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NCBC GULFPORT
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QUALITY CONTROL PLAN SITE 6 NCBC GULFPORT MS
2/15/1995
MORRISON KNUDSEN CORPORATION

QUALITY CONTROL PLAN

**NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI**

SITE 6 - FIRE FIGHTING TRAINING AREA

REVISION 0
FEBRUARY 15, 1995

CONTRACT #N62467-93-D-1106
DELIVERY ORDER #0002
Statement of Work #001

Prepared For:

**SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
P.O. BOX 190010
2155 EAGLE DRIVE
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Prepared By:

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SECTION 0.1 INTRODUCTION

The Quality Control Plan (QCP) presented herein is structured to implement the procedures necessary to achieve and maintain a consistently high level of quality in environmental remediation activities performed for the U.S. Navy Naval Facilities Engineering Command Southern Division. This consistency will be accomplished through the standardization and thorough documentation of field techniques and activities. This QCP is presented in a format specified by the Navy, and is intended to be a working document that provides the structure for achieving a high level of confidence in the quality of Delivery Order work.

Definable Features of Work

This QCP is generated to address the Naval Construction Battalion Center (NCBC) Gulfport remediation activities specified under Delivery Order No. 0002, **Statement of Work #001**. For the purposes of this QCP, the definable features of work include:

- Removal and disposal of existing wooden poles
- Well head reconstruction of the existing recovery well
- Monitoring well installation and development
- Recovery trench construction including excavation, soil disposal, collector well installation, and backfilling
- Conveyance trench construction including excavation, piping installation and backfilling
- Pump and treat system installation

Analytical Sampling

AT NCBC Gulfport, the analytical sampling effort will consist of characterization of excavated soils resulting from remedial activities under this delivery order, including drill cuttings from well installation activities. The Waste Management Plan (Appendix E to the Work Plan) details the approach to management and disposal of wastes generated under this remedial work. Table E-2 in the Waste Management Plan provides a summary of the waste sample analytical parameters. The role of Quality Control is to ensure that sampling is correctly accomplished, including maintenance of the integrity of the sampling process itself.

The objective of field sampling and laboratory analytical procedures is to obtain defensible data using the data quality objective (DQO) process for data collection. Data quality requirements for precision, accuracy, representativeness, comparability, and completeness are defined for a site and must be achieved in order to satisfy DQOs.

A major required component of all field investigation sampling plans is maintaining sample integrity from collection to data reporting. To maintain and document sample possession, chain-of-custody procedures must be implemented. Elements of the chain include at a minimum:

- Sample seals
- Labels with identification numbers to allow for sample tracking
- Field log books
- Field data record forms
- Chain-of-custody records

- Sample analysis request sheets
- Bills of lading and air bills
- Field and laboratory tracking forms

Field and laboratory sample custodians or their designated representatives are responsible for maintaining custody of samples. A sample is considered to be under a person's custody if one or more of the following conditions are met:

- It is in the person's physical possession.
- It is in view of the person.
- It is secured by the person so that no one can tamper with the sample without being detected.
- It is secured by the person in an area that is restricted to authorized personnel.

Chain of custody will be maintained in the field through use of field log books, chain-of-custody records, sample labels, custody seals and airbills/bills of lading. Once the samples have arrived in the laboratory the chain of custody is continued through use of an internal sample tracking system and locked or limited access sample storage areas. All records which are generated through the field and laboratory efforts are part of the Quality Assurance records kept in the project file. Each of the three steps which comprise the chain of custody process are described below.

Field Sample Custody

The sample custody program includes procedures for the preservation of samples, sample identification, recording sample collection locations, and specific considerations associated with sample acquisition. The chain of custody requires at a minimum, the following:

- Appropriate project identification information
- Sample identification
- Sample location
- Sample date and time
- Sample matrix
- Number of containers per sample
- Analysis required
- Samplers name
- Release and acceptance information; i.e., date, location, and technician's signature

In-situ or field measurements (e.g., pH measurements, temperature, conductivity, flow measurements, compaction, and air monitoring data) are recorded in field log books or on field data record forms. Sample containers are labeled or tagged appropriately according to applicable implementing procedures and plans. Labels or tags contain the following information:

- Organization and site name
- Location of sample collection
- Date and time of sample collection

- Preservation
- Sample identification number
- Name(s) of sampler(s)

Samples are accompanied by chain-of-custody records. Completed chain-of-custody documents are retained as quality assurance records and maintained in accordance with the Quality Assurance Program.

Laboratory Sample Custody

Samples are packaged and shipped to the laboratory in accordance with U.S. Department of Transportation requirements with a separate custody record accompanying each shipment. Authorized sample custodians at the laboratories sign for incoming field samples, obtain documents of shipment, and verify data entered onto the sample custody records. The laboratories are required to inform MK of receipt of samples within one working day. If any damage or shipping discrepancy is noted upon receipt of samples, the laboratories are required to inform the MK Quality Control Manager immediately, and the Site Quality Control Supervisor and Project Manager will be notified. The samples are then entered into an internal tracking system and placed in locked or limited access storage in order to maintain internal chain of custody. Contract laboratories are required to maintain custody of samples to assure sample integrity.

Quality Assurance Records

Records generated as a result of analytical sampling activities are Quality Assurance Records and

will be processed in accordance with the requirements of this QC Plan. Documents such as Chain of Custody Records, analytical testing results, and other required laboratory deliverables are essential documents necessary to ensure the integrity and defensibility of data used to make decisions in the remediation process. Further, Quality Assurance Records provide the record of events that have occurred for all features of the remedial work and their adequate generation, review, protection, and submittal is essential to the success of the project.

Data Quality Objective

Analytical sampling at NCBC Gulfport will be classified as Level E per NEESA 20.2-047B. This classification is made to establish the precision, accuracy, representativeness, completeness, and comparability requirements of environmental monitoring and measurement data. Samples will be collected in the field according to the Waste Management Plan and *MK Quality Execution Procedure (QEP) 6.1*, which provides the details for decontamination of sampling equipment, sample packaging and preservation, transportation, sample numbering, chain of custody, and documentation requirements. Samples will be collected in the field and sent to laboratories certified to perform the required analyses. Spiked and duplicate samples will be used to develop estimates of the accuracy and precision of the analytical data. Field surveillance of sampling, field measurements, and chain of custody procedures will be used to verify that proper techniques are being followed.

Three Phases of Control

This QCP integrates the Navy's Quality Control system of the *Three Phases of Control*. These phases, Preparatory, Initial, and Follow-up, represent a logical and systematic approach to

assuring the control and the quality of the remediation work processes. Integration of the Three Phases of Control is accomplished by the performance of Preparatory, Initial, and Follow-up inspections at representative points in the remediation work process. Details of these inspections are contained in Section 7 of this QCP, "Inspection System".

At each phase, Quality Control verification activities may be supplemented by the performance of detailed inspections of a particular activity. In these cases, Field Inspection Checklists have been generated to assure a thorough verification of the work process. The use of Field Inspection Checklists is detailed in the Testing Plan and Log, Section 8 of this QCP. Copies of the specified Field Inspection Checklists are provided in Section 10 of this QCP. When utilized, the completed Field Inspection Checklist is attached to the combined *Contractor Production Report/Contractor Quality Control Report (Form 01400-1/2)*.

Preconstruction/Quality Control Meetings

To ensure that all parties performing work at NCBC Gulfport fully understand the Quality requirements established for this Delivery Order, a Pre-Construction Meeting will be held prior to the start of construction/remediation activities. Attendees at the meeting include the Contracting Officer, or designee, the MK Project Manager, the MK Project Superintendent, and the MK Site QC Supervisor. Minutes of the meeting shall be prepared by the MK Site QC Supervisor and signed by all meeting attendees. A copy of the minutes of the meeting are then provided to the Navy and the MK Charleston Project Management Office .

After construction/remediation activities commence, the MK Site QC Supervisor will conduct *QC Meetings* at least once every two weeks or more frequently if appropriate. QC Meetings will be held with the MK Project Manager and superintendents, foreman, or managers responsible for upcoming work. The purpose of the QC Meeting is to review the minutes of the previous meeting, review the schedule, review the status of submittals, review the work to be accomplished in the next two weeks and any testing and documentation required, resolve any QC and production problems, and address any items that may require revising the QC Plan. QC Meetings will be documented, and a copy of the minutes of the meeting will be provided to the Contracting Officer within two working days after the meeting.

SECTION 1: QUALITY CONTROL PERSONNEL

Site Quality Control Supervisor

The Site Quality Control Supervisor appointed for the execution of Delivery Order 0002 at NCBC Gulfport is Mr. Gary Johnson. Mr. Johnson will report to the MK Program Quality Control Manager based in the MK Charleston Project Management Office. As the Site Quality Control Supervisor, Mr. Johnson is responsible for the following activities:

- Implementation of the Delivery Order Quality Control Plan (QCP);
- Performance of required tests and inspections, as specifically assigned in the QCP;
- Site supervision of the Quality staff, as applicable;
- Assist the PQCM in the submittals process;
- Regular and timely reporting of inspection/test results;
- Certification of completed work, invoices, and reports as may be designated in writing;
- Stoppage of work that does not comply with requirements established contractually.

Resume of Site Quality Control Supervisor

A copy of the resume of Mr. Gary Johnson is provided in Section 3 of this QCP.



INTER-OFFICE CORRESPONDENCE

DATE: December 22, 1994

TO: Gary Johnson FROM: G. Jones
MK Site Quality Control

LOCATION: Projects LOCATION: Charleston Project
Management Office

SUBJECT: **SOUTHDIV Environmental Response Action Contract**
Letter of Appointment-Site Quality Control Supervisor
NCBC Gulfport: Delivery Order 0002

You are hereby appointed as the MK Site Quality Control Supervisor for the Delivery Order No. 0002 remediation activities at NCBC Gulfport. You are responsible for implementing the MK Quality Control program described in the MK SOUTHDIV ERAC Quality Assurance Program Plan and the Quality Control Plan prepared specifically for this Delivery Order. Your duties, summarized below, are performed in support of the Program Quality Manager located at the MK Charleston Project Management Office and include but are not limited to the following elements:

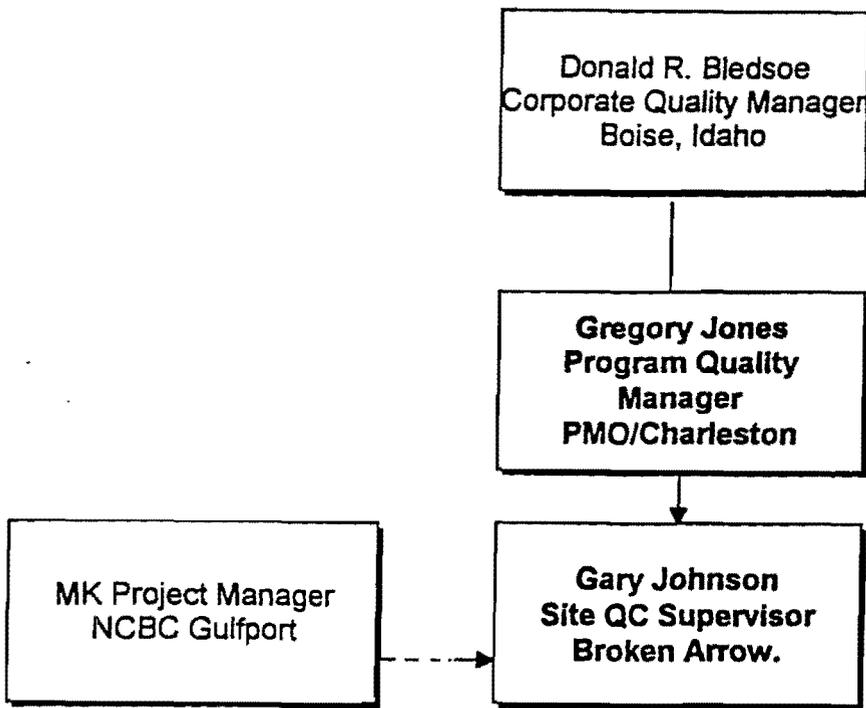
- Manage the performance of all on-site and off-site inspections and testing.
- Evaluate the results of the inspection and testing activities.
- Notify the Project Manager of acceptance or rejection of the work.
- Manage documentation of all inspections and testing and notifications to site project management through Contractor Quality Control Reports.
- Assist the MK Program Quality Manager in the review and certification of all required submittals relating to the Delivery Order for submission to the Navy.
- Interface and coordination of Quality Control activities with the U.S. Navy NCBC Gulfport personnel.

In addition, be advised that you possess the responsibility, the obligation, and the full authority to order the Project Manager to suspend work for which the standards established by the specifications for the performance of the work are not being met or maintained. Under such circumstances, and in cases where you find nonconforming work which does not warrant a suspension of work, you are authorized to direct the correction of nonconforming work.

In conclusion, be aware that the evaluation of our performance on this project will be governed, in large part, by your actions and efforts. As Site QC Supervisor, it is your responsibility to verify that we provide the Navy with a safe, quality project. To this end, you will report the status of your inspections, which reflect project performance, to me periodically.

SECTION 2: QUALITY CONTROL ORGANIZATION

**NCBC Gulfport
DELIVERY ORDER #0002
Quality Control Organization**



SECTION 3: NAMES AND QUALIFICATIONS OF QC PERSONNEL (RESUME)

WORK HISTORY
of
Gary L. Johnson

5/13/94 to Present

MK-FIC - Environmental Restoration Program (ERP)

Idaho Nuclear Energy Labs (INEL)

Idaho Falls, ID

Quality Engineer III - Responsible for: Remedial design/constructibility reviews; Vendor data review; Readiness reviews; Internal/external surveillance; Vendor evaluations; and Support of project field activities.

12/13/93 to 5/13/94

Morrison-Knudsen Corporation

McColl Project, Fullerton, CA

Superfund Site Remediation Study

Quality Program Manager - Responsible for implementation of Quality Assurance Program to include: review and implementation of Quality Assurance Project Plans (QAPPs) & Sampling Analysis Plans (SAPs); review of draft subcontract documents for compliance with SAPs and QAPPs; implementation of daily oversight of QC efforts and coordination with the Technical Task Manager for development of the quality / technical requirements of the SAPs and QAPPs; Quality Assurance Assessments.

5/28/91 to 12/13/93

MK Ferguson, Environmental Division

KP-STIP Project, Kodak Park

Rochester, NY

Quality Engineer III - Responsible for implementation of QA/QC civil and structural, receiving inspection, records retention and Quality Assurance Assessments relating to environmental

remediation of the Kodak Tank Improvement Project.

3/89 to 5/91

Empire Soils Investigations Inc.

Rochester Division

Henrietta, NY

Technical Services Manager - Responsible for: Implementation of the Quality Assurance Program for testing services; Supervisor/scheduler for up to 32 Civil Engineering Technicians; Implementation of the QA/QC Training Program; Nuclear Safety Officer; Project proposals and setup; Report review; and Procurement Officer for the Testing Dept.

3/88 to 3/89

Empire Soils Investigations Inc.

Rochester Division

Henrietta, NY

Laboratory Manager - Responsible for: Implementation of the QA/QC Program for laboratory activities; Supervisor of laboratory testing; and Scheduler for up to 20 field Civil Engineering Technicians.

8/78 to 3/88

Empire Soils Investigations Inc.

Rochester Division

Irondequoit, NY

Senior Civil Engineering Technician - Construction materials field QA/QC for major construction projects at: Kodak Park; Kodak Elmgrove; Orleans Correctional Facility (soils only); General Foods, Avon, NY; and Hyatt Regency Hotel, Rochester, NY. These projects included construction materials testing and inspection of soils, concrete, asphalt, reinforcing steel, structural steel, fireproofing, metal decking, roofing, visual weld, precast concrete, masonry, paint, surveying, and architectural finishes.

8/75 to 8/78

Empire Soils Investigations, Inc.

Rochester Division

Irondequoit, NY

Civil Engineering Technician - Construction materials testing and inspection. Including but not limited to concrete, soils, asphalt reinforcing steel, and structural steel.

4/73 to 8/75

Fact Geotechnical Services

Rochester Division

Henrietta, NY

Civil Engineering Technician - Construction materials testing and inspection. Including but not limited to concrete, soils, asphalt reinforcing steel, and structural steel.

12/68 to 12/72

United States Navy

USS Reclaimer ARS-42

Gunnernate/Guns - 3rd class - Responsible for preventive maintenance system for the Gunnery Dept./Deck Division. Experience included salvage techniques both underwater and aground, pumps from 2-12", and generators up to 50,000 watt.

CERTIFICATIONS (Gary Johnson)

Civil Level II - ANSI N45 2.6

Structural Level II - ANSI N45 2.6

Receiving Level II - ANSI N45 2.6

Radiological Worker Level II - D.O.E.

N.I.C.E.T. Certified Level III - Construction Materials Testing - Concrete, Soils and Asphalt.

N.I.C.E.T. Certified Level I - Geotechnical Engineering Technology - Laboratory and Construction.

A.C.I. Certified Grade I - Concrete Field Testing Technician

Troxler Certified - Nuclear Gauge Operator

F.A.A. Certified - Airport Construction Engineering Technician

N.Y.S.D.O.T. Certified - Concrete Inspector (Batch Plant Operations)

EDUCATION (Gary Johnson)

College: Plattsburg State College - Sept. 1967 to May 1968 - General Education

Community College of the Finger Lakes - June 1968 to Sept. 1968 - General Education

Monroe Community College - 1973 to 1977 (night school) - Construction Technology

SECTION 4: DUTIES, RESPONSIBILITIES, AND AUTHORITIES OF QC PERSONNEL

This section of the Quality Control Plan sets forth the duties, responsibilities, and authorities of Quality Control Personnel executing tests and inspections in support of Delivery Order No. 0002, Remedial Actions at NCBC Gulfport - Gulfport, Mississippi.

The Quality Control organization supporting Delivery Order work at NCBC Gulfport will consist of the following positions:

Site Quality Control Supervisor

A QC Organization Chart is provided in Section 2.0 of this QC Plan. The organization chart identifies the structure and areas of responsibility of the project team and line of reporting authority within the project management organization. Personnel with Quality Control responsibilities are distinct from personnel with project management responsibilities in that the oversight performed for quality control will be independent of the oversight performed for physical remediation/construction activities. Corrective measures necessitated by the results of inspection and testing will be implemented through the site project management personnel.

A copy of the memo appointing the Site Quality Control Supervisor (SQCS) is provided in Section 1.0 of this QC Plan.

The SQCS is responsible for overall implementation of this QC Plan at the project site, and has the authority to act independently in all Quality Control matters. The SQCS reports directly to the MK Program Quality Manager, and interfaces on a day-to-day basis with the site Project Manager. The SQCS has the authority to halt work if it is found to be nonconforming and

further processing may result in an inability to resolve the identified condition. Key responsibilities of the SQCS include:

- Manage the performance of all on-site and off-site inspections and testing;
- Evaluate the results of the inspections and testing;
- Maintain the Testing Plan and Log status provided in Section 8.0 of this QC Plan;
- Perform Preparatory, Initial, and Follow-Up Inspections per the schedule provided in Section 12.0 of this plan;
- Document results of inspection and testing activities on the Contractor Quality Control Report provided in Section 10.0 of this QC Plan;
- Maintenance of the status of the Rework Items List per Section 9.0 of this QC Plan;
- Performing physical sampling as detailed in the Work Plan and in accordance with the Testing Plan and Log provided in Section 10.0 of this QC Plan;
- Ensure that sample custody requirements are maintained.

Laboratory Quality Control Personnel

Laboratory Quality Control personnel will perform the laboratory tests as specified to generate the QC analytical data. Laboratory QC personnel will be qualified by training and experience in accordance with the selected laboratory's Quality Assurance/Quality Control Manuals.

SECTION 5: SUPPORTING/OUTSIDE ORGANIZATIONS

Scope of Work	Organization
Drilling and Monitoring Well Installation	Subcontracted
Recovery Trench Construction and Backfill	Subcontracted
Installation of Vertical Collector Wells	Subcontracted
Conveyance Trench Excavation and Backfill	Subcontracted
Laboratory Analysis (per Waste Management Plan)	Subcontracted

SECTION 6: SUBMITTALS

Submittals relating to this Delivery Order are processed in accordance with *MK Quality Execution Procedure (QEP) 4.1*. This procedure is presented in Section 13 of this QCP.

The initial submittal of the Submittal Register is provided in this section of the QCP.

SECTION 7: INSPECTION SYSTEM

QC Personnel

QC Personnel are responsible for conducting assigned inspections in accordance with the technical requirements provided in the applicable specifications and drawings, and for documenting the results of these inspections, tests, and observations in accordance with this QCP.

Inspection/Test Point

An Inspection or Test Point is that point in a work process where an inspection or test is to be performed. Inspection and Test Points are designated in the Testing Plan and Log contained in QC Plans.

Conduct of Inspections

Specific types and frequencies of tests will be detailed in the Testing Plan and Log contained within the QC Plan. Inspections will be performed utilizing inspection checklists as specified in the Testing Plan and Log.

Preparatory Inspection

The Contracting Officer will be notified at least two working days in advance of each preparatory phase. The preparatory phase inspection will be conducted with the superintendent and the foreman responsible for the definable feature of work. The results of the preparatory phase actions will be documented in the daily Contractor Quality Control Report. Prior of beginning work on each definable feature of work, the following will be performed:

- Review each paragraph of the applicable specification sections;

- Review the contract drawings;
- Verify that appropriate shop drawings and submittals for materials and equipment have been submitted and approved. Verify receipt of approved factory test results, when required;
- Review the testing plan and ensure that provisions have been made to provide the required QC testing;
- Examine the work area to ensure that the required preliminary work has been completed;
- Examine the required materials and equipment, and sample work to ensure that materials and equipment are on hand and conform to the approved shop drawings and submitted data;
- Review the Safety Plan and appropriate activity hazard analysis to ensure that applicable safety requirements are met, and that required material safety data sheets (MSDS) are submitted; and,
- Discuss construction methods.

Initial Inspection

At initiation of a representative sample of the given features of the work, the Site QC Supervisor will verify that the work meets the applicable quality requirements.

The following items will be verified during Initial Inspection:

- the workmanship meets the established quality requirements;
- configuration and construction methods, equipment, and tools appear to be effective;
- calibration of measurement and test equipment;
- materials and articles used are as specified;

- adequacy of inspection / testing methods;
- adequacy of applicable drawings; and,
- adequacy of safety and environmental precautions.

Follow-Up Inspection and Surveillance

The following will be performed for on-going work daily, or more frequently as necessary until the completion of each definable feature of work and documented in the Daily Contractor Quality Control Report:

- Ensure the work is in compliance with contract requirements;
- Maintain the quality of workmanship required;
- Ensure that testing is performed; and,
- Ensure that rework items are being corrected.

QC Plan Inspections

The Site Quality Control Supervisor will perform follow-up inspections based on the Inspection Plan and Log in Section 8.0 of this QC Plan. The Site QC Supervisor will document the results of each day's inspection on the Contractor Quality Control Report. Completed Contractor Quality Control Reports shall be submitted to the Program Quality Manager as a record.

Documentation

Contractor Quality Control Reports are required for each day that work is performed and for every 7 consecutive calendar days of no-work, on the last day of that no-work period. Account for each calendar day throughout the life of the project. The reporting of work shall be identified by terminology consistent with the construction schedule. Contractor quality control

reports are to be prepared, signed, and dated by the MK Site QC Supervisor and shall contain the following information:

- a) Identify the control phase and the definable feature of work.
- b) Results of the preparatory phase meetings held, including the location of the definable feature of work and a list of personnel present at the meeting. Verify in the report that for this definable feature of work, the drawings and specifications have been reviewed, and work methods and schedule have been discussed.
- c) Results of the initial phase meetings held, including the location of the definable feature of work and a list of personnel present at the meeting. Verify in the report that for this definable feature of work the preliminary work was done correctly, samples have been prepared and approved, the workmanship is satisfactory, test results are acceptable, work is in compliance with the contract, and the required testing has been performed, and include a list of who performed the tests.
- d) Results of the follow-up phase inspections held, including the location of the definable feature of work. Verify in the report for this definable feature of work that the work complies with the contract as approved in the initial phase, and that required testing has been performed, and include a list of who performed the tests.
- e) Results of the three phases of control for off-site work, if applicable, including actions taken.
- f) List rework items identified, but not corrected by close of business.
- g) As rework items are corrected, provide a revised rework items list along with the corrective action taken.
- h) Include a "Remarks" section in this report which will contain pertinent information including directions received, QC problem areas, deviations from the QC plan,

construction deficiencies encountered, QC meetings held, acknowledgment that as-built drawings have been updated, corrective direction given by the QC manager, and corrective action taken by the Contractor.

- i) Contractor quality control report certification.

Testing Plan and Log

As tests are performed, the QC manager shall record on the testing plan and log the date the test was conducted, the date the test results were forwarded to the Contracting Officer, and any remarks and acknowledgment that an accredited or Contracting Officer approved testing laboratory was used. Attach a copy of the updated testing plan and log to the last Daily Contractor Quality Control Report of each week.

Rework Items List

The MK QC manager shall maintain a list of work that does not comply with the contract, identifying what items need to be reworked, the date the item was originally discovered, and the date the item was corrected. There is no requirement to report a rework item that is corrected the same day it is discovered. Attach a copy of the MK rework items list to the last Daily Contractor Quality Control Report of each week. The Site QC Supervisor shall be responsible for including on this list items needing rework including those identified by the Contracting Officer.

As-Built Records

The QC manager is required to review the as-built records required by contract to ensure that as-built records are kept current on a daily basis and marked to show deviations which have been made from the contract drawings. The QC manager shall initial each deviation or revision.

Upon completion of work, the QC manager shall submit a certificate attesting to the accuracy of the as-built records prior to submission to the Contracting Officer.

Report Forms

Inspection and test results will be summarized daily on the "Contractor Quality Control Report", and supported by completed inspection/test checklists for the activity. Completed checklists are to be attached to the Contractor Quality Control Report.

Reports shall be submitted daily to the Contracting Officer, with a copy sent to the Program Quality Control Manager in the Project Management Office.

SUMMARY OF INSPECTION APPROACH: NCBC Gulfport DELIVERY ORDER 0002

Project Component	Required Inspection/Test	Applicable Procedure (Section VII of QCP)	Preparatory Inspection	Initial Inspection	Follow-up Inspection
Removal of wooden poles	Decontamination	QEP 8.1	Document on CQCR Form 1400-1	Document on CQCR Form 1400-1	Document on CQCR Form 1400-1
	Pole screening	QEP 8.1			
Well head reconstruction	Remove existing steel bumper post and concrete foundation	QEP 8.1	Document on CQCR Form 1400-1	Document on CQCR Form 1400-1	Document on CQCR Form 1400-1
	Cut existing steel casing and well blank pipe and remove existing concrete pad	QEP 8.1			
	Place new cover over well and concrete pad around well	QEP 8.1			
Piezometer Installation	Borehole drilling	QEP 6.1	Document on CQCR Form 1400-1	Document on CQCR Form 1400-1 and Field Inspection Checklist (FIC) WELL-01	Document on CQCR Form 1400-1
	Well construction	QEP 6.1			
	Well development	QEP 6.1			
Recovery Trench Construction	Excavation	QEP 8.1	Document on CQCR Form 1400-1	Document on CQCR Form 1400-1	Document on CQCR Form 1400-1 and FIC SO-01
	Vertical well collector installation	QEP 8.1			
	Backfilling	QEP 8.1			
Conveyance Trench Construction	Trench excavation	QEP 8.1	Document on CQCR Form 1400-1	Document on CQCR Form 1400-1	Document on CQCR Form 1400-1 FIC PI-01 and FIC SO-02
	Piping Installation	QEP 8.1			
	Backfilling	QEP 8.1			

SECTION 8: TESTING PLAN AND LOG

A Testing Plan and Log has been prepared and included in this section of the Quality Control Plan, and delineates the required tests and inspections applicable to a definable feature of work. The Testing Plan and Log identifies the project component, the specific inspection or test to be performed, the frequency of such testing or inspection, and lists the governing standard which governs the methodology to be employed. Qualitative and quantitative acceptance criteria is provided, either through an actual listing of the criteria or by reference to a supporting checklist, work plan element, or a governing regulation or standard.

The Testing Plan and Log is intended to serve as a living document and be utilized to record, in the field, the status of sampling and inspection performed in support of the Delivery Order work. The Log contains sections for the entry of specific sample or test numbers, the results of sampling or testing activity, and relevant comments.

It is the responsibility of the Site Quality Control Supervisor to ensure that these required entries are made, and that the Testing Plan and Log is maintained current.

TESTING PLAN AND LOG

CONTRACT NO./TITLE: MK SOUTH DIV ERAC

DELIVERY ORDER NO: 0002 NCBC Gulfport

Activity	Frequency	Governing Standard	Performed or Sampled By	Sample or Test Number	Acceptance Criteria	Results	Comments
Wooden Pole Removal							
Decontamination	After removal	Work Plan paragraph 2.4	MK		Visual confirmation of content removal		Document on CQCR
PID screening of poles	After pole decontamination	Work Plan paragraph 2.4	MK Site Health & Safety Officer		PID less than background		Document on CQCR
Well Head Reconstruction							
Removal of existing steel bumper post and concrete foundation	NA	Work Plan paragraph 2.8.1	MK		Work Plan paragraph 2.8.1		Document on CQCR
Cut existing steel casing and well blank pipe and remove existing concrete pad	NA	Work Plan paragraph 2.8.1	MK		Work Plan paragraph 2.8.1		Document on CQCR
Placement of well cover and concrete pad	After reconstruction	Work Plan paragraph 2.8.1	MK		Work Plan paragraph 2.8.1		Document on CQCR

Activity	Frequency	Governing Standard	Performed or Sampled By	Sample or Test Number	Acceptance Criteria	Results	Comments
Piezometer Installation							
Borehole drilling	Following utility survey	Work Plan paragraph 2.8.2	Drilling subcontractor		Work Plan paragraph 2.8.2		Document on CQCR
Well construction	Following borehole drilling	Work Plan paragraph 2.8.2	Drilling subcontractor		Work Plan paragraph 2.8.2		Document on FIC WELL-01
Well development	24 hours after installation of annular seal	Work Plan paragraph 2.8.2	MK		Work Plan paragraph 2.8.2		Document on CQCR
Recovery Trench							
Soil Excavation	After ROICC approval	Work Plan paragraph 2.6.2	Subcontractor		Work Plan paragraph 2.6.1		Document on CQCR
Vertical well collector installation	During construction of trench	Work Plan paragraph 2.6.5	MK		Work Plan paragraph 2.6.5 and 2.6		Document on CQCR
Backfill/compaction -excavated area	2' lifts	Work Plan paragraph 2.6.4	Certified materials testing contractor		Clean sand; Well rounded grains; 90-95% quartz; Coefficient of uniformity ≤ 2.5		Document on Field Inspection Checklist (FIC) SO-01
Disposal of excavated soil	Following backfill of excavated area	EPA 1311 (TCLP) EPA 7.3 (Reactivity) EPA 1010 or 1020A (Ignitibility) EPA 9040 or 9045 (Corrosivity - pH)	LAB		Less than maximum concentrations for contaminants per 40 CFR Part 261		Reference Waste Management Plan, Appendix E

Activity	Frequency	Governing Standard	Performed or Sampled By	Sample or Test Number	Acceptance Criteria	Results	Comments
Conveyance Trench							
Soil Excavation	After ROICC approval	Work Plan paragraph 2.7.2	Subcontractor		Work Plan paragraph 2.7.2		Document on CQCR
Piping Installation	Following trench excavation	Work Plan paragraph 2.7.4	MK		ASTM and Work Plan paragraph 2.7.4		Document on FIC PI-01
Backfill/compaction -excavated area	2' lifts	Work Plan paragraph 2.7.4	Materials testing contractor		Work Plan paragraph 2.7.4		Document on FIC SO-02
Pump and Treat System							
Equipment pad construction	Prior to equipment installation	ASTM and Work Plan paragraph 2.5.1	Subcontractor		ASTM and Work Plan paragraph 2.5.1		Document on FIC CO-01
Pump Installation	Following collection well installation	Work Plan paragraph 2.8.3	MK		Work Plan paragraph 2.8.3		Document on FIC ME-01
Oil/water separator Installation		Work Plan paragraph 2.5.2	MK		Work Plan paragraph 2.5.2		Document on FIC ME-02
Air stripper installation		Work Plan paragraph 2.5.2	MK		Work Plan paragraph 2.5.2		Document on FIC ME-03
Storage tank compound construction		Work Plan paragraph 2.5.1	MK		Work Plan paragraph 2.5.1		Document on CQCR
Product and effluent tank installation	Following compound construction	API recommended Practice, UL standard UL-142 and NFPA 30 & 30A recommended practice and Work Plan paragraph 2.5.2	MK		Work Plan paragraph 2.5.2		Document on FIC ME-04

SECTION 9: REWORK PROCEDURES

The Site Quality Control Supervisor is responsible for ensuring that deviating items are reported, tracked, and resolved. *MK Quality Execution Procedure (QEP) 13.1* establishes the requirements and responsibilities associated with the identification, reporting, and correction of deviating items. A deviating item is a departure from established requirements, and may be corrected through rework of the item or may result in a more formally documented solution requiring engineering evaluation. Deviations are usually identified by inspectors during the conduct of routine inspections or tests; however, deviations may be identified at any time by anyone involved with the work and reported to the applicable inspector or Quality Control Supervisor.

Identified deviations shall be identified on the Rework Items List. The Rework Items List is provided in Section 10 of this QCP, and shall be maintained current throughout the work process.

SECTION 10: REQUIRED QC DOCUMENTATION

This section of the Quality Control Plan delineates the required Quality Control documentation that is to be completed to support the NCBC Gulfport Delivery Order work. Table 10-1 provides a listing of the required checklists to be completed when performing inspections, and specific forms to be used for activities such as sample chain of custody. Samples of these forms are included as attachments to this section.

TABLE 10-1: *Required Documentation*

Document Name	Document Number	Completed By
Contractor Production Report	Form 01400-1	MK Production Supervision
Contractor Quality Control Report	Form 01400-1	MK Quality Control
Chain of Custody Form	Form 1799a/88	MK Quality Control/Sampling Tech.
Rework Items List	N/A	MK Quality Control
Field Inspection Checklist	SO-01	MK Quality Control
Field Inspection Checklist	SO-02	MK Quality Control
Field Inspection Checklist	PI-01	MK Quality Control
Field Inspection Checklist	CO-01	MK Quality Control
Field Inspection Checklist	WELL-01	MK Quality Control
Field Inspection Checklist	ME-01	MK Quality Control
Field Inspection Checklist	ME-02	MK Quality Control
Field Inspection Checklist	ME-03	MK Quality Control
Field Inspection Checklist	ME-04	MK Quality Control

CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE

PHASE	Y - YES; N - NO; SEE REMARKS; BLANK - NOT APPLICABLE	IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION AND LIST PERSONNEL PRESENT
PREPARATORY	THE PLANS AND SPECS HAVE BEEN REVIEWED	
	THE SUBMITTALS HAVE BEEN APPROVED	
	MATERIALS COMPLY WITH APPROVED SUBMITTALS	
	MATERIALS ARE STORED PROPERLY	
	PRELIMINARY WORK WAS DONE CORRECTLY	
	TESTING PLAN HAS BEEN REVIEWED	
	WORK METHOD AND SCHEDULE DISCUSSED	
INITIAL	PRELIMINARY WORK WAS DONE CORRECTLY	
	SAMPLE HAS BEEN PREPARED/APPROVED	
	WORKMANSHIP IS SATISFACTORY	
	TEST RESULTS ARE ACCEPTABLE	
	WORK IS IN COMPLIANCE WITH THE CONTRACT	
FOLLOW-UP	WORK COMPLIES WITH CONTRACT AS APPROVED IN INITIAL PHASE	

TESTING PERFORMED & WHO PERFORMED TEST

TESTING PERFORMED & WHO PERFORMED TEST

REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)

REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)

REMARKS

On behalf of the contractor, I certify that this report is complete and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

 AUTHORIZED QC MANAGER AT SITE

 DATE

GOVERNMENT QUALITY ASSURANCE REPORT

DATE

QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT

 GOVERNMENT QUALITY CONTROL MANAGER

 DATE

CONTRACTOR QUALITY CONTROL REPORT CONTINUATION SHEET

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE

CONTRACT NO.

REPORT NO.

PHASE	Y - YES; N - NO, SEE REMARKS; BLANK - NOT APPLICABLE	IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION AND LIST PERSONNEL PRESENT
PREPARATORY	THE PLANS AND SPECS HAVE BEEN REVIEWED.	
	THE SUBMITTALS HAVE BEEN APPROVED.	
	MATERIALS COMPLY WITH APPROVED SUBMITTALS.	
	MATERIALS ARE STORED PROPERLY.	
	PRELIMINARY WORK WAS DONE CORRECTLY.	
	TESTING PLAN HAS BEEN REVIEWED.	
	WORK METHOD AND-SCHEDULE DISCUSSED.	

PHASE	Y - YES; N - NO, SEE REMARKS; BLANK - NOT APPLICABLE	IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION AND LIST PERSONNEL PRESENT	
INITIAL	PRELIMINARY WORK WAS DONE CORRECTLY.		TESTING PERFORMED & WHO PERFORMED TEST
	SAMPLE HAS BEEN PREPARED/APPROVED.		
	WORKMANSHIP IS SATISFACTORY.		
	TEST RESULTS ARE ACCEPTABLE.		
	WORK IS IN COMPLIANCE WITH THE CONTRACT.		

CONTRACTOR QUALITY CONTROL REPORT CONTINUATION SHEET

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE ..

CONTRACT NO.

REPORT NO.

PHASE Y - YES; N - NO, SEE REMARKS; BLANK - NOT APPLICABLE IDENTIFY DEFINABLE FEATURE OF WORK, LOCATION AND LIST PERSONNEL PRESENT

WORK COMPLIES WITH CONTRACT AS APPROVED IN INITIAL PHASE.

TESTING PERFORMED & WHO PERFORMED TEST

FOLLOW-UP

REWORK ITEMS LIST/DEFICIENCY TRACKING SYSTEM

CONTRACT NO./TITLE: N62467-93-1106/MK SOUTH DIV ERAC

**DELIVERY ORDER NO: #0002, Naval Construction Battalion Center (NCBC) Gulfport
Gulfport, MS**

Number	Date Identified	Description	Contract Requirement (Spec. Section and Para.No.; Drwg. No., etc.)	Action Taken by QC Manager	Resolution	Date Completed	Remarks

REWORK ITEMS LIST/DEFICIENCY TRACKING SYSTEM

Number	Date Identified	Description	Contract Requirement (Spec. Section and Para.No.; Drwg. No., etc.)	Action Taken by QC Manager	Resolution	Date Completed	Remarks



Checklist Title

SOILS

Inspection Code

SO-01

Revision Date

FEB 95

Checklist

Page 1 of 2

**BACKFILL AND COMPACTION
RECOVERY TRENCH**

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
1	Confirm a soils report has been generated to confirm soils types and depth of water table.	N/A		
2	Confirm work areas have been located with the limits of work clearly established (stakes, lines, monuments).			
3	Identify existing improvements and items that are to remain and verify arrangements to protect these items from damage (such as trees, utility poles, buildings, fences and piping, etc.)			
4	Verify precautions are taken to prevent/contain the spillage of gas, oil, slurry, etc. to assure compliance with the base spill plan.			
5	Verify that shoring has been approved, as required, and that provisions have been made for safety barricades.			
6	Verify that excavation is performed in accordance with the Work Plan and within established bounds.			
7	Verify that sub-standard materials (tree roots, etc.) are removed.			
8	Verify that subsoil irregularities such as soft spots are removed.			
9	Confirm that drainage, de-watering, etc., conforms with design/specs.			
10	Ensure that materials, compaction, and work are performed, inspected, and tested in accordance with the Work Plan, procedures, standards, and specifications. Required reports shall be maintained.			

Specific Item Identification or Location, as applicable:

MK Project Number NCBC GULFPORT-Delivery Order 0002	Drawing Number	Work Package Number	Inspection Report Sheet _____ of _____
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Checklist Title

**SOILS
BACKFILL AND COMPACTION
RECOVERY TRENCH**

Inspection Code

SO-01

Revision Date

SEP 94

Checklist

Page 2 of 2

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
11	After an area has been excavated, confirm the area was resurveyed so foundations are properly located.	N/A		
12	Confirm footing areas are compacted.	N/A		
13	Check foundation excavations for adequacy, bracing, form clearance, etc.	N/A		
14	Confirm that footing drains are installed in manner specified.	N/A		
15	Check that backfill materials comply with specifications (moisture, density, gradation).			
16	See that corrective action measures have been performed where required, verified, and documented.			

PROVIDE DETAILED SKETCH:

Specific Item Identification or Location, as applicable:

MK Project Number

NCBC GULFPORT-Delivery Order
0002

Drawing Number

Work Package Number

Inspection Report

Sheet _____ of _____



Checklist Title	Inspection Code	Revision Date	Checklist
SOILS BACKFILL AND COMPACTION CONVEYANCE TRENCH	SO-02	SEP 94	Page 1 of 2

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
1	Confirm a soils report has been generated to confirm soils types and depth of water table.	N/A		
2	Confirm work areas have been located with the limits of work clearly established (stakes, lines, monuments).			
3	Identify existing improvements and items that are to remain and verify arrangements to protect these items from damage (such as trees, utility poles, buildings, fences and piping, etc.)			
4	Verify precautions are taken to prevent/contain the spillage of gas, oil, slurry, etc. to assure compliance with the base spill plan.			
5	Verify that shoring has been approved, as required, and that provisions have been made for safety barricades.			
6	Verify that excavation is performed in accordance with the Work Plan and within established bounds.			
7	Verify that sub-standard materials (tree roots, etc.) are removed.			
8	Verify that subsoil irregularities such as soft spots are removed.			
9	Confirm that drainage, de-watering, etc., conforms with design/specs.			
10	Ensure that materials, compaction, and work are performed, inspected, and tested in accordance with the Work Plan, procedures, standards, and specifications. Required reports shall be maintained.			

Specific Item Identification or Location, as applicable:

MK Project Number NCBC GULFPORT-Delivery Order 0002	Drawing Number	Work Package Number	Inspection Report Sheet _____ of _____
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Checklist Title	Inspection Code	Revision Date	Checklist
SOILS BACKFILL AND COMPACTION CONVEYANCE TRENCH	SO-02	SEP 94	Page 2 of 2

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
11	After an area has been excavated, confirm the area was resurveyed so foundations are properly located.	N/A		
12	Confirm footing areas are compacted.	N/A		
13	Check foundation excavations for adequacy, bracing, form clearance, etc.	N/A		
14	Confirm that footing drains are installed in manner specified.	N/A		
15	Check that backfill materials comply with specifications (moisture, density, gradation).			
16	Verify performance of ASTM D698 Standard Proctor by the testing laboratory for each soil type.			
17	Verify that backfill materials are compacted in lift thicknesses that do not exceed specification. Compaction testing of lifts shall also be confirmed.			
18	Verify performance of ASTM D 3017 and ASTM D 2922 (<i>Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth) and Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth, respectively)</i>) by the Testing Laboratory and documentation of results.			
19	See that corrective action measures have been performed where required, verified, and documented.			

PROVIDE DETAILED SKETCH:

Specific Item Identification or Location, as applicable:

MK Project Number	Drawing Number	Work Package Number	Inspection Report
NCBC GULFPORT-Delivery Order 0002			Sheet _____ of _____



Checklist Title

**PIPING
UNDERGROUND INSTALLATION**

Inspection Code

PI-01

Revision Date

JUL 94

Checklist

Page 1 of 3

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
1	Observe that pipe, fittings, and accessories are handled in such a manner as to avoid damage by impact, abrasions, or other causes.			
2	Check mechanical or finished ends for damage and pipe interior for dirt and foreign material, where accessible.			
3	Assure gaskets, lubricants, compounds, and other mechanical joint materials are handled and stored in accordance with manufacturer's recommendations.			
4	Assure all piping, fitting, and accessory materials are in accordance with job specifications.			
5	Assure all piping is laid in straight lines to alignment shown on drawings and to uniform grades between elevations shown on drawings at terminal structures, change of direction, and other locations.			
6	Check coatings or wrapping for damage before and during installation.	N/A		
7	Assure joints are in accordance with manufacturer's recommendations.			
8	Observe that welds are made by a qualified welder.	N/A		
9	For mechanical joints, assure the recommendations and/or specifications of the manufacturer of the pipe, fittings, and joint material for the lubrication and assembly of the joints are adhered to.	N/A		
10	Verify that bolts on flanges are properly tightened.	N/A		

REMARKS:

Specific Item Identification or Location, as applicable:

MK Project Number

NCBC GULFPORT-Delivery Order
0002

Drawing Number

Work Package Number

Inspection Report

Sheet _____ of _____



Checklist Title

**PIPING
UNDERGROUND INSTALLATION**

Inspection Code

PI-01

Revision Date

JUL 94

Checklist

Page 2 of 3

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
11	Assure piping is placed correctly in trench.			
12	Assure end surfaces are clean when joints are made.			
13	Assure trench width and depth are as specified on drawings.			
14	Assure bedding material is as specified by the Work Plan.			
15	Assure bedding material has been compacted to a density as required by the applicable code or standard.			
16	Check trench bedding for proper grading to provide a solid, continuous, uniform bearing for each section of pipe.			
17	Assure trenches are free of standing water.			
18	Verify that backfilling between joints will restrict any pipe movement during a hydro/pneumatic test.			
19	Assure all required inspections, tests, hydrostatic/pneumatic tests, and/or NDE work for the piping has been performed.			
20	Verify that the pipe/weld areas have wrapped as required by specification.	N/A		
21	Verify that DIPRA (spark) testing has been performed and the wrapping repaired where indicated.	N/A		
22	Assure all inspectors with jurisdictional authority of the applicable codes have witnessed the required inspections and tests, or have waived the witness/hold point.			
23	Check to see backfilling is carried on simultaneously on both sides of pipe to avoid injurious side pressure.	N/A		

Specific Item Identification or Location, as applicable:

MK Project Number

NCBC GULFPORT-Delivery Order
0002

Drawing Number

Work Package Number

Inspection Report

Sheet _____ of _____



Checklist Title

**CONCRETE PLACEMENT POUR CARD
PUMP AND TREAT SYSTEM**

Inspection Code

CO-01

Revision Date

MAR 94

Checklist

Page 1 of 1

PRE-PLACEMENT SIGN-OFF CHECKLIST

ITEM	REFERENCED DRAWING NUMBER AND REVISION	CONSTRUCTION RELEASE		CONSTRUCTION INSPECTION			
		RELEASE BY	DATE/TIME	MK-F SUPERVISOR	MK-F QUALITY	DATE	TIME
FORMS, LINE, AND GRADE							
FORMS - CLEAN, TIGHT; COATING AND BRACING							
STRUCTURAL STEEL							
REINFORCING STEEL							
EMBEDDED ITEMS							
ELECTRICAL							
MECHANICAL							
EMBEDDED PIPING							
DATE AND TIME POUR SCHEDULED							
SPECIFICATION							
CONCRETE SUPPLIER							
CONCRETE MIX DESIGN							
ACTUAL CUBIC YARDS POURED							
TIME POUR COMPLETED							

Attach Batch Plant Tickets and Concrete Test Results to the field copy of this Pour Card.

POST-PLACEMENT SIGN-OFF CHECKLIST

CONCRETE SURFACE PREPARATION							
CONSTRUCTION JOINTS							
FINAL CLEAN-UP, WEATHER PROTECTION							
CURING							

MK Project Number

NCBC GULFPORT - Delivery Order 0002

Start-Up System Number

Work Package Number

Inspection Report

Sheet _____ of _____



Checklist Title

**CONCRETE - PLACEMENT INSPECTION
PUMP AND TREAT SYSTEM**

Inspection Code

CO-01

Revision Date

MAR 94

Checklist

Page 1 of 3

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
1	Verify all requirements of concrete specifications have been met before delivery or placement of concrete – tests, mix design, ingredients, inspections, etc. Specifications for cold weather, etc., should be on hand, if needed or required. Concrete Pre-placement Checklist should have sign off approval completed.			
2	Testing laboratory is notified prior to pour, and testing is arranged at plant and/or site.			
3	Confirm all areas to receive concrete are cleaned, wetted, or otherwise prepared as required. Foundations are as required. Previously placed concrete is properly prepared to receive new.			
4	Vibrators and stand-by vibrators are as required. Frequency and amplitude are checked if required.			
5	Conveying equipment and depositing equipment are capable of making placement without segregation, loss of ingredients, formation of air pockets, or cold joints.			
6	Temporary form openings, tremies, chutes, etc., are as required.			
7	"Pockets" are vented to prevent air entrapment, as required.			
8	Sub-base and capillary fills are compacted and membrane is provided and installed as required.			
9	Arrangements for specified curing, sawed joints, and protection including cold weather protection, if needed, is as required.			

Specific Item Identification or Location, as applicable:

MK Project Number NCBC GULFPORT - Delivery Order 0002	Drawing No./Placement No.	Work Package Number	Inspection Report Sheet _____ of _____
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Checklist Title

**CONCRETE - PLACEMENT INSPECTION
PUMP AND TREAT SYSTEM**

Inspection Code

CO-01

Revision Date

MAR 94

Checklist

Page 2 of 3

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
10	Delivery of concrete and sequence of delivery is scheduled to allow continuous placement to prevent cold joints.			
11	Concrete vibration is being properly performed.			
12	Modified grout provided at first lift and where rebar congestion occurs, as required.			
13	Time interval between adding water to concrete and placement in final position is known.			
14	Age of concrete is within specified or required time limit and delivery tickets contain proper information.			
15	Slump tests are being performed per ASTM/ACI and at the frequency required by specification.			
16	Air tests are being performed per ASTM/ACI and at the frequency required by specification.			
17	Cylinders are being taken as required by ASTM/ACI and at the frequency required by specification.			
18	Lift Heights are within the established range.			
19	The timing of each lift is such that cold joints are prevented. Verify that concrete has not achieved initial set before additional concrete is added.			
20	Where cold joints are expected, due to delays in concrete deliveries, construction joints are formed per specification.			
21	Concrete pour is complete.			

Specific Item Identification or Location, as applicable:

MK Project Number

NCBC GULFPORT - Delivery Order
0002

Drawing No./Placement No.

Work Package Number

Inspection Report

Sheet _____ of _____



Checklist Title

**CONCRETE - PLACEMENT INSPECTION
PUMP AND TREAT SYSTEM**

Inspection Code

CO-01

Revision Date

MAR 94

Checklist

Page 3 of 3

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
22	Cylinders are properly stored per ASTM/ACI for at least 24 +/- 4 hours prior to their transportation to a test lab. (Note: Some mix designs may require longer storage prior to transportation. The storage times indicated herein shall be adjusted accordingly.)			
23	Grades, elevations, alignment, and forms adjustment and support are checked periodically to ensure initial conditions are maintained. Signs of form failure are to be reported immediately to the individual responsible for directing the pour.			
24	The Pour Card is completed and all documentation and cylinders are traceable to the pour.			
25	Type of finish on unformed surfaces is checked and provided as required. Verify that smooth, rubbed, broomed, non-slip, exposed aggregate, colored, etc., finishes are as required.			
26	Verify finish provides evenness, smoothness and levelness of surfaces within tolerance indicated. Slopes are as specified and as required.			

Specific Item Identification or Location, as applicable:

MK Project Number NCBC GULFPORT - Delivery Order 0002	Drawing No./Placement No.	Work Package Number	Inspection Report Sheet _____ of _____
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Checklist Title

MONITORING WELL INSTALLATION

Inspection Code

WELL-01

Revision Date

FEB 95

Checklist

Page 1 of 1

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
1	Total depth of boring measured to the nearest 0.10-foot.			
2	Six-inch layer of filter peck placed in bottom of boring.			
3	Well string, consisting of end cap, well screen, blank casing, centralizers, and screw cap installed in boring. Length of each component measured and recorded. Location of stainless steel centralizers measured and recorded.			
4	Sand pack installed from total depth to three feet below grade. Confirmed by measuring tape and recorded. If water used during installation, record volume added.			
5	Two feet of bentonite pellets installed to one foot below grade. Hydrated per manufacturer's specifications using potable water.			
6	Manhole cover installed to three inches above grade.			
7	Concrete pad installed to two inches above grade and sloped to the top of the manhole cover to promote runoff away from well.			
8	Well designation sign installed in concrete pad.			
9	Well development complete based on the following criteria: -A minimum of three casing volumes have been removed. -Specific conductance, pH, and temperature stabilized to within five percent for three consecutive measurements. -Water is free of visible sediment. -Turbidity is less than 10 NTUs.			
10	Padlock installed and locked.			

Specific Item Identification or Location, as applicable:

MK Project Number

NCBC Gulfport-Delivery Order 0002

Drawing Number

Work Package Number

Inspection Report

Sheet _____ of _____



Checklist Title MECHANICAL INSTALLATION OF GROUNDWATER TREATMENT EQUIPMENT	Inspection Code ME-01	Revision Date JUL 94	Checklist Page 1 of 2
--	---------------------------------	--------------------------------	---------------------------------

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
1	Verify that installation location is correct <u>prior to</u> and <u>after</u> concrete placement.			
2	Verify that anchor bolts are properly installed.	N/A		
3	Verify that subplates are properly installed.	N/A		
4	Check that equipment is handled in accordance with manufacturer's instructions, including protection of mechanical equipment from the weather during storage.			
5	Verify that concrete surfaces are properly prepared (clean, roughened, as necessary)			
6	Verify that alignment and leveling instruments are properly calibrated before use (to be witnessed by site representative).	N/A		
7	Verify that equipment is oriented correctly.			
8	Verify that electrical grounding is undamaged and completed, as applicable per Checklist EL-18.			
9	Verify proper installation and curing of grouting, if required.			
10	Verify tightening of bolts and nuts, as applicable.			
11	Verify proper installation of bentonite seals, as required.			
12	Verify correct material was utilized in construction per the Work Plan.			
13	Verify completion of flushing operations and bolting of flanges, as required.			

REMARKS:

Specific Item Identification or Location, as applicable:

MK Project Number NCBC Gulfport-Delivery Order 0002	Drawing Number	Work Package Number	Inspection Report Sheet _____ of _____
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MORRISON KNUDSEN CORPORATION
Engineering, Construction, & Environmental

Procedure Type

FIELD INSPECTION CHECKLIST

Checklist Title

**MECHANICAL INSTALLATION OF GROUNDWATER
TREATMENT EQUIPMENT**

Inspection Code

ME-01

Revision Date

JUL 94

Checklist

Page 2 of 2

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
14	Verify connection to system piping.			

PROVIDE DETAILED SKETCHES:

Specific Item Identification or Location, as applicable:

MKES Project Number

NCBC GULFPORT - Delivery Order
0002

Drawing Number

Work Package Number

Inspection Report

Sheet _____ of _____



Checklist Title

**MECHANICAL INSTALLATION OF GROUNDWATER
TREATMENT EQUIPMENT**

Inspection Code

ME-02

Revision Date

JUL 94

Checklist

Page 1 of 2

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
1	Verify that installation location is correct <u>prior to</u> and <u>after</u> concrete placement.			
2	Verify that anchor bolts are properly installed.	N/A		
3	Verify that subplates are properly installed.	N/A		
4	Check that equipment is handled in accordance with manufacturer's instructions, including protection of mechanical equipment from the weather during storage.			
5	Verify that concrete surfaces are properly prepared (clean, roughened, as necessary)			
6	Verify that alignment and leveling instruments are properly calibrated before use (to be witnessed by site representative).	N/A		
7	Verify that equipment is oriented correctly.			
8	Verify that electrical grounding is undamaged and completed, as applicable per Checklist EL-18.			
9	Verify proper installation and curing of grouting, if required.			
10	Verify tightening of bolts and nuts, as applicable.			
11	Verify proper installation of bentonite seals, as required.			
12	Verify correct material was utilized in construction per the Work Plan.			
13	Verify completion of flushing operations and bolting of flanges, as required.			

REMARKS:

Specific Item Identification or Location, as applicable:

MK Project Number

NCBC Gulfport-Delivery Order 0002

Drawing Number

Work Package Number

Inspection Report

Sheet _____ of _____



MORRISON KNUDSEN CORPORATION
Engineering, Construction, & Environmental

Procedure Type

FIELD INSPECTION CHECKLIST

Checklist Title

**MECHANICAL INSTALLATION OF GROUNDWATER
TREATMENT EQUIPMENT**

Inspection Code

ME-02

Revision Date

JUL 94

Checklist

Page 2 of 2

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
14	Verify connection to system piping.			

PROVIDE DETAILED SKETCHES:

Blank area for providing detailed sketches.

Specific Item Identification or Location, as applicable:

MKES Project Number

NCBC GULFPORT - Delivery Order
0002

Drawing Number

Work Package Number

Inspection Report

Sheet _____ of _____



Checklist Title

MECHANICAL INSTALLATION OF GROUNDWATER TREATMENT EQUIPMENT

Inspection Code

ME-03

Revision Date

JUL 94

Checklist

Page 1 of 2

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
1	Verify that installation location is correct <u>prior to</u> and <u>after</u> concrete placement.			
2	Verify that anchor bolts are properly installed.	N/A		
3	Verify that subplates are properly installed.	N/A		
4	Check that equipment is handled in accordance with manufacturer's instructions, including protection of mechanical equipment from the weather during storage.			
5	Verify that concrete surfaces are properly prepared (clean, roughened, as necessary)			
6	Verify that alignment and leveling instruments are properly calibrated before use (to be witnessed by site representative).	N/A		
7	Verify that equipment is oriented correctly.			
8	Verify that electrical grounding is undamaged and completed, as applicable per Checklist EL-18.			
9	Verify proper installation and curing of grouting, if required.			
10	Verify tightening of bolts and nuts, as applicable.			
11	Verify proper installation of bentonite seals, as required.			
12	Verify correct material was utilized in construction per the Work Plan.			
13	Verify completion of flushing operations and bolting of flanges, as required.			

REMARKS:

Specific Item Identification or Location, as applicable:

MK Project Number NCBC Gulfport-Delivery Order 0002	Drawing Number	Work Package Number	Inspection Report Sheet _____ of _____
--	----------------	---------------------	---



Checklist Title
**MECHANICAL INSTALLATION OF GROUNDWATER
TREATMENT EQUIPMENT**

Inspection Code
ME-04

Revision Date
JUL 94

Checklist
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ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
1	Verify that installation location is correct <u>prior to</u> and <u>after</u> concrete placement.			
2	Verify that anchor bolts are properly installed.	N/A		
3	Verify that subplates are properly installed.	N/A		
4	Check that equipment is handled in accordance with manufacturer's instructions, including protection of mechanical equipment from the weather during storage.			
5	Verify that concrete surfaces are properly prepared (clean, roughened, as necessary)			
6	Verify that alignment and leveling instruments are properly calibrated before use (to be witnessed by site representative).	N/A		
7	Verify that equipment is oriented correctly.			
8	Verify that electrical grounding is undamaged and completed, as applicable per Checklist EL-18.			
9	Verify proper installation and curing of grouting, if required.			
10	Verify tightening of bolts and nuts, as applicable.			
11	Verify proper installation of bentonite seals, as required.			
12	Verify correct material was utilized in construction per the Work Plan.			
13	Verify completion of flushing operations and bolting of flanges, as required.			

REMARKS:

Specific Item Identification or Location, as applicable:

MK Project Number

NCBC Gulfport-Delivery Order 0002

Drawing Number

Work Package Number

Inspection Report

Sheet _____ of _____



MORRISON KNUDSEN CORPORATION
Engineering, Construction, & Environmental

Procedure Type

FIELD INSPECTION CHECKLIST

Checklist Title

**MECHANICAL INSTALLATION OF GROUNDWATER
TREATMENT EQUIPMENT**

Inspection Code

ME-04

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Checklist

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ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
14	Verify connection to system piping.			

PROVIDE DETAILED SKETCHES:

Specific Item Identification or Location, as applicable:

MKES Project Number

NCBC GULFPORT - Delivery Order
0002

Drawing Number

Work Package Number

Inspection Report

Sheet _____ of _____

SECTION 11: LABORATORY QUALIFICATION PACKAGE

Analytical testing will be performed on investigation derived waste prior to disposal. Sample integrity will be maintained from collection to disposal through chain of custody procedures. Samples will be identified as discussed in the Waste Management Plan, Appendix E. Custody seals will be affixed to all shipping containers. Samples are accompanied by chain-of-custody records. Completed chain-of-custody documents are retained as quality assurance records and maintained in accordance with the Quality Assurance Program. Records generated as a result of analytical sampling activities are Quality Assurance Records and will be processed in accordance with the requirements of this QC Plan.

As of the time of generation of this Quality Control Plan, the analytical and earth sciences laboratories have not been selected for the testing to be performed at NCBC Gulfport. Laboratory services will be procured on a competitive basis, and work awarded only to those labs that meet the qualification requirements.

For analytical sample testing, the selected laboratory must meet, as a minimum, NEESA 20.2-047B requirements and shall have obtained NEESA approval as detailed in the subject document. The selected laboratory will be required to submit their laboratory QAPjP to MK.

Earth sciences testing laboratories will be required to submit evidence of qualification to MK, and the award of these services will also be based upon qualifications and competitive pricing.

SECTION 12: INSPECTION/PROGRESS SCHEDULE

The inspections outlined in the Testing Plan and Log follow the definable features of work outlined in Section 0.1, Introduction, to this QC Plan. Each definable feature of work is subject to preparatory, initial, and follow-up inspections of the work activity. Therefore, the schedule of inspections to be performed will mirror the construction/remediation schedule for Delivery Order 0002.

SECTION 13: REFERENCED PROCEDURES

This section of the Quality Control Plan contains, as attachments, copies of the MK Quality Execution Procedures (QEP) referenced in the body of the QCP. These procedures include:

- QEP 4.1, "Submittals"
- QEP 6.1, "Identification and Control of Samples"
- QEP 8.1, "Conduct and Control of Inspections"
- QEP 13.1, "Identification and Control of Deviations"



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1.0 SCOPE

This procedure describes the requirements for preparation and control of submittals developed for approval by the Navy Contracting Officer. This procedure describes the MK SOUTH DIV ERAC submittal origination, review, control and distribution process to be utilized in the execution of the work.

2.0 RESPONSIBILITIES

2.1 MK Program Manager (PM)

The PM is responsible for ensuring that adequate resources are provided to enable implementation of this procedure, and for ensuring that the program is effectively implemented.

2.2 MK Program Quality Manager (PQM)

The PQM is responsible for effectively implementing this procedure, for management of the submittal/document control process, for certification of submittals as required, and for approval of submittals as required.

2.3 Project Managers (PjM)

Responsible for identifying the types of submittals to be generated for execution of Delivery Order work, and for assignment of personnel to carry out the generation of submittals.

2.4 Submittal Originators

Responsible for the origination of submittals necessary to support Delivery Order execution, such as Work Plans, Sampling and Analysis Plans, and QC Plans. Originators shall prepare submittals suitable for the performance of work in the format specified in Section 4.4 "Submittal Format."

2.5 Document Control Supervisor (DCS)

Responsible for maintenance of the Submittal Register through regular database input and statusing, and for the distribution of controlled documents in accordance with this procedure.

3.0 DEFINITIONS

3.1 Submittal

Submittals are shop drawings, product data, samples, and administrative documents that require review, approval, and distribution. A detailed categorization and description of submittal types is provided in ATTACHMENT A & B. Submittal types include:



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- a. **Shop Drawings**. As used in this section, drawings, schedules, diagrams, and other data prepared specifically for this contract, by the Contractor or through the Contractor by way of a subcontractor, manufacturer, supplier, distributor, or other lower tier Contractor, to illustrate a portion of the work.
- b. **Product Data**. Preprinted material such as illustrations, standard schedules, performance charts, instructions, brochures, diagrams, manufacturer's descriptive literature, catalog data, and other data to illustrate a portion of the work, but not prepared exclusively for this contract.
- c. **Samples**. Physical examples of products, materials, equipment, assemblies, or workmanship, physically identical to a portion of the work, illustrating a portion of the work or establishing standards for evaluating the appearance of the finished work or both.
- d. **Administrative Submittals**. Submittals of data for which reviews and approval will be required to ensure that the administrative requirements of the project are adequately met but not to ensure directly that the work is in accordance with the design concept and in compliance with the contract documents.

3.2 **Document**

As used in this procedure, the term "document" is the general term applied to submittals.

3.3 **Controlled Document**

A Controlled Document is a document that is used to control/perform activities associated with design or construction where it is essential that these activities be carried out in accordance with the latest approved document. Controlled designation may be applied to other documents at the discretion of the PjM. Determination as to whether or not a document is to be released as "Controlled" is made when the document status as defined in Section 3.6 is designated as "Approved."

3.4 **Document Control/Document Control Center**

For the purposes of this procedure, the terms Document Control/Document Control Center apply to the Contractor's Document Control operations located on site. This is the prime point of entry for all information entering the project.

3.5 **Contract Documents**

Contract Documents are the contract and contract specified design/construction affecting documents.



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3.6 Document Status

The Document Status is assigned by the DCS to a submittal or a controlled document to indicate the state or condition of that item. Status options are as follows:

- a. "Approved" or "Approved as Submitted" - Use of this document is unrestricted;
- b. "Approved as Noted" - Use of document is unrestricted provided exception is not taken to noted comments.
- c. "Disapproved" or "Revise and Resubmit"- A status of submittals that indicates the submittal is incomplete or does not comply with the design concept or contract documents and requires resubmittal after appropriate changes.
- d. "Not Reviewed"- A status of submittals that indicates that the submittal has been previously reviewed and approved, is not required as a submittal, lacks review and approval by Mk, or is not complete. Submittals returned by the Navy marked "Not Reviewed" because of lack of review by MK or because of incompleteness shall be resubmitted to the Navy with appropriate action, change, or coordination.
- e. "Preliminary Release for Information"- A document status that indicates the document is in the process of being finalized but is being released for use in preliminary planning efforts. This status may also be used for documents that are routed internally for review, comment, or approval.
- f. "Information Only"-A document status that indicates the document may only be used for informational purposes and are not of controlled status. Information Only documents are not to be used as a source of design basis information or used as a reference in the completion or inspection of work.

3.7 Set Identification Number (Set I.D. No.)

The Set Identification Number is used in conjunction with the Controlled Document Standard Distribution List (SDL) system. Each individual or location that will receive Controlled Documents is assigned a Set Identification Number. This number is listed in red on the Controlled Document to indicate that the document is controlled and to whom or where it has been issued.

3.8 Standard Distribution List

3.8.1 A "Standard Distribution List" (Form QEP 8.1-3) of documents and Controlled Documents shall be maintained for the project by the DCS. It shall be updated as necessary and revision controlled by date. This list shall identify the individual(s) or organization(s) which shall receive the listed documents, the number of copies they receive, and any "Set I.D. Number" assigned to the copy.



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3.8.2 The Standard Distribution List may be generated manually or by sorting a computer database.

3.9 Navy

The use of the term "Navy" in this procedure refers to the U.S. Navy Southern Division Naval Facilities Engineering Command located in Charleston, South Carolina.

4.0 SUBMITTALS

4.1 Planning

4.1.1 Project Management performs the following steps upon receipt of a new Delivery Order.

- a. Defines a scope of work.
- b. Identifies a list of submittals required and the planned submittal date based on the scope of work.
- c. Prepares a cost summary sheet by cost code for each submittal.
- d. Transmits the submittal list with a Submittal Register (Part A) to the Navy for completion of Items (a) through (e).
- e. Upon receipt of the completed Submittal Register from the Navy, Project Management will assign an Originator to each of the submittals.
- f. The Submittal Register is forwarded to the DCS and is logged into the Document Control database.
- g. Management identifies and forwards to the DCS, a list of individuals who are to be on standard distribution for each submittal or group of submittals associated with the Delivery Order. This includes internal routing for review and comment prior to submittal to PQM for approval (e.g., Originator's department manager, Environmental Manager, Site Project Manager, Project Engineer, Project Controls Manager, Safety Supervisor, etc.).

4.2 Scheduling

4.2.1 Submittal originators shall coordinate preparation and processing of submittals with performance of the work so that work will not be delayed by submittal processing. Allow for potential requirements to resubmit.

4.2.2 Except as specified otherwise, allow a review period, beginning with receipt by the approving authority, that includes at least 15 working days for submittals for QC manager



approval and 20 working days for submittals for Contracting Officer approval. The period of review for submittals with Contracting Officer approval begins when the Government receives the submittal from the Contractor. The period of review for each resubmittal is the same as for the initial submittal.

4.3 Submittal Register

4.3.1 A Submittal Register will be used to track progress of submittals as they are processed. Users may arrange Parts A and B side-by-side in a notebook; however, submittal status will be maintained on a computer database by the DCC. (See Attachment C)

4.3.2 The Government will complete Sections (a) through (e) of the Submittal Register. These sections are described as follows:

- a. Column (a): Lists each specification section in which a submittal is required.
- b. Column (b): Lists each submittal description (SD number and type -- e.g., SD-04, Drawings) required in each specification section. Follow each submittal description with a list of material or products associated with that submittal.
- c. Column (c): Lists one principal paragraph in the specification section where a material or product is specified. This listing is only to facilitate submittal reviews. Do not consider entries in column (c) as limiting project requirements; do not consider that a blank must be filled in by Contractor or the Government.
- d. Column (d): Indicates approving authority for each submittal. A "G" indicates approval by Contracting Officer; a blank indicates approval by PQM.
- e. Column (e): Indicates, for submittals to be approved by Contracting Officer, specific reviewers other than QC organization. This column may or may not be filled out on the copy supplied by the Government.

4.3.3 Columns (f) through (i) will be used by the Contractor, QC organization, and Government on their own copies to record data established by the Contractor.

- a. Column (f): As submittals are processed, list a consecutive number assigned by Contractor for each group of submittals. Place this same number in the appropriate block of "Submittal Transmittal Form". **Note:** For a resubmission, repeat the same transmittal control number as used for the original submittal with a suffix beginning with "A". Subsequent resubmittals utilize the same control number with the next sequential suffix. For example, submittal #10 becomes 10A, 10B, 10C, etc.
- b. Column (g): List dates scheduled for approving authority to receive submittals. These dates are the scheduled beginnings of the submittal review period. the Contractor



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proposes these dates and the Contracting Officer approves them to establish the approved submittal register.

- c. Columns (h) and (i): Use to record Contractor's review when forwarding submittals to the QC organization.

4.3.4 Columns (j) through Column (o) will be used by Contractor, QC Organization and Government on their own copies.

- a. Column (j): Enter date submittal is transmitted to QC organization for PQM approval.
- b. Columns (k) and (l): If approving authority is Contracting Officer, enter date DCC transmits certified submittal to Contracting Officer; otherwise, no entries are required.
- c. Columns (m) and (n): If approving authority is Contracting Officer, enter the Government action and date of action as shown on returned submittal. If approving authority is PQM, enter QC action and date of action.
- d. Column (o): Enter date Contractor receives acted-on submittal.

4.4 Submittal Format

4.4.1 Identify submittals, except sample panel and sample installation, with the following information permanently adhered to or noted on each separate component of each submittal. Mark each copy of each submittal identically, with the following:

- a. Project title and location.
- b. Construction contract number and delivery order.
- c. The section and part number of the section by which the submittal is required.
- d. The submittal description (SD) number of each component of the submittal.
- e. If a resubmission to Contracting Officer, an alphabetic suffix on the submittal description, for example, SD-10A, to indicate the resubmission.
- f. The name, address, and telephone number of the subcontractor, supplier, manufacturer and any other second tier Contractor associated with the submittal.
- g. Product identification and location in project.

4.4.2 Format for Shop Drawings:

- a. Shop drawings shall be not less than 8-1/2 x 11" nor more than 30 x 42".



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- b. Present 8-1/2 x 11-inch shop drawings as a part of the bound volume for the submittals required by the section. Present larger drawings in the sets.
- c. Include on each drawing the drawing title, number, date, and revision numbers and dates, in addition to the information required in Paragraph 4.4.1.
- d. Dimension drawings, except diagrams and schematic drawings; prepare drawings demonstrating interface with other trades to scale. Identify materials and products for work shown.

4.4.3 Format for Product Data:

- a. Present product data submittals for each section as a complete, bound volume. Include a table of contents listing page and catalog item numbers for product data.
- b. Indicate, by prominent notation, each product which is being submitted; indicate the specification section number and paragraph number to which it pertains.
- c. Supplement product data with material prepared for the project to satisfy submittal requirements for which product data does not exist. Identify this material as developed specifically for the project.

4.4.4 Format of Construction Material Samples:

- a. Furnish samples in the sizes below, unless otherwise specified or unless the manufacturer has prepackaged samples of approximately the same size as specified:
 - (1) Sample of equipment or device: Full size.
 - (2) Sample of materials less than 2" x 3": Built up to 8-1/2 x 11".
 - (3) Sample of materials exceeding 8-1/2 x 11": Cut down to 8-1/2 x 11" and adequate to indicate color, texture, and material variations.
 - (4) Sample of linear devices or materials, such as conduit and handrails: 10-inch length or length to be supplied, if less than 10".
 - (5) Sample of non-solid materials (e.g., sand, paint, etc.): One pint, unless specified otherwise in technical sections.
 - (6) Sample panel: 4' x 4'.
 - (7) Sample installation: 100 square feet.



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- b. Samples showing range of variation: Where unavoidable variations must be expected, submit sets of samples of not less than three units showing the extremes and middle of the range.
- c. Reusable samples: Incorporate returned samples into the work only if so specified or indicated. Incorporated samples shall be in undamaged condition at the time of use.
- d. Recording of sample installation: Note and preserve the notation of the area constituting the sample installation but remove the notation at the final cleanup of the project.
- e. When a color, texture, or pattern is specified in naming a particular manufacturer and style, include one sample of that manufacturer and style for comparison.

4.4.5 Format of Administrative Submittals:

Submittals shall be in report form and comply with Paragraph 4.4.1.

4.5 Quantity of Submittals

4.5.1 Quantity of Shop Drawings:

- a. For shop drawings presented on sheets larger than 8-1/2" x 14", submit one reproducible and three prints of each shop drawing prepared for this project.

(1) Transmit reproducible rolled in mailing tubes.

(2) After review, the approving authority will retain the prints and return only the reproducible with notations resulting from the review.

- b. For shop drawings presented on sheets 8-1/2" x 14" or less, conform to the quantity requirements for product data.

4.5.2 Quantity of Product Data:

- a. Submit six copies of submittals of product data requiring review and approval only by the QC organization and seven copies of product data requiring review and approval by the Contracting Officer.

4.5.3 Quantity of Samples:

- a. Submit two samples, or two sets of samples showing range of variation, of each required item. One approved sample or set of samples will be retained by the approving authority and one will be returned to the Contractor.



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- b. Submit one sample panel. Include components listed in the technical section or as directed.
- c. Submit one sample installation, where directed.
- d. Submit one sample of non-solid materials.

4.5.4 Quantity of Administrative Submittals:

- a. Unless otherwise specified, submit administrative submittals which are 8-1/2" x 14" or smaller in the quantity required for product data.
- b. Unless otherwise specified, submit administrative submittals larger than 8-1/2" x 14" in the quantities required for shop drawings.

4.6 Submittal Origination

- 4.6.1 Originators of submittals prepare, format, and provide in the necessary quantities the submittal types detailed in Section 4.4, 4.5 and Attachment B.
- 4.6.2 Originators determine and verify field measurements, materials, and field construction criteria. Originator checks and coordinates each submittal with requirements of the work and contract documents.
- 4.6.3 Originator reviews submittal for conformance with project design concepts and compliance with the contract documents.
- 4.6.4 Originators ensure no work begins until submittals for that work have been returned as "approved," or "approved as noted" except to the extent that a portion of the work may be performed to generate the basis for the submittal.
- 4.6.5 Originator transmits submittal to the DCC to begin the review process.

4.7 Submittal Review Process

- 4.7.1 DCC updates the Submittal Register and transmits submittal for internal Review/Approval to standard distribution as indicated by project management. DCC uses MK Document Transmittal (Form QEP 8.1-1) and attaches Comment Submittal Form ((QEP 8.1-2). Reviewer checks an "Action Taken" box on the transmittal and returns it to the DCC by response-due date. DCC tracks transmittal responses.
- 4.7.2 If internal review results in approval, DCC updates Submittal Register and transmits submittal to PQM for approval.



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- 4.7.3 If internal review or review by PQM results in an status other than "Approved" or "Approved as Noted", DCC transmits submittal with returned Comment Submittal Form to originator for correction.
- 4.7.4 Originator corrects and forwards submittal to DCC. DCC retransmits to standard distribution to continue review process.
- 4.7.5 When submittal is approved by PQM as final approving authority, DCC assigns a SDL Number and transmits approved submittal to the standard distribution as a controlled document.
- 4.7.6 When Contracting Officer is final approving authority, the PQM or QC organization member specified in writing by MK as having that authority, signs the following certification. The signatures shall be in original ink. Stamped signatures are not acceptable.
- 4.7.7 Stamp each sheet of each submittal with the Contractor's certification stamp, except that data submitted in bound volume or on one sheet printed on two sides may be stamped on the front of the first sheet only.

"I hereby certify that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated into Contract Number _____, is in compliance with the contract drawings and specification, can be installed in the allocated spaces, and is submitted for Government approval.

Certified by Submittal Reviewer _____, Date
(signature when applicable)

Certified by QC Manager _____, Date
(signature)

- 4.7.8 When the approving authority is the PQM, the PQM will use the following approval statement when annotating submittals as "Approved" or "Approved as Noted".



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"I hereby certify that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated into Contract Number _____, is in compliance with the contract drawings and specification, can be installed in the allocated spaces, and is approved for use.

Certified by Submittal Reviewer _____, Date
(signature when applicable)

Certified by QC Manager _____, Date
(signature)

- 4.7.9 Submittal is then forwarded to DCC for transmittal to Contracting Officer for approval.
- 4.7.10 If Contracting Officer returns submittal as other than approved, DCC returns submittal to Originator for disposition.
- 4.7.11 Originator revises the submittal and modifies the submittal number beginning with an "A" for each resubmittal to the Contracting Officer (e.g., 10A, 10B, 10C, etc.) Note that the number modification begins upon first resubmittal to Contracting Officer.
- 4.8 **Submittal Implementation**
 - 4.8.1 The DCC maintains a current status of submittals by updating the Submittal Register as submittal actions occur until final acceptance of work by the Contracting Officer.
 - 4.8.2 When submittal is approved by Contracting Officer, DCC assigns a SDL Number and distributes the submittal as a controlled document.
 - 4.8.3 A copy of approved submittals is retained at the project site, including MK's copy of approved samples.
 - 4.8.4 When the approving authority is the QC manager, forward two copies of each approved submittal, except "samples", where one set is required, to the Contracting Officer.

5.0 REFERENCED FORMS

- Standard Distribution List (QEP 8.1-3)
- Document Transmittal (QEP 8.1-1)
- Comment Submittal Form (QEP 8.1-2)



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6.0 ATTACHMENTS

- a. Attachment 1: Categories and Descriptions of Submittal Types
- b. Attachment 2: Submittal Matrix
- c. Submittal Register



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ATTACHMENT A: Categories and Description of Submittal Types

SD-01, Data

Submittals which provide calculations, descriptions, or other documentation regarding the work.

SD-02, Manufacturer's Catalog Data

Data composed of catalog cuts, brochures, circulars, specifications, and product data, and printed information in sufficient detail and scope to verify compliance with requirements of the contract documents. A type of product data.

SD-03, Manufacturer's Standard Color Charts

Preprinted illustrations displaying choices of color and finish for a material or product. A type of product data.

SD-04, Drawings

Submittals which graphically show relationship of various components of the work, schematic diagrams of systems, detail of fabrications, layout of particular elements, connections, and other relational aspects of the work. A type of shop drawing.

SD-05, Design Data

Design calculations, mix designs, analyses, or other data, written in nature and pertaining to a part of the work. A type of shop drawing.

SD-06, Instructions

Preprinted material describing installation of a product, system, or material, including special notices and material safety data sheets, if any, concerning impedances, hazards, and safety precautions. A type of product data.

SD-07, Schedules



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A tabular list of data or tabular list including location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work. A type of shop drawing.

SD-08, Statements

A document, required of the Contractor, or through the Contractor by way of a supplier, installer, manufacturer, or other lower tier Contractor, the purpose of which is to further the quality or orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel, qualifications, or other verification of quality. A type of shop drawing.

SD-09, Reports

Reports of inspection and laboratory test, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

SD-10, Test Reports

A report signed by an authorized official of a testing laboratory that a material product, or system identical to the material, product, or system to be provided has been tested in accordance with requirements specified by naming the test method and material. The test report must state the test was performed in accordance with the test requirements; state the test results; and indicate whether the material, product, or system has passed or failed the test. Testing must have been within 3 years of the effective date of award of the delivery order. Analytical laboratory testing must have been completed within established sample holding times. A type of product data.

SD-11, Factory Test Reports

A written report which includes the findings of a test made at the job site, in the vicinity of the job site, or on a sample taken from the job site, or on a portion of the work, during or after installation. The report must be signed by an authorized official of a testing laboratory or agency and must state the test was performed in accordance with the test requirements; state the test results; and indicate whether the material, product, or system has passed or failed the test. A type of shop drawing.

SD-13, Certificates

Statements signed by responsible officials of a manufacturer of a product, system, or material attesting that the product, system, or material meets specified requirements. The statements must be dated after the award of this contract, name the project, and list the specific requirements which it is intended to address. A type of shop drawing.



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SD-14, Samples

Samples, including both fabricated and unfabricated physical examples of materials, products, and units of work as complete units or as portions of units of work. A type of sample.

SD-15, Color Selection Samples

Samples of the available choice of colors, textures, and finishes of a product or material, presented over substrates identical in texture to that proposed for the work. A type of sample.

SD-16, Sample Panels

An assembly constructed at the product site in a location acceptable to the Contracting Officer and using materials and methods to be employed in the work; completely finished; maintained during construction; and removed at the conclusion of the work or when authorized by Contracting Officer. A type of sample.

SD-17, Sample Installations

A portion of an assembly or material constructed where directed and, if approved, retained as a part of the work. A type of sample.

SD-18, Records

Documentation to ensure compliance with an administrative requirement or to establish an administrative mechanism. A type of administrative and closeout submittal.

SD-19, Operation and Maintenance Manuals

Data intended to be incorporated in an operations and maintenance manual. A type of administrative and closeout submittal.



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1.0 SCOPE

This procedure describes standard operating procedures for sampling during the site remediation activities, including decontamination, packaging, transport, and sample custody. Sample documentation is described and examples of types of documentation forms are provided.

2.0 RESPONSIBILITIES

2.1 Site Quality Control Supervisor (SQCS)

The SQCS is responsible for performance of preparatory, initial, and follow-up inspections of analytical sampling activities to ensure compliance with the requirements of this procedure and the Quality Control Plan. Additionally, the SQCS is responsible for maintaining the status of sampling activities on the Testing Plan and Log provided in the Quality Control Plan, Section 10.0.

2.2 Sample Technician

The Sample Technician is responsible for the physical collection of samples in accordance with the requirements of this procedure, and for ensuring proper chain of custody of collected samples.

3.0 DEFINITIONS

3.1 Sampling event

A sampling event is considered to be from the time the sampling personnel arrive at the site until these personnel leave for more than a day. An example of two sampling events would occur if sampling personnel went to a site for three weeks, drilled borings, and put groundwater wells in place. During this visit, soil and water samples were collected. The sampling crew then left the site for two months, thus concluding the first sampling event. The crew later returned to collect another set of groundwater samples over a three-day period. The second visit would constitute the second sampling event.

3.2 Trip Blank

Trip Blanks are QC samples which originate from analyte-free water taken from the laboratory to the sampling site and returned to the laboratory with the volatile organic (VOA) samples. One trip blank should accompany each cooler containing VOA's, should be stored at the laboratory with the samples, and analyzed by the laboratory. Trip blanks are only analyzed for VOA's.



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3.3 Equipment Rinsates

Equipment rinsates are a type of QC sample and are the final analyte-free water rinse collected after equipment decontamination and during a sampling event. Equipment rinsates will be taken once a week for each sample medium. If analytes pertinent to the project are found in the rinsate, the field decontamination procedure will be evaluated and improved. The rinsates are analyzed for the same parameters as the related samples.

3.4 Field Blanks

Field blanks are a type of QC sample that consist of the source water used in decontamination and steam cleaning. At a minimum, one field blank from each event and each source of water must be collected and analyzed for the same parameters as the related samples.

3.5 Field Duplicates/Splits

Field Duplicates (or splits) for soil samples will be collected in the field and prepared by homogenizing the soil sample and splitting into two samples. All samples except those designated for VOA analysis will be homogenized and split. For VOA analysis select segments of soil will be taken from the length of the core and placed into 40 ml glass vials. Cores may be sealed and shipped to the laboratory for subsampling if the project deems this appropriate. The field duplicates for water samples should be collected simultaneously. Field duplicates should be collected at a frequency of 10% per sample matrix for Levels C and D. For Level E, the duplicates should be analyzed at a frequency of 5%. All the duplicates should be sent to the primary laboratory responsible for analysis. The same samples used for field duplicates shall be split by the laboratory and be used as the laboratory duplicate or matrix spike and a matrix spike duplicate (MS/MSD). The rate for MSD's is 1 in 20. This means that for the duplicate sample, there will be analyses of the normal sample, the field duplicate, and the laboratory MS/MSD. A separate MS/MSD will not be collected in the field, but will be obtained from the field duplicate by splitting the sample in the laboratory.

4.0 SAMPLING REQUIREMENTS

4.1 Decontamination

4.1.1 Equipment that may come in contact with potentially contaminated soil, sediment, waste, or water will be decontaminated prior to and after use. Decontamination consists of steam cleaning (high pressure, hot water washing), phosphate-free detergent wash, and distilled, deionized (DI), or clean water rinse, as appropriate.

4.1.2 Sampling, drilling, and monitoring well installation equipment will be decontaminated utilizing EPA guidelines. Summary decontamination steps are as follows:



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4.1.2.1 Water Sampling Equipment

Prior to collecting a water sample, non-dedicated sampling equipment must be decontaminated according to the following procedure.

1. *Equipment.* Remove all visible contamination with clean tap water and an Alconox™ solution. If this is not effective, use a clean soft cloth or sponge or use pressurized water to clean equipment. If required, a brush may be used to clean stainless steel or metal equipment but not plastic equipment, which may be scratched by the brush. After cleaning equipment with tap water, triple rinse equipment with distilled water.
2. *Hoses.* Clean outside of hoses with high pressure hot water. Pump 3 volumes of clean tap water through hoses. If possible, use pressurized tap water. After cleaning hoses with tap water, pump 3 volumes of distilled water through hoses.
3. *Probe tips and meters.* Triple rinse with distilled water.
4. Collect sample according to the specific procedure for the sample type.
5. Rinse all sample collection equipment with clean tap water followed by distilled water. Store equipment in clean containers.

4.1.2.2 Soil and Sediment Sampling Equipment

Equipment used to collect samples for chemical analysis requires thorough decontamination, as described below:

1. Wash equipment (augers, split spoons, etc.) with distilled water, an Alconox™ solution, and/or a high-pressure washer. If visible contamination remains, steam clean the equipment.
2. A solvent rinse (Isoproponol) may be required to remove organic contamination that is not removed by washing and/or steam-cleaning.
3. Rinse with clean tap water.
4. Triple rinse all equipment with distilled water and allow to air dry.
5. Collect sample according to the specific procedure for the sample type.
6. Rinse all sample collection equipment with clean tap water followed by distilled water. Store equipment in clean containers.



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4.1.2.3 Drilling Equipment

Steam-clean downhole equipment on drill rigs, such as augers, drill rods, and drill bits, prior to and/or after use at a designated wash pad. Remove visible soil and grease.

4.1.2.4 Monitoring Well Installations

- Clean casing, screen, couplings, and caps used in monitoring well installation with high-pressure hot water (less than 125 degrees Fahrenheit) prior to installation. Remove visible foreign matter.
- Steam-clean the exterior surfaces and accessible interior portions of submersible, centrifugal, and positive-displacement pumps prior to each use.
- Steam-clean bailers and wash in phosphate-free detergent solution and rinse twice in distilled or DI water prior to each use. Water used for rinsing will be tested for all target analytes except dioxins at the beginning of the field programs to show that target analytes are not present above the reporting detection limit. Discard rope or string (used with bailers or disposable sampling bottles) that has been in contact with the water in the well or boring in accordance with WMPs, and replace with new string after each sample is collected.
- Wash steel tapes, well sounders, transducers, and water quality probes in a phosphate-free detergent solution, and rinse in distilled or DI water or wipe clean after each use. Clean the portion of these devices inserted into wells with a mild soap solution.

4.2 Sample Numbering

4.2.1 Sample identification will include the following information:

- Site name
- Sample matrix
- QC sample type
- Well or boring location number
- Sample interval/depth (when applicable)

4.2.2 The project will utilize a specific prefix, XXX, to the sample identification number. The prefix will be separated from the sample identification number with a backslash; for example, XXX\12345678. The laboratory will not utilize the site-specific prefix.



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4.2.3 The eight digit format will require that site designation, sample matrix, sample location, QC sample type, and sampling method/depth are coded and defined in the following format:
1 2 3 4 5 6 7 8

4.2.4 The first three digits, 1, 2, and 3, will indicate the sample origin. These digits are alphanumeric and will be created with some mnemonic device for the true name of the site. The first digit is an alphabetical character in order to facilitate data processing. Sample origin abbreviations will vary widely according to specific project requirements. Examples are given below:
·SMWU #9 - S09
·Plume #3 - P03
·Unit #10 - U10
·Background - B01

4.2.5 The type of installation will be represented by digits 4, 5, and 6. Designations for a well or boring installations will be made by using a "W" or a "B" respectively in the fourth digit, followed by the two-digit sample location identifier. The sample location identifier is a number assigned to the specific well or borehole.

4.2.6 The seventh and eighth digits are matrix-dependent and will represent sample intervals for soil samples or sample identifiers for groundwater samples. For groundwater samples, each sample will be given a number by sequential collection. Duplicate samples will have the same sample identification but will have the letter "D" in place of the eighth digit. Examples:
·XXX\S11B0901 represents the first soil sample from SWMU 11 at boring #9.
·XXX\P12W0702 represents the second groundwater sample collected from well #7 at plume #12.
·XXX\P12W072D represents a duplicate of the second sample example above.

4.2.7 The sample number shall be entered on sample labels, chain of custody forms, and in the appropriate section of the Testing Plan and Log in Section 8.0 of QC Plans. All sample identification information will also be documented in the sampler's field logbook, especially information not incorporated in the sample number.

4.2.8 QA/QC samples used to assess the precision and accuracy of the sampling and analyses will replace the fourth-digit (well or boring designation) when used. Digit 4 will represent the type of QC sample, followed by the month and day it was collected as digits 5, 6, 7, and 8. Samples required to meet this data quality objective are given below with their appropriate code:



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QA Sample Codes:

- F --- field blank
- E --- equipment rinsate
- T --- trip blank

4.2.9 The sample code will be followed by a four-digit date where the first two digits indicate the month and the second two digits indicate the day, (ex: August 14 would be written as 0814). As an example, XXX-W06-F1025 is the sample identifier for the field blank collected at SWMU 6 on October 25.

4.3 Sample Packaging and Transport

4.3.1 Each sample will be packaged and transported appropriately as described in the following protocol:

- Collect samples in appropriate containers and add preservatives, as needed (Table 1).
- Print the following information clearly in waterproof ink on the label for each sample container: the preservative that has been added to each sample container, the sample number, the project number, the initials of the sample collector, and the date and time the sample was collected. For water samples, package sets together if appropriate. Each VOC set should be placed together in a labeled ziplock plastic bag.
- Fill out field sample log and chain of custody record.
- Separate and place samples in coolers according to laboratory destination and according to expected concentrations (e.g., lowest concentration samples together). Each cooler must weigh less than 70 pounds including ice. Package samples well to protect from shipping damage.
- Place samples on ice, as necessary (Table 1).
- Seal the top two copies of each chain of custody form inside a ziplock bag. Use strapping tape to attach the packet to the inside of the cooler lid. Samples will always be accompanied by a chain of custody record. When transferring samples, both the individuals relinquishing and receiving the samples will sign and date the chain of custody record. Samples will be packaged properly for shipment, including isolation of samples thought to have high chemical concentrations, and dispatched to the appropriate laboratory for analysis.
- Secure cooler with custody seal.



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- Label coolers correctly; placing "Fragile" and "This-End-Up" labels on coolers, as appropriate.
- Transport the coolers to the designated analytical laboratories via MK Team personnel or designated couriers. The planned mode of sample transport is to use couriers employed by the laboratory. Alternatively, commercial couriers, MK Team couriers, or overnight shipment may be used. Specific transportation arrangements are dependent on the location of the Delivery Order Site and the analytical laboratories; specific procedures will be described in site-specific planning documents.

4.3.2 Soil samples intended for immunoassay-based field screening methods (e.g., EnSys methods for pentachlorophenol, total petroleum hydrocarbons) will be collected and stored in labeled containers that are appropriate for the type of analysis to be performed.

4.4 Sample Custody

4.4.1 Sample custody procedures will be followed through sample collection, transfer, analysis, and ultimate disposal. The purpose of these procedures is to assure that the integrity of samples is maintained during their collection, transportation, and storage prior to analysis, and sample material is properly disposed after analysis. Sample custody begins with the shipment of the empty sample containers. Sample containers are shipped from the laboratory in sealed coolers or cartons with appropriate seals and custody documentation. Sample quantities, types, and locations will be determined before the actual field work commences. The Sample Technician will be responsible for the care and custody of the samples until properly transferred. Custody transfer will be documented on the Chain of Custody Form.

4.4.2 At the chemical laboratory, a designated sample custodian will accept custody of the shipped samples and verify that the information on the sample label matches that on the chain of custody form(s). Pertinent information as to sample condition, shipment, pickup, and courier will also be checked on the chain of custody form(s). In addition, a project receipt checklist (e.g., Cooler Receipt Form) will also be completed by the custodian. Information on the date and time of receipt, method of shipment, and sample condition will be recorded on this form. The custodian will then enter the appropriate data into the laboratory sample tracking system. The laboratory custodian will use the sample number on the sample label as well as assign a unique laboratory number to each sample. The custodian will then transfer the sample(s) to the proper analyst(s) or store the sample(s) in the appropriate secure area.

4.4.3 Laboratory personnel will be responsible for the care and custody of samples from the time they are received, and are responsible for sample disposal. Data sheets and



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laboratory records will be retained as part of the permanent documentation for a period of at least 3 years.

- 4.4.4 Samples and extracts are retained by the analytical laboratory for up to 30 days after the data are reported by the laboratory. Unless notified otherwise by the site managers, excess or unused samples are disposed by the laboratory in a manner consistent with appropriate government regulations.

4.5 Sample Documentation

- 4.5.1 Each sample will be labeled and sealed properly immediately after collection. Sample identification documents will be carefully prepared so that identification and chain of custody records can be maintained and sample disposition can be controlled. Forms will be filled out with waterproof ink. The following identification documents will be used during the investigation.

- Sample Labels
- Field Logs
- Chain of Custody Forms

4.6 Sample Labels

- 4.6.1 Sample labels are necessary to prevent misidentification of samples. Preprinted sample labels will be provided. Where necessary, the label will be protected from water and solvents with clear label-protection tape. Each label contains the following information:

- Project name
- Project number
- Name of collector
- Date and time of collection
- Place of collection (job site)
- Sample number
- Well/boring number
- Depth
- Preservative, if any

4.7 Field Logs

A Field Log will be used daily by the Sample Technician to record activities as they relate to the progress of the investigation. The field logs will be retained in the investigation files according to project number for that task. Entries in the field log will include at least the following information:



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- Project name
- Project number
- Name of author and date
- Chronology and location of activities
- Names and affiliations of personnel onsite
- Instrument calibration details and identification number
- Decontamination procedures
- Sample collection or measurement methods
- Number of samples collected
- Sample identification numbers
- Sample distribution (laboratory)
- Field observations and comments
- Any modifications to or deviation from the site specific work plan.

4.8 Chain of Custody Record

4.8.1 A chain of custody record will be filled out for and will accompany every sample to the analytical laboratory to establish the documentation necessary to track sample possession from the time of collection. A copy of the chain of custody form will be retained in the investigation files according to project number. The record will contain the following information:

- Sample number or identification
- Names of samplers
- Signature of collector, sampler, or recorder
- Location of project
- Project manager's name
- Date of collection
- Place of collection (site location)
- Sample type
- Analyses requested
- Inclusive dates of possession
- Signature of person relinquishing or receiving sample
- Laboratory sample number, where applicable
- Date and time of sample receipt.
- Method of shipment and courier name.

4.9 Corrections to Sample Documentation

4.9.1 Original data recorded in field investigation daily reports, chain of custody records, and other forms will be written in waterproof ink. None of these documents will be altered, destroyed, or discarded, even if they are illegible or contain inaccuracies that require a replacement document.



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4.9.2 If an error is made on a document compiled by one individual, that individual will make the necessary correction by crossing a single line through the error, entering the correct information, and initialing and dating the change. The erroneous information will not be obliterated. Any subsequent error(s) discovered on a document will be corrected by the person discovering the error. All corrections will be initialed and dated. Site-specific documentation will be reviewed by site managers on a daily basis.

4.10 Transfer of Field Documentation

4.10.1 During site-specific field operations, field investigation daily logs will be telefaxed to Site Managers on a daily basis. In the absence of a facsimile, field geologists and/or engineers will be in contact with Site Managers, or at a minimum the field operations manager via mobile telephones. During drilling associated with the installation of monitoring wells, site managers will review boring logs prior to constructing the well.

4.10.2 At the end of each week of field operations, all field documentation will be copied, and hard copies sent to Site Managers for review. A copy of this documentation will also be kept at the onsite field office for future reference, if necessary. The original field documents will be submitted to the Resident Officer in Charge of Construction (ROICC). Copies of all documentation generated will be submitted to the MK Project Management Office in Charleston.

4.11 Project Files

4.11.1 It is anticipated that two sets of project files will be kept for each Delivery Order site. The original field documentation will be submitted to the ROICC on a daily basis, while copies of the same documentation submitted to the ROICC will be submitted to the MK Charleston Project Management Office on a daily basis.

5.0 REFERENCED FORMS

- a. Chain of Custody Record

6.0 EXHIBITS/TABLES

- a. EXHIBIT 1: Sample Labels and Chain of Custody Seal
- b. TABLE 1: Sample Preservation and Storage Requirements
- c. TABLE 2: Field Measurement Calibration Procedures and Precision Requirements
- d. TABLE 3: Example Summary of External (Field) QC Samples
- e. TABLE 4: Example Summary of Internal (Laboratory) QC Samples



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- f. TABLE 5: Example Quality Assurance Goals-Precision
- g. TABLE 6: Example Quality Assurance Goals-Accuracy, Percent Recovery
- h. TABLE 7: Summary of Calibration Procedures



MORRISON KNUDSEN CORPORATION

Procedure Type

QUALITY EXECUTION PROCEDURE

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EXHIBIT 1-SAMPLE TAGS

STANDARD

Sample ID:	 MORRISON KNUDSEN CORPORATION
Sample Description:	
Sample Date/Time:	
Requested Analyses:	
Project Number:	
Task Number:	
Preservative:	Phone Number:
Submission Date to Lab:	
Sampler's Signature:	

SOILS

Sample ID:	 MORRISON KNUDSEN CORPORATION
Sample Description:	
Location:	
Sample Date/Time:	
Sampler's Signature:	Project No.

WATER

DATE:	PUMP ID#:	 MORRISON KNUDSEN CORPORATION
SAMPLE #:	FLOW:	
TIME ON:	TIME OFF:	

CUSTODY SEAL



CUSTODY SEAL

DATE _____

SIGNATURE _____

Table 1. Sample Preservation and Storage Requirements

A. Volatile Organics

Matrix	Container	Minimum Sample Size/Container	Preservative	Holding Time (From Date Sampled)
Water Samples	3 40-ml vials with Teflon lined septum caps	40 ml	Cool, 4°C	10 days* 14 days
Soils/Sediments and Sludges	4-ounce glass jar with Teflon liner or core tube with Teflon liner	500 g	Cool, 4°C	10 days* 14 days
Concentrated Waste Samples	4-ounce glass jar with Teflon liner or core tube with Teflon liner	500 g	Cool, 4° C	10 days* 14 days

The above information applies to the following parameters and methods:

Parameter	Method
Volatile Hydrocarbons as Gasoline	DOHS LUFT
Volatile Aromatics (BTEX)	SW-846A 8020 (GC)
Volatile Organics	SW-846B 8240 (GC/MS)
*Volatile Organics	Contract Laboratory Protocol (GC/MS)

B. Semivolatile Organics

Matrix	Container	Minimum Sample Size/Container	Preservative	Holding Time (From Date Sampled)
Water Samples	(2) 1-liter amber glass with Teflon liner	1 liter	Cool, 4°C	Samples must be extracted within 7 days and analyzed within 40 days of extraction, *extract within 5 days, analyze within 40 days of extraction
Soils/Sediments and Sludges	4-ounce wide-mouth glass jar with Teflon liner	500 g	Cool, 4°C	Samples must be extracted within 7 days and analyzed within 40 days of extraction, *extract within 10 days, analyze within 40 days of extraction
Concentrated Waste Samples	4-ounce glass jar with Teflon liner or core tube with Teflon liner	500 g	Cool, 4°C	Samples must be extracted within 7 days and analyzed within 40 days of extraction, *extract within 10 days, analyze within 40 days of extraction

The above information applies to the following parameters and methods:

Parameter	Method		
Semivolatile Organics	SW-846B	8270	(GC/MS)
PAHs	SW-846B	8270	(GC/MS)
Organochlorine Pesticides and PCBs	SW-846B	8080	(GC)
Herbicides	SW-846B	8150	(GC)
Explosives	SW-846A	8330	(HPLC)
*Extractable Organics	CLP		
*PCBs	CLP		
*Pesticides	CLP		

*Contract Laboratory Protocol

C. Other Organics

Parameter	Method No.	Matrix	Holding Time (From Date Sampled)	Containers	Preservative	Minimum Sample Size/Container
Dioxins/Furans	SW-846B 8280	Water	30 days extraction 40 days analysis	(2) 1-liter amber glass	Cool, 4°C	1,000 ml
		Soil/Waste	30 days extraction 45 days analysis	core tube or glass jar	Cool, 4°C	500 g
Petroleum Hydrocarbons as Gasoline	DOHS LUFT 8015M-G	Water	14 days	(3) 40-ml vials with teflon liner	Cool, 4°C	40 ml
		Soil/Waste	14 days	core tube or glass jar	Cool, 4°C	500 g
Petroleum Hydrocarbons as Diesel, Fog Oil and Motor Oil	DOHS LUFT 8015M-D	Water	14 days extraction 40 days analysis	(2) 1-liter glass	Cool, 4°C	1,000 ml
		Soil/Waste	14 days extraction 40 days analysis	core tube or glass jar	Cool, 4°C	500 g
Non-Polar Oil and Grease	Std. Methods (5520)	Water	28 days	(2) 1-liter glass	Cool, 4°C, HCl to pH < 2, *H ₂ SO ₄ to pH < 2	1,000 ml
		Soil/Waste	28 days	core tube or glass jar	Cool, 4°C 1ml of HCl per 80 grams of sample	500 g

*Contract Laboratory Protocol

D. Metals

Parameter	Method No.	Matrix	Holding Time (From Date Sampled to Analysis)	Container	Preservative ^a	Minimum Sample Size/Container
Metals ICP, AA (except mercury and CrVI)	CLP SOW ILMO 3.0	Water	6 months	poly	HNO ₃ to pH < 2.0	500 ml
		Soil/Waste	6 months	core tube/glass jar	Cool, 4°C	500 g
Mercury (CV-AA)	CLP SOW ILMO 3.0	Water	28 days *26 days	poly	HNO ₃ to pH < 2.0	500 ml
		Soil/Waste	28 days *26 days	core tube/glass jar	Cool, 4°C	
Hexavalent Chromium	SW-846B 7196	Water	Extraction ASAP Analysis 24 hours after extraction	poly	Cool, 4°C	500 ml
		Soil/Waste	Extraction ASAP Analysis 24 hours after extraction	core tube/glass jar	Cool, 4°C	500 g
Organic Lead	DOHS LUFT org. Pb	Water	14 days	glass jar		
		Soil/Waste	14 days	core tube/glass jar	Cool, 4°C	500 g

^a Listed preservative is for total metals. Dissolved or suspended metals require filtration prior to pH adjustment.

*Contract Laboratory Protocol

E. Wet Chemistry

Parameter	Method No.	Matrix	Holding Time (From Date Sampled to Analysis)	Container	Preservative	Minimum Sample Size/Container
Bicarbonate Alkalinity	Std. Methods 2320 MCAWW 310.0,310.2 Std. Methods (407A,B,orD) MCAWW 325.1,325.2,325.3	Water	14 days	poly	Cool, 4°C	250 ml
Chloride	Std. Methods (407A, B, or D) MCAWW 325.1, 325.2, 325.3	Water	28 days	poly	Cool, 4°C	250 ml
Nitrate (include Nitrite)	MCAWW 353.2	Water	28 days	glass	Cool, 4°C, H ₂ SO ₄ to pH < 2	250 ml
Sulfate	MCAWW 375.1, 375.3, 375.4	Water	28 days	poly	Cool, 4°C	250 ml
pH	MCAWW 150.1 SW-846B 9045	Water Soil	immediately immediately	poly poly or glass	none Cool, 4°C	250 ml 100 g

Guide to Methods

- SW-846A - Test Methods for Evaluating Solid Waste Physical/Chemical, Third Edition, Rev. 2, 1992.
- SW-846B - Test Methods for Evaluating Solid Waste Physical/Chemical, Third Edition, Rev. 1, 1990.
- DOHS LUFT - California Department of Health Services Leaking Underground Fuel Tank Manual, May 1988.
- CLP SOW - EPA Contract Laboratory Program Statement of Work for Inorganic Analysis, ILMO 3.0, 1991.
- MCAWW - Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, March 1983.
- Std. Methods - Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, 17th Edition, 1989.2

Table 2. Field Measurement Calibration Procedures and Precision Requirements

Field Measurement	Instrument	Calibration Procedure	Precision
Water Level Survey	Electrical Sounder	Reference to Steel Tape	0.01 foot
	Pressure Transducer	Manufacturers Specifications	0.01 foot
Elevation of Sample Site	Level and rod	Surveyor Calibration	0.01 foot
Location of Sample Site	Steel or Fiberglass Tape	Reference to New Tape	1 foot
Soil Sample Depth	Steel or Fiberglass Tape	Reference to New Tape	Variable, depending on depth and surface irregularities
	Length of Drill Rod	Referenced to Steel Tape	0.5 foot
Water pH	pH Meter	2-Point Buffer Solutions	0.1 pH unit
Soil Slurry pH	pH Meter	2-Point Buffer Solutions	0.1 pH unit
Electrical Conductivity	Conductivity Meter	KCl Reference Solution	8 percent
Water Temperature	Temperature meter and Thermistor	Reference to NBS Mercury Thermometer	0.1 °C
Water Flow Rate	1 liter graduated cylinder and water	Reference to Calibrated Containers and Clock	0.10 L
	Flowmeters	Factory Calibrated	1 gallon per minute
Water Bicarbonate Alkalinity	pH Meter and Buret	2-Point Buffer Solutions NaHCO ₃ Reference Solution	0.1 pH unit
Portable Gas Analyzers	GC/PID or GC/FID	3 Dilutions of Standard Calibration Gas	Variable, depending on specific instrument and matrix
Subsurface Gas	Combustible Gas Indicator	2 Phases of Standard Calibration Gas	1%

Table 3. Example Summary of External (Field) QC Samples per Sampling Event¹

Type of Sample	Level C		Level D		Level E	
	Metal	Organic	Metal	Organic	Metal	Organic
Trip Blank (for volatiles only)	N/A	1/cooler	N/A	1/cooler	N/A	1/cooler
Equipment Rinsate ²	1/day	1/day	1/day	1/day	1/day	1/day
Field Blank	1/source/event ³ for all levels and all analytes					
Field Duplicates/Splits ⁴	10%	10%	10%	10%	5%	5%

¹From NEESA 20.2-047B, (Second Revision June-1988), "Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Restoration Program"

²Samples are collected daily; however, only samples from every other day are analyzed. Other samples are held and analyzed only if evidence of contamination exists.

³Sampling event is defined in Section 3.0 of QEP 6.1.

⁴The duplicate must be taken from the same sample which will become the laboratory matrix/spike duplicate for organics or for the sample used as a duplicate in inorganic analysis.

Table 4. Example Summary of Internal (Laboratory) QC Samples

Analysis	Method Blank	Matrix Duplicate	Matrix Spike/Matrix Spike Duplicate	Blank Spike/Blank Spike Duplicate	Surrogate Spikes
TPH as gasoline	1/20 ^a	NA	1/20 ^b	1/20 ^b	All samples
TPH as diesel, fog oil, motor oil	1/20 ^a	NA	1/20 ^b	1/20 ^b	All samples
BTEX (8020)	1/20 ^a	NA	1/20 ^b	1/20 ^b	All samples
VOCs (8240)	1/20 ^a	NA	1/20 ^b	1/20 ^b	All samples
SVOCs (8270)	1/20 ^a	NA	1/20 ^b	1/20 ^b	All samples
Dioxins (8280)	1/20 ^a	NA	1/20 ^b	1/20 ^b	NA
Explosives (8330)	1/20 ^a	NA	1/20 ^b	1/20 ^b	All samples
Metals	1/20 ^a	1/20	1/20 ^{b,c}	1/20 ^{b,c}	NA
PCBs (8080)	1/20 ^a	NA	1/20 ^b	1/20 ^b	All samples
Non-Polar Oil and Grease	1/20 ^a	NA	1/20 ^b	1/20 ^b	NA
PAHs (8270)	1/20 ^a	NA	1/20 ^b	1/20 ^b	All samples
Major Cations/Anions	1/20 ^a	NA	1/20 ^b	1/20 ^b	NA
Organic Lead	1/20 ^a	1/20	1/20 ^{b,c}	1/20 ^{b,c}	NA
pH	NA	1/20	NA	NA	NA

1/20^a = One per 20 or per lot of samples (as defined by laboratory), whichever is more frequent.

^b = General frequency of one per 20 samples, or as specified by the method.

^c = Matrix spike or blank spike duplicate not required.

Table 5. Example Quality Assurance Goals-Precision (expressed in Relative Percent Difference)

Parameter	Water			Soil	
	Laboratory Blank Spike Duplicate ¹	Matrix Spike Duplicate ²	Field Duplicate ³	Laboratory Blank Spike Duplicate ¹	Matrix Spike Duplicate ²
Aromatic Volatile Organics					
Benzene	12	25	30	12	25
Toluene	18	25	30	12	25
Ethylbenzene	18	25	30	13	25
Xylenes (total)	14	25	30	12	25
PCBs					
Aroclor 1254	36	40	50	29	35
Volatile Organics					
1,1-Dichloroethene	16	14	30	18	22
Trichloroethene	12	14	30	17	24
Benzene	12	11	30	21	21
Toluene	12	13	30	17	21
Chlorobenzene	12	13	30	12	21
Semivolatile Organics					
Phenol	29	42	50	25	35
2-Chlorophenol	28	40	50	22	50
1,4-Dichlorobenzene	28	28	50	22	27
n-Nitroso-di-n-propylamine	18	38	50	21	38
1,2,4-Trichlorobenzene	25	28	50	21	23
4-Chloro-3-methylphenol	25	42	50	17	33
Acenaphthene	16	31	50	16	19
4-Nitrophenol	50	50	50	50	50
2,4-Dinitrotoluene	15	38	50	16	47
Pentachlorophenol	45	50	50	47	47
Pyrene	24	31	50	23	36

Parameter	Water			Soil	
	Laboratory Blank Spike Duplicate ¹	Matrix Spike Duplicate ²	Field Duplicate ³	Laboratory Blank Spike Duplicate ¹	Matrix Spike Duplicate ²
Polycyclic Aromatic Hydrocarbons					
Naphthalene	30	35	50	30	35
Fluorene	30	35	50	30	35
Pyrene	30	35	50	30	35
Benzo(a)pyrene	30	35	50	30	35
Indeno(1,2,3-cd)pyrene	30	35	50	30	35
Dioxins and Furans					
2,3,7,8-TCDF	50	50	50	50	50
1,2,3,7,8-PeCDF	50	50	50	50	50
2,3,4,7,8-PeCDF	50	50	50	50	50
1,2,3,4,7,8-HxCDF	50	50	50	50	50
1,2,3,4,6,7,8-HpCDF	50	50	50	50	50
OCDF	50	50	50	50	50
2,3,7,8-TCDD	50	50	50	50	50
1,2,3,7,8-PeCDD	50	50	50	50	50
1,2,3,4,7,8-HxCDD	50	50	50	50	50
1,2,3,4,6,7,8-HpCDD	50	50	50	50	50
OCDD	50	50	50	50	50
Total Petroleum Hydrocarbons					
Diesel fuel	29	30	50	30	30
Gasoline	15	30	30	15	30
Fog Oil	30*	NA	50	30*	NA
Motor Oil	NA	NA	50	NA	NA
Non-Polar Oil and Grease	36	40	50	37	40
Metals by ICP					
Barium	NA	20	50	NA	20
Beryllium	NA	20	50	NA	20
Cadmium	NA	20	50	NA	20

Parameter	Water			Soil	
	Laboratory Blank Spike Duplicate ¹	Matrix Spike Duplicate ²	Field Duplicate ³	Laboratory Blank Spike Duplicate ¹	Matrix Spike Duplicate ²
Calcium	NA	20	50	NA	20
Chromium	NA	20	50	NA	20
Cobalt	NA	20	50	NA	20
Copper	NA	20	50	NA	20
Iron	NA	20	50	NA	20
Magnesium	NA	20	50	NA	20
Molybdenum	NA	20	50	NA	20
Nickel	NA	20	50	NA	20
Potassium	NA	20	50	NA	20
Silver	NA	20	50	NA	20
Sodium	NA	20	50	NA	20
Vanadium	NA	20	50	NA	20
Zinc	NA	20	50	NA	20
Metals by Furnace AA					
Antimony	NA	20	50	NA	20
Arsenic	NA	20	50	NA	20
Lead	NA	20	50	NA	20
Selenium	NA	20	50	NA	20
Thallium	NA	20	50	NA	20
Mercury (cold vapor)	NA	20	50	NA	20
Hexavalent Chromium	20	20	50	20	20
Bicarbonate Alkalinity	NA	20	50	NA	20
Anions by Ion Chromatography					
Chloride	NA	20	50	NA	NA
Sulfate	NA	20	50	NA	NA
Nitrate/Nitrite	NA	20	50	NA	NA

Parameter	Water			Soil	
	Laboratory Blank Spike Duplicate ¹	Matrix Spike Duplicate ²	Field Duplicate ³	Laboratory Blank Spike Duplicate ¹	Matrix Spike Duplicate ²
Organic Lead (LUFI)	NA	20	50	NA	20

* No historical method performance data available.

¹ Quality Assurance goals based on laboratory historical performance or as provided by commercial supplier.

² Quality Assurance goals are from EPA's Test Method for Evaluating Solid Waste SW-846, Third Edition, 1986b, or EPA Contract Laboratory Program Statement of Work, 1988. If method goals are not available, goals as based on prior experience and laboratory historical performance. Sample duplicate performed in lieu of matrix spike duplicate for metals analyses.

³ For high level samples requiring dilution, 100% RPD is acceptable.

Table 6. Example Quality Assurance Goals-Accuracy, Percent Recovery

Parameter	Water			Soil		
	Laboratory Spike ² Surrogate	Laboratory Blank Spike ¹	Laboratory Matrix Spike ²	Laboratory Spike ² Surrogate	Laboratory Blank Spike ¹	Laboratory Matrix Spike ²
Aromatic Volatile Organics						
Benzene	NA	75-122	65-135	NA	79-116	65-135
Toluene	NA	79-122	65-135	NA	81-115	65-135
Ethylbenzene	NA	73-117	65-135	NA	81-118	65-135
Xylenes (total)	NA	75-120	65-135	NA	85-114	65-135
a,a,a-Trifluorotoluene or 4-Bromofluorobenzene	75-118	NA	NA	65-135	NA	NA
PCBs						
Aroclor 1254	NA	65-135	65-135	NA	65-135	65-135
Decachlorobiphenyl	60-150	NA	NA	60-150	NA	NA
Tetrachloro-m-xylene	60-150	NA	NA	60-150	NA	NA
Volatile Organics						
1,1-Dichloroethene	NA	65-139	61-145	NA	63-165	59-172
Trichloroethene	NA	70-119	71-120	NA	68-114	62-137
Benzene	NA	81-129	76-127	NA	84-120	66-142
Toluene	NA	83-125	76-125	NA	81-118	59-139
Chlorobenzene	NA	83-125	75-130	NA	81-121	60-133
1,2-Dichloroethene-d4	76-114	NA	NA	70-121	NA	NA
Toluene-d8	88-110	NA	NA	81-117	NA	NA
4-Bromofluorobenzene	86-115	NA	NA	74-121	NA	NA
Semivolatile Organics						
Phenol	NA	17-55	12-89	NA	26-90	26-90
2-Chlorophenol	NA	46-114	27-123	NA	40-109	25-102
1,4-Dichlorobenzene	NA	38-111	36-97	NA	52-91	28-104
n-Nitroso-di-n-propylamine	NA	42-108	41-116	NA	41-100	41-126

Parameter	Water			Soil		
	Laboratory Spike ² Surrogate	Laboratory Blank Spike ¹	Laboratory Matrix Spike ²	Laboratory Spike ² Surrogate	Laboratory Blank Spike ¹	Laboratory Matrix Spike ²
1,2,4-Trichlorobenzene	NA	39-110	39-98	NA	41-104	38-107
4-Chloro-3-methylphenol	NA	54-116	23-97	NA	26-103	26-103
Acenaphthene	NA	49-111	46-118	NA	46-89	31-137
4-Nitrophenol	NA	10-80	10-80	NA	39-114	11-114
2,4-Dinitrotoluene	NA	48-118	24-96	NA	28-89	28-89
Pentachlorophenol	NA	13-153	9-103	NA	43-109	17-109
Pyrene	NA	57-150	26-127	NA	41-130	35-142
Nitrobenzene-d5	36-114	NA	NA	23-120	NA	NA
2-Fluorobiphenyl	43-116	NA	NA	30-115	NA	NA
Terphenyl-d14	33-141	NA	NA	18-137	NA	NA
Phenol-d5	10-94	NA	NA	24-113	NA	NA
2-Fluorophenol	21-100	NA	NA	25-121	NA	NA
2,4,6-Tribromophenol	10-123	NA	NA	19-122	NA	NA
Polynuclear Aromatic Hydrocarbons						
Naphthalene	NA	40-160	40-160	NA	40-160	40-160
Fluorene	NA	40-160	40-160	NA	40-160	40-160
Pyrene	NA	40-160	40-160	NA	40-160	40-160
Benzo(a)pyrene	NA	40-160	40-160	NA	40-160	40-160
Indeno(1,2,3-cd)pyrene	NA	40-160	40-160	NA	40-160	40-160
Nitrobenzene-d5	36-114	NA	NA	23-120	NA	NA
2-Fluorobiphenyl	43-116	NA	NA	30-115	NA	NA
Terphenyl-d14	33-141	NA	NA	18-137	NA	NA
Dioxins and Furans						
2,3,7,8-TCDF	NA	60-140	60-140	NA	60-140	60-140
1,2,3,7,8-PeCDF	NA	60-140	60-140	NA	60-140	60-140
2,3,4,7,8-PeCDF	NA	60-140	60-140	NA	60-140	60-140
1,2,3,4,7,8-HxCDF	NA	60-140	60-140	NA	60-140	60-140
1,2,3,4,6,7,8-HpCDF	NA	60-140	60-140	NA	60-140	60-140
OCDF	NA	60-140	60-140	NA	60-140	60-140
2,3,7,8-TCDD	NA	60-140	60-140	NA	60-140	60-140

Parameter	Water			Soil		
	Laboratory Spike ² Surrogate	Laboratory Blank Spike ¹	Laboratory Matrix Spike ²	Laboratory Spike ² Surrogate	Laboratory Blank Spike ¹	Laboratory Matrix Spike ²
1,2,3,7,8-PeCDD	NA	60-140	60-140	NA	60-140	60-140
1,2,3,4,7,8-HxCDD	NA	60-140	60-140	NA	60-140	60-140
1,2,3,4,6,7,8-HpCDD	NA	60-140	60-140	NA	60-140	60-140
OCDD	NA	60-140	60-140	NA	60-140	60-140
Total Petroleum Hydrocarbons						
Gasoline	NA	75-125	65-135	NA	75-125	65-135
4-Bromofluorobenzene	70-130	NA	NA	70-130	NA	NA
Fog Oil	NA	65-150*	NA	NA	65-150*	NA
Motor Oil	NA	NA	NA	NA	NA	NA
Diesel Fuel	NA	65-150	65-150	NA	65-150	65-150
Ortho-terphenyl	65-150	NNA	NA	50-150	NA	65-150
Non-Polar Oil and Grease	NA	65-135	65-135	NA	65-135	65-135
Organic Lead (LUFT)	NA	75-125	75-125	NA	75-125	75-125
Metals by ICP						
Barium	NA	75-125	75-125	NA	75-125	75-125
Beryllium	NA	75-125	75-125	NA	75-125	75-125
Calcium	NA	75-125	75-125	NA	75-125	75-125
Cadmium	NA	75-125	75-125	NA	75-125	75-125
Cobalt	NA	75-125	75-125	NA	75-125	75-125
Chromium	NA	75-125	75-125	NA	75-125	75-125
Copper	NA	75-125	75-125	NA	75-125	75-125
Iron	NA	75-125	75-125	NA	75-125	75-125
Magnesium	NA	75-125	75-125	NA	75-125	75-125
Molybdenum	NA	75-125	75-125	NA	75-125	75-125
Nickel	NA	75-125	75-125	NA	75-125	75-125
Potassium	NA	75-125	75-125	NA	75-125	75-125
Silver	NA	75-125	75-125	NA	75-125	75-125
Sodium	NA	75-125	75-125	NA	75-125	75-125

Parameter	Water			Soil		
	Laboratory Spike ² Surrogate	Laboratory Blank Spike ¹	Laboratory Matrix Spike ²	Laboratory Spike ² Surrogate	Laboratory Blank Spike ¹	Laboratory Matrix Spike ²
Vanadium	NA	75-125	75-125	NA	75-125	75-125
Zinc	NA	75-125	75-125	NA	75-125	75-125
Metals by Furnace AA						
Antimony	NA	75-125	75-125	NA	75-125	75-125
Arsenic	NA	75-125	75-125	NA	75-125	75-125
Lead	NA	75-125	75-125	NA	75-125	75-125
Selenium	NA	75-125	75-125	NA	75-125	75-125
Thallium	NA	75-125	75-125	NA	75-125	75-125
Mercury (cold vapor)	NA	75-125	75-125	NA	75-125	75-125
Bicarbonate Alkalinity	NA	NA	NA	NA	NA	NA
Hexavalent Chromium	NA	75-125	75-125	NA	75-125	75-125
Anions by Ion Chromatography						
Chloride	NA	86-109	75-125	NA	NA	NA
Sulfate	NA	88-106	75-125	NA	NA	NA
Nitrate plus Nitrite	NA	75-125	75-125	NA	NA	NA

¹ Quality Assurance goals based on laboratory historical performance or as provided by commercial supplier.

² Quality Assurance goals are from EPA's Test Method for Evaluating Solid Waste SW-846, Third Edition, 1986b. If method goals are not available, goals are based on prior experience and laboratory historical performance.

* No method performance data available.

Table 7. Summary of Calibration Procedures

Method	Parameter	Calibration	Frequency	Acceptance Criteria	Corrective Action
8015 (Modified) (GC/FID)	Total Petroleum Hydrocarbons	Multipoint calibration (minimum 5 points) each of gasoline or diesel	Initially and as required	$r \geq 0.995$ or % RSD < 20%	1) Evaluate system 2) Repeat calibration
		Continuing calibration check standard	Every 10 samples and beginning and end of sequence	+/- 15% from expected value for each standard beginning each 10 sample sequence	1) Evaluate system 2) Reanalyze standard 3) Recalibrate if appropriate
8020 (GC/PID)	Volatile Aromatics	Multipoint calibration (minimum 5 points)	Initially and as required	$r > 0.995$ or % RSD $\leq 20\%$	Recalibrate as necessary
		Continuing calibration check standard	Daily, before sample analyses	+/- 15% from expected value for each standard beginning each 10 sample sequence	1) Evaluate system 2) Reanalyze standard 3) Recalibrate if appropriate
8240 (GC/MS)	Volatile Organics	Check of instrument tuning criteria using BFB	Every 12 hours	Refer to method (SW846)	1) Retune instrument 2) Repeat BFB analysis
		Multipoint calibration (minimum 5 points)	Initially and as required	% RSD for CCCs < 30% Avg. RF > 0.30 (0.25 for CHBr ₃) for SPCCs	1) Evaluate system 2) Recalibrate as necessary
		Continuing calibration check standard	Every 12 hours	RF > 0.30 (0.25 for bromoform) for SPCCs % Difference < 25% for CCCs	1) Evaluate system 2) Repeat calibration check 3) Recalibrate as appropriate
8270 (GC/MS)	Semivolatile Organics	Check of instrument tuning criteria using DFTPP	Every 12 hours	Refer to method (SW846)	1) Retune instrument 2) Repeat DFTPP analysis
		Multipoint calibration (minimum 5 points)	Initially and as required	% RSD for CCCs < 30% Avg. RF > 0.050 for SPCCs	1) Evaluate system 2) Recalibrate if appropriate
		Continuing calibration check standard	Every 12 hours	RF > 0.050 for SPCCs % Difference $\leq 25\%$ for CCCs	1) Evaluate system 2) Repeat calibration check 3) Recalibrate if appropriate
8280 (GC/MS)	Dioxin and Furans	Check of instrument tuning using 1'C43 in high mass range	As required	Tune for maximum sensitivity of M/Z 414 & M/Z 502 a 4-10% of M/Z 219 (base peak)	Retune instrument

Table 7. Summary of Calibration Procedures (continued)

Method	Parameter	Calibration	Frequency	Acceptance Criteria	Corrective Action
8080 (GC/ECD)	PCBs	Multipoint calibration (5 point - CCl-CC5)	Initially and as required	Relative intensity criteria are isomer specific Internal std. and surrogates PCDDs/PCDFs \leq 15% RSD	1) Evaluate system 2) Recalibrate if appropriate
		Continuing calibration check standard	12 hours	RSD \leq 30% for RRF	1) Evaluate system 2) Repeat calibration as needed.
		Multipoint calibration (minimum five points)	Initially and as required	$r > 0.995$ or % RSD $\leq 20\%$; or RSE $\leq 20\%$ for quadratic curve	Recalibrate as necessary
		Check standard	Every 10 samples and end of sequence	15% from expected value for each standard beginning each 10 sample sequence	1) Evaluate system 2) Repeat calibration check 3) Recalibrate 4) Rerun affected samples
6010 (ICP)	Metals, Total and Dissolved	Laboratory mixed standard calibration	Daily prior to analyses	Linear Curve	Recalibrate if appropriate
		Calibration blank	After initial calibration	+/- RL	1) Rerun 2) Clean system 3) Rerun samples back to clean blank
		ICP interference check	Run at beginning of daily run, after 8 hours and/or end of run	80-120% of true value for EPA check sample elements	1) Recalibrate if appropriate 2) See inorganic supervisor
		Initial calibration check	After calibration	+/- 10%	Recalibrate if appropriate
		Continuing calibration check	10%	+/- 10%	1) Rerun 2) Recalibrate if appropriate
7421 7060 7740 7470/7471 7041 7841	Org. Lead/Lead Arsenic Selenium Mercury Antimony Thallium	Multipoint calibration (minimum 3 points, 4 for mercury)	Daily prior to analyses	$r > 0.995$	Recalibrate if appropriate

Table 7. Summary of Calibration Procedures (continued)

Method	Parameter	Calibration	Frequency	Acceptance Criteria	Corrective Action
		Initial calibration check	After calibration	+/- 10% for 7420 +/- 20% for 7470/7471	1) Rerun 2) Recalibrate as appropriate 3) Reanalyze affected samples
		Continuing calibration check standard	10%, plus end of run	Same as initial calibration check	Recalibrate as appropriate
		Calibration blank	After initial calibration	+/- RL	1) Rerun 2) Clean system 3) Rerun samples back to last clean blank
300.0 Ion Chromatography	Chloride	Multipoint calibration (minimum 3 points)	Initially and as required	$r > 0.995$	1) Check calculations 2) Repeat calibration
300.0 Ion Chromatography	Sulfate	Calibration blank	Daily	< RL	1) Rerun 2) Clean system 3) Rerun samples back to last clean blank
353.2	Nitrate plus Nitrite	Continuing calibration check standard	10%	+/- 10%	1) Check calculations 2) Recalibrate
310.1 Alkalinity	pH	Two-point calibration	Prior to analysis	Measured value within +/- 0.1 pH	1) Repeat calibration 2) See instrument manual
5520	Non Polar Oil and Grease	According to manufacturer's specifications	Prior to use	Manufacturer's specifications	Recalibrate



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1.0 SCOPE

This Quality Execution Procedure (QEP) establishes a standard method for conducting and reporting the results of inspections and tests that are performed in support of the project requirements. This QEP applies to all in-process and final inspections and tests conducted by both MK and Subcontractor personnel. This QEP also addresses MK surveillance of Subcontractor quality activities. Specific inspection and test methods and acceptance criteria are obtained from the applicable drawings, specifications, and procedures.

2.0 RESPONSIBILITIES

2.1 Program Quality Manager (PQM)

The Program Quality Manager is responsible for assuring MK compliance with this procedure, for ensuring observation by MK inspection personnel of designated Inspection/test point, for coordinating Client Inspection/test points, and for verifying Subcontractor compliance with the requirements of this QEP.

2.2 Site Quality Control Supervisor

The Site Quality Control Supervisor (SQCS) is responsible for implementation of this procedure at the field Delivery Order project level. The SQCS coordinates Quality Control activities at the project and implements the Three Phases of Control quality system, and is responsible for documenting and reporting the results of quality control inspections.

2.3 Project Manager (PjM)

The Project Manager is responsible for ensuring that Project Supervisors and/or the Subcontractors are provided with complete information regarding the requirements for their applicable Scope of Work.

2.4 Project Supervisors

Project Supervisors consist of those MK individuals who are responsible for directing MK's remediation/construction work forces (General Superintendent / Area Superintendents). These individuals are responsible for ensuring that MK's workers are qualified to perform the work to which they are assigned, for providing adequate notice when Inspection/test point are approaching, and for ensuring that work does not proceed beyond a point such that a required verification can not be performed.

2.5 Subcontractors

Subcontractors are responsible for ensuring the quality of their work. This responsibility includes providing qualified personnel and adequate equipment for the conduct of the work as well as any inspections and tests that the Subcontractor may be required to perform, providing adequate notification to MK when established Inspection/test point are approaching, ensuring



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that work does not proceed beyond a point such that a required verification cannot be performed, and documenting the results of inspections and tests the Subcontractor has been required to perform in accordance with this QEP.

2.6 QC Personnel

QC Personnel are responsible for conducting assigned inspections in accordance with the technical requirements provided in the applicable specifications and drawings and for documenting the results of these inspections, tests, and observations in accordance with this QEP.

3.0 DEFINITIONS

3.1 Inspection/Test Point

An Inspection or Test Point is that point in a work process where an inspection or test is to be performed. Inspection and Test Points are designated in the Testing Plan and Log contained in QC Plans. Preparatory, Initial, and Follow-up inspections are always inspection points; additional inspections or tests may also be required and are specified in the Quality Control Plan developed for a Delivery Order.

3.2 Three Phases of Control

The Three Phases of Control inspection system involves inspections at the Preparatory, Initial, and Follow-up phases of any definable feature of work for work performed under a Delivery Order. The specific attributes inspected at each phase are described in Section 4.0 of this procedure.

3.3 Definable Feature of Work

A definable feature of work, as defined by the Navy, is a task which is separate and distinct from other tasks and requires separate control requirements. Generally, each division of the specification can be considered a definable feature of work, although there may be more than one definable feature of work in a specification. Examples of a definable feature of work may include well drilling, investigative sampling, confirmatory sampling, or backfill and compaction of soils in an excavation.

4.0 CONDUCT OF INSPECTIONS

4.1 Extent of Inspection

Specific types and frequencies of tests will be detailed in the Testing Plan and Log contained within the QC Plan.

4.1.1 Inspections will be performed utilizing inspection checklists as specified in QC Plans.



4.2 Preparatory Inspection

4.2.1 Notify the Contracting Officer at least two working days in advance of each preparatory phase. Conduct the preparatory phase with the superintendent and the foreman responsible for the definable feature of work. Document the results of the preparatory phase actions in the daily Contractor quality control report. Perform the following prior of beginning work on each definable feature of work:

- a. Review each paragraph of the applicable specification sections;
- b. Review the contract drawings;
- c. Verify that appropriate shop drawings and submittals for materials and equipment have been submitted and approved. Verify receipt of approved factory test results, when required;
- d. Review the testing plan and ensure that provisions have been made to provide the required QC testing;
- e. Examine the work area to ensure that the required preliminary work has been completed;
- f. Examine the required materials and equipment, and sample work to ensure that materials and equipment are on hand and conform to the approved shop drawings and submitted data;
- g. Review the Safety Plan and appropriate activity hazard analysis to ensure that applicable safety requirements are met, and that required material safety data sheets (MSDS) are submitted; and,
- h. Discuss construction methods.

4.3 Initial Inspection

4.3.1 Upon initiation of a representative sample of the given features of the work, the Site QC Supervisor will verify that the work meets the applicable quality requirements.

4.3.2 The following items will be verified during Initial Inspection:

- a. the workmanship meets the established quality requirements;
- b. configuration and construction methods, equipment, and tools appear to be effective;
- c. calibration of measurement and test equipment;
- d. materials and articles used are as specified;
- e. adequacy of inspection / testing methods;



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- f. adequacy of applicable drawings; and,
- g. adequacy of safety and environmental precautions.

4.4 Follow-Up Inspection and Surveillance

4.4.1 Perform the following for on-going work daily, or more frequently as necessary until the completion of each definable feature of work and document in the daily Contractor quality control report:

- a. Ensure the work is in compliance with contract requirements;
- b. Maintain the quality of workmanship required;
- c. Ensure that testing is performed; and,
- d. Ensure that rework items are being corrected.

4.5 QC Plan Inspections

4.5.1 The Site Quality Control Supervisor will perform follow-up inspections based on the Testing Plan and Log in Section 8.0 of this QC Plan. The Site QC Supervisor will document the results of each day's inspection on the Contractor Quality Control Report.

4.5.2 Completed Contractor Quality Control Reports shall be submitted to the Resident Officer in Charge of Construction (ROIICC), with a copy sent to the MK Project Management Office in Charleston, SC.

5.0 DOCUMENTATION OF INSPECTIONS

5.1 Contractor Quality Control Report

5.1.1 Reports are required for each day that work is performed and for every 7 consecutive calendar days of no-work, on the last day of that no-work period. Account for each calendar day throughout the life of the project. The reporting of work shall be identified by terminology consistent with the construction schedule. Contractor quality control reports are to be prepared, signed, and dated by the MK Site QC Supervisor and shall contain the following information:

- a) Identify the control phase and the definable feature of work.
- b) Results of the preparatory phase meetings held, including the location of the definable feature of work and a list of personnel present at the meeting. Verify in the report that for this definable feature of work, the drawings and specifications have been reviewed, and work methods and schedule have been discussed.



- c) Results of the initial phase meetings held, including the location of the definable feature of work and a list of personnel present at the meeting. Verify in the report that for this definable feature of work the preliminary work was done correctly, samples have been prepared and approved, the workmanship is satisfactory, test results are acceptable, work is in compliance with the contract, and the required testing has been performed, and include a list of who performed the tests.
- d) Results of the follow-up phase inspections held, including the location of the definable feature of work. Verify in the report for this definable feature of work that the work complies with the contract as approved in the initial phase, and that required testing has been performed, and include a list of who performed the tests.
- e) Results of the three phases of control for off-site work, if applicable, including actions taken.
- f) List rework items identified, but not corrected by close of business.
- g) As rework items are corrected, provide a revised rework items list along with the corrective action taken.
- h) Include a "Remarks" section in this report which will contain pertinent information including directions received, QC problem areas, deviations from the QC plan, construction deficiencies encountered, QC meetings held, acknowledgment that as-built drawings have been updated, corrective direction given by the QC manager, and corrective action taken by the Project Supervision.
- i) Contractor quality control report certification.

5.2 Testing Plan and Log

5.2.1 As tests are performed, the QC manager shall record on the testing plan and log the date the test was conducted, the date the test results were forwarded to the Contracting Officer, and any remarks and acknowledgment that an accredited or Contracting Officer approved testing laboratory was used. Attach a copy of the updated testing plan and log to the last daily Contractor quality control report of each week.

5.3 Rework Items List

5.3.1 The MK Site QC Supervisor shall maintain a list of work that does not comply with the contract, identifying what items need to be reworked, the date the item was originally discovered, and the date the item was corrected. There is no requirement to report a rework item that is corrected the same day it is discovered. Attach a copy of the rework items list to the last daily Contractor quality control report of each month. The Contractor shall be responsible for including on this list items needing rework including those identified by the ROICC or other Contracting Officer representative.



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5.4 As-Built Records

5.4.1 The Site QC Supervisor is required to review the as-built records required by contract to ensure that as-built records are kept current on a daily basis and marked to show deviations which have been made from the contract drawings. The Site QC Supervisor shall initial each deviation or revision. Upon completion of work, the Site QC Supervisor shall submit a certificate attesting to the accuracy of the as-built records prior to submission to the ROICC or Contracting Officer.

5.5 Report Forms

5.5.1 Inspection and test results will be summarized daily on the "Contractor Quality Control Report", and supported by completed inspection/test checklists for the activity. Completed checklists are to be attached to the Contractor Quality Control Report.

5.5.2 Reports shall be submitted daily to the ROICC (as the Contracting Officer representative), with a copy sent to the Program Quality Manager in the Project Management Office.



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1.0 SCOPE

This Quality Execution Procedure establishes the requirements and responsibilities associated with identifying, reporting, controlling, dispositioning, and correcting deviations identified in the execution of work on the U.S. Navy Southern Division NAVFAC Environmental Response Action Contract.

2.0 RESPONSIBILITIES

2.1 Program Quality Control Manager (PQCM)

The PQCM is responsible for ensuring that a system of identification and resolution of deficient items is established for execution of the work. The PQCM is also responsible for the reporting of adverse trends and programmatic problems to the Program Manager, Project Manager, and MK Corporate Quality Manager.

2.2 Project Manager (PiM)

The Project Manager is responsible for coordinating the development of dispositions to those deviations which require an engineering evaluation to determine the appropriate corrective action, and for resolving items appearing on the Rework Items List.

2.3 Site Remediation/Construction Supervision

Remediation/Construction Supervision is responsible for assuring that identified deviations are controlled and corrected. If a Nonconformance Report (NCR) is issued, the corrective action shall conform to the disposition.

2.4 Site Quality Control Supervisor (SQCS)

The MK Site Quality Control Supervisor is responsible for identifying, documenting, and reporting deviations and for re-inspecting corrected deviations in accordance with this QEP.

2.5 Subcontractors

For work performed by subcontractors, the subcontractors are responsible for assuring that deviations are identified, controlled, documented, reported, corrected, and re-inspected. If a Nonconformance Report (NCR) is issued, the corrective action shall conform to the disposition.



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3.0 DEFINITIONS

3.1 Deviation

A Deviation is any departure from established requirements. Deviations may result in defects that may be corrected through rework or that may result in nonconformances that require engineering evaluation in order to be resolved.

3.2 Nonconformance

A Nonconformance is a deviation of such a nature that its resolution involves the coordination of multiple organizations or requires a formal engineering review. Generally, any deviation that cannot be resolved by performance of rework is considered a nonconformance.

4.0 PROCEDURE

4.1 Identification of Deviations

4.1.1 Deviations are usually identified by inspectors during the conduct of routine inspections or tests. However, deviations may be identified at any time by anyone involved with the work and reported to the applicable inspector or to the PQCM.

4.1.2 When deviations are identified, they should be tagged or otherwise marked, if feasible, by the inspector to both prevent inadvertent additional work that might hinder correction and to assist in locating the item for rework.

4.1.3 Many deviations involve situations where the condition can be corrected by re-performing operations that have already been specified without obtaining additional information or approvals. Examples include: depth of excavation insufficient; failure to achieve specified level of compaction, etc.

4.2 Documentation of Deviations

4.2.1 Deviations or items requiring rework shall be identified on the Contractor Quality Control Report that is completed daily.

4.2.2 Items requiring rework shall be entered on the Rework Items List. Deficient items that can be resolved by reworking by the end of the shift need not be recorded on the Rework Items List.

4.2.3 A copy of the Rework Items List shall be provided to the Project Manager or designee who is responsible for correction of the deficient item.

4.2.4 A copy of the Rework Items List shall also be submitted to the PQCM, as the lists are generated.



- 4.2.5 The SQCS shall maintain a current status of the resolution of items on the Rework Items List, and update the list as deficient items are reworked.
- 4.2.6 When all deviations on a Rework Items List are closed, the list shall be maintained for record purposes.
- 4.3 **Review by Program Quality Manager**
- 4.3.1 Rework Item Lists showing open deviations shall be reviewed by the PQCM to ensure the identified deviations are tracked and action is taken for resolution.
- 4.4 **Issuance of Nonconformance Reports**
- 4.4.1 A "Nonconformance Report" (NCR) (Form QEP 15.1-1) shall be issued by the SQCS to track the resolution of major deviations for the following conditions:
 - a. In the event resolution of a deviation requires engineering input because design requirements cannot be met;
 - b. Resolution requires the coordination of multiple organizations; or,
 - c. The Navy stipulates the use of this more formal deviation reporting method.
- 4.4.2 NCR's are sequentially numbered, with the next number being assigned by the PQCM from the "Nonconformance Report Log" (Form QEP 15.1-2).
- 4.4.3 The SQCS shall fully describe the nonconforming condition on the NCR form and consult with the PQCM and the PjM regarding any proposed corrective action.
- 4.4.4 The NCR shall be forwarded to the PjM, who will assign the disposition of the NCR to the applicable MK Discipline Engineer(s), or other responsible engineering organization.
- 4.4.5 At the time of issue of an NCR, the SQCS will also place a HOLD tag on the item in question, if possible, to assure the condition is identified in the field.
- 4.4.6 If required, a copy of any NCR shall also be submitted to the Contracting Officer within one day of the issue date.
- 4.5 **Implementation of NCR Dispositions**
- 4.5.1 The NCR form with the proposed disposition shall be returned to the SQCS by the Project Manager.
- 4.5.2 The PQCM, the PjM, and the Project Superintendent shall review the proposed Engineering disposition to verify that it can be implemented as proposed and that it does not violate any contract requirements.



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- 4.5.3 The POCM shall also verify that, where required, concurrence by the design organization or code or Navy representatives has been obtained for "Use-as-is" or "Repair" dispositions.
- 4.5.4 The applicable Project Superintendent or subcontractor is provided with the approved NCR disposition and performs the corrective action as specified.
- 4.5.5 The MK Site Quality Control Supervisor verifies that the disposition was performed as stipulated and documents the re-inspection on that day's Contractor Quality Control Report, noting the NCR number.
- 4.5.6 Upon acceptable re-inspection for the NCR, the SQCS shall also verify proper implementation of the corrective action and, if it was utilized, remove the HOLD tag.
- 4.5.7 The SQCS shall close out the Nonconformance Report and its entry on the Nonconformance Report Log.

- 5.0 REFERENCED FORMS
 - a. Rework Items List
 - b. QEP 15.1-1 -- "Nonconformance Report"