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CONTRACT CONSTRUCTION QUALITY PLAN RICHARDS GEBUR AIR FORCE BASE
KANSAS CITY MO
3/31/1995
DAMES & MOORE

**CONTRACT CONSTRUCTION QUALITY PLAN
RICHARDS-GEBAUR AIR FORCE BASE**

F41624-94-D-8102

DELIVERY ORDER 0001

**PREPARED FOR AIR FORCE CENTER FOR
ENVIRONMENTAL EXCELLENCE**

BROOKS A.F.B., TEXAS

March 31, 1995

**PREPARED BY
DAMES & MOORE, INC.**

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ACRONYMS

ADC	Air Defense Command
AFB	Air Force Base
AFBCA	Air Force Base Conversion Agency
AFCS	Air Force Communications
AFRES	Air Force Reserve
BCT	Base Realignment and Closure Cleanup Team
CFR	Code of Federal Regulations
CM	Corrective Measures
CQA	Construction Quality Assurance
CQC	Construction Quality Control
DRMO	Defense Revitalization and Marketing Office
EPA	Environmental Protection Agency
FFA	Federal Facility Agreement
FFS	Feasibility Field Study
FS	Feasibility Study
GSA	General Services Administration
HSWA	Hazardous and Solid Waste Amendments
LTSD	Land, Treatment, Storage and Disposal
MAC	Military Airlift Command
MDNR	Missouri Department of Natural Resources
ND	Not Determined
NPL	National Priorities List
PA	Preliminary Assessment
PCB	Polychlorinated Biphenyls
QAM	Quality Assurance Manager
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RFA	RCRA Facility Assessment
RFI	RCRA Facilities Investigation
RI	Remedial Investigation
SC	Site Characterization
QAM	Quality Assurance Manual
TGD	Technical Guidance Document
UST	Underground Storage Tank

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1.0 INTRODUCTION

1.1 LOCATION AND PHYSICAL ENVIRONMENT

Richards-Gebaur Air Force Base (AFB) is an Air Force Base Conversion Agency (AFBCA) base located in west-central Missouri, approximately 18 miles south of downtown Kansas City and about 3 miles east of the Kansas state line.

Richards-Gebaur AFB is located within the Osage Plains region of the Central Lowland physiographic province. The region is characterized by low relief, wide, maturely dissected uplands, and relatively steep valley slopes. The topography of Richards-Gebaur AFB is gently rolling with an elevation range between 1,060 and 960 feet above mean sea level. Most of the base storm water drains into the Little Blue River with the exception of the Belton Training Complex which drains into the West Fork of East Creek. Both of these watersheds ultimately flow into the Missouri River

1.2 GENERAL HISTORY

In 1941, portions of the land now occupied by Richards-Gebaur AFB were acquired by Kansas City for use as an auxiliary airport (Grandview Airport). In 1952, the Aerospace Defense Command leased the airport from the city for air defense operations, and in 1953 the property (approximately 2,400 acres) was formally conveyed to the United States government for establishment of an Air Force base. The C-46 airlift aircraft were the original Air force aircraft stationed at the base. Conversion to C-119 and C-124 aircraft occurred in 1957 and 1961, respectively. In 1957, the base was named Richards-Gebaur AFB.

Until 1970, the Air Defense Command (ADC) had the primary mission on base. In 1970, the Air Force Communications Service (AFCS) relocated its headquarters from Scott AFB, Illinois, to Richards-Gebaur AFB and assumed command. In 1971, the C-124 reciprocating engine aircraft were phased out and replaced with C-130 aircraft. It is reported that this conversion cut the industrial waste produced by the base as well as cutting the

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generation of waste oil in half. AFCS moved back to Scott AFB in 1977 and Richards-Gebaur AFB came under the Military Airlift Command (MAC).

Air Force Reserve (AFRES) assumed operation control of the base in October 1980. In 1981, around 80 percent of the base property (including runways and taxiways) was excessed (transferred) to the General Services Administration (GSA). The GSA then transferred a majority of the airport-related property to Kansas City Aviation Department as a public benefit transfer with the condition of continued runway access (for a fee) by the Air Force. Other excessed parcels were also transferred by GSA for public and other military uses to Kansas City, Federal Aviation Administration, city of Belton, the Department of the Navy, and the Department of the Army. Base property presently is comprised of about 428 acres. Associated with this acreage is about 421 acres of easements.

Richards-Gebaur AFB closed in September 1994 and all property is now under the operational control of AFBCA.

1.3 HAZARDOUS MATERIALS/HAZARDOUS WASTE OVERVIEW

Hazardous materials commonly utilized at Richards-Gebaur AFB included aviation and motor fuels, various grades of lubricants and heating fuels, hydraulic fluids, cleaning solvents and corrosives, paints, thinners, pesticides, and batteries. Hazardous waste was stored at 29 designated accumulation points and transferred to Facility 973 for off-base disposal. Richards-Gebaur AFB disposed of hazardous waste in cooperation with the Defense Reutilization and Marketing Office (DRMO) located at Whiteman AFB, MO. Hazardous waste is shipped off base in compliance with Missouri Department of Natural Resources (MDNR) and Resource Conservation and Recovery Act (RCRA) regulations.

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1.4 AUTHORITY

Subtitle C of the RCRA requires the U.S. Environmental Protection Agency (EPA) to establish a federal hazardous waste management program. This program must ensure that hazardous wastes are handled safely from generation until final disposition. EPA issued a series of hazardous waste regulations under Subtitle C of RCRA that are published in Title 40 Code of Federal Regulations (CFR) Parts 260 through 265 and Parts 122 through 124.

Parts 264 and 265 of 40 CFR contain standards applicable to owners/operators of all facilities that treat, store, or dispose of hazardous wastes. Wastes are identified or listed as hazardous under 40 CFR Part 261. Part 264 standards are implemented through permits issued by authorized States or EPA according to 40 CFR Part 122 and Part 124 regulations. Land treatment, storage, and disposal (LTSD) regulations in 40 CFR Part 264 issued on July 26, 1982, and July 15, 1985, establish performance standards for hazardous waste landfills, surface impoundments, land treatment units, and waste piles. Part 265 standards impose minimum technology requirements on the owners/operators of certain landfills and surface impoundments.

The EPA construction quality assurance (CQA) program for hazardous waste land disposal facilities, is intended to ensure that all design criteria, plans, and specifications are met or exceeded. Regulations are addressed in a Technical Guidance Document (TGD), Reference 6.01 in Section 6, which presents the required elements of a site-specific CQA plan. This TGD covers CQA for hazardous waste landfills, surface impoundments, and waste piles.

Compliance activities include management of petroleum products, hazardous materials, hazardous waste, asbestos, solid waste, pollution prevention, water quality, air quality, pesticides, PCBs, etc.

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The following Missouri law and regulations are applicable to AFBCA:

Missouri Statutes

Law -	Title 16 Chapter 260	
Rules -	Solid Waste	10CSR80
	Hazardous Waste	10CSR25
	UST/AST	10CSR20
	Hazardous Substance	10CSR24

1.5 RESOURCE CONSERVATION AND RECOVERY ACT

In 1984 the Hazardous and Solid Waste Amendments (HSWA) were passed that established broad new authorities in the RCRA program to assist USEPA in the cleanup of releases of hazardous waste/hazardous constituents that threaten human health or the environments. HSWA extended RCRA authority to release to all media and all units at RCRA facilities. Under HSWA, the RCRA corrective action program consists of three phases:

- RCRA Facility Assessment (RFA)
- RCRA Facility Investigation (RFI)
- Corrective Measures (CM)

No permitted RCRA facilities are present or required by law at Richards-Gebaur AFB.

1.6 INSTALLATION RESTORATION PROGRAM

The Installation Restoration Program (IRP) was initiated at Richards-Gebaur in 1982 with a preliminary assessment of past waste disposal practices. Since that time, multiple studies have identified seven IRP sites (on AFBCA property). Preliminary assessment work is in progress at one IRP site. SC work is complete at two of the seven IRP sites. SC is in progress at five IRP sites. RI work is in progress at one IRP site. One IRP site is undergoing site closure (RI/FS) work was not required). The only IRP site with SC evaluation underway is the Fire Valve Area-SS009. Additional SC is planned for four IRP sites. Physical evidence (not just sampling) can trigger a preliminary assessment/site characterization.

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1.7 COMPLIANCE PROGRAM STATUS

Compliance activities at Richards-Gebaur AFB are being coordinated with environmental restoration activities under the IRP when necessary. The base does not require or have any RCRA-permitted facilities for waste storage, and does not treat hazardous waste on site. The base is closed and does not generate hazardous waste. The generator ID has been retired. Compliance activities address the management of petroleum products, hazardous materials, hazardous waste, asbestos, solid waste, pollution prevention, water quality, air quality, pesticides, polychlorinated biphenyls (PCBs), etc. Corrective actions and closure activities remain compliance issues regardless of size or scope. AFBCA has not generated hazardous waste; however, should this occur it is expected that the base would be a small quantity generator.

1.8 NCP STATUS, FEDERAL FACILITIES AGREEMENTS, ETC.

Richards-Gebaur AFB has no sites on the National Priorities List (NPL) and subsequently has not entered into a Federal Facility Agreement (FFA).

1.9 FORMAT

This plan includes five elements which cover all planned construction activities for Richards-Gebaur AFB which include:

1.9.1 Responsibility and Authority

The responsibility and authority of organizations and key personnel (by title) involved in remedial actions are described in this CQA plan. These organizations are:

- Owner - Department of Defense
- Permitting Agency - MDNR
- Reviewing Agency - EPA
- Remedial Action Contractor - Dames & Moore
- Subcontractors - As required

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1.9.2 CQA Personnel Qualifications

The qualifications of the CQA officer and supporting CQA inspection personnel from the above organizations are presented in this CQA plan. Training and experience necessary to fulfill their identified responsibilities are delineated in individual site specific CQA plans.

1.9.3 Inspection Activities

The observations and tests that will be used to ensure that construction meets all design criteria, plans, and specifications are described in this CQA plan.

1.9.4 Sampling Strategies

Sampling activities, sample size, methods for determining sampling locations, frequency of sampling, acceptance and rejection criteria, and methods for ensuring that corrective measures are implemented as addressed in the design criteria, plans, and specifications are presented in this CQA plan and/or included in contractor procedures within their respective quality assurance programs.

1.9.5 Documentation

Reporting requirements are described this CQA plan. Included are daily construction summary reports (daily logs), nonconformance reports, test and sampling data reports, acceptance/rejection reports, and project final report. Provision for storage of all records is also presented.

2.0 RESPONSIBILITY AND AUTHORITY

2.1 PRINCIPAL ORGANIZATIONS

This section describes what organizations are involved with the design and construction of projects at the Richards-Gebaur AFB.

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2.2 RESPONSIBILITIES

Responsibilities of each existing organization are delineated for all phases of the Richards-Gebaur AFB remedial action projects. These responsibilities are summarized as follows:

2.2.1 AFCEE/ERB

- Responsible for the technical monitoring of Contractor performance, and will act as the technical point of contact for this effort.
- Expedite the technical reviews of the Contractor's proposal for any changes to the delivery order.
- Authorize release of materials or actions requiring Government concurrence, as specified in the delivery order.
- Coordinate activities with contractor personnel and other individuals involved in this effort at Richards-Gebaur AFB.
- Expedite the review of invoices/payment vouchers.
- Be responsible for the inspection and acceptance of the completed effort specified in subject delivery order.
- Maintain written records, for PCO review, of all actions taken by technical personnel and the contractor to ensure that costs, schedule and technical performance is documented.
- Attend meetings, i.e., site visits, pre-performance conferences, as the official Government technical representative, as needed.
- Expedite the evaluation of technical reports submitted by the contractor.

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2.2.2 Permitting Agency

The MDNR is the State agency authorized to administer requested TSD facility permits.

2.2.3 Environmental Protection Agency (EPA)

EPA Region VII has review oversight over MDNR permitting at Richards-Gebaur AFB.

2.2.4 Remedial Action Contractor

Dames & Moore is responsible for all phases of the remediation process as described in the contract.

2.2.4.1. Quality of Shop Drawings

Dames & Moore is responsible for quality of shop drawings. Responsibilities will be described in individual site specific CQA plans.

Shop drawings will include the following, as appropriate:

- Calculations
- Analysis
- Drawings
- Technical specifications (construction and procurement)
- Review/disposition of non-conformance
- Review/monitor test records
- Prepare technical procurement packages.

Engineering during remediation will include, as appropriate:

- Shop drawing review
- Checking and verification of all design documents
- Internal assessments to monitor adherence to procedures
- Technical review and approval of submittals for procured item.

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2.2.4.2 Construction Inspection

Dames & Moore is responsible for construction inspection service. Responsibilities will be described in individual site specific CQA plans. Inspection services will include as appropriate:

- Prequalification of vendors (manufacturer, supplier, installer)
- Receipt inspection of all materials used for delivery orders.
- Acceptance inspection and/or testing
- In-situ testing of aggregates, soils, concrete, and other material
- Laboratory analysis
- Photography
- Control survey
- As-built drawings
- Documentation
- Evaluation of quality control results
- Documentation and control of non-conformance
- Evaluation of quality assurance results
- Records management.
- Documentation and control of non-conformance

2.3 QUALITY ASSURANCE PROGRAM

Dames & Moore has a rigorous QA program based on national standards including requirements of American National Standards Institute (ANSI) and the America Society for Testing of Materials (ASTM), (Section 7). The program is documented in the Corporate Quality Assurance Manual. Specific responsibilities will be provided in individual site CQP.

2.3.1 Responsibilities of Key COA Personnel

The Dames & Moore Program Manager is responsible for:

- Overall project management including schedules, costs, performance measurement, and corrective actions

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- Final resolution of disputed items of construction
- Approval of engineering shop drawings
- Approval of engineering change orders
- Approval of construction and project closeout
- Project management for all functions including schedule, cost, and technical performance and conformance to regulatory and quality requirements
- Implementation of corrective actions, if required
- Prompt disposition of non-conforming items
- Preparation and issuance of the project final report
- Maintenance of the project central files

The Delivery Order Manager is responsible for the following design related activities:

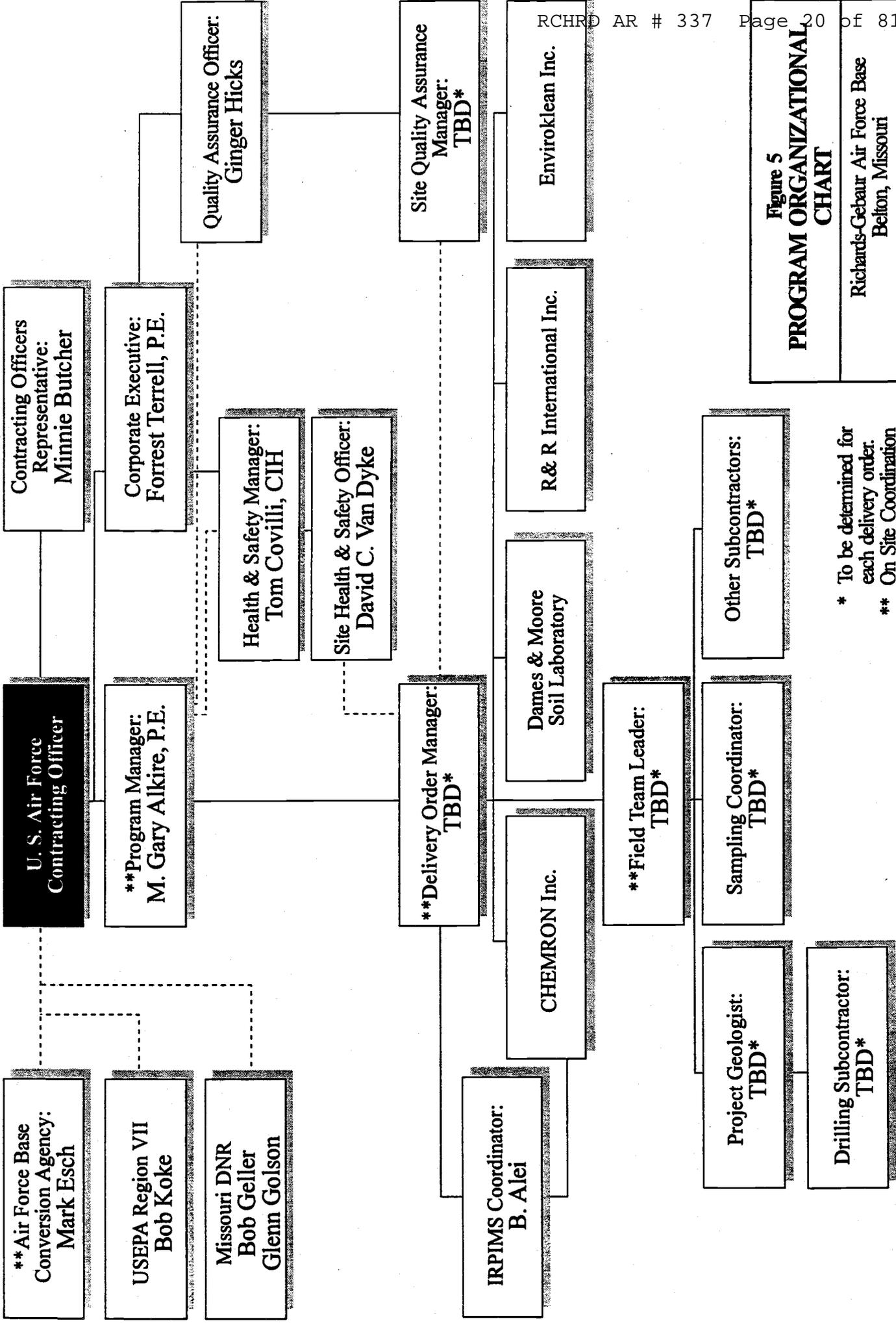
- Engineering design including calculations, analysis, drawings, specifications
- Checking/approval of design documents
- Review of vendor submittals against the requirements of drawings and technical specifications
- Technical Disposition for Non-conformance Reports (NCRs)
- Design change control during construction
- Approval of Inspection Plans

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The Delivery Order Manager is responsible for the following construction activities:

- Meeting all project objectives including technical quality, schedules, costs, progress and regulatory requirements
- Schedule and coordination of all inspection and testing activities at specified "hold" points (see Responsibility Matrix, Appendix 1) in accordance with design requirements
- Ensure equipment requiring calibration is controlled and properly used
- Data recording, validation, reduction, and analysis per applicable standards and procedures
- Logs, progress reports, photographs, and other documentation of construction activity and quality processes
- Prompt identification of defective work and implementation of corrective measures or replacements as necessary
- Implementation of corrective actions, as required
- Inspection and/or acceptance testing
- Conducting of assessments to verify that inspection, data acquisition and management, and documentation is being accomplished in accordance with Richards-Gebaur AFB requirements
- Quality assurance program and supporting document
- Monitor contractor compliance by conducting assessment

Organizational Chart Richards-Gebaur Air Force Base Delivery Order No. 1



**Figure 5
PROGRAM ORGANIZATIONAL
CHART**

Richards-Gebaur Air Force Base
Belton, Missouri



* To be determined for each delivery order.
** On Site Coordination

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The Site Quality Assurance Personnel are responsible for:

- Inspection of in-situ or in-plant construction at all "hold points" as indicated in the responsibility matrix in Appendix 1
- Inspection related documentation of construction progress and quality acceptance inspection at specified "hold points"
- Acceptance/rejection of in-situ or in-plant construction/fabrication at specified "hold points"
- Initiation of reports of non-compliance and closure verification
- Use and maintenance of inspection and testing instruments requiring calibration
- Summary progress reports
- Inspection of as-built drawings
- Independent testing services as specified by Construction Specifications and as delineated by site specific plans
- Data acquisition for verification of in-situ densities, aggregate and soil mixture production, concrete quality, etc., for all construction as requested by contractor and at "hold points" as indicated in the responsibility matrix in Appendix 1
- Laboratory analysis including design, specification, test, and sampling of concrete mixtures
- Documentation of test results through field and laboratory report
- Calibration of materials testing instruments and equipment

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The Project Geologist is responsible for:

- Coordination of design and construction features with site characterization parameters
- Resolution of technological matters concerning geology, hydrology, and/or hydrogeology

The Field Team Leader is responsible for:

- Development and implementation of appropriate construction procedure
- Control of construction schedules, costs, progress
- Quality of construction
- Operation, maintenance and calibration (where applicable) of all equipment used for construction
- Prompt disposition of non-conforming items including the removal, replacement, or re-work of any portion of the work or materials not meeting design specifications until specifications are met
- Preparation of procurement documents for purchase of materials and their placement in the work in accordance with the design requirements
- Replacement and re-compaction of materials removed for testing purposes
- Obtaining disposition of deficiencies involving use "as-is" or repair, rework, reject from the design engineer
- Construction safety

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The Site Quality Assurance Manager is responsible for:

- Quality control inspection of construction
- Application of quality control inspection "hold points" in which work on a particular construction is stopped pending acceptance inspection by indicated person/organization
- Development and implementation of inspection procedure
- Verification of equipment calibration prior to use
- Inspection planning
- Documentation and reporting deficiencies
- Qualification of subcontractors
- Receipt inspection of purchased items and services to determine conformance to design specifications
- Observing and accepting/rejecting material delivery and unloading processes
- Verification of construction practice consistent with the objective of meeting the requirements of the approved plans and specifications for the Richards-Gebaur AFB
- Conducting assessments to ensure adherence to procedures in construction inspection, testing, surveying and procurement functions identified in the responsibilities matrix
- Achievement of quality standards for all construction features
- QC review of subcontractor work

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2.3.2 Subcontractors Responsibilities

Subcontractors will be solicited for the Richards-Gebaur AFB project to provide manufacture, supply, installation, and test specifically procured materials. Procurement specific CQA documentation will be provided in delivery order specific CQA plans. Technical requirements will consist of Richards-Gebaur AFB drawings and specifications prepared by Dames & Moore (see Appendix D).

Subcontractors under the auspices of contractor CQA personnel, will be required to prepare and submit for approval the following:

- CQA plans (to be inserted in Appendix E of this CQA plan) that cover all activities included in their scope of work for manufacture, supply, installation, and test of special materials and related systems and equipment
- Certifications for required personnel qualifications, methods, and equipment

Each manufacturer, supplier, and installer must pre-qualify by being able to produce materials and workmanship that meet overall requirements specified in procurement documents and technical requirements contained in project drawings and specifications as shown in Appendix D. Upon award, subcontractors shall submit CQA plans for their respective scope of work which are subject to the review and approval of CQA. These subcontractor CQA plans will become part of the requirements for the Richards-Gebaur AFB project by being contained in Appendix E of this CQA plan.

Requirements of subcontractor CQA plans may include:

- Material physical properties and test methods
- Shop drawings
- Written instruction for storage handling and installation
- Statement of qualifications for all personnel who will be involved the installation,

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quality control and supervision including education

- A quality control manual describing details including, but not limited to sampling frequency, standard testing procedures, certification labeling of product, and submission of all required QC data and test results
- A detailed description, including equipment to be used, for field installation
- Procedures and list of equipment that will be used

2.4 CONSTRUCTION MEETINGS

Meetings will be held during the procurement and construction phases of the project per the following schedule:

2.4.1 Preconstruction Meeting

A pre-construction meeting will be held prior to the start of construction. CQA personnel from Richards-Gebaur AFB and subcontractor organizations will be present. State and EPA representatives will be invited to attend. The purpose of this meeting is to:

- Ensure that CQA procedures are in place in the central file as part of the CQA plan
- Ensure that all personnel assigned to the project are qualified and trained in the requirements of the CQA plan commensurate with their respective duties and responsibilities
- Provide each organization with all relevant CQA documents and supporting information
- Familiarize each organization with the site-specific CQA plan and its role relative the design criteria, plans, and specifications

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- Determine any changes to the CQA plan that are needed to ensure that the facility will be constructed to meet or exceed the specified design
- Review the responsibilities of each organization
- Review activity schedules for major construction milestones
- Discuss established procedures or protocol for observations and tests including sampling strategies
- Discuss established procedures or protocol for handling construction deficiencies repairs, and retesting
- Review methods for distributing and storing documents and reports
- Review methods for documenting and reporting inspection data
- Review work area security and safety protocol
- Discuss procedures for the location and protection of construction materials and for the prevention of damage of the materials from inclement weather or other adverse events
- Conduct a site walk-around to review construction material and inspection equipment storage locations

This meeting will be documented by the Delivery Order Manager and minutes will be transmitted to all parties.

2.4.2 Construction Meetings

Richards-Gebaur AFB and subcontract personnel will meet on a regular or as required basis.

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- Prepare for critical activities during the procurement and construction phases of the project including in-plant inspections, material acceptance tests, and system inspection, and approval
- Review test data as required
- Address safety, construction, operation, or potential problem areas
- Resolve open issues including nonconformances, disputes, etc.

Progress meetings will be scheduled on a day-to-day basis by cognizant construction and inspection personnel and/or CQA officer and others as required to address significant issues, review previous activities, or resolve problems. Weekly progress reports shall be prepared and distributed by Dames & Moore inspection personnel.

Documentation of all formal meetings will be accomplished through conference reports, memorandums, record of oral information, etc.

3.0 COA PERSONNEL QUALIFICATIONS

3.1 QUALIFICATIONS OF KEY PERSONNEL

Delivery order specific CQPs will include biographies of key quality personnel in Appendix C, including brief summaries of qualifications, education, training, and work history.

4.0 INSPECTION ACTIVITIES

4.1 CONSTRUCTION DOCUMENTS

Appendix D of delivery order specific CQP's will include a set of reduced design drawings\shop drawings, references to the standard construction specifications; and a copy of the project specific specifications.

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4.2 INSPECTION PROCEDURES

The Site Quality Assurance Manager will perform quality control inspections of Richard-Gebaur AFB construction projects in accordance with the inspection and testing methods described in the site specific CQA plans and the appropriate inspection or test procedures.

The Site Quality Assurance Manager will ensure conformance in the field of all construction activities with the contract documents. His authority will not extend beyond that limit without specific approval of the Quality Assurance Officer or described in a delivery order specific plan.

The Site Quality Assurance Manager will conduct visual surveillance of daily construction activities and judge compliance of those activities to contract requirements; prepare daily progress reports; conduct materials sampling and conduct or arrange for testing of these materials; measure and document the amount of work performed on a daily basis; prepare a record of work satisfactorily completed on a daily basis; describe the methods, equipment and manpower employed in the conduct of daily work activities; record any unusual conditions encountered as well as needs to change or amend the contract to accommodate changed conditions; document accidents or safety procedures violations; document and control non-conformance; document corrective measures; and maintain a record of construction on the drawings on which to base "as built" drawings.

The CQA Manager will be responsible for timely preparation and submittal via the Quality Assurance Officer of all required document action and reports.

Detailed procedures and a copy of the daily form are in Appendix G.

4.3 CONTROL OF NON-COMPLIANCE

Dames & Moore policies for documentation, notification and control of non-conformance or non-compliance of Contractor activities emphasize:

- Promptness of notification

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- Immediate verbal notification of the Field Team Leader on site of non-compliance with reference to pertaining sections of the contract documents.
- Written notification following the verbal notification onsite.
- If compliance is achieved within 24 hours, original notice is so marked and filed.
- If compliance is not achieved within 24 hours, copies of the notification are forwarded to the Quality Assurance Officer, Delivery Order Manager, and Program Manager, and a non-conformance report is prepared.
- Non-compliance reports are forwarded to the Quality Assurance Officer, Delivery Order Manager, and Program Manager.

The preparation of a following Non-Compliance Report within 24 hours of issuance of the Non-Compliance Notice provides immediate involvement of Program Manager and assures quick solutions to non-compliance in the field.

The Dames & Moore Site Quality Assurance Manager will work with the Field Team Leader to help avoid reporting and involvement of upper management in the correction of non-compliance.

Corrective measures required to bring a Contractor's activity into compliance with the Contract Documents, are already defined by those Contract Documents. It remains the Field Team Leaders responsibility, in coordination with subcontractors, as appropriate to determine how that compliance is to be accomplished and by what means.

Detailed procedures and copies of sample letters are in Appendix H.

4.4 CHANGE ORDERS

Change orders required so as to meet delivery order objectives will be identified to the Delivery Order Manager. Work will not proceed on these changes without the prior written consent of the Contracting Officer. (All changes (ie, approved, and field) will be noted in the

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daily log).

4.5 GOVERNMENT INTERFACE

Government personnel, who are responsible for acceptance inspection services, shall provide acceptance/rejection inspection functions at prescribed "hold points" shown in Appendix 1. All waivers of hold points will be documented. Acceptance shall be in accordance with current project requirements specified in the Technical Documents (Specification/Design Drawings).

4.6 EQUIPMENT, MATERIALS AND SERVICES RECEIPT INSPECTION

Appendix I provides procedures for receipt inspection of equipment, materials, and services.

5.0 MONITORING TESTS AND OBSERVATIONS

Tests necessary to validate quality attributes of an item will be performed in accordance with approved, documented test procedures. These procedures will provide the following information as applicable:

- Test objectives.
- Test prerequisites, including such things as preparation and completeness of items to be tested, controlled environment conditions, plant conditions, required system isolation and tagging requirements, and personnel training and qualifications
- Range and accuracy requirements for calibrated measuring and test equipment, and need for special tools or materials.
- Acceptance/rejection criteria as defined in the applicable design and/or procurement documents.
- Safety precautions.

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- Step-by-step testing instruction.
- Test monitoring requirements and mandatory inspection hold and witness points.

Where necessary to preclude inadvertent bypassing of a test or operation within a test, measures such as stamps, tags, labels, routing cards, status checklists or other suitable means shall be used to identify the items which have satisfactorily passed the required test or operation. All measuring and test equipment selected for use in the performance of work and acceptance inspections will be of proper type, range, accuracy, and tolerance for the use intended, and shall be uniquely identified and their use shall be controlled. The equipment shall be adjusted, maintained, and calibrated at prescribed intervals or prior to use using procedures and employing standards having known valid relations to nationally recognized standards. If no standard exists, the basis for calibration will be documented. The selection of calibration intervals is based on experience, inherent stability, purpose, frequency and conditions of use, accuracy required, and conditions affecting the measurement.

Calibration identification and control is not required for rulers, tape measures, levels, and other such devices, where normal commercial equipment provides adequate accuracy. The validity of all calibration standards will be supported by certificates, reports, or data sheets which provide evidence of calibration traceability and indicate the date of calibration, facility, and any deviations from standard environmental conditions.

The status of nonconforming, inoperative, or malfunctioning structures, systems, and components shall be documented and the nonconforming item visibly identified to preclude inadvertent use.

Test report will be reviewed and also placed in the project master file by the Site Quality Control Manager.

The quality control inspection methods and testing requirements for soils are shown in Table A since they are common to most delivery orders. Other methods and testing requirements will be defined in the site specific CQA plans and will cover requirements for specific remedial actions.

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TABLE A**Quality Control Inspection Methods for Soil**

Inspection	Inspection Method	Test Method Reference
Removal of unsuitable materials greater than 3 inches in diameter	Observation	N/A
Proof rolling of subgrade	Observation	N/A
Filling of fissures or voids	Observation	N/A
Compaction of soil backfill	Observation/In situ Compaction Tests	ASTM D2922-91 or D3017-88
Surface finishing	Observation	N/A
Sterilization	Suppliers Certificate and Observation	N/A
Slope	Survey	N/A
Depth of excavation	Survey	N/A
Seepage	Observation	N/A
Soil type	Visual-Manual procedure or Particle size analysis	ASTM D2488 or ASTM D422
Soil type	Particle size analysis	ASTM D422
Cohesive soil consistency in field	Penetration tests or Field vane shear test	ASTM D3441 or ASTM D2573
Strength test in laboratory	Unconfined compressive strength Triaxial compression	ASTM D2166 ASTM D2850

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Inspection	Inspection Method	Test Method Reference
Moisture content	Nuclear - Field Oven-dry method	ASTM D 3017 ASTM D2216
In-place density	Nuclear method	ASTM D2922

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Inspection	Inspection Method	Test Method Reference
Moisture-density relation	Modified and Standard Proctor	ASTM D1557 ASTM D598
Strength test in laboratory	Unconfined compressive strength or Triaxial compression	ASTM D2166 or ASTM D2850
Cohesive soil consistency in field	Penetration tests or Field vane shear test	ASTM D3441 or ASTM D2573
Permeability	Flex Wall Saturated Permeability	ASTM D5084
Relative Density	Min/Max Index	ASTM D4254/D4243
Atterburg Limits	Property Index	ASTM D427/D4318
Swell/Settlement		ASTM D4546

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6.0 SAMPLING STRATEGIES

6.1 OVERVIEW

The responsibility matrix in Appendix A indicates the responsible organizational components for sampling, testing, and acceptance of construction features detailed in the Richards-Gebaur AFB project drawings and specifications.

Appendix B outlines procedures for sampling, testing, acceptance, data requirements, etc. of Richard-Gebaur AFB work features for each contractor organization. Operating procedures are part of Dames & Moore Corporate Quality Assurance Manual (QAM) as discussed in Section 2.3.

Subcontractor(s), under the auspices of Dames & Moore, are responsible for the manufacture, supply, and installation of materials. These subcontractors are required to prepare and submit CQA plans which cover all sampling and testing under their respective scopes of work. Subcontractor CQA plans must meet the technical requirements as contained in the Richards-Gebaur AFB project drawings and specifications.

When required, Dames & Moore will conduct "in-plant" inspections prior to release for shipment of materials. Dames & Moore has responsibility for acceptance of materials at the site and for approving subcontractor plans for material installation, test, and acceptance. After such approval, subcontractor CQA plans will form Appendix E of this CQA plan. The responsibility matrix in Appendix A delineates detailed responsibilities for subcontractors.

6.2 CONTENT

For CQA activities under each responsible organization, procedures for testing and sampling, and acceptance/rejection, whether "in-plant," "in-situ," or in the laboratory, shall include:

- Required data type
- Criteria for acceptance or rejection

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- Required frequency of testing/sampling based on quantities of materials, time, or other factors as appropriate
- Activities to be conducted by inspectors/testing technicians
- Required equipment
- Documentation requirements
- Other related requirements, standards, etc.

Related general items such as calibration of equipment, change control, and record management shall also be contained in individual contractor QA procedures.

6.3 SAMPLING REQUIREMENTS

Specific sampling responsibilities are designated in Appendix A.

Procedures outlined in Appendix B for activities assigned to contractors include test and sampling frequency and methodology, and referenced industry standards, acceptance criteria imposed by the technical and quality requirements.

- Production test sampling used for acceptance testing shall be selected by an approved random process, such as MIL-STD-105E.
- All testing shall be performed by the designated Independent Testing Laboratory.
- Sample size shall be identified in individual delivery orders.

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7.0 DOCUMENTATION

7.1 OVERVIEW

CQA responsibilities for each organization are designated in the responsibility matrix in Appendix A. Individual contractor organizations are responsible for documentation relating to their respective activities.

7.2 PROTOCOL

Required protocol for generation and management of QA records for specified construction activities is addressed in contractor procedures which includes:

- Preparation and use of required documentation for specific procurement inspection testing, sample selection, and/or data collection requirements
- Review, approval and validation methods and responsibilities
- Data acquisition, verification and preservation
- Forms and formats
- Document control including revisions and updates
- Records storage and management

CQA records for the Richards-Gebaur AFB project include:

- Personnel and material certifications
- Daily construction inspection logs
- Soils and materials testing reports
- Laboratory testing reports
- Non-conformance reports
- Problem disposition/resolution reports

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- Photographs
- Weekly progress reports
- Conference reports
- Project completion (Final) report
- Receipt Inspection Forms

Logs, test reports, and other project documentation will be signed and dated by prepare and approving authority. Exact formats for required documentation covering all Richard-Gebaur AFB CQA activities are included in contractor procedures (Appendix B) or as stated in subcontractor CQA plans contained in Appendix E.

Acceptance inspection/test records, including as-built drawings, will be prepared by Dames & Moore in accordance with the technical and quality requirements and submitted to the master files upon project completion. Copies of all inspection records will be submitted to the Richard-Gebaur AFB project central file upon completion. The project central file will serve as a database for all project activities conducted under this CQA plan.

7.3 PHOTOGRAPHY

Preparing and maintaining a photographic log of all key construction activities including testing and sampling activities is the responsibility of Dames & Moore. Photographs will be clearly marked as to photographer identity, date, time, and brief description of each activity and will be kept in a separate log as part of the Richard-Gebaur AFB central file.

Photography is the responsibility of the Field Team Leader. He will assure that views have been taken of the following:

- Views of major construction at preconstruction and during various stages of completion and when completed.
- Scenes of value in connection with changed conditions, claims, or potential claims.
- Detailed views of work in place for which removal has been ordered because of

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non-compliance with plans and specifications.

- Construction in which unusual difficulties have been overcome or where the subject is of technical interest.
- New methods of construction
- Property of material damages.
- Emergency conditions and safety violations.
- Accident scenes.

The Field Team Leader will verify that each picture taken is completely described and identified.

7.4 FINAL REPORT

A final construction/project report will be prepared by Dames & Moore. It will contain:

- Summary of design and construction activities
- Actual (or by reference) test data, daily logs, intermediate reports and other related documentation to support in situ as constructed
- Conference reports and other documentation for meetings, problem or issue analysis and resolution etc.
- Reduced-size copies of as-built drawings.

7.5 RECORDS MANAGEMENT

Records management is the responsibility of Dames & Moore. Copies of all permanent records will be kept in the Richards-Gebaur AFB central file as required by the contract.

8.0 REFERENCES

The following references are included in the text of this CQA plan to provide a basis for conducting CQA activities to industry accepted standards and methods:

- 7.01 Technical Guidance Document (TGD): Construction Quality Assurance for Hazardous Waste Land Disposal Facilities; EPA/530-SW-86-031, U.S. EPA, dated 10/86
- 7.02 Military Standards Sampling Procurement MIL-STD-105E
- 7.03 American Water Works Association (AWWA)
- 7.04 American Society for Testing and Materials (ASTM), Annual Book of ASTM Standards 1993 Issue
- 7.05 U.S. Department of Energy (DOE), Order 5700.6C, Quality Assurance, dated 1991
- 7.06 American National Standards Institute (ANSI)
- 7.07 Designer's QAP
- 7.08 Contractor's QAP
- 7.09 Drawing List
- 7.10 Dames & Moore Quality Assurance Plan

APPENDIX A

RESPONSIBILITY MATRIX

Responsibilities will be described in individual site specific CQA plans.

APPENDIX B

CONTRACTORS SAMPLING, TESTING; AND ACCEPTANCE PROCEDURES

Procedures will be described in individual site specific CQA plans.

A
P
P
E
N
D
I
X

C

APPENDIX C
PERSONNEL QUALIFICATIONS

Personnel qualifications will be described in individual site specific CQA plans.

APPENDIX D

DESIGN DRAWINGS

APPENDIX E
SUBCONTRACTOR CQA PLANS

Subcontractor CQA plans will be provided in individual site specific CQA plans.

APPENDIX F

FORMS

CHECKLIST**ENVIRONMENTAL REVIEWS OF PROJECT DESIGNS AND DRAWINGS**

REVIEWER: DATE: _____

DOCUMENT(S) NUMBER:

GENERAL:	YES	NO	ND
Does design document include the use or storage of radioactive material or waste, or a location/area contaminated by radioactivity?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does design document involve or affect storage or disposal of hazardous mixed waste, as defined in 40 CFR 261?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does design document involve or affect disposal of nonhazardous solid waste (includes sewage sludge, asbestos waste)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does design document include bulk storage of petroleum products in aboveground or underground storage tanks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does design document require ground clearing or excavations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does design document include particulate or fume discharge other than that resulting from ground clearing or excavation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is project located in a floodplain, as defined in E.O. 11988, or a wetland, as defined in E.O. 11990?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does design document include plumbing and/or wastewater discharge (including storm water)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Will project be affected by storm water as defined in 40 CFR 122?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

GENERAL:

YES NO ND

Does design document involve the removal, abatement, renovation, or disposal of asbestos-containing material (ACM)?

NEPA DOCUMENTATION:

- NEPA documentation exists for this design:
- The existing EIS covers this design:
- Another NEPA document exists for this design (specify: _____)
- A NEPA document is in preparation by
- No NEPA document is required for this design
- NEPA documentation must be prepared:
 - A CX applies (specify: _____)
 - An EA applies (specify: _____)
 - An ADM will be prepared
 - Type of NEPA documentation is yet to be determine
- No further comments are required for this design

Use appropriate comment sheet(s) to clarify positive responses

RADIOACTIVITY COMMENT SHEET

References:

1. 10 CFR 20, Standards for Protection Against Radiation
2. 10 CFR 61, Low-level Radioactive Waste
3. 40 CFR 191, Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High Level and Transuranic Radioactive Wastes
4. Missouri Title 16, Chapter 260

Will design involve removal of soil from an area contaminated by radioactivity? _____

Will radioactive or mixed waste be generated as a result of this design? _____

Does design include provisions for the safe collection and disposal of such waste? _____

Comments:

Drawing not approved based upon these concerns.

Landfill (land application)

Specific References:

Hazardous Waste Landfill: 40 CFR 264 permitting
40 CFR 270 construction

Solid Waste Landfill: 40 CFR 240
NAC 444.1-1000

What permits are required? _____

WATER COMMENT SHEET (Continued)

Part 4 Storm Water

Specific Reference: 40 CFR 122.26
Missouri Title 40, Chapter 640, 10CSR20

Does the design incorporate an industrial activity, or will the design include a conveyance or system of conveyances for storm water? _____

Does the design include provisions for stored materials, including solvents, detergents, plastic pellets, hazardous substances, chemicals reportable under SARA Title III, pesticides, sludges (40 CFR 122-26(a)(12)? _____

Will equipment which handles the above-mentioned materials, be exposed to storm water?

Is a storm water permit required for this activity? _____

Is the designed facility included in an existing storm water permit? _____

Comments:

Drawing not approved based upon these concerns.

ATTACHMENT G
DAILY INSPECTION REPORTS

DAILY INSPECTION REPORTS

PURPOSE

The daily inspection report is a legal document that describes all construction activities taking place on the site for a specific day. The report will be used for progress reporting, contract documentation, and claims.

RESPONSIBILITY

Daily reports shall be completed on the Dames & Moore form (attached) by each project Site Quality Assurance Manager (CQA Manager).

PROCEDURE

1. The CQA Manager will fill in the project title, project number, contractor, date, and the report number, which will be the number of official working days the contractor has worked.
2. The Summary of Construction Activities section should indicate the hours between which the individual writing the daily report worked for the calendar day.
3. The weather shall be described by checking the appropriate box for weather, temperature, wind, and humidity. As inclement weather may be a basis for an extension of time, it is more important to adequately describe poor weather than good weather, and to note changing conditions. Additional comments concerning weather may be provided in the Summary of Construction Activities.
4. Under the Summary of Construction Activities section enter the text for description of work performed for each of the following titles, i.e., delays and difficulties, change order work, orders or instructions given, unsatisfactory work, disputes, tests, safety, and visitors. A complete summary should be given of the work accomplished each day, including the names and types of work of all subcontractors, locations of work, and whether it was completed or not. The work performed should be subdivided by contract, by building (giving location reference in the building), and by trade. Work related to a change order or force account should be noted as such and the start date and completion date should be given for each change.

5. When a contract is being monitored with a CPM schedule, the CQA Manager shall identify the activity of the CPM which directly relates to the description of work performed. From this information the impact on the specific activity may be measured. The date the activity starts and is completed should be noted. The duration of Contractor error will be noted and referenced, and schedule impact will be documented. The CQA Manger will note the critical path controlling activity which is being accomplished, and also describe any loss in productivity that is actually observed. Examples are:
 - Heavy rain caused washout of trench, concrete pour delayed 2 or 3 weeks.
 - Contractor cannot proceed with operations beyond activity number 502.

6. It is of major importance to record the date and time if they have any potential significance in a claim. Examples include:
 - When the event first became apparent.
 - Start and completion dates of the construction activity.
 - Delivery dates of related materials and equipment.
 - The dates of significant actions or the date when the problem was resolved.

7. The report will signed by _____ CQA Manager. A copy will be maintained by the CQA Manager and a copy will be filed in the appropriate official file designation.

ATTACHMENTS

Daily Inspection Reports

For Submittal to Resident Project Representative to compile Daily Construction Report

DATE _____

DAY	S	M	T	W	Th	F	S
-----	---	---	---	---	----	---	---

Project Title: _____ Project No. _____

WEATHER

Feature _____

TEMPERATURE

Contractor _____ Type of Work _____

WIND

HUMIDITY

Brite Sun	Clear	Overcast	Rain	Snow
To 32°	32°-50°	50°-70°	70°-85°	85° up
Still	Moderate	High	Report No.	
Dry	Moderate	Humid		

CONTRACTOR'S WORK FORCE (Indicate classifications, including Subcontractor personnel)
EQUIPMENT IN USE OR IDLED (Identify which) _____

MATERIALS OR EQUIPMENT DELIVERED _____

NON-CONFORMING MATERIALS OR WORK (Describe reason for non-conformance) _____

FIELD PROBLEMS (which could result in delay or claim) _____

QUANTITIES OF PAY ITEMS PLACED _____

SUMMARY OF CONSTRUCTION ACTIVITIES _____

FOLLOWUP INSPECTIONS OF PREVIOUSLY REPORTED DEFICIENCIES
DISTRIBUTION:

INSPECTOR'S DAILY RECORD OF WORK PROGRESS

(CONTINUATION SHEET)

Date: _____

Project: _____

SUMMARY OF CONSTRUCTION ACTIVITIES (Continued)

SITUATIONS NEEDING ATTENTION

ORDERS RECEIVED AND/OR ISSUED

APPENDIX H
CONTROL OF NON-COMPLIANCE

CONTROL OF NON-COMPLIANCE

PURPOSE

The Notice of Non-Compliance is a tool to track those items installed contrary to the contract plans and specifications.

RESPONSIBILITY

It is the responsibility of the Site Quality Assurance (CQA) Manager to ensure that work complies with minimum standards of acceptability. Dames & Moore CQC Managers have the responsibility to notify the Contractor of non-complying work and to judge whether instructions to remedy non-complying work have been satisfactorily addressed by the Contractor in a timely fashion. If not, a formal Notice of Non-Compliance needs to be completed by the CQA Manager.

PROCEDURE

1. When a deficient item of work has been identified by the CQA Manager and not satisfactory repaired by the Contractor, a formal Non-Compliance Notice (Attachment) will be issued.
2. A copy of the notice will be sent to the Field Team Leaders Quality Assurance Officer, Delivery Order Manager and the Program Manager.
3. The Contractor is to notify the Field Team Leader of the intended method of repair by filling out the second part of the form.
4. When items of non-compliance have been satisfactory addressed by the Contractor, a written confirmation of compliance should be prepared for the Project Manager's signature and transmitted to the Contractor (Attachment).
5. As the project approaches completion, all unresolved notices of non-compliance shall form part of the final punchlist for project closeout and final inspection.

ATTACHMENTS

Notice of Non-Compliance
Sample Letter of Compliance



NON-COMPLIANCE NOTICE

To _____

Date	
Time	AM / PM
Inspector	

Project Title _____ Project No. _____

Contractor _____ Contract No. _____

You are hereby notified that tests inspection indicates that the _____

_____ does not conform to the specifications requirements.

The specification violated is Section _____ Article/Paragraph _____

Under the provisions of the contract specifications, the requirements are _____

Noncomplying work may be required to be removed and replaced at no cost to the Owner.

It shall be your responsibility to determine the corrective action necessary, and to determine whether you wish to discontinue operations until additional investigations by the Owner or Engineer confirm or refute the initial findings.

CQA Monitor

Non-compliance notice was received by Contractor on _____
Date

By _____

Title _____

Date: _____

Subject: Project Name _____
Contract No. _____
Notice of Non-Compliance Date: _____

Dear _____

This letter will serve as confirmation that the of Non-Compliance Notice Dated _____ has been satisfactory addressed and completed. Your cooperation in resolving this mater was appreciated.

Very truly yours,

Project Manager

cc: File

APPENDIX I

Equipment, Materials, and Services Receipt Inspection

RECEIPT INSPECTION

Proper inspection on arrival is one of the most important aspects of procuring equipment, materials, and services. The purpose of inspection is to ensure that the equipment, materials, and services received are as ordered. Any nonconformance is entered in the historical quality assurance record for the project.

Receipt inspections are performed as soon as possible after an item has been received. The requisitioner or his/her designee is responsible for performing receipt inspection of equipment and materials. Purchased items or services will not be used until the receipt inspection has been completed.

The person performing the receipt inspection determines whether the equipment and materials meet the following requirements:

- Conditions of the purchase order.
- Correspondence between quantity received and quantity shipped.
- Required documentation to accompany the materials, equipment, or report resulting from services is included.
- Freedom from shipping damage.
- Status of calibration, where applicable.

If the equipment, materials, or services do not meet the above requirements, a deficiency report is prepared. If the deficiency is expected to directly damage quality it is labeled as nonconforming and a nonconforming report is prepared. The preparer of the Purchase Order or the Delivery Order Manager assures that the supplier is notified of the deficiency. Objective evidence (record of telephone conversation or letter) must be prepared and a copy must be supplied to the Site Quality Assurance Manager.

Dames & Moore's "right of access" to perform any necessary audits or surveillance is required in the purchase order to ensure that services provided by suppliers comply with the quality requirements imposed by the specification in those cases where conformance cannot be verified upon receipt.

Source inspections are to be conducted of suppliers providing items or services where indicated by concerns for quality.

Dames & Moore, Inc.

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RECEIPT INSPECTION FORM

LOCATION _____

This inspection form generated on _____ for procurement of

_____ (equipment, material, or service)

from _____

(vendor)

_____ (vendor address)

Purchase Order No. _____

A. The following items must be checked visually (and initialed in the appropriate box).

OK	DEFICIENT	(Item name and description)	NUMBER ORDERED	NUMBER RECEIVED
<input type="checkbox"/>	<input type="checkbox"/>	1. _____	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	2. _____	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	3. _____	<input type="checkbox"/>	<input type="checkbox"/>

If deficient, give resolution: _____

(Name/Title)

(Signature)

(Date)

