Q
☐	20. Special training requirements	Q
☐	21. Interface requirements	Q
☐	22. Access requirements planning	Q
☐	23. Documents to be generated	Q
☐	24. Management reports	M, Q
☐	25. Report/product requirements	M, Q
☐	26. Report/product review	M, Q
☐	27. Quality control requirements	Q
☐	28. Quality assurance requirements	M, Q
☐	29. Community relations assistance requirements	
☐	30. Emergency planning considerations	
☐	31. Health and safety requirements	

*Items marked with an "M" are mandatory and must be included in any Work Plan to which they apply. Items marked with a "Q" affect quality; if any of these items on an existing Work Plan are revised, the revisions must be clearly noted on the updated Work Plan and properly distributed (the same distribution as for the initial Work Plan).

WUG 4460 02 0183

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Subject WORK PLANS	Number QAP 2.5	Page B-1
	Revision 1	Effective Date 10/30/83

Attachment B

Sample Work Plan

The following is a Work Plan format currently in use by Region 1. This format is not mandatory but is presented for reference.

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Subject WORK PLANS	Number QAP 2.5	Page B-5
	Revision 1	Effective Date 10/30/83

Attachment B, Continued

Sample Work Plan

TASK WORK PLAN		
<u>(Name of Project)</u>		
<u>Tasks (Designated Task Manager)</u>	<u>Estimated Completion Date</u>	<u>Estimated Labor Hours</u>
Task 1.0		
1.1		
1.2		
1.3		
1.4		
1.5		
1.6		
1.7		
Task 2.0		
2.1		
2.2		
2.3		
2.4		
2.5		
2.6		
2.7		
Task 3.0		
3.1		
3.2		
3.3		
3.4		

NWS 445B 02 0105

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Subject WORK PLANS	Number QAP 2.5	Page B-6
	Revision 1	Effective Date 10/30/83

Attachment B, Continued

Sample Work Plan

TASK WORK PLAN, Continued

<u>Tasks (Designated Task Manager)</u>	<u>Estimated Completion Date</u>	<u>Estimated Labor Hours</u>
<u>Task 3.0 (Continued)</u>		
<u>3.5</u>	<u> </u>	<u> </u>
<u>3.6</u>	<u> </u>	<u> </u>
<u>3.7</u>	<u> </u>	<u> </u>
<u>Task 4.0</u>		
<u>4.1</u>	<u> </u>	<u> </u>
<u>4.2</u>	<u> </u>	<u> </u>
<u>4.3</u>	<u> </u>	<u> </u>
<u>4.4</u>	<u> </u>	<u> </u>
<u>4.5</u>	<u> </u>	<u> </u>
<u>4.6</u>	<u> </u>	<u> </u>
<u>4.7</u>	<u> </u>	<u> </u>
<u>Task 5.0</u>		
<u>5.1</u>	<u> </u>	<u> </u>
<u>5.2</u>	<u> </u>	<u> </u>
<u>5.3</u>	<u> </u>	<u> </u>
<u>5.4</u>	<u> </u>	<u> </u>
<u>5.5</u>	<u> </u>	<u> </u>
<u>5.6</u>	<u> </u>	<u> </u>
<u>5.7</u>	<u> </u>	<u> </u>
<u>Task 6.0</u>		
<u>6.1</u>	<u> </u>	<u> </u>
<u>6.2</u>	<u> </u>	<u> </u>

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Subject WORK PLANS	Number QAP 2.5	Page B-7
	Revision 1	Effective Date 10/30/83

Attachment B, Continued
Sample Work Plan

TASK WORK PLAN, Continued		
<u>Tasks (Designated Task Manager)</u>	<u>Estimated Completion Date</u>	<u>Estimated Labor Hours</u>
<u>Task 6.0 (Continued)</u>		
6.3		
6.4		
6.5		
6.6		
6.7		
<u>Task 7.0</u>		
7.1		
7.2		
7.3		
7.4		
7.5		
7.6		
7.7		
<u>Task 8.0</u>		
8.1		
8.2		
8.3		
8.4		
8.5		
8.6		
8.7		

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Subject WORK PLANS	Number QAP 2.5	Page B-8
	Revision 1	Effective Date 10/30/83

Attachment B, Continued

Sample Work Plan

TASK WORK PLAN, Continued

<u>Tasks (Designated Task Manager)</u>	<u>Estimated Completion Date</u>	<u>Estimated Labor Hours</u>
<u>Task 9.0</u>		
9.1		
9.2		
9.3		
9.4		
9.5		
9.6		
9.7		
<u>Task 10.0</u>		
10.1		
10.2		
10.3		
10.4		
10.5		
10.6		
10.7		

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Subject WORK PLANS	Number QAP 2.5	Page B-9
	Revision 1	Effective Date 10/30/83

Attachment B, Continued

Sample Work Plan

SCHEDULE OF TASK COMPLETION		Month, Week, Day, etc.												Tasks
1.0	1.1													1.1
	1.2													1.2
	1.3													1.3
	1.4													1.4
	1.5													1.5
	1.6													1.6
	1.7													1.7
2.0	2.1													2.1
	2.2													2.2
	2.3													2.3
	2.4													2.4
	2.5													2.5
	2.6													2.6
	2.7													2.7
3.0	3.1													3.1
	3.2													3.2
	3.3													3.3
	3.4													3.4
	3.5													3.5
	3.6													3.6
	3.7													3.7

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Subject WORK PLANS	Number QAP 2.5	Page B-10
	Revision 1	Effective Date 10/30/83

Attachment B, Continued

Sample Work Plan

SCHEDULE OF TASK COMPLETION, Continued									
Month, Week, Day, etc.									
Task									
4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	5.0	5.1
									5.2
									5.3
									5.4
									5.5
									5.6
									5.7
									6.0
									6.1
									6.2
									6.3
									6.4
									6.5
									6.6
									6.7

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0036

Subject		Number QAP 2.5	Page B-11
WORK PLANS		Revision 1	EFFECTIVE DATE 10/30/83

Attachment B, Continued

Sample Work Plan

SCHEDULE OF TASK COMPLETION, Continued		Month, Week, Day, etc.
Tasks		
7.0	7.1	
	7.2	
	7.3	
	7.4	
	7.5	
	7.6	
	7.7	
8.0	8.1	
	8.2	
	8.3	
	8.4	
	8.5	
	8.6	
	8.7	
9.0	9.1	
	9.2	
	9.3	
	9.4	
	9.5	
	9.6	
	9.7	

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Subject WORK PLANS	Number QAP 2.5	Page B-11
	Revision 1	Effective Date 10/30/83

Attachment B, Continued

Sample Work Plan

SCHEDULE OF TASK COMPLETION, Continued		Month, Week, Day, etc.												Tasks
														7.0
														7.1
														7.2
														7.3
														7.4
														7.5
														7.6
														7.7
														8.0
														8.1
														8.2
														8.3
														8.4
														8.5
														8.6
														8.7
														9.0
														9.1
														9.2
														9.3
														9.4
														9.5
														9.6
														9.7

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Subject WORK PLANS	Number QAP 2.5	Page B-12
	Revision 1	Effective Date 10/30/83

Attachment B, Continued
Sample Work Plan

SCHEDULE OF TASK COMPLETION, Continued									
Month, Week, Day, etc.									
Tasks									
10.0									
10.1									
10.2									
10.3									
10.4									
10.5									
10.6									
10.7									

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Subject WORK PLANS	Number QAP 2.5	Page B-13
	Revision 1	Effective Date 10/30/83

Attachment B. Continued

Sample Work Plan

PROJECT OVERVIEW

Technical Approach:

Personnel Assignments (provide names):

Chemists:

Hydrogeologists:

Toxicologists:

Environmental
Scientists/
Engineers:

Others:

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Subject WORK PLANS	Number QAP 2.5	Page B-14
	Revision 1	Effective Date 10/30/83

Attachment B, Continued

Sample Work Plan

PROJECT OVERVIEW, Continued

Equipment Needed (major items only):

<u>Item</u>	<u>When Needed</u>	<u>Remarks</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Safety and Health Considerations:

Task	_____
Task	_____
Task	_____
Task	_____
Task	_____

Anticipated and/or known hazards or problems that may be encountered during field work are:

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Subject WORK PLANS	Number QAP 2.5	Page B-15
	Revision 1	Effective Date 10/30/83

Attachment B, Continued

Sample Work Plan

PROJECT OVERVIEW, Continued

Interface/Planning Requirements:

Access Requirements and Planning:

Interface Requirements with EPA/State/Local:

Emergency Planning Considerations:

Training Requirements/Needs:

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Subject WORK PLANS	Number QAP 2.5	Page B-16
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Attachment B, Continued

Sample Work Plan

PROJECT OVERVIEW, Continued

Procurement Planning:

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Subject WORK PLANS	Number QAP 2.5	Page B-17
	Revision 1	Effective Date 10/30/83

Attachment B, Continued

Sample Work Plan

PROJECT QA/QC PLAN

Please check off the following tasks that will be performed during the course of the project. Then, at the bottom of the page and on subsequent pages, describe fully, for each task, the appropriate procedures and actions that will be taken to provide both quality assurance and quality control. If a given task has a standard operating procedure (SOP) that is documented, please refer to that procedure.

- ☐ Ambient Air Sampling (OVA, HNU, etc.)
- ☐ Ground-Water Sampling
- ☐ Surface-Water Sampling
- ☐ Soil/Sediment Sampling
- ☐ Tap Water Sampling
- ☐ Land Surveying
- ☐ Electrical Resistivity Survey
- ☐ Electromagnetic Survey
- ☐ Magnetometer Survey
- ☐ Metal Detection Survey
- ☐ Ground Penetrating Radar Survey
- ☐ Seismic Survey
- ☐ Water Level Measurements
- ☐ Perimeter Survey
- ☐ Site Inspection
- ☐ Soil Borings/Well Installation
- ☐ Bedrock Fracture Analysis
- ☐ Pump/Permeability Tests
- ☐ Preparation of Water Table Maps
- ☐ Preparation of Bedrock Contour Maps

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Subject WORK PLANS	Number QAP 2.5	Page B-18
	Revision 1	Effective Date 10/30/83

Attachment B, Continued

Sample Work Plan

PROJECT QA/QC PLAN, Continued

_____	Determination of Ground-Water Flow
_____	Decontamination Procedures
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

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Subject WORK PLANS	Number QAP 2.5.	Page C-1
	Revision 1	Effective Date 10/30/83

Attachment C

Standardized Work Plan

The following is a standardized Work Plan for routine nontechnical work. A copy of the TDD must be attached to complete the Work Plan.

This standardized Work Plan may not be used for tasks that generate data or involve field activities.

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Subject WORK PLANS	Number QAP 2.5	Page C-2
	Revision 1	Effective Date 10/30/83

Attachment C. Continued

Standardized Work Plan

WORK PLAN FOR
ROUTINE/NONTECHNICAL WORK

TDD No. _____

NOTE: See attached TDD.

Technical Approach:

☐ As described on TDD

☐ Other: _____

Project Manager: _____

Other Personnel: _____

Report/Final Product:

☐ As described on TDD

☐ Other: _____

Review By: _____

Date Work Will Start: _____

Date Work Will Finish: _____

The following portions of the Quality Assurance Manual are applicable:

2.3, 6.0, 7.0, 7.2, 14.0, 14.1, 15.0, 15.1, 16.0, 16.1, 17.0, 17.1;

others: _____

No data will be generated as a result of this work.

No field activities are involved.

Preparer: _____

Review/Approval: _____

Quality Assurance Representative

Review/Approval: _____

Regional Project Manager

NUS 4430 52 0183

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 NUS CORPORATION A Halliburton Company Superfund Division	QUALITY ASSURANCE MANUAL ISSUE B	Number	QAR 4.0	Page	1 of 1
		Effective Date		Revision	
		10/30/83		1	
		Applicability			
		All Division Activity			
Subject		Prepared			
		S. A. Ryers			
DATA ACQUISITION		Approved			
		R. A. Burns			

1.0 Requirements

1.1 Data acquisition instrumentation, analytical standards and methods, and techniques for data collection and reduction shall be controlled. Data acquisition activity shall, where possible, be based on nationally recognized standards and methods and shall be evaluated prior to use and periodically during use to verify accuracy, stability, and repeatability.

1.2 Equipment, such as magnetometers and resistivity meters, used in data acquisition for field activities shall be operated in accordance with the manufacturer's instructions.

1.3 Monitoring systems employed during project activities shall be installed, used, and maintained in accordance with the recommendations of the manufacturers of the system components and the design organization involved in system development.

1.4 The activities related to sample collection, analysis, and reporting shall be controlled in accordance with the applicable Work Plans.

2.0 Implementation

2.1 QAP 4.1, Field Data Collection

2.2 QAP 4.2, Data Reduction, Validation, and Reporting

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 NUS CORPORATION A Halliburton Company Superfund Division	QUALITY ASSURANCE MANUAL ISSUE B	Number	QAP 4.1	Page	1 of 2
		Effective Date	10/30/93	Revision	1
		Applicability	All Division Activity		
		Prepared	S. A. Byers		
Subject		FIELD DATA COLLECTION		Approved	R. A. Burns

1.0 Purpose

This procedure establishes controls over the collection of environmentally related data during field activities.

2.0 Applicability

The collection of data during field activities shall be conducted in accordance with this procedure.

3.0 Definitions

Field Data--For purposes of this procedure, field data are defined as any and all information collected during activities at a site under study. Sample collection is controlled by other procedures.

4.0 Discussion

To maintain the integrity of data generated during field activity, basic procedural controls must be established. These controls consist of planning data collection activities and using calibrated equipment in accordance with manufacturer's instructions.

5.0 Responsibilities

5.1 The Manager of FIT Operations is responsible for ensuring that FIT data collection activities are properly conducted.

5.2 The Manager of the Remedial Planning Office is responsible for ensuring that all remedial field investigation data collection activities are properly conducted.

6.0 Procedure

6.1 All field data collection activities shall be planned in advance to the degree possible. This planning will be reflected in the Work Plan for the activity.

6.2 Observations and information obtained from reconnaissance and site inspection shall be documented in field logbooks.

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Subject FIELD DATA COLLECTION	Number QAP 4.1	Page 2 of 2
	Revision 1	Effective Date 10/30/83

6.3 Photographs taken during field activities will be documented with logbook entries including the date taken, the photographer, the site name, the Technical Directive Document/Work Assignment, and a description of the scene depicted. The photographs shall be traceable to the logbook entries. Alternative methods of identification include labels on the backs of photographs or display of a placard or sign during photography.

6.4 Field Equipment

6.4.1 Equipment used during site investigations to collect evidentiary value data shall be calibrated in accordance with manufacturer's instructions prior to being used for data collection.

6.4.2 Equipment used for data collection will be operated in accordance with established procedures or manufacturer's instructions.

6.4.3 Data readings from equipment will be recorded promptly in the field logbook or on data reporting forms. The record shall be signed and dated by the data recorder.

6.4.4 Personnel using field equipment shall be trained in its use.

7.0 Records

None.

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 NUS CORPORATION A Halliburton Company Superfund Division	QUALITY ASSURANCE MANUAL ISSUE B	Number	Page
		QAP 4.2	1 of 2
		Effective Date	Revision
		10/30/83	1
		Applicability	
All Division Activity			
Prepared			
S. A. Byers			
Approved			
R. A. Burns			
Subject: DATA REDUCTION, VALIDATION, AND REPORTING			
1.0 <u>Purpose</u> This procedure establishes a method for data reduction, validation, and reporting. 2.0 <u>Applicability</u> This procedure will apply to all data reduction, validation, and reporting for environmentally related measurements, that may be used as evidence in litigation. 1 3.0 <u>Definitions</u> None. 4.0 <u>Discussion</u> Established techniques must be employed for data reduction. The exact method used for data reduction must be documented for each situation. Where possible, written procedures or instructions should be used to control data reduction techniques. For evidentiary value data, instructions or procedures must be employed. 1 5.0 <u>Responsibilities</u> The Manager of PIT Operations and the Manager of the Remedial Planning Office are responsible for ensuring the control of data reduction, validation, and reporting techniques. 6.0 <u>Procedure</u> 6.1 The specific techniques used for data reduction and validation will be dependent on the situations presented. The Work Plan shall address the specific methods to be used, which shall be based on nationally accepted methods. 1 6.2 Field Data 6.2.1 Data collected during field activities (e.g., resistivity meter readings) will be analyzed using accepted techniques. The calculations involved will be reviewed by technically competent personnel.			

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Subject DATA REDUCTION, VALIDATION, AND REPORTING	Number QAP 4.2	Page 2 of 2
	Revision 1	Effective Date 10/30/83

6.2.2 The project Work Plan shall describe the calculations to be performed with the data collected and shall specify who will perform the calculations and who is responsible for conducting an independent review of the calculations.

6.3 Laboratory Data

For each major measurement parameter, including all pollutant measurement systems, the following shall be briefly described in the Work Plan. (For data generated under the EPA laboratory protocol for the Control Laboratory Program, the definition of data reduction techniques is the responsibility of the EPA.)

1. The data reduction scheme to be used for collected data, including all equations planned for calculating the concentration of the measured parameter and the applicable reporting units.
2. The principal criteria that will be used to validate data integrity during collection and reporting of data.
3. The methods that will be used to identify and treat outliers.
4. The data flow or reporting scheme from collection of raw data through storage of validated results.
5. Key individuals who will handle the data in the reporting scheme.

7.0 Records

None.

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 A Halliburton Company Superfund Division	QUALITY ASSURANCE MANUAL ISSUE B	Number	Page
		QAR 5.0	1 of 1
		Effective Date	Revision
		10/30/93	1
		Applicability	
		All Division Activity	
		Prepared	
		S. A. Ryers	
		Approved	
		R. A. Burns	
Subject		PROCUREMENT DOCUMENT CONTROL	

1.0 Requirements

- 1.1 Procedures shall be established to ensure that applicable requirements necessary to ensure quality are included or referenced in documents for the procurement of items and services.
- 1.2 Changes in procurement documents shall be subject to the same degree of control as the preparation of the original document.
- 1.3 To the extent necessary, procurement documents shall require contractors to provide a quality assurance program that is consistent with the pertinent requirements of the project quality assurance program.
- 1.4 Before the award of a subcontract agreement, criteria shall be established for the evaluation of applicable subcontractors to ensure that the subcontractors can meet the procurement requirements.

2.0 Implementation

- 2.1 QAP 5.1, Preparation of Procurement Documents
- 2.2 QAP 5.2, Subcontractor Quality Assurance Requirements
- 2.3 Section IV, Zone Management Plan, Subcontracting Plan

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 NUS CORPORATION A Halliburton Company Superfund Division	QUALITY ASSURANCE MANUAL ISSUE B	Number	QAP 5.1	Page	1 of 3
		Effective Date	10/30/83	Revision	1
		Applicability	All Division Activity		
		Prepared	S. A. Ryers		
Subject		PREPARATION OF PROCUREMENT DOCUMENTS		Approved	R. A. Burns

1.0 Purpose

This procedure describes the requirements for the preparation of documents for the purchase of items and services.

2.0 Applicability

This procedure is applicable to all procurements.

3.0 Definitions

3.1 Procurement document--Purchase orders, contracts, and letters of authorization used to obtain items or services.

3.2 Subcontractor--Any person, including a corporation, partnership, or business association of any kind, who holds an agreement or purchase order to perform all, or any part, of the work, or to make or furnish any article or service required for the performance of a cost reimbursable contract or other type of contract or of a subcontract entered into thereunder.

4.0 Discussion

None.

5.0 Responsibilities

5.1 The preparation of procurement documents shall be the responsibility of the Zone Deputy Project Manager or his designee.

5.2 All procurement documents that may affect quality shall be reviewed and approved by the Quality Assurance and Security Manager or the cognizant Quality Assurance Representative to ensure that quality assurance requirements are included.

6.0 Procedure

6.1 All procurements shall be made using a standard purchase order form or attachments to such a form. Each page of the procurement shall have an assigned purchase order number on it. All procurements will be in accordance with the Subcontracting Plan in the Zone Management Plan.

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6.2 All procurement documents shall include or reference the applicable quality assurance requirements.

6.3 All procurement documents shall reference applicable drawings of and specifications for the item or services being procured. When required, such referenced drawings and specifications and their revisions shall be included in the package furnished to the bidder (subcontractor).

6.4 Procurement documents shall reference any specific requirements for the subcontractor (1) to provide instructions, procedures, drawings, specifications, inspections, test plans, and records, as well as to identify test or calibration equipment that is not supplied with the procured items but is needed for testing or calibration, or (2) to submit such documents for review and approval.

6.5 Other specific documentation, such as mechanical and chemical property certifications, material traceability, and information for as-built drawings and documents, shall be identified when required.

6.6 Any specific requirements for data collection, preparation, submital, and documentation shall be noted in the requests for bid and in the subcontract or purchase order.

6.7 Rights of access by NUS Corporation to facilities, processes, and records shall be clearly delineated, as shall any requirements for quality verification during processing.

6.8 The procurement document shall list, or define, records and documents to be supplied by the subcontractor.

6.9 If records retention is to be performed by the subcontractor, it shall be stipulated in the procurement document, which shall identify the records required, the retention period, and any special conditions of storage.

6.10 Requirements shall be established for the subcontractor to report to NUS any deviation from procurement requirements and the disposition of each case. The requirements for reporting defects and noncompliance shall be clearly specified.

6.11 Any special requirement for the identification of procured items shall be included in the procurement documents. The identification requirements for components shall conform to the drawing and specification. The identification data shall clearly relate the item to the contract or purchase order; shall prevent the use of incorrect material, parts, and components; and shall indicate the subcontractor's acceptance standard.

6.12 The procurement documents shall include required reference to any special handling, packaging, preservation, and shipping required to sustain the quality of the item.

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6.13 Subcontract agreements for items and services shall require that the subcontractor (1) document and implement a quality assurance program appropriate to the item or service to be procured or (2) provide the mechanism that will exert the necessary controls to ensure that the appropriate quality assurance requirements are met.

6.14 Bid packages, purchase orders, and contracts shall require the successful subcontractor to impose on his subcontractors or suppliers standards of quality that are appropriate to the importance and complexity of the item and that ensure the suppliers' conformance with all conditions of the purchase order or subcontract.

6.15 The quality assurance program of subcontractors shall be subject to periodic audits during the life of the contract. Items that cannot or will not be inspected upon receipt shall have provisions made for quality verification at the source as part of the requirements in the subcontract or purchase order.

7.0 Records

All approved procurement documents shall be maintained by the originating organization in accordance with QAP 16.1.

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		All Division Activity	
		Prepared	
		S. A. Byers	
		Approved	
		R. A. Burns	
Subject: SUBCONTRACTOR QUALITY ASSURANCE REQUIREMENTS			

1.0 Purpose

NUS Corporation (NUS) has established a comprehensive quality assurance program to manage activities related to the Project for Performance of Remedial Response Activities at Uncontrolled Hazardous Substance Facilities. The requirements of the quality assurance program are applicable to subcontractors whose activities can affect the quality of the project. This procedure outlines the quality assurance program requirements and discusses how they are applied by NUS to subcontract agreements.

2.0 Applicability

2.1 A quality assurance program consistent with the requirements of the NUS quality assurance program must be established and implemented by all subcontractors whose activities can affect the quality of the project. The type of program established will vary depending on the importance of the activities with respect to project quality, and may vary from administrative procedures to a formally issued QA manual.

2.2 Exhibit 5.2-1 lists typical project activities that may affect the quality of the project. Subcontractors engaged in these activities, or similar activities, must be controlled by an appropriate quality assurance program.

2.3 Specific quality assurance requirements will be included in each subcontract agreement.

3.0 Definition

Subcontractor--Any person, including a corporation, partnership, or business association of any kind, who holds an agreement or purchase order to perform all, or any part, of the work, or to make or furnish any article or service required for the performance of a cost reimbursable contract or other type of contract or of a subcontract entered into thereunder.

4.0 Discussion

The quality assurance objectives established by NUS for the project can be divided into two types: management objectives and objectives regarding the measurement of data.

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Exhibit 5.2-1

Activities That May Affect Quality*

Community relations
 Construction
 Design of remedial activities and action
 Drilling of wells
 Feasibility studies
 Geophysical services
 Information collection
 Investigative activities
 Management information system development
 Monitoring system operation
 Preliminary remedial response planning
 Procurement of analytical services
 Quality assurance services
 Record maintenance
 Remedial investigation
 Report preparation
 Sample analysis
 Sample collection
 Sample control
 Security
 Site inspection
 Surveying
 Well logging
 Work Plan preparation

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*Partial listing intended to clarify the scope of the project QA program.

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4.1 NUS Management Objectives

4.1.1 Management objectives are related to the establishment of management controls for critical project activities. These controls are intended to ensure that the project is conducted in an efficient and effective manner. Management objectives are applicable, as appropriate, to all project activities.

4.1.2 The primary management objectives of the quality assurance program for the project are as follows:

1. To maintain the evidentiary value of the information produced.
2. To establish good quality practices and procedures for use in critical project activities.
3. To ensure that such activities as field investigations, laboratory analyses, and technical reports are carried out in accordance with approved procedures.
4. To ensure that remedial designs and assessments are properly prepared and reviewed.
5. To ensure that the activities of subcontractors and support agencies or organizations are conducted with the same level of quality as NUS activities.
6. To ensure that subcontractor performance complies fully with the requirements of the subcontract agreement with NUS.

4.1.3 The project Quality Assurance Manual has been established to meet these objectives. Individual Work Plans will be prepared to control specific tasks and assignments. Procurement documents shall reference the applicable program elements (see Section 6.4 below).

4.2 NUS Objectives for Measurement of Data

4.2.1 Objectives have also been established for the measurement of data. This set of objectives is intended to ensure the quality of data generated by the project related to sampling, monitoring systems, and laboratory analysis.

4.2.2 Although the use of monitoring systems or performance of laboratory analyses may not be required of NUS during the project, quality assurance objectives must be provided to subcontractors or other organizations involved in such activities on behalf of NUS.

4.2.3 The quality of data generated by sampling, monitoring, or analysis is defined in terms of the following:

1. Accuracy. The degree of agreement of a measurement (or an average of measurements of the same thing), X , with an accepted reference or true value, T , usually expressed as the

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difference between the two values, $X - T$, or the difference as a percentage of the reference or true value, $100 (X - T) / T$, and sometimes expressed as a ratio, X / T .

2. Precision. A measure of mutual agreement among individual measurements of the same property, usually under prescribed similar conditions. Precision is best expressed in terms of the standard deviation. Measures of precision vary in terms of the prescribed similar conditions.
3. Completeness. A measure of the amount of valid data obtained from a measurement system compared with the amount that was expected to be obtained under correct, normal conditions.
4. Representativeness. The degree to which data accurately and precisely represent a characteristic of population, parameter variations at a sampling point, a process condition, or an environmental condition.
5. Comparability. The confidence with which one data set can be compared with another.

4.2.4 The exact values of these quality characteristics will vary depending on the situations presented and the analytical processes and procedures involved. The processes and procedures to be used throughout the project are based upon established techniques and methods. Existing U.S. Environmental Protection Agency (EPA) standard operating procedures will be used as applicable. Where these are not available or suitable, nationally recognized testing procedures such as those established by the American Society for Testing and Materials (ASTM) will be employed.

4.2.5 Individual Work Plans will detail the quality characteristics expected from the selected methods of analysis. For each characteristic, a table will be prepared summarizing the quality objectives.

4.3 **Quality Assurance Program Structure**

This section outlines the basis for the NUS QA program. | 1

4.3.1 The quality assurance program for the project, applicable to all project activities that affect quality, is based upon the applicable parts and guidance of American National Standards Institute/ American Society of Mechanical Engineers (ANSI/ASME) NOA-1-1979. The contents have been developed to reflect consideration of the technical and administrative aspects of the project.

4.3.2 The quality assurance activities related to the project are controlled by the following documents:

1. The NUS Corporate Quality Assurance Policy Manual.

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2. The project Quality Assurance Management Plan, submitted with the NUS proposal.

3. The Quality Assurance Project Plan, submitted with the NUS proposal to the EPA.

4. The Quality Assurance Plan contained in the Zone Management Plan.

5. The project Quality Assurance Manual prepared to implement the Quality Assurance Management Plan, submitted with the NUS proposal.

The information contained in the Quality Assurance Manual implements all the above documents. It should not be necessary to supply subcontractors with copies of these documents.

4.4 Quality Assurance Program Elements

This section describes the quality assurance elements that make up the NUS QA program. Specific elements will be imposed on the subcontractors.

4.4.1 Design control. Activities related to design shall be defined, controlled, and verified. Applicable design inputs of all types will be specified on a timely basis, verified for accuracy, and correctly translated into design documents. Design adequacy will be verified by persons other than those who performed the initial design. Organizational interfaces related to design shall be identified and adequate communications procedures established. Design changes will be governed by control measures commensurate with those applied to the original design.

4.4.2 Data acquisition. Data acquisition instrumentation, laboratory analytical standards and methods, and data collection and reduction methods shall be controlled. They will be based on nationally recognized standards and techniques and will be evaluated before use and periodically during use to verify accuracy, stability, and repeatability. In addition, procedures will be developed to control field investigation activities.

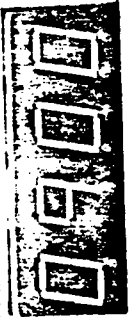
The specific techniques of data reduction and validation for laboratory activities shall depend on the situations presented. Data reporting methods also may vary.

Specific routine procedures to assess data precision, accuracy, and completeness shall be prepared.

4.4.3 Procurement document control. Applicable technical bases and other requirements necessary to ensure adequate quality will be included

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or referenced in documents for the procurement of items and services. To the extent necessary, procurement documents will require that subcontractors have a quality assurance program consistent with the applicable requirements of the NUS quality assurance program. If a subcontractor to NUS is required to procure materials or services, their procurement documents shall impose the applicable portions of the NUS program on their subcontractors, consistent with their subcontract agreement.

4.4.4 Instructions and procedures. Activities affecting quality shall be prescribed by and performed in accordance with documented procedures or other documents of a type appropriate to the work. The procedures shall, as necessary, include or reference appropriate quantitative or qualitative acceptance criteria for determining that prescribed activities have been accomplished satisfactorily.

4.4.5 Document control. The preparation, issuance, and revision of documents that specify quality requirements or prescribe activities affecting quality shall be controlled to ensure that correct documents are being employed. Such documents, including changes thereto, shall be reviewed for adequacy and approved for release by authorized personnel.

Documents that control project activities shall be controlled to ensure that correct and applicable documents are available at the locations where they are to be used. The controls will be documented in procedures and will include:

1. Identification of documents to be controlled.
2. Identification of personnel, positions, or organizations responsible for preparing, reviewing, approving, and issuing documents.
3. Review of documents for adequacy, completeness, and correctness before they are approved and issued.

Any changes to controlled documents other than those defined as minor changes (see below) will be considered major revisions and will be reviewed and approved by the same project organizations that performed the original review and approval unless other organizations are specifically designated. The reviewing organization will have access to pertinent background data or information upon which to base its approval. Minor changes to documents, such as inconsequential editorial corrections, will not require the same review and approval as the original documents.

Measures to control the maintenance of documentation related to laboratory analysis shall be established. This documentation includes logbooks, field data records, sample identification documents,

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chain-of-custody records, sample inventories, and reports. Measures to control supporting information such as maps, photographs, and drawings shall also be developed.

The preparation and issuance of reports external to the project shall be controlled. All such reports will be reviewed and approved before issue. This review will be conducted by technically qualified personnel other than those that were involved in report preparation.

Measures shall be established to control confidential information such as information that represents trade secrets. Documents containing such information will be indexed and maintained in secured files. Only authorized personnel with a valid need shall be allowed access to confidential information.

Computer codes used for analysis modeling or design applications shall be baselined, controlled, and documented. Documentation stored by computer systems (e.g., chain-of-custody records and analysis reports) will be adequately safeguarded.

- 4.4.6 Control of purchased items and services. The procurement of items and services shall be controlled to ensure conformity with specified requirements. Such control will include the following as appropriate: supplier evaluation and selection; evaluation of objective evidence of quality furnished by the supplier; source inspection and audit; and examination of items or services upon delivery or completion.

The exact extent of the quality activities undertaken relative to a given procurement will be determined by the procurement initiator and reviewed by the Quality Assurance and Security Manager.

All procurement activities shall be consistent with the terms, conditions, schedule, and provisions of the NUS contract with the EPA.

- 4.4.7 Identification and control of laboratory samples. Samples taken during field investigations shall be clearly identified to allow traceability. The exact locations of sample collections will be recorded. Field tracking and reporting forms will be employed to establish sample custody before shipment for analysis.

Established procedures for sample preservation shall be followed. These procedures are included in the Contract Laboratory Program User's Guide.

Procedures for the preparation of reagents or supplies that become an integral part of samples (e.g., filters) shall be documented.

Chain-of-custody procedures shall be established to control the handling of samples. The chain-of-custody procedures shall be in 11

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accordance with the EPA National Enforcement Investigation Center (NEIC) procedure.

The sampling procedures to be used are based primarily on EPA methods and techniques. Where these are not available, NUS will draw upon its experience and will use established corporate procedures.

For each major measurement parameter, a description of the sampling procedures will be provided. The description will include the following:

1. Techniques or guidelines used to select sampling sites.
2. Specific sampling procedures used (by reference in the case of standard procedures and by actual description of the entire procedure in the case of nonstandard procedures).
3. Charts, flow diagrams, or tables delineating sampling program operations.
4. Containers, procedures, reagents, and other items used for sample collection, preservation, transport, and storage.
5. Special conditions for the preparation of sampling equipment and containers to avoid sample contamination (e.g., containers for organics should be solvent-rinsed; containers for trace metals should be acid-rinsed).
6. Sample preservation methods and holding times.
7. Time considerations for shipping samples promptly to the laboratory.
8. Sample custody or chain-of-custody procedures.
9. Forms, notebooks, and procedures used to record sample history, sampling conditions, and analyses performed.

Chain-of-custody protocols are good project management tools and are required for purposes of litigation. The project Quality Assurance Manual details field and laboratory sample custody procedures and includes descriptions and samples of the documents to be used. Additional guidance is provided by the EPA Contract Laboratory Program User's Manual.

4.4.8 Control of laboratory analysis processes. Laboratory analysis techniques used by contracted laboratories shall be based on EPA-accepted practices and methods.

The analytical procedures employed by the contractor laboratory shall be determined by the substances involved in accordance with

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their EPA contract or subcontract. (NUS will not provide subcontractors with copies of EPA procedures.)

Standard operating procedures (SOP) are generally used in environmental data collection. Most have received EPA approval as published in 40 CFR 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants," December 3, 1979. Other procedures approved for use will be provided in detail in the Work Plans. Additional suitable reference sources for analytical procedures include "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods" (EPA, SW846, 1980) and "National Handbook of Recommended Methods for Water-Data Acquisition" (U.S. Geological Survey, 1977, and revisions).

To maintain confidence in the results of laboratory analysis, quality control checks are a routine practice at all laboratories, as such checks are approved by EPA. Their specific uses will depend on the substances involved. All quality control checks employed shall be based on nationally recognized procedures. During the project, procedures outlined by the EPA will be employed as applicable.

The plans for individual projects will reference or describe all quality control procedures used in the field as samples are submitted for analysis by contract laboratories. These procedures include the use of

1. Replicates
2. Spiked samples
3. Split samples
4. Surrogate spikes
5. Reagent blanks

The frequency of the quality control checks in the laboratory varies in accordance with the complexity of the measurement technique involved. Customarily, every tenth sample is analyzed by the laboratory in duplicate for a given set of parameters to prepare the data and statistics needed for laboratory control charts. Spiked samples will also be prepared and analyzed to determine accuracy or bias.

- 4.4.9 Inspections. Field inspections and site investigations shall be conducted in accordance with established methods and procedures, using the site-specific Work Plan developed.

Personnel assigned to inspections and investigations will be trained in the techniques required and the practices to be followed.

- 4.4.10 Control of measuring and test equipment. Tools, gauges, instruments, and other measuring and test equipment used for activities affecting quality shall be controlled and, in accordance with manufacturer's recommendations, calibrated and adjusted to maintain accuracy within necessary limits.

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Only equipment for obtaining data that may be used in enforcement actions will be subject to this requirement. Other equipment, such as health and safety monitoring or laboratory equipment, is controlled by other plans or contractor procedures.

A complete preventive maintenance schedule for all laboratory and field equipment used to collect monitoring data will be provided.

Most maintenance programs are specifically required by individual instruments or devices. Cleanliness is of course necessary to minimize instrument downtime. The replacement of tubing or other parts, such as valves, fittings, columns, and cells; the reconditioning of electrodes; the adjustment of optics; and the replacement of batteries and the like are the maintenance items included in the schedule.

Some complex instrumentation will be maintained by the equipment manufacturer on an annual contract basis.

Lists of spare parts required for equipment will be maintained by each office using equipment for collection of field data.

The calibration procedures used shall be in accordance with manufacturer recommendations. If equipment calibration procedures are extremely complex, or if the equipment is provided on a lease basis, outside calibration services may be employed. In these situations, the Quality Assurance Manual controls on procurement of service organizations will be implemented.

The project-specific plans will specify the equipment and instrument requirements and the calibration procedures to be employed (by reference or description), their frequency, and their sources (i.e., traceability).

Records of calibration will be maintained.

Many instruments will require daily or as-used calibrations; others will be calibrated less frequently.

4.4.11 Handling, storage, and shipping of materials. The methods and procedures used in the handling, storage, and shipping of hazardous or toxic materials will be documented and will be based on current regulations.

Established procedures of sample preparation and preservation will be adhered to. These are outlined in the Contract Laboratory Program User's Manual.

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Personnel involved in the handling of hazardous or toxic materials will be trained in the procedures involved and in health and safety practices.

- 4.4.12 Control of nonconformances. Activities, services, or items that do not conform to established requirements shall be controlled to prevent them from degrading the project. Controls will be established to provide for the identification, documentation, evaluation, and disposition of nonconformances. Nonconforming materials will be segregated to prevent their inadvertent use.

Subcontractors supplying materials or services shall notify NUS within 48 hours of the discovery of a nonconforming condition. This notification should be addressed to the Quality Assurance and Security Manager.

- 4.4.13 Corrective action. Conditions detrimental to quality shall be identified promptly and corrected as soon as practicable. In the case of a significant detrimental condition, the cause will be determined and corrective action taken to preclude recurrence. The identification, cause, and correction of significant conditions detrimental to quality will be documented and reported to appropriate levels of management. Follow-up action will be taken to verify the implementation of corrective action.

Corrective procedures for activities related to laboratory analysis will be described in the contractor's procedures. The procedures will include the following elements:

1. The predetermined limits for data acceptability.
2. Procedures for corrective action when data exceed the established limits.
3. The person responsible for corrective action related to each measurement system in use.

Corrective action required by other conditions, such as unsatisfactory audit findings or significant nonconformances, will be initiated by the Quality Assurance and Security Manager.

The exact methods of corrective action cannot be determined without a definition of the specific situations, quality levels involved, and the analysis processes to be used.

Periodically, the Quality Assurance and Security Manager will forward to the Zone Project Manager and the Zone Deputy Project Manager a report summarizing the quality assurance and quality control status of the project (TDDs and Work Assignments) and any

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conditions detrimental to quality. Topics to be included in the monthly report are as follows:

1. Assessment of measurement data accuracy, precision, and completeness reported by the contract laboratories.
2. Results of any performance audits conducted.
3. Results of system audits conducted.
4. Any nonconformances initiated.
5. Training provided to project personnel.
6. Any significant quality assurance problems, together with recommended solutions.

Each subcontractor shall submit similar reports to the Quality Assurance and Security Manager.

4.4.14 Records. Records that furnish documentary evidence related to quality activities shall be specified, prepared, and maintained. The records will be legible, identifiable, and retrievable and will be protected against damage, deterioration or loss. Requirements and responsibilities for record transmittal, distribution, retention, maintenance, and disposition will be established by the subcontract agreement and documented. Records should be submitted to NUS as they are generated unless it is desirable to transfer records in bulk at the completion of the work. Provisions will be made for handling confidential information.

4.4.15 Audits. Planned and scheduled audits are performed by NUS to verify compliance with all aspects of the quality assurance program and to determine its effectiveness. These audits will be performed in accordance with written procedures or checklists by personnel who do not have direct responsibility for performing activities being audited. Audit results will be documented and then reported to and reviewed by responsible management. Follow-up action will be taken where indicated.

The audit reports, including nonconformances discovered and their resolution, will be available for review by the EPA.

The effectiveness of quality assurance techniques and their implementation can be evaluated by means of audits. The Quality Assurance Manual details the audit requirements.

The overall quality assurance program is audited periodically by other NUS organizations. However, the effectiveness of the components of the measurement systems must be determined to ensure their accuracy and suitability for specific situations presented.

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Individual Project Plans will describe the internal and external audits that will be required to monitor the capability and performance of any measurement systems.

5.0 Responsibilities

5.1 The NUS Zone Project Manager has overall authority and responsibility for the implementation of the quality assurance program for the project. | 1

5.2 The Quality Assurance and Security Manager is the person responsible within NUS for the development, maintenance, and implementation of the NUS quality assurance program. He will audit the program to verify proper implementation. This includes audits of subcontractors, as appropriate. The Quality Assurance and Security Manager is assisted in quality assurance program implementation by Quality Assurance Representatives who are resident in NUS Region I, II, III, and IV offices, the Remedial Planning Office, and the Zone Project Management Office.

5.3 Each subcontractor shall identify the person (or persons) within their organization responsible for the quality assurance related to the subcontract. The person designated must have the technical expertise, qualifications, and authority to ensure that the subcontract is performed in compliance with the NUS contract. | 1

5.4 In carrying out their duties, the subcontractor quality assurance personnel shall have access to all work areas. They shall have the freedom to identify quality problems; initiate, recommend, or provide solutions to quality problems through designated channels; verify the implementation of solutions; and ensure that further processing or action is controlled until unsatisfactory conditions are corrected.

6.0 Procedure

6.1 Quality assurance requirements, commensurate with those applicable to NUS activities, shall be imposed on subcontractors to NUS.

6.2 The Requests for Bids issued by NUS will specify the portions of the NUS quality assurance program that are applicable to the subcontract agreement. The requirements shall be clearly explained so that the subcontractor can correctly develop the necessary program.

6.3 The Requests for Bids will require prospective subcontractors to submit with their bids information related to any existing quality assurance program as well as previous experience with projects involving quality assurance programs.

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6.4 The subcontractor must establish a quality assurance program consistent with the portions of the NUS program applied to the particular procurement activity. The portions of the NUS program that a subcontractor must comply with will be provided as part of the solicitation and the subcontract agreement. The information is considered "proprietary" to NUS.

6.5 Activities affecting quality shall be accomplished under suitably controlled conditions. The list of activities affecting quality presented in Exhibit 5.2-1 is not intended to be comprehensive; it is only intended to provide guidance to project personnel in determining quality-related tasks.

6.6 Supporting Program Documentation

Standard operating procedures and guidelines shall be prepared as necessary for the subcontracted activities that require such a degree of control. In instances where additional supporting procedures or instructions are required, these may be prepared for the specific application, or the use of the existing NUS procedures may be documented. NUS will provide the subcontractor with the required supporting program documentation as applicable. The subcontractor shall advise NUS when such documentation is needed. |1

6.7 Quality Assurance Training

Quality assurance training shall be provided for subcontractor personnel in accordance with the terms of the subcontract agreement. |1

6.8 Audits

6.8.1 The Quality Assurance and Security Manager will monitor the performance of subcontractors engaged in work that may affect quality. This monitoring may be accomplished through surveillance visits or through reports provided by individual project managers.

6.8.2 Periodically the Quality Assurance and Security Manager will perform audits on randomly selected subcontractors. |1

6.8.3 If the quality assurance performance of a subcontractor becomes suspect, the Quality Assurance and Security Manager will investigate the situation. This investigation may take the form of meetings with subcontractor management or formal audits.

7.0 Records

Subcontract agreement

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		Applicability All Division Activity	
		Prepared S. A. Byers	
Subject INSTRUCTIONS AND PROCEDURES		Approved R. A. Burns	

1.0 Requirements

1.1 Activities affecting quality shall be prescribed and performed in accordance with documented instructions and/or procedures of a type appropriate to the circumstances.

1.2 Instructions and procedures shall include appropriate quantitative or qualitative criteria for determining that quality-affecting activities have been satisfactorily accomplished.

2.0 Implementation

QAP 6.1, Preparation of Instructions and Procedures

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		Applicability	All Division Activity		
		Prepared	S. A. Byers		
Subject		PREPARATION OF INSTRUCTIONS AND PROCEDURES			
		Approved R. A. Burns			

1.0 Purpose

This procedure establishes a uniform format for preparation of procedures and instructions.

2.0 Applicability

The procedure contained herein is applicable to all formal instructions and procedures generated by NUS as part of the Superfund Project. It is not applicable to instructions provided in the body of Work Plans or other similar documents.

3.0 Definitions

3.1 Procedure--An administrative quality assurance document.

3.2 Instruction--A document that specifies or describes how an activity is to be performed. It may include methods to be employed, equipment or materials to be used, and the sequence of operations.

4.0 Discussion

4.1 The organization responsible for preparing a procedure or an instruction is responsible for communicating with the organizations affected by its provisions and for soliciting an internal review and concurrence by all organizations to be affected by its provisions.

4.2 As a minimum, instructions for work shall contain appropriate references to governing requirements and any applicable standards, as well as the appropriate quality assurance procedures. Additional information necessary to the valid, expeditious completion of the task shall include the source(s) of input data, reference material to be evaluated, computer codes to be used, other applicable work instructions, and the quality control checks to be exercised.

4.3 For repetitious activities, instructions may be limited to a reference to a standard document or manual.

5.0 Responsibilities

Instructions shall be prepared by the Manager of the Remedial Planning Office, the Manager of Field Investigation Team (FIT) Operations, and the Zone Deputy Project Manager, or their designees, for all activities involving investigations or inspections, sampling activities, reviews, analyses, and the use and maintenance

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Subject PREPARATION OF INSTRUCTIONS AND PROCEDURES	Number QAP 6.1	Page 2 of 3
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of field and laboratory equipment and for data reduction and processing. Instructions shall be reviewed by the cognizant Quality Assurance Representative and/or the Quality Assurance and Security Manager.

6.0 Procedure

6.1 Organizations preparing procedures and instructions shall provide a statement of the purpose of the procedure or instruction and clearly delineate its objectives. The organization shall determine what other organizations are affected by the procedure or instructions and determine the optimum method of handling organizational interfaces, the sequence of actions, the forms required, and the approval levels necessary for implementation.

6.2 Quality Assurance Procedures (QAPs) shall provide, where appropriate, objective evidence that work was performed in compliance with the approved instructions and shall include quantitative or qualitative acceptance criteria, as appropriate. Compliance during field activities should normally be documented in field logbooks.

6.3 Procedures related to quality assurance (QAPs) shall be in the format outlined below. It is not required that each subject heading be developed for each procedure; however, the subject heading shall be followed by the word "none" if no further breakdown of the subject is required.

1. Purpose. Describe the purpose and scope of the procedure. Be as specific as possible; do not generalize.
2. Applicability. Identify the applicability of the procedure.
3. Definitions. Define words and phrases having a special meaning or application within the procedure.
4. Discussion. Use if necessary to furnish context or background information to make the procedure more meaningful or to make its application or execution more understandable.
5. Responsibilities. Identify the organizational positions and responsibilities of people who are charged with implementing the procedure.
6. Procedure. Identify the step-by-step sequence of activities to be followed. Be specific in context and scope.
7. Records. Identify any records to be retained after completion of the procedure.

6.4 Standard operating procedures and work instructions shall be developed by individual organizations using the format best suited to their applications.

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7.0 Records

Copies of all Quality Assurance Procedures, including revisions, shall be retained in accordance with QAP 16.1. Storage and Retrieval of Quality Assurance Records.

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 NUS CORPORATION A Halliburton Company Superfund Division	QUALITY ASSURANCE MANUAL ISSUE B	Number QAR 7.0	Page 1 of 1
		Effective Date 10/30/83	Revision 1
		Applicability All Division Activity	
		Prepared S. A. Ryers	
Subject DOCUMENT CONTROL		Approved R. A. Burns	

1.0 Requirements

1.1 Measures shall be established to control the issuance of quality affecting documents, such as manuals, procedures, and drawings, including changes thereto, which describe activities affecting quality.

1.2 The measures established shall ensure that documents, including changes thereto, are reviewed for adequacy, approved for release by authorized personnel, and distributed to and used at the location where the described activity is performed.

1.3 Changes to documents shall be reviewed and approved by the organization that performed the original review and approval or by its designee.

2.0 Implementation

2.1 QAP 7.1, Identification of Controlled Evidentiary Documents

2.2 QAP 7.2, Issuance and Distribution of Controlled Documents

2.3 QAP 7.3, Development, Documentation, Verification, and Retention of Software Programs

2.4 QAP 7.4, Technical Reports

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		Effective Date	10/30/83	Revision	1
		Applicability			
		All Division Activity			
		Prepared			
		S. A. Byers			
		Approved			
		R. A. Burns			
Subject IDENTIFICATION OF CONTROLLED EVIDENTIARY DOCUMENTS					

1.0	<u>Purpose</u>
	This procedure describes the requirements for identification and control of documents that may be used as evidence during litigation.
2.0	<u>Applicability</u>
	This procedure is applicable to controlled evidentiary documents. In specific project offices, the cognizant EPA regional office may use different procedures. These EPA procedures may be employed. 1
3.0	<u>Definitions</u>
	Controlled evidentiary documents--Those documents, including changes thereto, that there is a reasonable belief that they will be of use as evidence during litigation. These documents are released by authorized personnel and distributed for use by the individuals performing the activities. 1
4.0	<u>Discussion</u>
	Controls are established to provide assurance that documents of an evidentiary value are prepared and maintained properly.
	If a specific office chooses to utilize the document control procedures used by that region, this is acceptable. However, the exact procedures utilized must be documented in formal procedures. 1
5.0	<u>Responsibilities</u>
	The organization originating controlled documents shall be responsible for identifying them in accordance with this procedure.
6.0	<u>Procedure</u>
6.1	Every controlled document shall have a unique identifier (number).
6.2	Each procurement document shall have a sequential purchase-order number assigned to it.
6.3	Accountable documents used by employees shall include items such as logbooks, sample tags, chain-of-custody records, and bench cards. Each document bears a serialized number. 1

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Subject IDENTIFICATION OF CONTROLLED EVIDENTIARY DOCUMENTS	Number QAP 7.1	Page 2 of 4
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6.4 Unless prohibited by weather conditions, ink is used in recording all data on serialized accountable documents. | 1

6.5 Serialized Documents | 1

Documents related to field activities, such as sample tags, chain-of-custody forms, and logbooks, shall be numbered serially and their distribution controlled. This control may be through the EPA office issuing the documents. Each FIT Regional Project Manager and the Remedial Planning Office Manager are responsible for ensuring that a sufficient supply of documents is obtained for an investigation and that these documents are properly distributed to the appropriate personnel. | 1

6.6 Project Logbooks

6.6.1 The original holders of logbooks (e.g., project manager) will document the transfer of logbooks to other individuals who have been designated as project manager to perform specific tasks on the project. Temporary transfers to record data need not be documented. All pertinent information must be recorded in these logbooks from the time each individual is assigned to the project until the project is completed. | 1

6.6.2 Logbook entries shall be dated, legible, and contain accurate and inclusive documentation of an individual's project activities. Since the logbook forms the basis for the later written reports, it must contain only facts and observations. Language should be objective, factual, and free of personal feelings or other terminology which might prove inappropriate. The responsible project personnel number the logbooks with the appropriate project code and station number. All in-situ measurements and field observations are recorded in the logbooks with all pertinent information necessary to explain and reconstruct sampling operations. Entries made by individuals other than the person to whom the logbook was assigned are dated and signed by the individual making the entry. | 1

6.6.3 All project logbooks are the property of the NUS Corporation (NUS) and are to be turned over to the responsible manager when a project assignment has been concluded, except in situations where more than one project is documented by a logbook. (However, this practice should be avoided.) | 1

6.6.4 As an alternative to recording detailed sampling information in logbooks, separate sampling record forms may be used. However, general site information must be recorded in the logbook. | 1

6.7 Sample Identification Documents

6.7.1 Assignments by NUS of all serialized sample tags to field personnel are recorded in logbooks. Individuals are accountable for each tag assigned to them until it has been filled out, attached to a sample, and transferred to another individual with the corresponding chain-of-custody record. At no time are any sample tags to be | 1

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Subject IDENTIFICATION OF CONTROLLED EVIDENTIARY DOCUMENTS	Number QAP 7.1	Page 3 of 4
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discarded; if any of these forms are lost, voided, or damaged, it is noted in the appropriate logbook immediately upon discovery.

6.7.2 At the completion of any field-sampling investigation, all unused sample tags are returned to the FIT Regional Project Manager by the individual to whom they were originally assigned. This individual lists the serial numbers of the returned items in the proper logbook and signs and dates the transfer. | 1

6.8 Corrections to Documentation | 1

6.8.1 As previously noted, unless prohibited by weather conditions, all documentation in logbooks, sample tags, custody records, and other data sheets are filled out with waterproof ink. None of the accountable serialized documents listed are to be destroyed or thrown away, even if they are illegible or contain inaccuracies that required that they be replaced.

6.8.2 If an error is made in a project logbook assigned to one individual, that individual may make corrections by crossing a line through the error and entering the correct information. Changes made are dated and initialed. If an error is discovered on a sample tag or custody record, the person who made the error should correct it when possible. Corrections or insertions are made by inserting the word or abbreviation for "corrected," the date, and the correcting person's initials beside the correction. This procedure applies to words or figures inserted or added to a previously recorded statement. | 1

6.8.3 If a sample tag is lost in shipment, if a tag was never prepared for a sample(s), or if a properly tagged sample was not transferred with a formal chain-of-custody record, a written statement is prepared detailing how the sample was collected. The statement is air-dispatched or hand-transferred to the laboratory. The statement should include all pertinent information, such as field logbook entries regarding the sample and whether the sample was in the sample collector's physical possession or in a locked compartment until hand-transferred to the laboratory. Copies of the statement are distributed to the responsible manager, the Zone Deputy Project Manager, the Quality Assurance and Security Manager, and the appropriate project files. | 1

7.0 Records

7.1 Field logbooks

7.2 Field data records

7.3 Field laboratory logbooks

7.4 Sample tags

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Subject IDENTIFICATION OF CONTROLLED EVIDENTIARY DOCUMENTS	Number QAP 7.1	Page 4 of 4
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7.5	Chain-of-custody records
7.6	Controlled document logbook
7.7	Confidential inventory log

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		Effective Date	Revision
		10/30/83	1
		Applicability	
		All Division Activity	
		Prepared	
		S. A. Byers	
		Approved	
		R. A. Burns	
Subject: ISSUANCE AND DISTRIBUTION OF CONTROLLED DOCUMENTS			

1.0 Purpose

This procedure describes the requirements for the issuance and distribution of controlled documents.

2.0 Applicability

This procedure is applicable to all documents controlled for project management purposes. It is not applicable to evidentiary documents such as tags, logbooks, etc. Work Plans are controlled by QAP 2.5, except for Work Plans transmitted to personnel outside the Superfund Project.

3.0 Definitions

Controlled Documents--For purposes of this procedure, controlled documents is defined as documents such as manuals, procedures, or instructions that must be controlled to ensure that the most recent issue is used for project activity.

4.0 Discussion

None.

5.0 Responsibilities

The Manager of the Remedial Planning Office, the FIT Operation Manager, and the Zone Deputy Project Manager shall designate members of their staff who shall have responsibility for the following:

1. Issuing numbers for controlled documents originating in the respective offices
2. Issuing controlled documents originating in the offices
3. Establishing and maintaining a distribution list for all controlled documents issued by the offices
4. Maintaining a record of acknowledgment of receipt of all controlled documents
5. Maintaining a current master file of all controlled documents applicable to the work of the office

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Subject ISSUANCE AND DISTRIBUTION OF CONTROLLED DOCUMENTS	Number QAP 7.2	Page 2 of 4
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6.0 **Procedure**

6.1 Each controlled document will be given a sequential number by the designated individual in the originating office.

6.2 The issuance and distribution of all controlled documents will be documented.

6.3 Controlled documents will be distributed on the basis of the originating office's distribution list using a document transmittal form (see Exhibit 7.2-1), with return receipt required.

6.4 The return receipt shall be documented on the controlled document distribution log.

6.5 **Revisions to Documentation**

6.5.1 Major revisions to documents shall be subjected to the same level of review and approval as the original document. Distribution of revised documents shall include all holders of the original document.

6.5.2 Minor changes to documents, such as inconsequential editorial corrections, shall not require that the revised documents receive the same review and approval as the original documents; however, they must be reviewed and approved at the highest level as before.

6.6 **Analysis Documentation**

Analysis documentation for the Contract Laboratory is specified by the EPA. For non-contract laboratory analysis, the EPA protocol shall be adhered to or project specific instructions provided to the laboratory.

6.7 **Reports**

All reports shall be subjected to an independent review by technically qualified personnel prior to issuance.

6.8 **Confidential Information**

Any information received from site owners or their representatives with a request of confidentiality is handled as "confidential." A separate, locked file is maintained for the segregation and storage of all confidential and trade-secret information. Upon receipt, this information is directed to and recorded in a confidential inventory log by the responsible FIT Regional Project Manager. The information is then made available to authorized personnel, but only after it has been logged out. The information shall be returned to the locked file at the conclusion of each working day. Confidential information may not be reproduced except upon approval by and

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Subject ISSUANCE AND DISTRIBUTION OF CONTROLLED DOCUMENTS	Number QAP 7.2	Page 3 of 4
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under the supervision of the Zone Deputy Project Manager. Any reproduction should be kept to an absolute minimum. The cognizant manager will enter all copies into the document control system and apply the same requirements as for the original. In addition, this information may not be entered into any computer or data-handling system. Confidential documents may not be destroyed except upon approval by and under the supervision of the Zone Project Manager. The Zone Deputy Project Manager shall remove and retain the cover page of any confidential information disposed of for 1 year and shall keep a record of the destruction in the confidential inventory log.

6.9 Computer Codes and Documentation

Computer codes used for analysis modeling or design applications shall be baselined, controlled, and documented. Documentation stored by computer systems (e.g., chain-of-custody records and analysis reports) shall be adequately safeguarded.

6.10 Photographs

When movies, slides, or photographs are taken which visually show the effluent or emission source and/or any monitoring or sampling locations, they are numbered to correspond to logbook entries. The name of the photographer, date, time, site location, and site description are entered sequentially in the logbook as photographs are taken. Once developed, the slides or photographs should be assigned numbers that correspond to the logbook descriptions. Where possible, the information should be transferred to the photographs.

7.0 Records

7.1 Distribution log

7.2 Document transmittal form

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Subject ISSUANCE AND DISTRIBUTION OF CONTROLLED DOCUMENTS	Number QAP 7.2	Page 4 of 4
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NUS CORPORATION SUPERFUND DIVISION		DOCUMENT TRANSMITTAL					
TO:		DATE:					
SENDER:		REFERENCE NUMBER:					
THE FOLLOWING DOCUMENT(S) IS TRANSMITTED TO YOU FOR: ☐ USE ☐ RECORDS ☐ INFORMATION							
TITLE / ID NO.	REV NO	NO OF COPIES	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">CONTROLLED NUMBERS</td> <td style="width: 50%; padding: 5px;">UNCONTROLLED NUMBERS</td> </tr> <tr> <td style="height: 100px;"></td> <td></td> </tr> </table>	CONTROLLED NUMBERS	UNCONTROLLED NUMBERS		
CONTROLLED NUMBERS	UNCONTROLLED NUMBERS						
NOTE:							
☐ ABOVE DOCUMENT(S) IS TO BE USED FOR WORK PLAN ☐ ABOVE DOCUMENT(S) IS RESTRICTED TO USE ONLY FOR WORK PLAN ☐ DESTROY PREVIOUS REVISION OF THE ABOVE DOCUMENT(S) ☐ RETURN PREVIOUS REVISION OF THE ABOVE DOCUMENT(S) TO SENDER ☐ RETAIN PREVIOUS REVISION OF THE ABOVE DOCUMENT(S) FOR YOUR RECORDS ☐ THIS DOCUMENT IS PROPRIETARY INFORMATION ☐ THIS DOCUMENT IS CONFIDENTIAL ☐ OTHER 							
PLEASE ACKNOWLEDGE RECEIPT OF THE ABOVE DOCUMENT(S) BY SIGNING THIS TRANSMITTAL FORM AND PROMPTLY RETURNING IT TO THE ADDRESS NOTED BELOW. IF PREVIOUS REVISION OF THE DOCUMENT(S) IS TO BE DESTROYED, THE FOLLOWING SIGNATURE ALSO CERTIFIES THE DESTRUCTION OF THE DOCUMENT(S).							
SIGNATURE:		DATE:					
SIGNED COPY OF THIS TRANSMITTAL SHOULD BE RETURNED TO:							
THE ABOVE PROPRIETARY DOCUMENT(S) REMAINS THE PROPERTY OF NUS AND MAY BE RECALLED AT ANY TIME							

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EXHIBIT 7.2-1

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 NUS CORPORATION A Halliburton Company Supertund Division	QUALITY ASSURANCE MANUAL ISSUE B	Number QAP 7.3	Page 1 of 5
		Effective Date 10/30/83	Revision 1
		Applicability All Division Activity	
		Prepared S. A. Byers	
Subject DEVELOPMENT, DOCUMENTATION, VERIFICATION, AND RETENTION OF SOFTWARE PROGRAMS		Approved R. A. Burns	

1.0 Purpose

This procedure establishes a standard method for the development, documentation, verification, and retention of software programs.

2.0 Applicability

This procedure is applicable to all software programs used for analyses, modeling, or other quality-affecting activities. It is applicable to software programs acquired from outside sources as well as programs developed internally. It is not applicable to routine management information systems.

3.0 Definitions

None.

4.0 Discussion

None.

5.0 Responsibilities

The Zone Deputy Project Manager specifies the scope of program documentation and verification and maintains a computer program documentation file. He or his designee supervises program development, documentation, and verification.

6.0 Procedure

6.1 Development

Generation of a software program should proceed in an orderly fashion from a specification, through flow charting and coding in the desired language, to debugging of the program.

6.2 Documentation

The Zone Deputy Project Manager or his designee shall be responsible for ensuring that all computer programs, whether developed internally or acquired from an outside source, are documented in sufficient detail that each can be understood and verified by an independent reviewer. The program documentation shall conform to

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Subject DEVELOPMENT, DOCUMENTATION, VERIFICATION, AND RETENTION OF SOFTWARE PROGRAMS	Number QAP 7.3	Page 2 of 3
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"Guidelines for the Documentation of Digital Computer Programs."
The program documentation should contain the following:

1. Program identification. Give the program name, descriptive title, and information necessary to uniquely define the current version.
2. Description of problem or function. Define the problem to be solved or function to be performed by the program.
3. Method of solution. Summarize mathematical techniques, procedures, and numerical algorithms employed for solution.
4. Related material. List any auxiliary programs or external data files required for implementation of this program.
5. Restrictions. Discuss limitations imposed by the mathematical model or computer facilities.
6. Computer(s). Identify the computer(s) on which the program has been successfully executed.
7. Programming languages. Indicate the languages used and approximate fraction of each.
8. Operating systems. Identify the software system and versions used.
9. Machine requirements. List the computer hardware required for implementation of the program.
10. Authors. Give the names and addresses of the author(s) and the individual(s) currently responsible for the program.
11. References. List directly related publications and other reference materials.
12. Users manual. Describe all input required for the program, including input format. Include all information required for a successful computer run (e.g., special input techniques, handling of consecutive cases, default values of input parameters). Provide sample problem(s) with control cards and physical interpretation of input and output.
13. Source. List the source program as compiled or assembled.

6.3 Verification

- 6.3.1** Verification is the process of ensuring that the program performs correctly. Verification is required for all computer programs used for quality-affecting work. The extent and degree of verification will depend on the end use of the results of the analysis for which

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Subject DEVELOPMENT, DOCUMENTATION, VERIFICATION, AND RETENTION OF SOFTWARE PROGRAMS	Number QAP 7.3	Page 3 of 5
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the program is employed. The Zone Deputy Project Manager or his designee originating the program shall determine the extent of verification and indicate this extent by checking the appropriate boxes under item 5 of the record of computer software verification (Exhibit 7.3-1). He shall also be responsible for ensuring that the required verification has been performed.

6.3.2 For programs that are widely used and accepted, verification may be limited to running originator-supplied sample problems. For other programs, verification shall be accomplished by checking the mathematical modeling, numerical analysis, and computer program logic, and then doing either of the following:

1. Demonstrate that the computer program solutions to a series of test problems are in substantial agreement with those obtained by a similar, independently written program in the public domain. The program from the public domain should be a generally recognized program with sufficient history to justify its applicability and validity without further demonstration.
2. Demonstrate that the program's solutions to a series of test problems are in substantial agreement with those obtained by hand calculations or from accepted experimental or analytical results published in the technical literature.

6.3.3 The test problems chosen for program verification should be demonstrated to be representative of the range of applicability of problems to be analyzed by the program.

6.3.4 The program verification should be fully documented, including methods used, details of independent calculations (manual or computer), results, and conclusions. This document shall be attached to the record of computer software verification.

6.4 Retention

All documentation generated for a software program shall be labeled with sufficient information to uniquely identify the version of the program to which it is applicable and shall be retained in the files of the project. A master copy of the production program deck shall be maintained. No changes to this deck will be made without proper authorization by the Zone Deputy Project Manager or his designee. Such authorization may be granted only after the modifications have complied with the provisions of this procedure.

7.0 Records

Software documentation

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NUS CORPORATION SUPERFUND DIVISION		RECORD OF COMPUTER SOFTWARE VERIFICATION	
SOFTWARE PACKAGE NAME:		PAGE	OF
DEVELOPER:			
PROGRAMMER:			
COMPUTER TYPE:			
VERIFICATION SCOPE: ☐ SAMPLE PROGRAM FROM ORIGINATOR ☐ MATHEMATICAL MODELING ☐ COMPLETE ☐ SPOT CHECK ☐ NUMERICAL ANALYSIS ☐ COMPLETE ☐ SPOT CHECK ☐ DATA LIBRARIES USED ☐ COMPLETE ☐ SPOT CHECK ☐ BENCHMARK AGAINST EXISTING PROGRAMS ☐ BENCHMARK AGAINST EXPERIMENTAL RESULTS ☐ BENCHMARK AGAINST HAND CALCULATIONS ☐ VERIFICATION TESTING PROGRAM		PROGRAM USE: ☐ DESIGN ☐ CALCULATIONS ☐ MANAGEMENT INFORMATION ☐ ANALYSIS ☐ OTHER	
DESCRIPTION OF VERIFICATION ACTIVITIES AND FINDINGS			

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EXHIBIT 7.3-1

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Subject DEVELOPMENT, DOCUMENTATION, VERIFICATION, AND RETENTION OF SOFTWARE PROGRAMS	Number QAP 7.3	Page 5 of 5
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NUS CORPORATION SUPERFUND DIVISION	RECORD OF COMPUTER SOFTWARE VERIFICATION
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DESCRIPTION OF VERIFICATION ACTIVITIES AND FINDINGS (CONT'D):

PAGE OF

VERIFIED BY:

DATE:

ACCEPTED BY (REGIONAL/OFFICE MANAGER):

DATE:

REVIEWED BY QA:

DATE:

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EXHIBIT 7.3-1 (continued)

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		Effective Date 10/30/83	Revision 1
		Applicability All Division Activity	
		Prepared S. A. Byers	
Subject TECHNICAL REPORTS		Approved R. A. Burns	

1.0 Purpose
 This procedure describes the controls established for the preparation and issuance of technical reports.

2.0 Applicability
 All technical reports generated by the Superfund Division shall comply with the requirements of this procedure. The actual format of the reports is controlled by procedures (e.g., style guide).

3.0 Definition
 None.

4.0 Discussion
 None.

5.0 Responsibilities

5.1 Project Managers
 The project managers for individual tasks (Technical Directive || Document/Work Authorization) are responsible for the generation of project technical reports.

5.2 Regional Project Managers
 The cognizant Regional Project Manager is responsible for the review and approval of technical reports issued by the Field Investigation Team (FIT) offices.

5.3 Manager of Remedial Planning Office
 The Manager of the Remedial Planning Office is responsible for the review and approval of technical reports generated in relation to Remedial Planning Office activities.

6.0 Procedure

6.1 All reports will be generated using technically qualified personnel.

6.2 Reports will be subjected to a review by qualified personnel that || are independent of the report preparation.

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Subject TECHNICAL REPORTS	Number QAP 7.4	Page 2 of 2
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6.3 The reviewer will verify the following:

1. The report accurately reflects the input data used.
2. The report is in compliance with the requirements initially specified by the U.S. Environmental Protection Agency (EPA).
3. The report is technically accurate.
4. The report is clearly understood. 1

6.4 Prior to issuance, each report will provide the following:

1. The name of the report preparer
2. The name and signature of the issuing manager
3. A unique report number
4. The date of issue

6.5 All reports shall be transmitted to the EPA with a cover letter. Copies shall be retained by the office originating the cover letter and the report. Other copies shall be distributed in accordance with established procedures.

7.0 Records
Reports generated.

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REV. 0

QAP 7.5
SUPERFUND DIVISION QA MANUAL
INTERIM DOCUMENT REVIEW PROCEDURE

1.0 PROCEDURE

This procedure covers the review and approval of technical reports and other documents. Quality assurance records and other review and approval documents are identified. Disposition and retention guidelines for reviewed documents are given.

2.0 APPLICABILITY

This procedure is applicable to the independent review and approval required for all technical documents.

3.0 DEFINITIONS

None.

4.0 DISCUSSION

NUS Corporate Quality Assurance policy requires that all technical reports shall be independently reviewed before submittal to the client. Documentation of the completed review is required. Evidence of technical review shall consist of separate formal, standardized forms: the Record of Review and Review Comment Record. Sign-off is also required on report cover sheets or title pages as further evidence of documentation of review and approval.

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5.0 RESPONSIBILITY

5.1 Regional Project Managers

The cognizant Regional Project Manager is responsible for the review and approval of technical reports issued by the Field Investigation Team (FIT) offices.

5.2 Manager of Remedial Planning Office

The Manager of the Remedial Planning Office is responsible for the review and approval of technical reports generated in relation to Remedial Planning Office activities.

5.3 Technical Review Committee

The responsibility for review of reports and other project work lies with a multi-disciplinary Technical Review Committee (TRC). Regional Project and Remedial Planning Managers, or their designees, will identify personnel eligible to participate on their individual Technical Review Committee. Technical Review Committee members shall not review their own technical inputs to a report. The size and composition of the Committee vary with the complexity of the report to be reviewed. The Chairman of the Technical Review Committee will be appointed by the cognizant Manager.

5.4 Report Author

It is the responsibility of the author or coordinator of a report to establish the review schedule. For most reports, the author or coordinator of a report will be the cognizant Project Manager. After all review comments have been incorporated into a single report, each TRC member will receive a copy of the revised document. TRC members should not sign the record of review until they are satisfied that their review comments have been adequately addressed.

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5.5 Quality Assurance Representative

It is the responsibility of the REM/FIT Quality Assurance Representatives to assist in the preparation and review of the work product to ascertain that quality assurance requirements have been met. They should document completion of all quality assurance inputs or quality assurance portions of the work product. They are also responsible for determining the disposition of all pertinent comments.

6.0 PROCEDURE

6.1 Every draft or final report prepared for transmittal to the client will be reviewed by a Technical Review Committee (TRC). Members of a TRC include the following individuals or their designees:

- Manager of Communications - if community relations work was involved
- Regional Project Coordinator - for EPA work within a given Region
- Manager of Health and Safety - if Health and Safety are discussed
- Director of Projects
- Applicable Project Section Manager
- RAMP Coordinator - RAMPS only

In addition, the Chairman of the Technical Review Committee will appoint two or three technical reviewers to the TRC covering areas of expertise included in the report. If more than three reviewers are needed because of the complexity or importance of a report, the Chairman of the Technical Review Committee will seek agreement for added review staff from the cognizant Project Manager.

6.2 Once a TRC is assigned for a given report, the author shall prepare a Record of Review and the Review Comment Record (RCR).

6.3 The author shall contact each TRC member and the editor and notify them when the report will be ready for review and the due date of the the report.

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This should be done immediately after the TRC has been established. This is especially critical in the case of work plans and community relations plans where the total time to produce the document is very limited.

- 6.4 The author shall distribute the draft report to the TRC and the editor. The report should be completely typed and all figures, tables, drawings, and appendices completed and included. This distribution should occur at least seven working days prior to the required submittal date. In a situation where a review needs to be expedited, the time period may be shortened, but without sacrifice to the quality of the review process. Such emergency situations should be agreed upon between the author of a report and the Chairman of the Technical Review Committee. A preliminary draft may be issued if required.
- 6.5 The author shall obtain substantive (non-editorial) comments from all reviewers and incorporate or address all comments. Discussions should be held with the reviewers if there are any questions on differing technical approaches. Disposition of all comments shall be recorded on the Review Comment Record (RCR).
- 6.6 The author shall have the draft retyped and redistributed along with a copy of the reviewer's original comments (RCR) to all reviewers and the editor for final signoff.
- 6.7 The author shall obtain the signature of all reviewers and the editor on the Record of Review or revise the report as required.
- 6.8 After all draft comments have been received by the Project Manager, they should either be inserted into the report or otherwise disposed of. Once the document has been retyped for submittal to the client, the QA Representative must initiate the review of comments along with a copy of the retyped report to insure that all comments have been addressed. Once

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this is completed, the QA Representative can sign the technical review sheet. Without this signature, the report shall not be submitted to the cognizant Manager or his designate for signature and submittal to the client. The attached RCR forms are used for documenting disposition of comments.

- 6.9 The author shall obtain a document control designation from the Quality Assurance Representative if the document is controlled.
- 6.10 The author shall submit the QA approved report and Record of Review to the cognizant Manager or his designate.
- 6.11 The author shall obtain the Manager's signature (or that of his designee in his absence) on the report cover.
- 6.12 The author shall retain all review documentation in the central project file under an appropriate Quality Assurance category.
- 6.13 The author shall distribute the report in accordance with division and client requirements. Letters of transmittal shall include control numbers, and statements of confidential or proprietary nature of the report, if applicable.
- 6.14 Upon receipt of client comments, the author shall prepare a single copy incorporating the client's comments. The Project Manager should initiate the review process again at this time. The technical review process in this case will include the Regional Coordinator (on EPA projects only) the Director of Projects, and the Chairman of the Technical Review Committee. The final report shall also be reviewed by a technical editor. The QA Representative shall initiate a review for disposition of comments and record disposition on a final RCR.
- 6.15 The author shall obtain the cognizant Manager sign off for the final report.

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- 6.16 The author shall distribute the final product in accordance with client and division requirements.
- 6.17 The author shall retain all final review documentation in the central project file under an appropriate Quality Assurance category.
- 6.18 Draft copies and hand written comments may be disposed of once the final version has been submitted to the client. A draft review copy shall be retained in the central project file. All client comments and technical responses shall also be retained.

7.0 RECORDS

These records shall be retained in the central file for project life and delivered to the client upon project completion, if so requested.

- Record of Review forms including RCR.
- Review copy of draft (one copy) (include all reviewer's comments) (include client marked copy).
- Final Work Product (one copy).

A copy of the completed Record of Review and Review Comment Record (RCR) should be submitted to the Chairman of the Technical Review Committee and to the REM/FIT QA Representative.

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INTERIM DOCUMENT REVIEW PROCEDURE

QAP 7.5

REV. 0

04/13/84

SFD

Reports will not be signed for transmittal to a client without a copy of the Record of Review attached to the report following the cover sheet. The Record of Review is not transmitted to the client.

RECORD OF REVIEW

PROJECT NAME _____ NUS PROJECT NO. _____
 REPORT TITLE _____
 CLIENT _____ CLIENT PROJECT NO. _____
 REPORT STATUS: DRAFT _____ FINAL _____ DUE DATE _____
 DOCUMENT/REPORT NO. _____
 AUTHOR/PROJECT MANAGER _____

TECHNICAL REVIEWERS

APPROVAL

DATE

COMMENTS

PROJECT SECTION MANAGER
 SIGNATURE REQUIRED ON
 ALL REPORTS

PROJECT DIRECTOR SIGNATURE
 REQUIRED ON ALL REPORTS

REGIONAL COORDINATOR
 APPLICABLE REGION

RAMP COORDINATOR
 (RAMPS) ONLY)

HEALTH/SAFETY
 (IF APPLICABLE)

COMMUNITY RELATIONS
 (IF APPLICABLE)

DISCIPLINE REPRESENTATIVES
 ASSIGNED BY THE DISCIPLINE
 DIRECTOR

EDITOR
 (ALL SUPERFUND REPORTS/
 OTHER CLIENTS FINAL
 REPORTS ONLY)

QUALITY ASSURANCE
 SIGNATURE REQUIRED PRIOR TO
 GENERAL MANAGER SIGN OFF.

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STATUS SYMBOLS FOR REVIEW COMMENT RECORD (RCR)

- C - Closed, comments addressed or incorporated
- O - Open
- P - Resolution pending
- N/A - Not applicable, engineer (PM) may provide justification
- R - Rejected, engineer provide justification
- N/G - Not germane, comments or statements discuss issues other than those in report context.
- N/R - No response, justification needed
- N/S - Not substantive; comments are editorial, i.e., syntax, grammar, spelling, typographical and will not be addressed in the review.

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A Halliburton Company

REVIEW COMMENT RECORD (RCR)

PROJECT NO. 4 PAGE

1 OF 1

LOCATION / PHONE

ORGANIZATION / GROUP

REVIEWER

PROJECT

COMMENT NUMBER / TITLE(S)

II. CLOSING

TO AGREEMENT WITH INDICATED COMMENT DISPOSITION(S)

REVIEWER
NAME
DATE

DATE

REVIEWER
NAME
DATE

DATE

STATUS

DISPOSITION (PROVIDE JUSTIFICATION IF NOT ACCEPTED)

QA
CHECK

COMMENTS/RECOMMENDATIONS (PROVIDE TECHNICAL JUSTIFICATION FOR THE COMMENT AND DETAILED RECOMMENDATION OF THE ACTION REQUIRED TO CORRECT/RESOLVE THE DISCREPANCY / PROBLEM INDICATED)

PAGE
NUMBER

123

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REVIEWED		REVIEW COMMENT RECORD (RCR) CONTINUATION				
ITEM	PAGE NUMBER	COMMENT(S)/DISCREPANCY(IES) (PROVIDE TECHNICAL JUSTIFICATION FOR THE COMMENT AND DETAILED RECOMMENDATION OF THE ACTION REQUIRED TO CORRECT/RESOLVE THE DISCREPANCY/PHENOMENON INDICATED)	QA FILE#	DISPOSITION (WHENVER JUSTIFICATION IS NOT ACCEPTED)	STATUS	

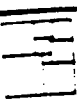
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 NUS CORPORATION A Halliburton Company Superfund Division	QUALITY ASSURANCE MANUAL ISSUE B	Number	QAR 8.0	Page	1 of 1
		Effective Date		Revision	
		10/30/83		1	
		Applicability			
Subject: CONTROL OF PURCHASED ITEMS AND SERVICES		All Division Activity			
		Prepared			
		S. A. Ryers			
		Approved			
		R. A. Burns			

1.0 Requirements

- 1.1 The procurement of items and services shall be controlled to ensure conformance with specified requirements.
- 1.2 Such control shall provide for the following as appropriate: sub-contractor evaluation and selection, evaluation of objective evidence of quality furnished by the subcontractor, source inspection, audit, and examination of items or services upon delivery or completion.
- 1.3 Methods established to evaluate subcontractor performance shall be used.
- 1.4 All procurement activities shall be consistent with the terms, conditions, schedule, and provisions of the contract with the U.S. Environmental Protection Agency.
- 1.5 The exact extent of the quality assurance activities undertaken relative to a given procurement shall be determined by the procurement initiator and reviewed by the Quality Assurance and Security Manager.

2.0 Implementation

- 2.1 QAP 8.1, Control of Procurement Activities
- 2.2 QAP 8.2, Evaluation and Selection of Subcontractors

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 NUS CORPORATION A Halliburton Company Superfund Division	QUALITY ASSURANCE MANUAL ISSUE B	Number QAP 8.1	Page 1 of 3
		Effective Date 10/30/83	Revision 1
		Applicability All Division Activity	
		Prepared S. A. Byers	
Subject CONTROL OF PROCUREMENT ACTIVITIES		Approved R. A. Burns	

1.0 Purpose
This procedure details the actions to be taken to control the performance of subcontractors.

2.0 Applicability
This procedure is applicable to all project procurement activities.

3.0 Definition
Subcontractor--Any person, including a corporation, partnership, or business association of any kind, who holds an agreement or purchase order to perform all, or any part, of the work, or to make or furnish any article or service required for the performance of a cost reimbursible contract or other type of contract or of a subcontract entered into thereunder.

4.0 Discussion
To provide cost-effective procurement, measures must be taken to ensure that the requirements applied to a particular procurement activity are implemented by the subcontractor. This is accomplished by a combination of controlling the preparation of procurement documents, determining that the selected subcontractor is capable of supplying the items or services specified, and monitoring the subcontractor's performance and correcting the performance as required.

5.0 Responsibilities

5.1 The Subcontracting Officer is responsible for procurement activities.

5.2 Each subcontractor is responsible for applying these same requirements to subtier subcontractors if quality assurance requirements are imposed on them.

5.3 The Quality Assurance and Security Manager is responsible for assisting as required in the selection of procurement sources and for evaluating the quality assurance activities of subcontractors.

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Subject CONTROL OF PROCUREMENT ACTIVITIES	Number OAP 8.1	Page 2 of 3
	Revision 1	Effective Date 10/30/83

6.0 Procedure

6.1 Procurement Activities

All project procurement activities, whether direct or through subcontractors, are accomplished in accordance with documented procedures. For materials and services that may affect quality, the procedures provide for the integration of the following activities, as appropriate:

1. Procurement document preparation, review, and change control
2. Selection of procurement sources
3. Purchaser and supplier control of nonconformances to the procured item or service
4. Purchaser verification activities (e.g., surveillance, inspection, or audit), including notification for hold and witness points
5. Acceptance of item or services
6. Documentation of compliance with the technical requirements of the subcontract. | 1

6.2 Subcontractor Selection

6.2.1 The selection of subcontractors is based on an evaluation of their capability to provide items or services in accordance with the requirements of the procurement documents.

6.2.2 This evaluation is performed and the results documented by personnel knowledgeable in the requirements (technical and quality) of the item or service to be procured. Such an evaluation may include one or more of the following actions, as appropriate:

1. A direct evaluation of the subcontractor's facilities and personnel to determine technical and quality capabilities and the level of implementation of the subcontractor's quality assurance program.
2. An objective review and evaluation of the subcontractor's current quality assurance program documentation (e.g., subcontractor quality assurance program, manual, and procedures, as appropriate).
3. An evaluation of the subcontractor's history (including current capability) of providing an identical or similar product or service that performs satisfactorily. | 1

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Subject CONTROL OF PROCUREMENT ACTIVITIES	Number OAP 8.1	Page 1 of 3
	Revision 1	Effective Date 10/30/83

6.3 Subcontractor Performance Evaluation

Where deemed necessary by the Subcontractors Officer, the performance of an individual subcontractor will be monitored. | 1

The methods used to verify the subcontractor's in-process performance include, as appropriate, the following:

1. Establishing an understanding between NUS and the subcontractor of the provisions and specifications of the procurement documents.
2. Identifying the subcontractor's planning techniques and processes to be used.
3. Reviewing specified subcontractor documents generated or processed during activities fulfilling procurement requirements.
4. Establishing the extent of source surveillance, inspection, or audit activity by NUS, including agreed-to hold and witness points.

6.4 Acceptance of Purchased Items or Services

6.4.1 The methods used to accept an item or service from a subcontractor are source (inspection) verification, receiving inspection, subcontractor certification of conformance, by review of the goods or services provided or a combination of these. | 1

6.4.2 When certificates of conformance are used, sufficient documentary evidence shall be available to verify the validity of such certifications. In those cases where the purchased item is to be installed or used, the certificates of conformance shall be available before installation or use.

6.5 Revisions to Procurement Documentation

Any revisions to procurement documentation receive the same level of review and approval as the original document.

7.0 Records

7.1 Subcontract agreements or purchase orders

7.2 Subcontractor evaluation documentation

7.3 Reports of subcontractor audits

7.4 Documentation supplied by subcontractors

NUS 445B 52 0103

CIB 002

0103

 NUS CORPORATION A Halliburton Company Superfund Division	QUALITY ASSURANCE MANUAL ISSUE B	Number	OAP 8.2	Page	1 of 3
		Effective Date	10/30/93	Revision	1
		Applicability	All Division Activity		
		Prepared	S. A. Byers		
Subject		EVALUATION AND SELECTION OF SUBCONTRACTORS		Approved	R. A. Burns

1.0 Purpose

This procedure describes the methods to be used to evaluate and select subcontractors who provide items and services that may affect quality.

2.0 Applicability

This procedure provides guidance in the evaluation and approval of all subcontractors who provide items or services that may affect quality. The exact methods to be used will be determined by the Subcontracting Officer.

3.0 Definition

Subcontractor--Any person, including a corporation, partnership, or business association of any kind, who holds an agreement or purchase order to perform all, or any part, of the work, or to make or furnish any article or service required for the performance of a cost reimbursable contract or other type of contract or of a subcontract entered into thereunder.

4.0 Discussion

None.

5.0 Responsibilities

5.1 The Manager of the Remedial Planning Office, the Field Investigation Team (FIT) Operation Manager, and the Zone Deputy Project Manager shall identify and select potential subcontractors. They shall request the evaluation of potential subcontractors to determine that they are qualified to supply items or services.

5.2 The Quality Assurance and Security Manager will conduct the subcontractor evaluation.

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Subject EVALUATION AND SELECTION OF SUBCONTRACTORS	Number OAP 8.2	Page 2 of 3
	Revision 1	Effective Date 10/30/83

6.0 **Procedure**

6.1 **Subcontractor Evaluation**

The Quality Assurance and Security Manager shall use documented methods to evaluate subcontractors. The method used shall consist of either or both of the following:

1. A record survey, which evaluates the subcontractor's history of providing a quality product that performs satisfactorily in actual use. Data to be evaluated should include the experience of other users of similar products of the prospective subcontractor, purchasers' records accumulated in connection with previous procurement actions, product operating experience, and the subcontractor's quality assurance manual (plan and procedures). This method normally will be accomplished using data submitted by the prospective subcontractor and purchasers' records.
2. A formal audit of the subcontractor facilities and quality assurance program.

6.2 **Purchase Specification Requirements**

The above evaluation of the subcontractor shall be based on the purchase specification requirements and shall include the following considerations, as applicable:

1. Adequacy of the subcontractor's quality assurance plan and procedures.
2. Degree of implementation of the quality assurance plan and procedures.
3. Capability and qualifications of the subcontractor's staff.
4. Adequacy of the subcontractor's procedures for calibration, nondestructive evaluations, welding, cleaning, heat treatment, pipe bending, operating, testing, and so on.
5. Effectiveness of the subcontractor's control over his supplier.
6. Ability of the subcontractor to comply with codes and standards required by the purchase specification.

6.3 **Documentation**

The Quality Assurance and Security Manager shall document the areas considered in evaluating the subcontractor and the conclusions reached.

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Subject EVALUATION AND SELECTION OF SUBCONTRACTORS	Number QAP 8.2	Page 3 of 3
	Revision 1	Effective Date 10/30/83

7.0 Records

Copies of all subcontractor evaluations and audits shall be retained
as quality assurance records.

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 NUS CORPORATION A Halliburton Company Superfund Division	QUALITY ASSURANCE MANUAL ISSUE B	Number QAR 9.0	Page 1 of 1
		Effective Date 10/30/93	Revision 1
		Applicability All Division Activity	
		Prepared S. A. Rivers	
Subject IDENTIFICATION AND CONTROL OF LABORATORY SAMPLES		Approved R. A. Burns	

1.0	<u>Requirements</u>
1.1	Samples taken during field investigations shall be identified to allow traceability.
1.2	The exact location of sample collection shall be recorded.
1.3	Field tracking and reporting forms shall be employed to establish sample custody prior to shipment for analysis.
1.4	Established procedures for sample preservation shall be followed.
1.5	Documentation shall be made of the procedures for preparation of reagents or supplies that become an integral part of samples (e.g., filters).
1.6	Chain-of-custody procedures shall be followed for all samples.
2.0	<u>Implementation</u>
2.1	QAP 9.1, Chain of Custody
2.2	QAP 9.2, Sample Control

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 ENUS CORPORATION A Halburton Company Superfund Division	QUALITY ASSURANCE MANUAL ISSUE B	Number	Page
		QAP 9.1.F2	1 of 4
		Effective Date	0
		Appropriation	Region II FIT II Activity
		Prepared	J. Drake
		Approved	
Subject		CHAIN OF CUSTODY	

1.0 Purpose

This procedure establishes a method for maintaining chain-of-custody control for samples.

2.0 Applicability

The procedures detailed in QAP 9.1.F2 are used in place of those detailed in QAP 9.1 and are referenced for Region II FIT activity only.

3.0 Definitions

Sample custody--A sample is under custody if it is in someone's possession; if it is in someone's view, after being in their physical possession; if it was in someone's physical possession and then they locked it up to prevent anyone from tampering with it; or if it is in a designated and identified secure area.

4.0 Discussion

None.

5.0 Responsibilities

5.1 The Manager of FIT Operations and the Manager of the Remedial Planning Office are responsible for implementing the chain-of-custody procedures as required.

5.2 The cognizant FIT Regional Project Managers shall ensure that all sampling activities are conducted in accordance with this procedure.

6.0 Procedure

6.1 Due to the evidentiary nature of sample-collecting investigations, the possession of samples must be traceable from the time the samples are collected until they are introduced as evidence in legal proceedings. To maintain and document sample possession, chain-of-custody procedures are followed.

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Subject CHAIN OF CUSTODY	Number OAP 9.1.F2	Page 2 of 4
	Revision 0	(Revision Date)

6.2 After collection and identification, the samples are maintained under the chain-of-custody procedures. Each person involved with sample handling shall be trained in the chain-of-custody procedures.

6.3 Field Custody Procedures

6.3.1 When collecting samples for evidence, field personnel should collect only an amount that provides a fair representation of the media being sampled. To the extent possible, the quantity and types of samples and sample locations are determined before the actual field work begins and are detailed in the Work Plan. As few people as possible should handle the samples. The sample location is recorded in a field log book with the sample number, date, time, personnel, sample type, designation of the sample as a grab or composite, and any preservative used.

6.3.2 The field sampler transfers the samples to the sampling team sample manager who is responsible for the care and custody of the samples until the chain-of-custody form is completed and the samples are transferred or properly dispatched.

6.3.3 The field log book maintains the sample custody from the time the sampler takes the sample until the project sample manager completes the chain-of-custody record form.

6.3.4 A label identifying the sample shall be completed for each sample. Waterproof ink shall be used. This label shall be covered with clear plastic tape to maintain numbers through decontamination procedures.

6.3.5 During the course and at the end of the field work, the team leader determines whether these procedures have been followed and whether additional samples are required.

6.4 Transfer of Custody and Shipment

6.4.1 Samples are accompanied by a chain-of-custody record (similar to Exhibit 9.1-1). The exact form will depend on the individual EPA region. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents the transfer of samples from the custody of the sampler or appointed designee to that of another person, a mobile laboratory, or the permanent laboratory.

6.4.2 Samples will be properly packaged for shipment and dispatched to the appropriate laboratory for analysis, with a separate signed chain-of-custody record enclosed in each sample box or cooler. Shipping containers will be padlocked or custody-sealed for shipment to the laboratory. Procedures used will vary depending on the situation presented. The preferred procedure includes use of a custody seal wrapped across filament tape that is wrapped around the package at

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Subject CHAIN OF CUSTODY	Number QAP 9.1.F2	Page 3 of 4
	Revision 0	Effective Date

least twice. The custody seal is then folded over and stuck to itself so that the only access to the package is by cutting the filament tape or breaking the seal to unwrap the tape. The seal is signed before the sample is shipped. The chain-of-custody record shall be dated and signed, to indicate transfer to the carrier.

6.4.3 Whenever samples are split with a facility or government agency, a separate chain-of-custody record is prepared for those samples and marked to indicate with whom the samples are being split

6.4.4 All packages will be accompanied by the chain-of-custody record, which shows identification of the contents. The original record will accompany the shipment, and a copy will be retained by the Field Investigation Team (FIT) Regional Project Manager.

6.4.5 If samples are sent by common carrier, a bill of lading should be used. Receipts of bills of lading will be retained as part of the permanent documentation.

7.0 Records

7.1 Chain-of-custody records

7.2 Receipts of bills of lading

7.3 Work Plan

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Subject CHAIN OF CUSTODY	Number OAP 9.1 E2	Page 4 of 4
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Doc. No. _____
CHAIN OF CUSTODY RECORD

ENVIRONMENTAL PROTECTION AGENCY - REGION 6
 Environmental Services Division
 WASH. MET. AREA 20007

Name of User and Address											
Sample Number	Number of Samples	Description of Sample									
						Person Assuming Responsibility for Sample				Time	Date
						Sample Number	Subsampled By	Received By	Time	Date	Reason for Change of Custody
						Sample Number	Subsampled By	Received By	Time	Date	Reason for Change of Custody
Sample Number	Subsampled By	Received By	Time	Date	Reason for Change of Custody						
Sample Number	Subsampled By	Received By	Time	Date	Reason for Change of Custody						

Page No.

EXHIBIT 9.1-1

WUB 6450 22 0102

CIB 002

CIB 006 1034

 NUS CORPORATION A Halliburton Company Superfund Division	QUALITY ASSURANCE MANUAL ISSUE B	Number	Page
		QAP 9.2.F2	1 of 4
		Effective Date	Revision
			0
		Appropriability Region II FIT Activity	
		Prepared J. Drake	
Subject SAMPLE CONTROL		Approved	

1.0 Purpose

This procedure establishes methods for the control of laboratory samples.

2.0 Applicability

The procedures detailed in QAP 9.2.F2 are used in place of those detailed in QAP 9.2 and are referenced for Region II FIT activity only.

3.0 Definitions

None.

4.0 Discussion

4.1 To provide adequate evidentiary value to laboratory results, proper sample control must be established.

4.2 Samples collected as part of the project activities will normally be analyzed by U.S. Environmental Protection Agency (EPA) contract laboratories. However, situations may arise where, because of laboratory availability or the need for special analysis techniques, samples will be sent to laboratories contracted by NUS Corporation (NUS). In either case, sample custody (chain-of-custody) procedures must be adhered to.

4.3 The procedures outlined below are minimum requirements. The exact details of the sample handling may vary depending on the EPA region involved or the laboratories used.

5.0 Responsibilities

5.1 The cognizant Field Investigation Team (FIT) Regional Project Manager is responsible for implementation of the requirements of this procedure.

5.2 The Zone Deputy Project Manager is responsible for ensuring that subcontracting laboratories adhere to the controls established for laboratory samples.

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Subject SAMPLE CONTROL	Number QAP 9.2.F2	Page 2 of 4
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5.3 The Quality Assurance and Security Manager is responsible for maintaining records related to the qualification of personnel involved in sample analyses and for assigning each qualified person an identification number.

6.0 Procedure

6.1 Sample Identification

6.1.1 The method of identification of a sample depends on the type of measurement performed. An in-situ measurement is one in which the sample is collected or the measurement is performed and the data are recorded directly in logbooks, together with identifying information, while in the possession of the sampling team. Examples of in-situ measurements are pH, temperature, conductivity, flow measurement, continuous air monitoring, and stack gas analysis.

6.1.2 Samples for which in-situ measurements are not performed are identified by a uniquely numbered label with the case number and a sample number. This label shall be covered with clear plastic tape to maintain label integrity through the decontamination procedures. The following information is recorded in the appropriate logbook, the sample identification number; the date, time, and location of sample collection; a designation of the sample as a grab or composite; the type of sample and the preservative used; and any remarks. Any pertinent in-situ measurements and field observations are also recorded in the field logbook.

6.1.3 After collection and identification, the sample is preserved, if required, and maintained under the chain-of-custody procedures.

6.2 Transfer of Custody

6.2.1 Samples are accompanied by a chain-of-custody record (see QAP 9.1). When samples are transferred from one individual's custody to another's, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents the transfer of custody of samples from the sampler or appointed designee to another person, to a mobile laboratory, or to a specified analytical laboratory.

6.2.2 Samples will be properly packaged for shipment and dispatched to the appropriate laboratory for analysis with a separate chain-of-custody record prepared for each laboratory. Shipping containers will be padlocked, sealed, or otherwise secured for shipment to the laboratory. The chain-of-custody record shall be completed to document transfer to the courier.

6.3 Laboratory Custody Procedures

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6.3.1 Laboratory activities are not within the scope of NUS responsibilities for the REM/FIT project. The procedures presented in this section are for information only.

6.3.2 Typically, a sample custodian or a designated alternate will receive samples for the laboratory and verify that the information on the sample tags matches that on the chain-of-custody record included with the shipment. The custodian signs the record in the appropriate space; a laboratory staff member performs this function in the field. Couriers picking up samples at the airport, post office, or other location shall sign in the appropriate space.

6.3.3 The custodian distributes samples to the storage areas and transfers custody to the analysts at their request. The names of individuals who receive samples are recorded in internal laboratory records. Laboratory personnel are responsible for the care and custody of samples from the time they receive them until they return them to the custodian for storage. Samples received after normal working hours may be analyzed immediately or stored as appropriate.

6.4 Analyst, Instrument, and Sample Entry Logbooks

6.4.1 Logbooks and data sheets that are used for various purposes (chemical or biological analyses, equipment calibration, etc.) within the laboratories are maintained in accordance with practices instituted by the individual laboratories. The procedures outlined below are for information only. If NUS contracts for laboratory services, the procedures will be used as a basis for reviewing the quality assurance procedures established by laboratories under consideration.

6.4.2 Laboratory observations and calculations not recorded on serialized bench cards, instrument graph printouts, and so on are entered in a serialized logbook assigned to the analyst. The logbook should contain information sufficient to recall and describe succinctly each step of the analysis performed should the analyst be required to testify in subsequent enforcement proceedings. Sufficient detail should be provided to enable others to reconstruct the analysis should the analyst not be available to do so. Any irregularities observed during the testing process should be noted. If, in the technical judgment of the analyst, it is necessary to deviate from a particular analytical method, the deviation shall be properly justified and documented. Evidence of approval to deviate from the method should be available.

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6.4.3 When an individual is assigned a logbook for use on a variety of projects, each page normally contains information about only one project and is labeled with the project number. Each page is dated and signed by the individual. All bench cards, instrument printouts, and other separate documents are labeled similarly. Notes (taken at meetings, from research articles, etc.) that do not relate to a particular project are not kept in the assigned logbook. When a laboratory logbook is completed, it is returned to the document custodian, and a new logbook is issued. The custodian or other appropriate staff member maintains an inventory sheet for each logbook, listing the project code pertaining to each page. Logbooks that have been completed and turned in are used for reference purposes only.

6.4.4 Where applicable, the document custodian issues a serialized instrument logbook in which all information relating to calibration and maintenance of a particular laboratory instrument is recorded. A serialized sample entry logbook is used in the laboratory to record the receipt of the samples by the laboratory for analysis. Again, each page should contain information about one project only.

6.5 Documentation is made of the procedures used in preparing samples including any reagents employed. This documentation is found either in the chemist's laboratory logbook or in computer-generated assignment sheets that describe the sample preparation required.

6.6 If any supplies (e.g., filters) become part of the sample, this is documented.

7.0 Records

7.1 Field Logbook

7.2 Data sheets

7.3 Laboratory records

7.4 Laboratory logbooks or computer files

7.5 Chain-of-custody records

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		Effective Date		Revision	
		10/30/83		1	
		Applicability			
Subject: CONTROL OF LABORATORY ANALYSIS PROCESSES		All Division Activity			
		Prepared			
		S. A. Byers			
		Approved			
		R. A. Burns			

1.0

Requirements

1.1

Laboratory analysis techniques used by contracted laboratories shall be based on nationally accepted practices and methods.

1.2

Internal quality control checks shall be employed by laboratories.

2.0

Implementation

QAP 10.1, Analysis Techniques

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		Effective Date	Revision
		10/30/83	1
		Applicability	
All Division Activity			
Prepared			
S. A. Ryers			
Approved			
R. A. Burns			
Subject			
ANALYSIS TECHNIQUES			

1.0 Purpose

This procedure establishes methods and techniques for the control of laboratory analysis processes.

2.0 Applicability

This procedure will apply to all laboratory analysis processes, except where the EPA regional office requests the use of alternate procedures. | 1

3.0 Definitions

None.

4.0 Discussion

4.1 To ensure the evidentiary value of analysis results, correct laboratory techniques must be employed. Control of the laboratory practices must be established.

4.2 Laboratory analysis is outside the scope of NUS Corporation (NUS) activities related to the REM/FIT project. Laboratory services will normally be supplied by U.S. Environmental Protection Agency (EPA) contractor laboratories. In some cases, however, NUS may contract for laboratory services. If this happens, the procedures described below will be used as guidelines in evaluating the quality assurance procedures established by potential contractors. Otherwise, the procedures are for information only.

5.0 Responsibilities

5.1 The cognizant Field Investigation Team (FIT) Regional Project Manager and the Manager of the Remedial Planning Office are responsible for implementation of the requirements of this procedure.

5.2 The Zone Deputy Project Manager is responsible for ensuring that subcontracting laboratories adhere to the controls established for the project.

5.3 The Quality Assurance and Security Manager is responsible for maintaining records related to the qualification of personnel involved in sample analysis and for assigning each qualified person an identification number.

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ANALYSIS TECHNIQUES	Revision 1	Effective Date 10/30/83

6.0 Procedure

6.1 The analysis techniques employed are based on nationally recognized methods.

6.1.1 Standard operating procedures are generally used in environmental data collection. Most have received approval by the EPA, as published in 40 CFR 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants." Other sources are "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and the "National Handbook of Recommended Methods for Water-Data Acquisition."

6.1.2 For situations where EPA-approved methods are not available, techniques published by the American Society for Testing and Materials or methods routinely employed by NUS laboratories may be employed.

6.2 The exact analysis techniques to be used shall be documented in the task or assignment Work Plan.

6.3 Quality control checks shall be performed as a routine laboratory practice. Procedures to be used to evaluate laboratory data include the following quality control checks:

- Replicates
- Spiked samples
- Split samples
- Control charts
- Surrogate spikes
- Reagent blanks
- Method blanks
- Internal standards
- Routine standardization and calibration
- Quality control samples
- Performance evaluation studies

6.4 The specific quality control checks to be implemented will be documented in the Work Plan.

6.5 The results of laboratory analysis shall be completely documented. The types of information to be documented shall include the method used; the sample identification; raw analytical data such as absorbencies, peak heights, or peak areas; the instrument used; instrument settings; calibration or standardization procedures; the date analyzed; the analyst's signature; and the analysis results.

7.0 Records

7.1 Work Plan documentation of analysis techniques used

7.2 Laboratory records of analysis

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		All Division Activity	
		Prepared	
		S. A. Rvers	
		Approved	
		R. A. Burns	
Subject		INSPECTIONS	

1.0 Requirements

1.1 All inspection and reconnaissance activity shall be conducted in accordance with a Work Plan prepared for the specific site under consideration.

1.2 All available documents and data shall be obtained and reviewed before performing a reconnaissance or inspection.

1.3 Activities shall be conducted in compliance with the EPA-specified requirements.

2.0 Implementation

2.1 QAP 11.1, Offsite Reconnaissance

2.2 QAP 11.2, Onsite Inspections

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		Applicability	All Division Activity		
		Prepared	S. A. Byers		
Subject		Approved			
OFFSITE RECONNAISSANCE		R. A. Burns			

1.0 Purpose
 This procedure provides information related to offsite reconnaissance.

2.0 Applicability
 This procedure is applicable to all offsite reconnaissance work. The information presented is to be considered in the preparation of Work Plans for offsite reconnaissance activities. The procedure is not a requirement. Reference in a Work Plan does not make the requirements of this procedure mandatory.

3.0 Definitions
 Offsite reconnaissance--All investigation activities that do not require site entry. Such activities range from information-gathering activities conducted from a desk to visits to offsite locations to collect samples.

4.0 Discussion
 All activities related to offsite reconnaissance are to be controlled by detailed Work Plans.

5.0 Responsibilities
 The Field Investigation Team (FIT) Operation Manager and the cognizant FIT Regional Project Manager are responsible for implementation of this procedure.

6.0 Procedure

6.1 Objectives of Reconnaissance

6.1.1 The objectives of most offsite reconnaissance work are as follows:

1. Characterization of hazardous substances. Involves the identification of suspected hazardous substance's human and environmental toxicity, flammability, infectiousness, volatility, water solubility, and persistence, as well as other characteristics.
2. Identification of pollutant dispersal pathways. Consists of an evaluation of the physical environment of a site and the

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3. Identification of receptors. Involves identification of sectors of the public or the environment that are subject to exposure to hazardous substances.
 4. Characterization of site management practices. Consists of obtaining information on such practices as site security measures and disposal or containment procedures.
- 6.1.2 In many cases, these objectives can be met by examining existing information, thereby precluding the need for field work.
- 6.2 Information Sources
- 6.2.1 The information needed to meet the first objective listed above--the characterization of hazardous substances--can be obtained from the following sources:
1. Site records
 - a. Inventories
 - b. Shipment manifests
 - c. Permits
 2. Waste generator records
 3. Personal interviews
 - a. Site personnel
 - b. Public officials
 - c. Other interested persons
 4. Monitoring/sampling data (if available)
- 6.2.2 The following information sources can be used in identifying pollutant dispersal pathways:
1. For geological information--
 - a. U.S. Geological Survey (USGS) publications
 - b. USGS topographic maps
 - c. State geological publications and maps
 2. For hydrological information--
 - a. USGS water resources publications
 - b. State water resources publications
 - c. Flood insurance rate maps from the U.S. Department of Housing and Urban Development

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3. For aerial imagery--

- a. U.S. Environmental Protection Agency (EPA) sources (EMIL, EPIC, NEIC)
- b. Other sources (NASA EROS, local planning agencies, private companies)

4. For weather information--the National Weather Service

In addition, EPA site reports, if available, may be helpful in identifying pollutant dispersal pathways.

6.2.3 The information sources listed below may be useful in identifying receptors.

- 1. U.S. Public Health Service
- 2. Local planning agencies
- 3. Federal and state fish and wildlife departments
- 4. Local universities
- 5. Local naturalists
- 6. Aerial imagery
- 7. Medical reports
- 8. Local newspapers

6.2.4 To characterize site management practices, the following information sources can be used:

- 1. State and local regulatory offices
- 2. Interviews with site management and workers
- 3. Aerial imagery
- 4. Occupational Safety and Health Administration/National Institute for Occupational Safety and Health records
- 5. Local fire departments

6.3 Review of Information

The information obtained from the sources listed above should be thoroughly reviewed to characterize the site and to determine whether any offsite or onsite field work is necessary.

6.4 Protection of Evidentiary Value of Information

Through the offsite reconnaissance, information can be obtained to assess the magnitude of the problem and to develop the Work Plan for a full field investigation. Because such information may provide evidence in support of legal action, all documents, notes, photographs, maps, and samples must conform to chain-of-custody and document control requirements.

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6.5 Offsite Sample Requirements

6.5.1 The Work Plan shall detail the requirements for obtaining environmental samples at offsite locations to demonstrate the migration of waste to receptors.

6.5.2 Environmental samples, which include surface runoff, groundwater, soil, sediment, biological, and ambient air samples obtained off the site, shall be analyzed in approved laboratories.

6.5.3 After collection and identification, the samples are maintained under the chain-of-custody procedures described in QAP 9.1.

6.5.4 Shipping and labeling of samples is covered in QAP 13.1.

6.6 Photographs

6.6.1 Photographs are important in documenting the cause-and-effect relationship of the offsite migration of hazardous materials, especially with respect to environmental damage and potential exposure to the public. Whenever samples are collected, photographs shall be taken to verify the written description in the field logbook. The following information must be written in the logbook:

1. Time, date, location, and, if appropriate, weather conditions
2. Complete description or identification of the subject in the photograph and the reason why the photograph was taken
3. A number keyed to a location on the site sketch or map
4. Name of person taking the photograph

6.6.2 When the photographs are developed, the information recorded in the field logbook shall be put on the back of the photographs or referenced on the photograph. Photographs and negatives are part of the project files and must be accounted for under document control procedures.

6.7 Sketch Maps

Wherever possible, a map of the site environs, prepared from aerial photographs, should be completed before conducting the offsite portion of an inspection. If aerial photographs are not available, then the map must be sketched in the field. The map shall include all residences and other buildings in the vicinity of the site, drainage ditches, surface waters, known water wells, general land-use patterns, roads, and reference points (e.g., telephone poles and their serial numbers). All sampling points must be noted on the map.

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6.8 Exposed Soils and Rocks

6.8.1 If detailed studies of the soils, overburden, and bedrock in the area of the site are not available, subsurface materials exposed through stream erosion, road cuts, or construction grading shall be noted and described on sketch maps.

6.8.2 The description shall include soil type (sand and clay content), bedrock types, depths, stratification, dip, and evidence of fractures or fault lines, as well as a rough measure of soil elasticity and permeability (obtained by compressing a ball of wet soil in one's hands; highly permeable materials will crumble instead of sticking together). If necessary, samples of soils and rock will be collected for laboratory analysis of physical characteristics.

6.9 Report

The results of the offsite reconnaissance shall be documented in a report, a copy of which will be sent to the Zone Project Management Office. Any other reporting requirements shall be specified in the Work Plan.

7.0 Records

7.1 The Work Plan used

7.2 Logbooks

7.3 Chain-of-custody record

7.4 Photographs

7.5 Site sketches and maps

7.6 Report of offsite reconnaissance

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		Applicability All Division Activity	
		Prepared S. A. Byers	
Subject ONSITE INSPECTIONS		Approved R. A. Burns	

1.0 Purpose
This procedure provides information related to onsite inspections.

2.0 Applicability
This procedure is applicable to onsite inspections. The information presented is to be considered in the preparation of Work Plans for site inspections. The procedure is not a requirement.

3.0 Definitions
Onsite Inspection--All investigation activities that are conducted at the site. Such activities range from an initial limited-scope site-screening study to a comprehensive field investigation.

4.0 Discussion
Activities related to site inspections are to be controlled by detailed Work Plans.

5.0 Responsibilities
The Zone Deputy Project Manager is responsible for ensuring that this procedure is used to conduct all site inspections.

6.0 Procedure

6.1 Preparation for Inspection
Before an onsite inspection begins, an extensive review of information about the site shall be conducted. The information that is to be reviewed is the same as that discussed in QAP 11.1, Offsite Reconnaissance.

6.2 Objectives and Scope of Work

6.2.1 After the site information has been thoroughly reviewed, the objectives and scope of work of the inspection shall be developed and reviewed with the appropriate personnel.

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6.2.2 The objectives of the inspection may include--

1. Determination of the need for emergency response
2. Determination of disposal practices and methods
3. Evaluation of compliance with Federal, state, and local regulations
4. Determination of the extent of contamination
5. Determination of amounts and locations of hazardous waste stored
6. Determination of potential for materials to migrate offsite
7. Determination of access control
8. Documentation or determination of imminent hazards
9. Development of remedies to bring the site into compliance
10. Review of site records
11. Inventory of drums or drum contents
12. Mapping of the site
13. Preparation of safety procedures for field investigation
14. Determination of potential sampling sites for field investigation
15. Collection of samples during inspection

6.2.3 The scope of the work of the inspection will delineate how the work is to be accomplished. It is essential that all personnel involved agree on the scope of work necessary to meet the objectives. During the inspection, some modifications in the scope of work may be necessary when unforeseen circumstances arise. Any changes must be noted on the Work Plan.

6.3 Safety

During the initial inspection, safety precautions are paramount to all other considerations because the inspector will not have adequate knowledge of site conditions. Protective clothing may or may not be required onsite; however, disposable shoes or shoe covers must be worn. The team leader has the responsibility to decide whether additional protective clothing and equipment are necessary.

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6.4 Conduct of Inspections

6.4.1 The investigation must be thorough and unhurried. The inspection is complete only when the objectives are met and the inspector is satisfied that all data and information have been collected to assess the situation. The inspector must carefully review the field notes before leaving the area to ensure that the objectives have been met.

6.4.2 Before the inspection is completed, the inspector shall prepare a sketch of the site, in the logbook if possible, locating fixed reference points and locations of disposal and storage. If photographs are taken, they should be keyed to the sketch. If samples are collected, the sample locations should be marked on the sketch. Inventory of visible drums should be made where possible and also located on the sketch. The contents of the drums will probably be different than the contents specified on the labels; nevertheless, the labels may provide useful information.

6.4.3 In addition to the drum inventory, the inspector must check for sewers and drains, spills, or liquid disposal and must evaluate the runoff potential. The potential for fires, explosions, and other imminent hazards should also be evaluated. If the situation requires an emergency response, the oil and hazardous materials coordinator in the U.S. Environmental Protection Agency (EPA) Regional Office must be contacted immediately. Observations of soils and exposed subsurface materials should be made; however, care should be taken not to handle materials which may be contaminated.

6.5 Mapping the Site

6.5.1 After the site has been visually inspected to determine the extent of the problem, a map of the onsite area shall be prepared, with fixed landmarks (power poles, buildings, etc.) established as reference locations. Distances should be determined by measurement with a survey tape or hand-held range finder, or a combination of both. The range finder should be calibrated by the inspector before measurements are taken. The survey tape may be contaminated by contact with material at the site; therefore, the tape should be disposed of or decontaminated upon completion of the inspection. Photographs of various areas of the site will aid in preparing the final map.

6.5.2 The map is important when preparing the Work Plan for a comprehensive field investigation. Potential sample locations can be identified and reviewed prior to the investigation, and field participants can become familiar with the layout.

6.6 Sampling

6.6.1 All samples collected at the site are to be considered highly hazardous unless there is reliable evidence to the contrary. The samples should therefore be handled with caution. Onsite samples

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include contaminated soils or sludges and liquids from onsite impoundments or pits, leachates, and so on.

6.6.2 After collection and identification, the samples are maintained under the chain-of-custody procedures described in QAP 9.1.

6.6.3 All samples taken from closed containers on hazardous waste sites must be considered to be not only highly hazardous but also potential Poison A. The EPA Project Officer or the regional hazardous waste program coordinator shall be notified so that the containers can be moved by trained personnel. The shipping procedures to be used are those specified for Poison A and detailed in QAP 13.1.

6.7 Photographs

6.7.1 During the onsite inspection, photographs shall be taken at various locations to document conditions and provide visual proof of potential hazards. Photographs must also be taken at every sampling location to verify the written description in the field logbook. The following information must be written in the field logbook and then transposed onto the back of the photographs.

1. The time, date, location, and, if appropriate, weather conditions.
2. A complete description or identification of the subject in the photograph and why the photograph was taken.
3. A number keyed to a location on the site sketch or map.
4. The name of the person who took the photograph.

6.7.2 If slides are taken, the developed slide must be referenced to the correct description in the field logbook. In some cases, processed slide numbers will not correspond to the number on the camera.

6.7.3 When the photographer uses a self-contained breathing apparatus, the face mask will make focusing the camera difficult; therefore, it is recommended that a Polaroid camera (or equivalent camera) with automatic focus sensor be used.

6.7.4 Permission to take photographs must be obtained from the owner or operator of the site. If permission is denied, the owner/operator or representative should be asked to take the photographs, review them, and send copies. Another approach is to give the owner/operator the roll of film and ask that it be developed and sent to the FIT Regional Project Manager.

6.7.5 Photographs and negatives are part of the project files and must be accounted for under document control procedures.

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6.8 Leaving the Facility

6.8.1 When the inspection is completed, the inspector shall notify the appropriate person at the site. If samples have been collected, Federal regulations require that prior to leaving the site the owner, operator, or agent in charge be given a receipt describing the sample(s) and, if requested, a portion of each sample equal in volume or weight to the portion retained. If split samples are provided, a chain-of-custody record should be completed for the split samples and signed by the owner or agent. If air samples are to be split, duplicate samples must be collected; the need for duplicate samples must be determined before sampling.

6.8.2 If safety clothes or equipment have become contaminated, disposal may be done at the site, provided that the disposal is acceptable to the owner or agent and can be done safely.

6.8.3 If access to the site is controlled by fencing and locked gates, the inspectors must lock the gates when leaving if the owner or agent is not there. An entry should be made in the field logbook of the date and time the gate was locked. If the gate was left unlocked, an entry should be made stating the reason.

6.9 Report

The results of the onsite inspection shall be documented in a report, a copy of which will be sent to the Zone Project Manager. Any other reporting requirements shall be specified in the Work Plan.

7.0 Records

7.1 The Work Plan used

7.2 Logbooks

7.3 Chain-of-custody record

7.4 Photographs

7.5 Site sketches and maps

7.6 Report of onsite inspection

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		Applicability All Division Activity	
		Prepared S. A. Ryers	
Subject CONTROL OF MEASURING AND TEST EQUIPMENT		Approved R. A. Burns	
1.0 <u>Requirements</u> 1.1 Methods shall be established and documented to ensure that measuring and test equipment and analytical instruments used in activities affecting quality are of the proper range, type, and accuracy to verify conformance with established requirements. 1.2 Records shall be maintained and equipment suitably marked to indicate calibration status. 2.0 <u>Implementation</u> QAP 12.1. Implementation of Measuring and Test Equipment Controls			

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		Applicability	All Division Activity		
		Prepared	S. A. Byers		
Subject		Approved			
IMPLEMENTATION OF MEASURING AND TEST EQUIPMENT CONTROLS		R. A. Burns			

1.0 Purpose

This procedure establishes the methods by which controls for tools, gauges, analyzers, instruments, and other measuring and test equipment used for activities affecting quality are established and implemented.

2.0 Applicability

This procedure is applicable to all project equipment used to obtain data that may be used as evidence during litigation. Health and safety procedures control equipment usage related to safety.

3.0 Definitions

Certified standard--A standard having known valid traceability to a recognized standard (national or equivalent).

4.0 Discussion

Measuring and test equipment used to obtain data will be calibrated and controlled. Equipment used for health and safety activities is not in the scope of this procedure.

5.0 Responsibilities

5.1 Measuring and test equipment used in gathering field data shall be procured and controlled to ensure that accuracy is maintained within design limits and that the required reproducibility and traceability are present.

5.2 The Remedial Planning Office Quality Assurance Representative and the Field Investigation Team (FIT) Office Quality Assurance Representatives shall identify equipment in their offices requiring calibration and verify that such calibration is maintained.

5.3 The project offices may calibrate and inspect their own measuring and test equipment, or they may use the services of an approved laboratory. In either case, the cognizant quality assurance representative shall be responsible for ensuring that written procedures are used for the calibration work and for the control of standards.

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6.0 Procedure

6.1 Measuring equipment used in environmental monitoring or analysis and test equipment used for calibration and maintenance shall be controlled by established procedures.

6.2 Measuring and test equipment shall have an initial calibration and shall be recalibrated at scheduled intervals against certified standards that have known and valid traceability to recognized national standards. Calibration intervals for each item shall be, as a minimum, in accordance with manufacturer's recommendations. Normally, equipment will be calibrated before each project. Test equipment used for calibration of sensors shall themselves be recalibrated at least once a year or when maintenance or damage indicates a need for recalibration.

6.3 Calibration standards shall be maintained and used in an environment with temperature, humidity, and cleanliness controls that are compatible with the accuracy and operating characteristics of the standards.

6.4 An inspection will be made during the equipment calibration to evaluate the physical condition of the equipment. The inspection will be intended to detect any abnormal wear or damage that might later affect the operation of the equipment before the next calibration. Equipment found to be out of calibration or in need of maintenance or repair will be identified and removed from service.

6.5 The Quality Assurance and Security Manager shall be notified if measuring and test equipment is found to be out of tolerance during inspection and calibration. The corrective actions to be taken include evaluating the validity of previous inspection or test results; evaluating the acceptability of the items inspected or tested since the last calibration check; and repeating the original inspections or tests using calibrated equipment when it is necessary to establish the acceptability of previous inspections or tests.

6.6 Each item of measuring and test equipment in the calibration program shall be identified in such a way as to show its calibration status and calibration expiration date. Equipment history records for measurement and test equipment shall be used to indicate calibration status and conditions, corrections to be applied, results of inservice checks, and repair history. This will provide a basis for establishing calibration frequencies and for remedial action if the instrument is found out of calibration.

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Subject IMPLEMENTATION OF MEASURING AND TEST EQUIPMENT CONTROLS	Number QAP 12.1	Page 3 of 3
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6.7 An equipment calibration recall system shall be used to ensure that all test equipment identified as being in the calibration program is properly returned for testing after the required interval. The recall system shall identify where the particular item is to be physically located or the specified area for which it was issued or checked out for use.

6.8 Written procedures, appropriate to the item of equipment, shall be used to specify preoperational checks, environmental requirements, step-by-step instructions for use, and instructions for shutdown, layaway, and recall.

7.0 Records

Records of environmental monitoring systems or instrument calibrations are quality records and are to be maintained in accordance with QAP 16.1.

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		10/30/83	1
		Approbability	
		All Division Activity	
		Prepared	
		S. A. Ryers	
		Approved	
		R. A. Burns	
Subject HANDLING, STORAGE, AND SHIPPING OF HAZARDOUS MATERIALS			

1.0 Requirements

1.1 The handling, storage, shipping, and preservation of material and equipment shall be conducted so as to prevent their damage, deterioration, or loss.

1.2 Hazardous materials shall be transported in accordance with the applicable regulatory requirements.

1.3 The handling, storing, shipping, cleaning, and preserving of materials and equipment, including experimental specimens and results, shall be in accordance with approved procedures.

1.4 Procurement documents shall include, as required, instructions for handling, storing, shipping, cleaning, and preserving the item being supplied and shall specify packaging and marking requirements.

1.5 Specifications and procedures shall establish the requirements for special-handling tools and equipment to ensure safe and adequate handling of critical, sensitive, or hazardous materials.

2.0 Implementation

QAP 13.1, Packaging, Marking, Labeling, and Shipping of Samples from Hazardous-Waste Sites

NUM 0004 02 0100

CIB002

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		Effective Date	10/30/83	Revision	1
		Applicability	All Division Activity		
		Prepared	S. A. Ryers		
Subject		PACKAGING, MARKING, LABELING, AND SHIPPING OF SAMPLES FROM HAZARDOUS-WASTE SITES		Approved	
				R. A. Burns	

1.0 Purpose

This procedure provides information related to methods for marking, labeling, and shipping of samples collected from hazardous-waste sites.

2.0 Applicability

This procedure is applicable to the packaging, marking, labeling, and shipping of all samples taken at a hazardous-waste site. The procedure provides reference information for use in planning project activities. The information provided does not represent mandatory requirements.

3.0 Definitions

None.

4.0 Discussion

None.

5.0 Responsibilities

5.1 The Field Investigation Team (FIT) Operation Manager and the cognizant FIT Regional Project Manager shall ensure that the requirements of this procedure are implemented.

5.2 Quality assurance personnel shall monitor the transportation of hazardous wastes using surveillance and audit techniques.

6.0 Procedure

6.1 The procedures described below are for information only. All materials shall be handled in accordance with regulatory and contractual requirements.

6.2 Unanalyzed samples from hazardous-waste sites may not be fixed with any preservative or preserved with ice or dry ice.

6.3 If a material identified in the U.S. Department of Transportation (DOT) Hazardous Material Table (49 CFR 172.101) is known to be contained in a sample, that sample should be transported as prescribed in the table.

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Subject PACKAGING, MARKING, LABELING AND SHIPPING OF SAMPLES FROM HAZARDOUS-WASTE SITES	Number OAP 13.1	Page 2 of 4
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6.4 Unanalyzed samples from hazardous-waste sites may be transported by rented or common-carrier truck, bus, or railroad or by Federal Express Corporation (air cargo); they may not be transported by any other common carrier air transport, even "cargo only" aircraft. Those samples taken from closed drums or tanks, however, must not be transported by Federal Express Corporation.

6.5 If samples are transported by any type of government-owned vehicle, including aircraft, DOT regulations are not applicable. However, U.S. Environmental Protection Agency (EPA) and FIT personnel will use the packaging procedures described in 6.7 below, except that the bill of lading with certification form does not have to be executed.

6.6 DOT regulations provide a worst-case procedure for packaging, marking, labeling, and shipping materials classed as "Poison A" (49 CFR 173.328). If there are data that indicate the possibility of the presence of "Poison A" chemicals or compounds, the worst-case procedure must be followed. These samples may not be transported by Federal Express Corporation (air cargo) or other common carrier aircraft or by rented, nongovernment aircraft. (Samples may be shipped by ground transport or government aircraft.)

6.7 The packaging requirements for unanalyzed samples from hazardous-waste sites are generally as follows:

1. Collect the sample in a polyethylene or glass container that is of an outer diameter narrower than the valve hole on a DOT Spec. 3A1800 or 3AA1800 metal cylinder. Fill the sample container, allowing sufficient ullage (approximately 10 percent by volume) so it will not be liquid-full at 130°F. Seal the sample container.
2. Attach a properly completed sample identification tag to the sample container.
3. With a string or flexible wire attached to the neck of the sample container, lower the container into a metal cylinder that has been partially filled with noncombustible, absorbent, loose packaging material (vermiculite or earth). Allow sufficient cushioning material between the bottom and sides of the container and the metal cylinder to prevent breakage. After the cylinder is filled with cushioning material, drop the ends of the string or wire into the cylinder valve hole. Only one sample container may be placed in a metal cylinder.
4. Replace the valve, torque to 250 ft-lb (for 1-inch opening), and replace the valve protector on the metal cylinder using Teflon tape.

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5. Mark and label the cylinder as described below.

6. One or more cylinders may be placed in a strong outside container.

7. Mark and label the outside container and complete shipping papers as described below.

6.8 The marking and labeling requirements for unanalyzed samples from hazardous-waste sites are generally as follows:

1. Use abbreviations only where specified.
2. Place the following information on the side of the cylinder or on a tag wired to the cylinder valve protector: "Poisonous Liquid or Gas, n.o.s."; laboratory name and address. The information may be either hand printed or in label form.
3. Place the following label on the cylinder: "Poisonous Gas." (The "Poisonous Liquid" label is not acceptable here, even if the sample is liquid.)
4. If the metal cylinders are placed in an outside container, both the container and cylinders inside must have the same markings and labels as above. In addition, mark "Laboratory Sample" and "Inside Packages Comply with Prescribed Specifications" on the top of the outside container. Mark "THIS SIDE UP" on the outside container and place upward-pointing arrows on four sides.

6.9 The requirements for shipping paper for unanalyzed samples from hazardous-waste sites are as follows:

1. Complete the shipper-provided bill of lading and sign the certification statement (if carrier does not provide, use a standard industry form). Provide the following information in the order listed (one form may be used for more than one exterior container; use abbreviations only as specified): "Poisonous Liquid, n.o.s."; "Limited Quantity" or "Ltd. Qty."; "Laboratory Samples"; "Net Weight _____" or "Net Volume _____" (of hazardous contents), by cylinder, if more than one cylinder is inside an exterior container. The net weight or net volume must be placed just before or just after the "Poisonous Liquid, n.o.s." marking.
2. Complete a chain-of-custody record and include it in the container or with the cylinder.

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Subject PACKAGING, MARKING, LABELING AND SHIPPING OF SAMPLES FROM HAZARDOUS-WASTE SITES	Number QAP 13.1	Page 4 of 4
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3. Unless samples are driven to the laboratory, a team member will accompany shipping containers to the transport carrier and, if required, will open the outside container(s) for freight inspection.

6.10 Personnel involved in the handling of hazardous or toxic materials are trained in the procedures involved and in health and safety practices.

7.0 Records

7.1 Bill of lading

7.2 Certification statement

7.3 Chain-of-custody record

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CIB 006 1061

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		10/30/83		1	
		Applicability			
		All Division Activity			
Subject CONTROL OF NONCONFORMANCES		Prepared			
		S. A. Byers			
		Approved			
		R. A. Burns			
 1.0 <u>Requirements</u> A system shall be established to control items or services that do not conform to applicable requirements in order to prevent them from degrading the project. This system shall include, as appropriate, procedures for identification, documentation, segregation, disposition, and notification of affected organizations. Nonconforming items shall be reviewed and accepted, rejected, repaired, or reworked in accordance with documented procedures. 2.0 <u>Implementation</u> QAP 14.1, Nonconformance Reporting, Evaluation, and Disposition					

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		Applicability			
		All Division Activity			
Subject		Prepared			
		S. A. Byers			
NONCONFORMANCE REPORTING, EVALUATION, AND DISPOSITION		Approved			
		R. A. Burns			

1.0 Purpose

The purpose of this procedure is to establish a system for the reporting, evaluation, and disposition of nonconformances.

2.0 Applicability

This procedure is applicable to all activities controlled by the Superfund Division quality assurance program.

3.0 Definitions

For the purpose of this procedure, a nonconformance shall be defined as an identified or suspected deficiency in an approved or verified document (e.g., technical report, analysis, calculation, computer program); or an item where the quality of the end item itself or subsequent activities using the document or item would be affected by the deficiency; or an activity that is not conducted in accordance with the established plans or procedures.

4.0 Discussion

None.

5.0 Responsibilities

5.1 All technical staff shall be responsible for reporting suspected nonconformances by initiating a nonconformance report.

5.2 The Manager of the Remedial Planning Office, the Field Investigation Team (FIT) Operation Manager, and the Zone Deputy Project Manager shall handle nonconformances within their organizations by--

1. Evaluating reported nonconformances.
2. Controlling further work on nonconforming items.
3. Determining disposition or action to be taken.

5.3 The Quality Assurance and Security Manager or his designee is responsible for--

1. Maintaining a log of nonconformances.

NUS 449A 22 0102

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Subject NONCONFORMANCE REPORTING, EVALUATION, AND DISPOSITION	Number QAP 14.1	Page 2 of 4
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2. Reviewing nonconformance reports.
3. Evaluating disposition or action taken.
4. Closing out nonconformance reports.
5. Ensuring that nonconformance reports are included as part of final project documentation package.

6.0 Procedure

- 6.1 Any staff member engaged in project work who discovers or suspects a nonconformance (as defined above) is responsible for initiating a nonconformance report (Exhibit 14.1-1). This staff member shall obtain a nonconformance report number from the Quality Assurance and Security Manager.
- 6.2 The Manager of the Remedial Planning Office, the FIT Operation Manager, or the Zone Deputy Project Manager shall evaluate each nonconformance report and shall provide a disposition. A disposition is provided by checking the appropriate box(es) on the nonconformance report and describing the actions to be taken.
 - 6.2.1 The cognizant manager shall also ensure that no further project work dependent on the nonconforming item or activity is performed until approval is obtained and the nonconformance report is closed out.
 - 6.2.2 If the nonconformance is related to material, the cognizant manager shall be responsible for marking or identifying, with the nonconformance report number, the nonconforming item (if practical) and indicating that it is nonconforming and not to be used. Following closeout of the nonconformance report, the cognizant manager shall clear the item (i.e., remove the nonconforming label) or dispose of the item, as appropriate.
 - 6.2.3 The actual action taken to resolve the nonconformance shall be evaluated by the Zone Deputy Project Manager. A brief description of the activity (or activities) performed to clear the nonconformance shall be noted on the nonconformance report.
 - 6.2.4 The cognizant quality assurance representatives shall provide surveillance to ensure that nonconforming items are being adequately controlled to prevent their inadvertent use in project work.
- 6.3 The Quality Assurance and Security Manager shall review the nonconformance report and any supporting documentation to ensure that (1) appropriate and complete action was taken in accordance with the final disposition, (2) appropriate reviews, evaluations, reverifications, and specified additional reviews have been completed, and (3) all required signatures are noted and dated on the report. The Quality Assurance and Security Manager shall close out each nonconformance report by signing and dating the report.

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Subject NONCONFORMANCE REPORTING, EVALUATION, AND DISPOSITION	Number QAP 14.1	Page 3 of 4
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6.4 The Quality Assurance and Security Manager shall at least semi-annually analyze logged nonconformance reports and identify apparent unsatisfactory trends. Such analyses shall be documented in the semiannual report on the status of the quality assurance program, prepared for the Zone Project Manager and the Zone Deputy Project Manager. Unsatisfactory trends shall be reported to management in accordance with QAP 16.1.

7.0 Records

7.1 A copy of each closed nonconformance report shall be included in the quality assurance file. Copies of all nonconformances shall be maintained by the Quality Assurance and Security Manager in accordance with QAP 16.1.

7.2 The Quality Assurance and Security Manager (or his designee) shall maintain a log of nonconformances.

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NUS CORPORATION SUPERFUND DIVISION		NONCONFORMANCE REPORT	
NCR NO.:	INITIATING OFFICE:	DATE:	TYPE NCR
NONCONFORMANCE DESCRIPTION (ATTACH ADDITIONAL PAGES AS REQUIRED)			
REPORTED BY (NAME):		TITLE:	DATE:
CONCURRENCE (COORDINANT MANAGER):		DATE:	
RECOMMENDED DISPOSITION (ATTACH ADDITIONAL PAGES AS REQUIRED)			
☐ REPERFORM PER PROCEDURE / INSTRUCTION NO. _____ ☐ ACCEPT-AS-IS		☐ REJECT ☐ OTHER (EXPLAIN BELOW)	
NAME / TITLE:			DATE:
ACTION ASSIGNED TO (NAME):		TITLE:	DATE:
ACTION TAKEN:			
EVALUATED / ACCEPTED BY (MANAGER):		DATE:	
CORRECTIVE ACTION REQUIRED:			
CORRECTIVE ACTION DETERMINATION BY (NAME):		TITLE:	DATE:
QUALITY ASSURANCE CLOSEOUT (NAME):			DATE:

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EXHIBIT 14.1-1

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		Effective Date 10/30/83	Revision 1
		Applicability All Division Activity	
		Prepared S. A. Byers	
		Approved R. A. Burns	
Subject CORRECTIVE ACTION			
1.0 <u>Requirements</u> 1.1 Conditions adverse to quality, such as deficiencies and nonconformities, shall be promptly identified and corrected. 1.2 The identification of significant conditions adverse to quality, the cause of the conditions, and the corrective actions taken shall be documented and reported to appropriate levels of management. 2.0 <u>Implementation</u> QAP 15.1, Implementation and Documentation of Corrective Actions			

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		Applicability	
		All Division Activity	
		Prepared	
		S. A. Byers	
		Approved	
		R. A. Burns	
Subject: IMPLEMENTATION AND DOCUMENTATION OF CORRECTIVE ACTIONS			

1.0 Purpose

This procedure establishes the methods for implementing and documenting major corrective actions.

2.0 Applicability

This procedure is applicable to activities and programs that address corrective actions.

3.0 Definitions

None.

4.0 Discussion

- 4.1 The corrective action program covers the analysis of the cause(s) of any negative audit findings and the corrective actions required. This program includes the investigation of the cause(s) of significant or repetitious unsatisfactory conditions relating to the quality of materials, components, or services or the failure to implement or adhere to required quality assurance practices.

5.0 Responsibilities

- 5.1 The Quality Assurance and Security Manager is responsible for reviewing all audit reports and all nonconformance reports to determine significant or repetitious conditions adverse to quality, or the failure to implement or adhere to required quality assurance practices.
- 5.2 When such problems are identified, the Zone Deputy Project Manager or his designee shall investigate the causes of the problems and shall be responsible for defining and implementing the necessary actions to correct them, as well as to remedy any immediate effects of the problems.

6.0 Procedure

6.1 Reviews

- 6.1.1 The results of all audits shall, within 30 days of receipt, be reviewed by the Quality Assurance and Security Manager to determine the need for corrective action beyond the corrective action identified in the audit report. If this audit review reveals

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Subject IMPLEMENTATION AND DOCUMENTATION OF CORRECTIVE ACTIONS	Number OAP 15.1	Page 2 of 2
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that major or long-term corrective actions are needed, the Zone Deputy Project Manager will obtain from his staff a commitment to define and implement the necessary actions to correct the cause(s) of the problem as well as to remedy any immediate effects of the problem.

- 6.1.2 If a deficiency that affects the quality and/or validity of a work product is discovered after final quality verification, the project work and verification process shall be reviewed for adequacy. Modifications to project work will be initiated if necessary.

6.2 **Corrective Action Approval**

Proposed major corrective actions shall be approved by the Zone Project Manager. The Quality Assurance and Security Manager shall concur with proposed major corrective actions.

6.3 **Corrective Action Review**

The Zone Deputy Project Manager shall review the results of major corrective actions after implementation to determine the effectiveness of the actions and shall report the results of this review to the Zone Project Manager.

7.0 **Records**

Documentation supporting major corrective actions will be maintained in the department files and/or the project files and in the quality assurance files in accordance with QAP 16.1.

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		Effective Date 10/30/83	Revision 1
		Applicability All Division Activity	
		Prepared S. A. Ryers	
		Approved R. A. Burns	
Subject QUALITY ASSURANCE RECORDS			

1.0	<u>Requirements</u>
1.1	Sufficient records shall be maintained to furnish evidence of activities affecting quality.
1.2	The records required shall be specified.
1.3	Required quality assurance records shall be identifiable and retrievable.
1.4	Requirements and responsibilities for record transmittal, retention, and maintenance after the completion of work shall be established and documented.
2.0	<u>Implementation</u>
2.1	QAP 16.1, Storage and Retrieval of Quality Assurance Records
2.2	QAP 16.2, Control of Duplicate Quality Assurance Records

FORM 045A 02 0102

CIB 002

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CIB 006 1070

 NUS CORPORATION A Halliburton Company Superfund Division	QUALITY ASSURANCE MANUAL ISSUE B	Number QAP 16.1	Page 1 of 5
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		Applicability All Division Activity	
		Prepared S. A. Byers	
Subject STORAGE AND RETRIEVAL OF QUALITY ASSURANCE RECORDS		Approved R. A. Burns	

1.0 Purpose

This procedure describes the methods to be used to store and retrieve quality assurance records.

2.0 Applicability

This procedure applies to all documents that have been determined to be quality assurance records.

3.0 Definitions

3.1 Quality assurance records--Those records that furnish documentary evidence of the quality of items or services and of activities affecting quality. For the purpose of this procedure, a document is considered a quality assurance record when the document has been completed and has received all required approvals, and all activities related to the respective Technical Directive Document (TDD), Work Assignment (WA), or Support Direction Document have been completed.

3.2 Working file--Those files maintained for an individual project (TDD/WA) in the specific office responsible for that project.

3.3 Quality assurance file--The file maintained in each project office that will, by the time the entire project is terminated, include all quality assurance documents generated in support of project activities.

3.4 Quality assurance records index--A listing of all quality assurance records. The index should indicate storage locations (see Exhibit 16.1-1).

3.5 Authorized access listing--A form placed on the outside of each quality assurance file that lists the personnel who have unrestricted access to the file (see Exhibit 16.1-2).

4.0 Discussion

4.1 The evidentiary value of data generated by project activities is dependent upon the proper maintenance of quality assurance records.

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4.2 Upon completion of the activities related to a specific project, the documentation accumulated shall be inventoried and placed into the quality assurance record status.

5.0 Responsibilities

5.1 The Zone Deputy Project Manager or his designee shall be responsible for ensuring that the procedure for the storage and retrieval of quality assurance records is being implemented.

5.2 The Field Investigation Team (FIT) Regional Project Managers, the Zone Deputy Project Manager, the Manager of the Remedial Planning Office, and the FIT Operation Manager shall each designate a document custodian who shall be responsible for records maintenance.

5.3 The document custodians shall be responsible for preparing and maintaining the quality assurance records index and for ensuring that all quality assurance records maintained at their respective offices are properly identified and stored.

5.4 The Zone Document Custodian, designated by the Zone Deputy Project Manager, shall maintain the Zone Project Management Office quality assurance records files, and a composite quality assurance records index.

5.5 Each task or assignment project manager shall be responsible for identifying in the Work Plan those documents to be designated as quality assurance records. They shall also be responsible for ensuring that records identified in Work Plans are being maintained in accordance with this procedure for storage and retrieval of quality assurance records.

6.0 Procedure

6.1 A quality assurance records index shall be initiated at the beginning of the overall project using the information provided in the Work Plans. The document custodians shall maintain current working files for documents originating within individual organizations during the active phase of individual projects.

6.2 All data received from outside the project will be retained by the organization using the data.

6.3 Duplicates of quality assurance records shall be maintained in accordance with QAP 16.2, Control of Duplicate Quality Assurance Records, if required by the controlling Work Plan or applicable procedure.

6.4 Access to working files shall be controlled to restrict nonproject personnel to having access only in the presence of project personnel.

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6.5 Access to all files containing quality assurance records shall be controlled. | 1

6.6 Removal of quality assurance records from the files will be controlled by use of a withdrawal card. The withdrawal card shall be put in the file in place of the removed document and shall indicate the date the document was removed. Upon return of the document, the withdrawal card will be removed from the file by the document custodian.

6.7 Transmittal of any quality assurance record shall be by means of the document transmittal form of QAP 7.2.

6.8 A record of external transmittal of all project quality assurance records will be maintained by the Zone Document Custodian.

6.9 Upon termination of the entire project, all quality assurance records retained shall be dispositioned as required by the U.S. Environmental Protection Agency (EPA).

6.10 Upon termination of an individual task or assignment, working files shall be processed for storage as quality assurance records.

7.0 Records

7.1 At the completion of an individual project, the cognizant project manager and document custodian shall be responsible for disposition of all project quality assurance records as prescribed in the Work Plan for that project and the applicable procedures.

7.2 Quality assurance records, including test procedures, work instructions, and software program documentation and verification records, shall be maintained by the originating organization. Revisions to existing documents such as procedures, work instructions, and computer programs shall be filed with the original document, together with any and all previous revisions. Copies of superseded versions will be retained for at least 5 years.

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QUALITY ASSURANCE RECORDS LOG			
NUS CORPORATION SUPERFUND DIVISION		QUALITY ASSURANCE RECORDS LOG	
ECO/TSD/MIL	SITE	SITE NO	OFFICE
ECO/TSD/MIL MANAGER		DOCUMENT CUSTODIAN	
PROJECT NO		PAGE OF	
STORAGE LOCATION		FILE NO	
RECORD DESCRIPTION			

EXHIBIT 16.1-1

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LIMITED ACCESS QUALITY ASSURANCE RECORDS

ACCESS LIMITED TO THE FOLLOWING PERSONNEL:

_____	_____
_____	_____
_____	_____
_____	_____

EXHIBIT 16.1-2

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		Applicability	All Division Activity		
		Prepared	S. A. Ryers		
Subject		AUDITS AND SURVEILLANCES			
		Approved R. A. Burns			

1.0 Requirements

- 1.1 Quality assurance audits and surveillances are conducted by the Quality Assurance and Security Manager (or his designee) and by personnel of other NUS Corporation quality assurance staffs in accordance with preestablished procedures.
- 1.2 Audits of all facets of the project are conducted at least annually with qualified personnel.
- 1.3 Surveillances are conducted as required to verify quality assurance program adequacy and compliance.
- 1.4 Audits are conducted to verify compliance with the Superfund Division quality assurance program and to determine the effectiveness of the program.

2.0 Implementation

- 2.1 QAP 17.1. Conduct of Audits
- 2.2 QAP 17.2. Audit Scheduling
- 2.3 QAP 17.3. Qualification and Certification of Quality Assurance Personnel
- 2.4 QAP 17.4. Preparation for Audits
- 2.5 QAP 17.5. Audit Follow-Up
- 2.6 QAP 17.6. Quality Notice

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 NUS CORPORATION A Halliburton Company Superfund Division	QUALITY ASSURANCE MANUAL ISSUE B	Number	OAP 17.4	Page	1 of 3
		Effective Date	10/30/83	Revision	1
		Applicability	All Division Activity		
		Prepared	S. A. Byers		
Subject		PREPARATION FOR AUDITS			
1.0 <u>Purpose</u> This procedure details the actions required to prepare for an audit.					
2.0 <u>Applicability</u> This procedure is applicable to all audits performed.					
3.0 <u>Definitions</u> None.					
4.0 <u>Discussion</u> Preparation for an audit consists of the selection of an audit team, preparation of an audit plan and audit checklists, special training and orientation of the audit team, and notification of the organization to be audited. These activities should be performed in a timely manner to ensure that the audit will be performed properly.					
5.0 <u>Responsibilities</u> It is the responsibility of the audit team leader to ensure compliance with the actions detailed in this procedure.					
6.0 <u>Procedure</u>					
6.1 Audit Team Selection					
6.1.1 The audit team leader for internal audits shall be selected by the Quality Assurance and Security Manager.					
6.1.2 Audit team members shall also be selected by the Quality Assurance and Security Manager.					
6.1.3 Individuals shall be selected for quality assurance audit team assignments on the basis of experience or training commensurate with the complexity or special nature of the activities to be audited. Any special abilities, specialized technical training, previous experience, personal characteristics, education, or physical capability that is applicable to the assignment shall be considered during selection.					

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PREPARATION FOR AUDITS	Revision 1	Effective Date 10/30/83

6.2 Written Audit Plan

6.2.1 The audit team leader shall be responsible for the preparation of a written audit plan, when specifically requested by the Manager of Quality Assurance and Security. | 1

6.2.2 The audit plan shall include the following information: | 1

1. Audit number
2. Audited organization
3. Subject of the audit
4. Scope of the audit
5. Projects or activities to be audited
6. Names of audit team members
7. Schedule
8. Applicable documents

6.3 Audit Checklists

6.3.1 The audit team leader shall be responsible for directing the preparation of audit checklists or an audit guide. | 1

6.3.2 The following guidelines shall be used in preparing audit checklists:

1. Initial baseline audits. Checklists shall be based on quality assurance program documents (e.g., quality assurance manuals, plans, procedures, applicable standards).
2. Follow-up audits. Checklists shall be based on a review and evaluation of findings from previous audits, responses to these findings, and available objective evidence of implementation of corrective action.
3. Periodic audits. Checklists shall emphasize areas considered critical to the program at the time of the audit or found weak but not reported as a finding during a previous audit.

6.4 Audit Team Orientation

The team leader shall prepare the team prior to initiation of the audit and shall assign specific areas for each member to audit in accordance with checklists they have prepared. Pertinent policies, procedures, standards, instructions, manuals, plans, codes, regulatory requirements, prior audit reports, and responses should be made available to the team for information and review. Also, each auditor shall be provided with copies of the audit plan, procedures, and checklists necessary to ensure an orderly audit. The team

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leader shall ensure that the auditors understand the internal and external organizational and contractual interfaces and responsibilities of the organization to be audited.

7.0

Records

None.

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		QAP 17.5	1 of 2
		Effective Date	Revision
		10/30/83	1
		Applicability	
		All Division Activity	
		Prepared	
		S. A. Ryers	
		Approved	
		R. A. Burns	
Subject AUDIT FOLLOW-UP			

1.0 Purpose
 This procedure describes the actions to be taken to ensure that corrective action on audit findings is adequate and complete.

2.0 Applicability
 This procedure is applicable to all internal quality assurance audits.

3.0 Definitions
 None.

4.0 Discussion
 None.

5.0 Responsibilities
 It is the responsibility of the audit team leader to comply with the actions as specified in this procedure.

6.0 Procedure

6.1 Audit Response
 The Zone Project Manager shall take those actions necessary to correct the deficiencies identified during the audit in a timely manner.

6.2 Audit Follow-Up

6.2.1 The audit team leader shall follow up all open findings in audit reports, receive audit report responses, and evaluate the responses to ensure that corrective action for each finding has been adequately completed or scheduled.

6.2.2 The audit team leader may accomplish follow-up as required through written communication, reaudit, or other appropriate means.

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Subject AUDIT FOLLOW-UP	Number QAP 17.5	Page 2 of 2
	Revision 2	Effective Date 10/30/83

6.2.3 The audit team leader shall inform the audited organization in writing of any unsatisfactory response, indicating why the response is considered unsatisfactory and specifying a reply due date. The Quality Assurance and Security Manager shall be informed of unsatisfactory responses by copy of the written notification.

6.3 Audit Finding Closure

6.3.1 Each audit finding shall be considered open until a satisfactory written reply (e.g., response report, follow-up response) has been received from the audited organization, documenting that the corrective action has been completed.

6.3.2 Only the audit team leader can close an audit finding. He shall indicate the closure by signing and dating the Quality Notice form (see QAP 17.6).

7.0 Records
None.

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		Effective Date		Revision	
		10/30/83		1	
		Applicability			
		All Division Activity			
Subject		Prepared			
		S. A. Ryers			
QUALITY NOTICE		Approved			
		R. A. Burns			

1.0 Purpose

This procedure describes the method of documenting findings identified during audit or surveillance activities.

2.0 Applicability

This procedure is applicable to all the findings of an internal quality assurance audit conducted by project personnel and to the results of observations by personnel performing surveillance of quality-related activities. It may be applied to external audits at the discretion of the Quality Assurance and Security Manager.

3.0 Definitions

None.

4.0 Discussion

This procedure provides for a uniform method of reporting the results of an audit and ensures that all applicable information is provided in order that appropriate follow-up work can be performed.

5.0 Responsibilities

Completion of the quality notice form (Exhibit 17.6-1) shall be the responsibility of the audit team members and/or surveillance personnel.

6.0 Procedure

6.1 The quality notice form shall be used to document all findings of internal audits or surveillance activities and the resolution of the findings. Findings shall be categorized as follows:

1. Category A (Deficiency). Recognition of a specific requirement (e.g., program, procedure, process) that has been violated.
2. Category B (Observation). Recognition of an activity or action that might be improved but is not in violation of a specific requirement.

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6.2 The processing of the quality notice form shall be as outlined in QAP 17.5. All closed quality notice forms shall be retained as quality assurance records.

7.0 Records
None.

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Subject QUALITY NOTICE	Number QAP 17.6	Page 3 of 4
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NUS CORPORATION SUPERFUND DIVISION		QUALITY NOTICE	
(1) QN NO	(2) CODE	(3) CATEGORY ☐ OFFICE ☐ SOG-TRG-WA ☐ PROGRAM	
(4) SOURCE ☐ QA INTERNAL AUDIT ☐ QA EXTERNAL AUDIT ☐ OTHER			
(5) PROJECT		(6) AUDIT GUIDE REFERENCE	
(7) AUDITED ORGANIZATION	(8) ORGANIZATIONAL UNIT	(9) ACTIVITY	
(10) RESPONSE ASSIGNED TO		(11) REPORTED BY	(12) DATE
(13) ☐ OBSERVATION		(14) ☐ DEFICIENCY	
(15) REFERENCE DOCUMENT			
(16) REQUIREMENT (CITE)			
(17) DESCRIPTION			
(18) RESPONSE DUE DATE	(19) SCHEDULED REAUMT DATE	(20) APPROVED BY	(21) DATE
(22) RESPONSE (TO BE COMPLETED BY AUDITED ORGANIZATION)			
TO SUBSTANTIATE COMPLETION OF CORRECTIVE ACTION ATTACH DOCUMENTATION AS APPROPRIATE		(23) SUBMITTED BY	(24) DATE
TO BE COMPLETED BY AUDITING ORGANIZATION			
(25) ☐ SATISFACTORY	(26) ☐ UNSATISFACTORY	(27) REVIEWED BY	(28) DATE
(29) ☐ SATISFACTORY	(30) ☐ UNSATISFACTORY	(31) REAUMT DATE	(32) REFERENCE ON FORM (FOR UNSATISFACTORY REAUMT)
(33) REMARKS		(34) ☐ QUALITY NOTICE CLOSED	(35) DATE
		(36) APPROVED BY	

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EXHIBIT 17.6-1

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Subject QUALITY NOTICE	Number OAP 17.6	Page 4 of 4
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NUS QUALITY NOTICE FORM INSTRUCTIONS

The Quality Notice Form shall be used by persons performing Quality Assurance (QA) Audit or Surveillance of activities affecting the quality and effective formulation or implementation of a defined QA program. This form is applicable to all types of goods and services, domestic and foreign, provided in accordance with requirements of a QA Program. This form may be used by project management representatives for monitoring, diagnosis, actions or events associated with QA programs pertinent to work performed under their jurisdiction.

The Quality Notice Form shall be used by personnel described above to describe the condition when:

- Specified quality for a product, process or system has been noticed, i.e., a quality DEFICIENCY level finding is to be documented by the observer and appropriate corrective action is to be initiated for scheduled accomplishment by the subcontracted organization, or
- The capability of the subcontracted organization to demonstrate such meaningful level of confidence, continuing achievement of appropriate quality appears to be in jeopardy, i.e., an OBSERVATION is to be documented by the observer and is to be acted upon by the subcontracted organization in accordance with agreements established by the observer with the subcontracted organization.

(11) Enter identifier for each Quality Notice (QN) issued. Unless prescribed otherwise, the observer shall establish identification appropriate to his needs, e.g., 01, 02. (12) Leave blank (this space may be used for subsequent classification and quality trend analysis). (13) Mark the box(es) which best describes the category of the reported observation or deficiency. (14) Mark the box which describes the source of the cited observation or deficiency (see Note 1 below). (15) Enter identification to e.g., name or number of project under which activity was performed. (16) Enter identification of guide used to initiate and identify the observation or deficiency, e.g., audit checklist, detailed steps of work, memorandum, action item report, letter, etc. (17) Enter name and location of organization subjected to audit/surveillance/monitoring action. (18) Enter name of department or section where the noted observation or deficiency occurred. (19) Identify the specific task, action or work component under-going audit/surveillance/monitoring when the observation or deficiency was noticed and identified, e.g., performing magnetic particle inspection of component - visual crack detection, reducing strip chart data for wind speed and wind direction histogram. (100) Enter the name of the subcontracted organization representative responsible for providing observation or deficiency response. (111) Enter the observer's name. (112) Record the date on which the observation or deficiency was documented. (113) Mark the box when quality is in jeopardy as described above in instruction 8 (see Note 2 below). (114) Mark the box when quality is violated as described above in instruction A (see Note 2 below). (101) A. When item (113) is marked, enter the name and identification of appropriate documentation containing the specific quality requirements that should be implemented to prevent or to mitigate the conditions adverse to quality. B. When item (114) is marked, enter the name and identification of documentation containing the specific quality requirements violated. (102) A. When item (113) has been marked, enter list(s) of specified specific quality requirements that should be implemented to prevent or to mitigate the conditions adverse to quality. B. When item (114) is marked, enter excerpt from specific quality requirements violated. (115) Record in your standard language a description of the observation or deficiency.	(103) Record the due date of the response from the audit/surveillance organization. (104) Record the next scheduled date for audit/surveillance/monitoring action to assess effectiveness or deficiency correction progress. When the exact date of the assessment can not be determined, enter "TBD" (to be determined). Enter to-A year appropriate when assessment will not be made. (105) Enter name of person authorized to approve the QN. Unless prescribed otherwise, this will be the audit team leader or the observer (see item 11). (106) Record date QN was approved for transmittal to the audit/surveillance organization. (107) Record in detail the least response. To be satisfactory it must: A. Describe any affected product, results, or materials. B. Correct the situation that caused the QN to be issued. C. Provide a mechanism to prevent recurrence. D. Specify who shall do the above and. E. When it shall be accomplished. (120) Enter name of person in the subcontracted organization who has submitted the response. (121) Record the date that the response was submitted. (122) Mark the box that describes the response. (123) Enter the name of the person who reviewed the response. (124) Record the date the response was reviewed. (125) When an on-site assessment of the observation or deficiency is made, mark the box that describes the action taken by the subcontracted organization. Enter tick when an on-site assessment will not be made. (126) Record the date that on-site assessment was made. The assessment, mark the block tick. (127) Record all QN numbers documenting assessment of the original observation or deficiency. No assessment, mark the block tick. (128) Enter comments pertinent to FULL evaluation of corrective action or conditions for closing the QN otherwise enter "N/A". (129) When conditions are corrected, mark the box to close the QN. (130) Enter the name of the person who approved closing the QN. (131) Record the date the QN was closed.
--	---

Note 1: QN's initiated by "other" than QA personnel are to be immediately sent to QA for action.
Note 2: Items (113) and (114) are mutually exclusive, i.e., the observer must choose and mark only one of these two boxes.

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EXHIBIT 17.6-1 (continued)

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Appendix QA-2

The following Region II FIT Guidance is provided:

<u>Number</u>	<u>Subject</u>
QAT-2-1.1	Project Docket Logs
QAT-2-1.2	Written Documentation of Field Activities
QAT-2-1.3	Photographic Documentation of Field Activities

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Region II FIT
Quality Assurance Guidance
Project Docket Logs

Preparer: *Robert J. Pitt*

Date: 2/13/85

Review/Approval: *Kerry J. Pitt*
RPM

Date: 2/18/85

CIB 002



PROJECT FILE DOCKET LOGS

1.0 Purpose

The purpose of the project docket log is to provide an indexing system for all items/documents placed in a project file.

2.0 Applicability

This procedure is applicable to all Region II FIT Superfund Project work assignments.

3.0 Definitions

Project Docket Log: A chronologized indexing system for all items/documents placed in a project file.

Docket Number: A four digit sequenced number followed by a suffix. The suffix identifies the location of the document/item in the project file.

4.0 Discussion

Project file docket logs are a requirement of the Superfund Project. When EPA requests a project file, they will require every item/document contained in it to be inventoried. This is the primary purpose of the project file docket log system. Eventually, when all Region II FIT files are turned over to EPA, detailed inventories of all project file contents will have to be provided.

5.0 References

This procedure complies with the following sections of the NUS Superfund Division QA Manual:

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<u>Procedure/Requirement</u>	<u>Section/Paragraph</u>
QAR 16.0 Quality Assurance Records	1.2, 1.3
QAP 16.1 Storage and Retrieval of Quality Assurance Records	4.0, 5.3

6.0 RESPONSIBILITY

It is the responsibility of the project manager to ensure that all items/documents placed in the project file are inventoried and identified using a project file docket log.

7.0 Procedure

The docket log system provides an inventory of file contents and a system for locating each document/item placed in the project file. The docket log system thus acts as a file index, where the suffix portion of the docket number is designed to identify a specific project file subsection. The Document Custodian will maintain project file docket logs under the direction of the responsible Project Manager for routine Superfund project work assignments including the following:

- o Site Inspections
- o Preliminary Assessments, Site Reconnaissance
- o Data Evaluation/Presentations
- o Report Critiques/Evaluation
- o Conference/Meetings
- o Training

Attachment A provides guidance showing how docket numbers will be assigned. The project file subsections listed in Attachment A are those usually associated with the work assignments listed above. The following procedure will be used to initiate and maintain project docket logs.

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1. When assigned a project, the responsible project manager will initiate the project file and advise the Document Custodian to initiate the project file docket log.
2. Project documents/items must be given to the Document Custodian with a detailed description of what the document/item is, and in what project file subsection it is to be placed. The Document Custodian will assign the document/item a sequential docket number, record it on the project docket log, and place it in the project file in the appropriate file subsection.

Docket logs for projects such as remedial investigations and any other complex special assignments from EPA will be developed by the responsible project manager and QA representative. In these cases the project manager must first develop a system by which the project file will be organized and second, develop an appropriate docket log system which not only lists all documents/items placed in the project file, but identifies appropriate subsections in which they can be found. When such a docket log system is developed, the QA representative will assign appropriate personnel to maintain the project files and docket all documents/items placed in it.

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ATTACHMENT A

Guidance for the use of the docket numbers is provided in this attachment. Table One provides a list of the docket numbers. Table Two provides a list of the docket number suffixes and associated project file subsections.

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**ATTACHMENT A
TABLE ONE
DOCKET NUMBER SUFFIXES**

<u>Four Digit Sequential No. - Suffix</u>	<u>Types of Documents Identified</u>
NNNN - ADM	TDD, AOC, any other project control documents
NNNN - C	Memos, telecon notes, letters
NNNN - B	Background information, references
NNNN - WS	Work and safety plans
NNNN - F	Field notes, logbooks, etc.
NNNN - P	Photographs (identified by developed role and/or photo logs, etc.)
NNNN - SMD	Sample management documentation traffic reports, chain of custodies, etc.
NNNN - D	Final products of project work - draft and final reviewed/approved documents generated for the client
NNNN - QA	Documentation of quality control activities to ensure quality assurance requirements are met; (e.g. Document/Report Review Logs, Interim Document Review Documentation, etc.), QA Records Log
NNNN - LD	Lab data, results of sample analysis
NNNN - MM.	Meeting minutes, conference proceedings, agendas, attendance lists
NNNN - TR	Documentation at training, course outline, attendance lists, documentation of completion

NOTE: NNNN is a four digit sequential number; 0001, 0002...etc.

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ATTACHMENT A
TABLE TWO
DOCKET NUMBER SUFFIXES AND ASSOCIATED PROJECT FILE SUBSECTIONS

<u>Docket Number Suffix</u>	<u>Project File Subsection</u>
ADM	TDD, AOC, Administrative
C	Correspondence
B	Background
WS	Work/Safety Plan
F	Field Notes
P	Photographs
SMD	Sample Management Documentation
LD	Lab Data
MM	Conference Proceedings
TR	Training
D	Deliverables
QA	QA/QC Records

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Region II FIT
Quality Assurance Guidance

Written Documentation of Field Activities

Prepared: Richard H. Lutz

Date: 2/11/85

Review/Approval: Ronald M. Vroman

RPM

Date: 2/12/85

CIB 002

WRITTEN DOCUMENTATION OF FIELD ACTIVITIES

1.0 Purpose:

This procedure describes requirements and details procedures for documentation of field activities.

2.0 Applicability:

This procedure is applicable to the conduct of all field activities by Region II FTT as part of the Superfund Project.

3.0 Definitions:

Controlled Evidentiary Document: Those documents which potentially may be used as evidence during litigation.

Field Data: Any and all information collected during activities at a site under study.

Field Log Book: A controlled document used to record field activities and identify the personnel involved.

4.0 References

This procedure complies with the following sections of the NUS Superfund Division Quality Assurance Manual.

<u>Procedure</u>	<u>Paragraph/Section</u>
QAP 4.1 Field Data Collection	6.2
QAP 7.1 Identification of Controlled Evidentiary Documents	6.1, 6.4, 6.5, 6.6, 6.8

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<u>Procedure</u>	<u>Paragraph/Section</u>
QAP 9.2 F2 Sample Control	6.1.1, 6.1.2, 6.4
QAP 11.1 Off Reconnaissance	6.6, 6.7, 6.8
QAP 11.2 Onsite Inspections	6.4, 6.5, 6.7

5.0 Discussions

Documentation of an investigative team's field activities often provides the basis of technical site evaluations and other such related written reports. Additionally, all records and notes generated in the field may be considered evidence and potentially be subject to scrutiny in litigation. It is essential that all field documentation provide a clear, unbiased picture of field activities.

6.0 Responsibilities

The field operations project manager and the Region II FIT project manager are responsible for implementation of this procedure.

7.0 Procedures

In Region II FIT, serialized field log books provide the basic means for documenting field activities. This procedure provides guidance for the assignment field notebooks and documentation of field activities.

7.1 Assignment of Field Log Books

When work assignment requires field activities, it is the project managers responsibility to obtain serialized field log books. Log books are issued by written request using a "Request for Field Notebooks" form. A copy of this form is provided in Attachment A. A record is maintained documenting the assignment of each field log book and all "Request for Field Notebooks" forms are kept on file.

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Once issued the following information must be provided on the inside front cover of each log book:

- o Project Name (site name)
- o Site Location
- o TDD Number
- o Date of Issue

Control and maintenance of field log books is ultimately the responsibility of the project manager. Usually the field log book is assigned by the project manager to field team members who are designated responsible for the task of documenting field activities.

7.2 Documentation of Field Activities

It is required that field log books are properly written and provide a clear picture of all field activities. This is important because field notes may become involved in litigation. Specifically, they may be required to prepare responses to interrogatories filed by attorneys for an alleged responsible party as part of a court action brought against the responsible party by EPA. Attachment B provides interrogatories where both REMPO and FIT I have worked and were asked by EPA to assist in preparation of responses. The type of information required to answer each of the questions identified with an asterisk should be documented in field notes.

Step by step instructions and procedures for documenting field activities are provided below. These instructions and procedures are organized as follows:

- o The first set of instructions and procedures provides general guidance relating to the format and technique in which log book entries are to be made. It is important that field activities are documented in the most organized, chronological manner as possible.

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- o The second set of instructions provides guidance on information to be recorded when documenting field activities. Generally the who, what, where and when of all field activities must be recorded.

Instructions and procedures relating to the format and technique in which log book entries are made are as follows:

1. Leave the first two pages blank. They will provide space for a table of contents to be added when the log book is complete.
2. If a photo log is to be generated, leave space for it on the last five to ten pages of the log book. The photo descriptions should be generated tabularly and not combined with notes on general site activities.
3. All entries should be made in ink. Waterproof ink is recommended.
4. All entries should be made in language which is objective, factual, and free of personal feelings or other terminology which might prove inappropriate.
5. All entries must be printed as neatly as possible.
6. All entries are to be accompanied by the appropriate military time (such as 1530 instead of 3:30). A time entry should be made every thirty minutes or less.
7. Errors must be lined through and initialed. No erroneous notes are to be made illegible.
8. Entries should start on a new page at the start of each days field activities.
9. The person taking notes will sign and date each page as they are completed.

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10. A second person, not directly involved with the field activities being documented, will read through each page to ensure that the notes are legible and contain an accurate picture of the field activities. When satisfied, the second person will countersign the page. Review by a second person should occur as soon as possible after the notes were taken. It is recommended that such review occur at the end of each days activities.
11. Entries made by team members, other than the team member assigned to task the document field activities, must sign and date the entry.
12. Later additions, clarifications, or corrections must be dated and signed.

Instructions and procedures providing guidance on the information to be recorded on field activities are provided below:

1. The first written page identifies the date, time, TDD number, site name, location, NUS personnel and their responsibilities, other non-NUS personnel and observed weather conditions.
2. Similarly, when starting a new page at the start of each days activities, identify the date, time, TDD number, site name, location, NUS personnel and their responsibilities, other non-NUS personnel and observed weather conditions.
3. Include a sketch or map of the site which can be used to locate photo and/or sample locations. Note landmarks, indicate north, and if possible, include an approximate scale, include as many sketches and maps as necessary.

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4. Create a photo log to document photos taken in the field. The photo locations should be referenced on the site sketch or map. Information in the photo log must include the date, time, photographer, sample number, roll number, frame number, photo ID number and description. Indicate if the film is for slides or prints in the column for roll number. Photo ID numbers can be added at the time the photo log is assembled. QAT-2-1.3 provides detailed guidance for Photographic Documentation of Field Activities.
5. Record onsite health and safety measures used. Describe observed potential hazards to health and safety. Document the level of protection used, decontamination procedure used and specific decontamination solutions.
6. As part of the chain of custody procedure, recorded in-situ sampling information must include sample number, date, time, sampling personnel, sample type, designation of sample as a grab or composite, and any preservative used. Sample locations should be referenced by sample number on the site sketch or map.
7. When sampling is complete, a summary log is to be completed. It must include date, time, sample number, description, field book reference page, and the number and date of the chain of custody from on which the sample is listed. Indicate whether or not the sample was split.
8. Information for in-situ measurements must include a sample ID number, the date, time, and personnel taking measurements. Pertinent in-situ measurements include but are not limited to pH, temperature, conductivity, flow measurements, continuous air monitoring measurements, and stack gas analysis. If infield calculations are necessary, they must be checked and signed by a second team member.

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9. All other infield calculations (such as for determining well volumes) must be checked and signed by a second team member.
10. Record details regarding relevant information obtained during the onsite interviews. Include names of persons interviewed, the interest group represented, their address and phone number.
11. Record any other relevant information which would be difficult to generate at a later date.

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ATTACHMENT A

The following form is attached:

"Request for Field Notebooks"

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REQUEST FOR FIELD NOTEBOOKS

SITE NAME: _____

SITE ADDRESS: _____

TDD NUMBER: _____

PROJECT MANAGER: _____

NUMBER OF NOTEBOOKS NEEDED: _____

BOOKS TO BE ASSIGNED TO: _____

DATE NEEDED: _____

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ATTACHMENT B

This attachment provides a copy of the following correspondence:

C-586-9-4-150, From: Paul Clay
Subject: Attached Interrogatories

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INTERNAL CORRESPONDENCE

C-582-9-4-150

TO: See Distribution
FROM: P. Clay *PC*
SUBJECT: Attached Interrogatories

DATE: September 17, 1984

COPIES: File

Attached are some excerpts from interrogatories filed by attorneys for a site owner as part of a court action brought against the owner by EPA. Both REMPO and FIT I have worked at the site and have been asked by EPA to assist in the preparation of responses.

It is suggested that you circulate the attached to your staff, as it reinforces the need for all of the emphasis that we place on field notes, work plans, sample documentation, standard procedures, etc. It is also a good example of tactics used by defense attorneys to stall court proceedings. Also attached is an interesting definition of "document", which came from another court case. Please call if you have any questions.

PC/aw

Enclosure (2)

Distributions:

Region II
~~G. Glenn~~
M. Warner

RECEIVED

SEP 19 1984

NUS CORPORATION
REGION II
SENT TO _____

NUS 004 REVISED 0101

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- (c) the size and volume of such sample.
11. For each and every testing and analysis identified in your answer to Interrogatory 10(a), please state fully and in complete detail:
- ~~(a) the name, address, employer and occupation of each person conducting such testing and analysis;~~
- * (b) the location where such testing and analysis took place, including but not limited to, street address, town and state;
- (c) a complete description of all procedures and protocols followed in conducting such testing and analysis;
- (d) the precise quantitative and qualitative results of such testing and analysis;
- (e) the precise reasons such testing and analysis was conducted;
- (f) the exact cost of such testing and analysis;
- * (g) the date and time of day of such testing and analysis;
- (h) the quality assurance and control procedures used for such analysis;
- (i) the detection limits of such testing and analytical methods; and
- (j) the volume and weight of the sample of such testing and analysis.
12. For each and every soil sample removed by the plaintiff, its agents, servants or employees from property owned by its predecessor, please state fully and in complete detail: or
- * (a) a complete description of such sample;
- * (b) the exact location from which such sample was taken, giving measurements in feet and inches from fixed objects and boundaries;
- * (c) the exact depth in feet and inches from which such sample was taken;
- * (d) the name and address of each person taking such sample;
- * (e) the name and address of each person present when such sample was taken;
- * (f) the date and time of day such sample was taken;
- (g) the exact legal authority relied upon in taking such samples, including the full citation of each statute and other law relied upon;
- (h) a complete description of any and all testing and analysis done on such sample;
- (i) * (1) the rationale for collecting such samples at the identified location;
- (a) if sampling location was changed in field for any reason

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- (j) the procedures for collecting such sample;
 - * (k) the chain of custody form used to transfer such sample;
 - * (l) the decontamination procedures used to ensure there were no cross-contamination of samples;
 - * (m) sample preservation and shipment procedures for such sample; and
 - * (n) the results of any field measurements taken during the collection of such sample.
13. For each and every testing and analysis identified in your answer to interrogatory 12(h), please state fully and in complete detail:
- (a) the name, address, employer and occupation of each person conducting such testing and analysis;
 - (b) the location where such testing and analysis took place, including but not limited to, street address, town and state;
 - (c) a complete description of all procedures and protocols followed in conducting such testing and analysis;
 - (d) the precise quantitative and qualitative results of such testing and analysis;
 - (e) the precise reasons such testing and analysis was conducted;
 - (f) the exact cost of such testing and analysis;
 - (g) the date and time of day of such testing and analysis;
 - (h) the quality assurance and control procedures used for such analysis;
 - (i) the detection limits of such testing and analytical methods;
 - (j) the volume and weight of the sample of such testing and analysis; and
 - * (k) the type of equipment used for such testing and the calibration results of such equipment.
14. For each and every water sample removed by the plaintiff, its agents, servants or employees from property owned by please state fully and in complete detail:
- * (a) a complete description of such sample;
 - * (b) the exact location from which such sample was taken, giving measurements in feet and inches from fixed objects and boundaries;
 - * (c) the exact depth in feet and inches from which such sample was taken;
 - * (d) the name and address of each person taking such sample;
 - * (e) the name and address of each person present when such sample was taken;
 - * (f) the date and time of day such sample was taken;

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- (g) the exact legal authority relied upon in taking such samples, including the full citation of each statute and other law relied upon;
- (h) a complete description of any and all testing and analysis done on such samples;

- * (i) the elevation of the water surface from which such sample was taken;
- (j) the rationale for collecting such samples at the identified location;
- (k) the procedures for collecting such sample;
- (l) the chain of custody form used to transfer such sample;
- * (m) the decontamination procedures used to ensure there were no cross-contamination of samples;
- * (n) sample preservation and shipment procedures for such sample;
- * (o) the results of any field measurements taken during the collection of such sample; and
- * (p) the size and volume of such sample.

15. For each and every testing and analysis identified in your answer to interrogatory 14(h), please state fully and in complete detail:

- (a) the name, address, employer and occupation of each person conducting such testing and analysis;
- (b) the location where such testing and analysis took place, including but not limited to, street address, town and state;
- (c) a complete description of all procedures and protocols followed in conducting such testing and analysis;
- (d) the precise quantitative and qualitative results of such testing and analysis;
- (e) the precise reasons such testing and analysis was conducted;
- (f) the exact cost of such testing and analysis;
- (g) the date and time of day of such testing and analysis;
- (h) the quality assurance and control procedures used for such analysis;
- (i) the detection limits of such testing and analytical methods; and
- (j) the volume and weight of the sample of such testing and analysis.

For each and every water sample removed by the plaintiff, its agents, servants or employees from property owned by its predecessors, please state fully and in complete detail: or

- (a) if sampling location was changed in field for any reason

- (f) the exact cost of such testing and analysis;
 - (g) the date and time of day of such testing and analysis;
 - (h) the quality assurance and control procedures used for such analysis;
 - (i) the detection limits of such testing and analytical methods; and
 - (j) the volume and weight of the sample of such testing and analysis.
18. With respect to statement that "The River is the discharge point for essentially all the groundwater leaving the site," as stated in the Design Studies Report for Emergency Action, Page 11, please summarize and list the specific data that were evaluated to make this assessment.
19. With respect to statement that sediments underlying the River contained significant levels of volatile or organic constituents, please state fully and in complete detail:
- (a) the specific concentrations detected;
 - (b) the specific contaminants detected;
 - (c) the exact location such specific concentrations were located, giving measurements in feet and inches from fixed objects and boundaries;
 - (d) how the headspace analyses relate to analyses of the sediments; and
 - (e) the specific procedures and protocols used for sample collection and analysis.
20. Please state fully and in complete detail how aquifer coefficients were determined such as transmissivity, porosity, and hydraulic conductivity.
21. Please describe fully and in complete detail all Laboratory Quality Assurance/Quality Control Programs used for all soil and water sampling, testing and analysis performed in connection with the plaintiff's investigation of the site.
22. Please state fully and in complete detail the rationale for determining monitoring well locations.
23. Please state fully and in complete detail the rationale for determining well screen depths.
24. Please state fully and in complete detail each manner in which the site investigations performed by changed the original remedial investigation work plan proposed by the NUS Corporation in May, 1983.
- ~~25. Please state the name and address of every resident using water from the town wells in the vicinity of the site.~~
26. For each and every planned and/or on-going interim remedial or other action being taken by the plaintiff, its agents, servants and employees at the site, please state fully and in complete detail:

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EPA prior to a litigation

SCHEDULE A

AS USED IN THIS SCHEDULE, THE WORD "DOCUMENTS" SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING: PAPERS, BOOKS, RECORDS, LETTERS, PHOTOGRAPHS, TANGIBLE THINGS, CORRESPONDENCE, COMMUNICATIONS, TELEGRAMS, CABLES, TELEX MESSAGES, MEMORANDA, NOTES, NOTATIONS, LABORATORY WORK PAPERS, OTHER WORK PAPERS, LEDGER SHEETS, TRANSCRIPTS, MINUTES, REPORTS AND RECORDINGS OF TELEPHONE OR OTHER CONVERSATIONS, OR OF INTERVIEWS, OR OF CONFERENCES, OR OF OTHER MEETINGS, AFFIDAVITS, STATEMENTS, SUMMARIES, OPINIONS, REPORTS, STUDIES, DRAFTS OF REPORTS, DRAFTS OF STUDIES, ANALYSES, BULLETINS, NOTICES, ANNOUNCEMENTS, ADVERTISEMENTS, INSTRUCTIONS, CHARTS, MANUALS, BROCHURES, PUBLICATIONS, SCHEDULES, JOURNALS, STATISTICAL RECORDS, DESK CALENDARS, APPOINTMENT BOOKS, DIARIES, LISTS, LOGS, FIELD LOGS, TABULATIONS, SOUND RECORDINGS, COMPUTER PRINTOUTS, GAS CHROMATOGRAMS, MASS SPECTRA, DATA PROCESSING, PROGRAM LIBRARY, DATA PROCESSING INPUT AND OUTPUT, MICROFILM, BOOKS OF ACCOUNT, RECORDS, INVOICES, DIAGRAMS, GRAPHS, GRAPHS OR MATERIALS WITH HANDWRITING OR OTHER PRINTING ON THEM, BOOKS, LIBRARY REFERENCES, TEXTBOOKS, TREATISES, GOVERNMENT PUBLICATIONS, AND ANY OTHER DOCUMENTS OF ANY KIND WHATSOEVER CONCERNING OR RELATED IN ANY WAY TO THE CLAIMS ASSERTED BY THE UNITED STATES.

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Region II FIT
Quality Assurance Guidance

Photographic Documentation of Field Activities

Preparer:

J. Kent L. L. L.

Date:

2/11/85

Review/Approval:

Ronald M. Noman for

Date:

RPM
2/12/85

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01/01/85

PHOTOGRAPHIC DOCUMENTATION OF FIELD ACTIVITIES**1.0 Purposes**

During off site and on site investigations, photographs can provide information which can be used to help assess the magnitude of the problem and document visual proof of potential hazards. Because such information may provide evidence in support of legal action, photographs and negatives must conform to document control requirements.

2.0 Applicability

This procedure is applicable to both on site and off site investigations. The information presented is to be considered in the preparation of work plans.

3.0 Discussion

All activities related to the collection of photographic evidence during on site and off site investigations are to be controlled by detailed work plans. Photographs will help document site conditions observed and the evidentiary value of samples collected in the field.

4.0 References

This procedure complies with the following sections of the NUS Superfund Division Quality Assurance Manual.

<u>Procedure</u>	<u>Paragraph/Section</u>
QAP 4.1 Field Data Collection	6.3
QAP 7.1 Identification of Controlled Evidentiary Documents	6.1
QAP 7.2 Issuance and Distribution of Controlled Documents	6.10

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<u>Procedure</u>	<u>Paragraph/Section</u>
QAP 11.1 Offsite Reconnaissance	6.6
QAP 11.2 Onsite Inspections	6.5.1, 6.7, 6.8.3

5.0 Definitions:

None

6.0 Responsibilities:

The field operations project manager and the Region II FIT project manager are responsible for implementation of this procedure.

7.0 Procedure:

Photographs are important in documenting the cause-and-effect relationship of the off site migration of hazardous materials, especially with respect to environmental damage and potential exposure to the public. Photographs should clearly demonstrate proper field procedures. Specifically during on site inspections, photographs shall be taken at various locations to document conditions and provide proof of potential hazards. During sampling activities, photographs must be taken to document sample locations and help demonstrate that samples were being properly taken. Subjects of interest for which a photo may be taken are listed below:

1. Sampling locations.
2. Sampling activities.
3. Over-all views of the site, showing physical characteristics such as ponds and hills or man-made features such as roads and buildings.
4. On site and adjacent land use.

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5. Entrances, fences, access roads and gates.
6. Posted notices and signs displaying ownership, permits, land use, etc.
7. Drums or stockpiles.
8. Leachate seeps, pools, discolored water or oil-stained soil.

A 35-mm color print and slide should be taken of each subject of interest. A polaroid-type camera is a recommended back up.

Avoid using unusual filters, lenses or films. If these are used for any reason, document the reason and specify the equipment used in the field logbook. All photos are to be documented chronologically in a tabular form in the field logbook (see QAT-2-1.2). Documentation is to be as in the following example:

<u>Date</u>	<u>Time</u>	<u>Photographer</u>	<u>Sample #</u>	<u>Roll #</u>	<u>Frame #</u>	<u>ID #</u>	<u>Description of Photo</u>
mm/dd/yy	0945	A. Thomas	123	1P Print	1		J. Smith & B. Jones sampling at #1 Main Street. Looking SE. Note dump in back- ground.
mm/dd/yy	1023	J. Smith	124	1S	1		

In accordance with the example above, please note the following guidance when generating a photo log.

- o Indicate the time when photos and slides are taken using the 24-hour clock. Example: 3:00 pm would translate to 1500
- o When applicable, sample number should be referenced on a site sketch or map.

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- o When indicating the film roll number, use a suffix of a P or S to indicate print or slide film respectively.
- o Indicate the sequential frame numbers for both slides and prints. The frame numbers in the photo log will be chronological but may not be in sequence with the number sequence indicated on the developed slide or print negatives.
- o The description of photo should be detailed enough to describe the scene depicted.

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