EXHIBIT C

QUALITY ASSURANCE AND QUALITY CONTROL PROGRAM FOR SESI PROPERTY CLOSURE CONSTRUCTION

QUALITY ASSURANCE AND QUALITY CONTROL PROGRAM
FOR
CLOSURE CONSTRUCTION
AT
SESI PROPERTY
OTAY MESA
SAN DIEGO COUNTY, CALIFORNIA

PREPARED FOR:

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1.0 INTRODUCTION

The United States District Court plans to close the Sesi Property in accordance with the Closure and Post-Closure Maintenance Plan (Closure Plan) prepare for this site. The Closure Plan was prepared in compliance with selected applicable federal, state and local regulations, including California Code of Regulations (CCR), Title 27, Sections 20323 and 20324. This document presents the Construction Quality Assurance/Quality Control (QA/QC) Plan to be implemented during the closure construction at the site.

The QA/QC plan presented in this manual is to be used in conjunction with the project Plans and Specifications.

1.1 Objectives of the Construction Quality Assurance/Quality Control Plan

The Construction QA/QC Plan has been prepared to meet the following objectives:

- To provide a quality assurance program and quality control procedures which will demonstrate that the closure design is properly implemented by performing monitoring and testing during construction

- To provide a mechanism which allows the evaluation of design changes that occur during construction

- To prepare and maintain documentation that can demonstrate the design has been implemented and the performance requirements have been met. This will form the basis for closure certification per CCR Title 27, Section 21880

- To serve as a reference source for personnel performing and monitoring the construction activities

- To establish lines of communication and responsibilities of all project personnel.

1.2 Contents of the Construction Quality Assurance/Quality Control Plan

This plan contains general direction as well as specific technical information for the control of construction activities. This includes:

- Definition and organization (Section 2) - Reporting mechanism, responsibilities and authorities, and project communications

- Construction quality assurance/quality control (Section 3) - Overall requirements for construction monitoring and testing, the means for resolving nonconformances and verifying correction, design change control, and as-built documentation

- Documentation (Section 4) - It is required that construction monitoring and testing be documented so that their performance and results can be demonstrated. This section discusses the types of records to be prepared, a description of the onsite records system and its maintenance, and the responsibility for preparing and maintaining records

- Field and laboratory QA/QC Program (Section 5) - Verification test type and frequency activities to be monitored during cover fill placement and compaction, and nonconformances during cover fill construction and suggested corrective actions.

2.0 DEFINITION OF OPERATIONS AND RESPONSIBILITIES

The Sesi property waste fill closure construction is to be managed by a project team that is responsible for the design and construction. The organization chart for the project team is shown in Figure 1 and the definitions and responsibilities are discussed in the following sections.

2.1 Owner

In this plan, "Owner" is defined as Mr. Sesi, represented by the United States District Court, and its authorized agents. The Court is a duly authorized agent of the Owner who coordinates with the involved regulatory agencies and directs through its consultant the entire closure construction project that includes the design and construction aspects.

2.2 Regulatory Agency Project Coordinators

The Regulatory Agency Project Coordinators are the representatives of the California Regional Water Quality Control Board, San Diego Region (RWQCB), the California Integrated Waste Management Board (CIWMB), and a Local Enforcement Agency (LEA), represented by the City of San Diego Solid Waste Local Enforcement Agency.

2.3 Design and Construction Management Consultant

In this plan, "Construction Management Consultant (CMC)" Manager is defined as a representative of an independent firm that is contracted to the owner through the Court for the preparation of Plans and Specifications, Construction QA/QC Plan, As-Built Report and providing construction management during closure. During the closure construction phase of the project, the CMC Manager will be available for consultation and review in the event that design/specification changes are required as a result of unexpected field conditions or for evaluation of the Contractor's proposed alternative materials or design. In the detailed technical specifications entitled "Technical Specifications (Special Provisions) for the Sesi Property Closure," the CMC Manager is referred to as the "Engineer."

The CMC organization will consist of the CMC Manager, a QA/QC Manager, and QA/QC Technicians. The QA/QC Manager has overall responsibility for reviewing and approving QA/QC activities, and is responsible for daily direction of QA/QC Technicians and testing laboratories. The QA/QC Technicians conduct observation, sampling, testing and documentation as required by this document and as directed by the QA/QC Manager.

The QA/QC Manager shall be a Registered Civil Engineer or Certified Engineering Geologist licensed by the Sate of California, and should have a minimum of 5 years experience in quality control and construction monitoring on projects involving earthworks and related construction activities on landfill projects. The QA/QC Manager should have a minimum of 5 years experience in a similar capacity and be familiar with all the quality control aspects of the project.

The QA/QC Manager and Technicians are responsible for observing, testing, and documenting activities related to construction QA/QC during the closure construction. The role of the QA/QC Manager and Technicians is critical to successful control and demonstration of construction procedures and required documentation. Their responsibilities include the following:

- Perform documentation and monitoring of materials received and obtain required samples of incoming materials for testing

- Perform construction monitoring and in-situ tests as specified and at the frequencies required

- Collect samples in the field for subsequent testing by onsite or offsite laboratories

- Report nonconformances, as appropriate, to the Contractor's representatives, if correction can be made during the normal course of work

- Report nonconformances to the CMC Manager, if correction cannot be readily achieved to the satisfaction of the QA/QC Technician.

- Report to the CMC Manager any activities which are adverse to overall quality and any nonconformances which are recurring, even though resolution is readily achievable

- Document nonconformances

- Report to the CMC Manager the modifications made to the Plans and Specifications

- Document the construction monitoring and testing activities and prepare the as-built report.

2.4 Construction Contractor

The Construction Contractor (Contractor) is the firm or its representatives responsible for the construction activities so that the landfill closure construction is in accordance with the Plans and Specifications. The Contractor, and subcontractor(s) and their lead personnel must have previous experience in carrying out large scale earthwork and landfill closure construction projects at the level of quality expected in this project. Responsibilities of the Contractor include the following:

- Assign duties and supervise the construction crew

- Manage the day-to-day execution of construction activities in accordance with the construction documents, Health and Safety Plan and the provisions of this Plan

- Procure subcontractor services for construction with the approval of the CMC Manager

- Conform to federal, state, local safety regulations and the health and safety guidelines established for the waste pertinent to the construction work

- Notify the QA/QC Technician when materials are received onsite so that receiving monitoring can be performed

- Report to the CMC Manager the modifications of the construction documents needed to address unexpected field conditions so that review and approval of changes can be accomplished prior to their implementation.

- Completed construction records required by this plan.

2.5 Project Communications

Communication between project participants is crucial and includes the exchange of information which allows required reporting and work to proceed.

Communications in the form of construction documents, monitoring results, test results, and daily logs must be timely so that reviews and evaluation of construction activities can take place.

Figure 1 includes the lines of communication which provide links between the various groups participating in the project. Communication within the staff of different groups must be on an as-needed basis, and not solely though the team leaders and Construction Manager.

2.5.1 Preconstruction Meeting

Before construction beings, a Preconstruction Meeting will be held to review and acquaint personnel with the requirements of the Construction Quality Assurance/Quality Control Plan, the Plans and Specifications, the Contractor's workplan, the construction schedule and the site Health and Safety Plan. The meeting should be led by the CMC. Attendance at the meeting should include: CMC Manager, QA/QC Manager, QA/QC Technicians, Surveyor, Construction Contractor, Project Manager, and other Contractor representatives such as superintendents and foremen. Representatives of the regulatory agencies will be invited to attend the meeting. Meeting notes shall be prepared by the CMC and maintained in the onsite records system. Subcontractor personnel shall attend the meeting as appropriate to their scope of work. If subcontractor(s) were absent during the preconstruction meeting, the CMC Manager shall meet with the subcontractors to review appropriate activities of their work and document these meetings.

2.5.2 Progress Meetings

Formal progress meetings shall be held weekly by the CMC Manager, Contractor, and the QA/QC Manager to discuss the progress of the work which specifically includes the following:

- Review scheduled work activities
- Discuss the Contractor's personnel and equipment assignments for the day
- Review the previous day's activities and accomplishments

- Review QA/QC test data
- Discuss deficiencies or problems associated with the above
- Plan future construction activities.

The meeting shall be documents by the CMC. The regulatory agency representatives shall be invited to attend the weekly progress meetings.

2.5.3 Conflict Resolution Meeting

A special meeting may be called by the CMC Manager, Contractor, and QA/QC Manager to discuss activities adverse to construction quality and to provide resolution. Meeting notes shall be prepared by the CMC. It is intended that these meetings be called to discuss quality problems which cannot be readily resolved and/or which are ongoing or recurring.

The meeting should:

- Define and discuss the quality-related problem
- Review solutions
- Implement a plan to resolve the quality-related problem.

Resolution shall be approved by the CMC and the Contractor.

3.0 CONSTRUCTION QUALITY ASSURANCE/QUALITY CONTROL

The CMC Manager and Contractor representatives such as superintendents and foremen are responsible for performing the work according to the Plans and Specifications. The CMC is responsible for verifying and documenting the construction through monitoring and testing.

The components of the final cover designed for the Sesi Property Closure Project are as follows:

- A foundation layer - a minimum of 2 feet thick
- A low permeability layer - a minimum of 1 foot thick
- A vegetative layer - 1½ feet thick.

Cover materials will be evaluated using performance specifications rather than method specifications. The controlling performance specifications for final cover materials will be their in-place density (relative compaction) and moisture content. The critical performance specification for the low permeability layer will be permeability testing. Permeability tests will be by laboratory test (ASTM D5084) methods. The maximum allowable permeability is 1.0×10^{-6} cm/sec.

3.1 Construction Verification

A specific field/laboratory testing program for quality control is included in Section 5. This program, which serves as a guidance for the field QA/QC Technicians, specifies the required monitoring, type and frequency of testing and the acceptance criteria. This program also provides a summary of activities to be monitored during cover construction, common deficiencies, and suggested corrective actions.

The project guidelines for earthwork are contained in the Plans (Construction Drawings) and Specifications. These are to be strictly adhered to except where specifically superseded in subsequent soils reports or by a change in the prevailing guidance documents, as approved by the LEA or other state agency.

3.1.1 General

A. The Contractor shall be responsible for the satisfactory completion of all earthwork in accordance with the project Plans and Specifications.

B. The project CMC Manager, QA/QC Manager, and QA/QC Technicians, shall provide engineering inspection and testing services.

C. All clearing stripping and site preparation for the project shall be accomplished by the Contractor to the satisfaction of the QA/QC Manager.

D. It is the Contractor's responsibility to prepare the ground surface to receive the fills, to the satisfaction of the QA/QC Manager and to place, spread, mix, water and compact the fill in accordance with the job specifications and as recommended by the CMC. The Contractor shall also remove all material considered by the QA/QC Manager to be unsuitable for use in the construction of any of the final cover layers.

E. The Contractor will have suitable and sufficient compaction equipment on the job site to handle the amount of fill being placed. If necessary, equipment will be shut down temporarily in order to allow time for proper compaction of fills. If needed, compaction equipment will also be shut down temporarily to allow time for inspection and testing of fills by the QA/QC Manager and/or QA/QC Technicians. Sufficient watering apparatus will also be provided by the Contractor, with due consideration to the type of fill materials, rate of placement, and time of year.

F. Clay soils for the low permeability layer will be watered, processed, and stockpiled for curing. The soil should be covered for a period of at least 48 hours prior to pick-up, transport and use in low permeability layer construction.

G. Low permeability layer production will not exceed the volume of available stockpiled and cured soil.

H. Manual rock picking of +1-inch rock and moisture conditioning during placement of the low permeability layer will be conducted.

I. When work is interrupted by rains, earthwork operations shall not be resumed until field tests by the QA/QC Technicians indicate the moisture content and density of the fill are within the specified limits.

J. Plant salvage, and Site revegetation shall be monitored and accomplished by the Contractor to the satisfaction of the QA/QC Manager.

K. A final report shall be prepared by the QA/QC Manager, a registered Civil Engineer or Certified Engineering Geologist in the Sate of California. The report shall be issued to the CMC attesting to the Contractor's conformance with these specifications. Plans used in this report will be an "As-Built" plan prepared by the Engineer.

3.1.2 Field Testing

Monitoring of the fill placement shall be provided by the QA/QC Manager and/or the QA/QC Technicians during the grading. Specific field testing will be performed onsite by QA/QC Technicians according to the procedures cited in the Technical Specifications and the testing program listed in Section 5 of this Plan.

Where sheepsfoot rollers are used, the soil may be disturbed to a depth of several inches. The field tests and extraction of samples for laboratory testing, shall be done, in the compacted material below the disturbed surface.

To provide prompt confirmation or rejection of the material or the constructed work, field tests shall be performed by the QA/QC Technicians, as soon as the material is received or as the portion of the constructed work is completed. Prompt testing minimizes the possibility of removing satisfactory work which has been added to defective material or work.

During construction of the low permeability layer, the active fill area will be checked by the QA/QC Technicians at the beginning of each grading day. Any desiccated soils will be thoroughly watered and processed in preparation for receiving additional fill lifts.

3.1.3 Laboratory Testing

Specific laboratory testing will be performed by onsite or offsite laboratories on samples of materials used in construction. Testing shall be performed in accordance with the specified methods. It is noted that while each test method cited is an approved procedure to test for a specific characteristic, not every test can stand alone for construction acceptance.

Laboratory tests are generally used to correlate field test results with primary characteristics of interest and to provide periodic confirmation of field test results. Laboratory tests shall be performed as soon as the samples are collected to provide prompt evaluation on acceptance or rejection of the material and the constructed work.

For the purposes of cross checking, the following schedule will be maintained:

> Permeability - If a permeability test of the low-permeability layer yields results greater than the limits presented in the specifications, two additional tests of the same type will be taken in the immediate vicinity. If either of these "check" tests fails to meet requirements, this area of the low-permeability layer will be considered inadequate and will be removed or reprocessed.
>
> Compaction - If an in-situ moisture/density test of any final cover layer yields results less than the required relative compaction or is outside the specified moisture window, the area of the cover will be considered inadequate and will be reworked. Additional in-situ moisture/density tests may be performed in the vicinity to estimate the extent of the area to be reworked.

No additional material shall be placed in a reworked area until it has been testing and found to meet the specification requirements.

3.1.4 Construction Monitoring

Construction shall be monitored to check whether the work and materials used meet the requirements of the construction Plans and Specifications. QA/QC Technicians shall monitor the construction activity according to the guidelines provided in Table 1 or in the Technical Specifications.

Monitoring low-permeability layer of import material shall be performed at the time of delivery to evaluate that the materials meet the specifications. All materials placed as part of compacted fill must be inspected and observed by the QA/QC Technicians. Material deemed unlikely to meet the performance specifications shall be removed from the site. No material shall be used prior to approval by the QA/QC Technicians.

Field monitoring consists primarily of visual assessment. Monitoring may include measurements of materials and documentation of equipment used, construction techniques employed, and quality of the constructed work. Monitoring is performed either during the construction process or shortly after completion of the work. The results of visual monitoring shall be documented in a daily field monitoring report.

3.1.5 Manufacturer's Certificates

Manufacturer's certificates shall be obtained from suppliers for selected materials received, such as asphaltic concrete mix, Portland cement concrete, geotextile, geomembrane, high density polyethylene pipe, corrugated metal pipe, riprap, fertilizer, seeds, etc. The certificates shall include the supplied quantity and a statement that the materials meet specifications.

3.2 Nonconformance/Corrective Action

Nonconforming items and activities are those which do not meet the requirements of the Plans and Specifications, the procurement document criteria, the approved work procedures, or the acceptance criteria set in the Construction Quality Assurance/Quality Control Plan. Nonconformance may be detected and identified by:

- QA/QC Technician or Surveyor - During construction through field monitoring, testing, and surveying
- Contractor - During the course of their ongoing visual monitoring
- Laboratory Personnel - During the preparation for and performance of laboratory testing
- CMC - During the performance of audits, surveillance, and other quality assurance activities.

It is the responsibility of the QA/QC Technician or QA/QC Manager to notify the CMC Manager of significant nonconformances which could impact the quality of the work. The CMC Manager shall request appropriate corrective actions if necessary to mitigate nonconformances. Table 3 includes a list of some of the common nonconformances and suggested actions to correct them.

Completion of corrective actions for significant nonconformances shall be verified by CMC Manager as a part of his future activities. Any significant, recurring nonconformance shall be evaluated by the QA/QC Manager and the CMC Manager to determine their cause. Appropriate changes shall be instituted to prevent its recurrence. When such an evaluation is performed, the results shall be documented. Approval of corrective action shall be indicated by signature and date on the approval page or title block for each document.

3.3 Design/Specification Modifications

Modification of the original Specifications and Plans are to be expected. Modification does not imply a nonconformance to the work, but indicates that original plans must be revised to fit the field conditions encountered during construction. Modification of construction documents shall be recorded, evaluated, and reported to the regulatory agency coordinators prior to implementation.

It is the responsibility of the QA/QC Manager to appropriately record the modifications and to make the documentation available to the CMC Manager. Following the review and approval process, the revised construction documents shall be made available to the Contractor for implementation.

4.0 DOCUMENTATION

To provide evidence of satisfactory work performance, all stages of the Sesi Property Closure Project construction shall be documented. Information shall be recorded on standardized forms or in a bound field logbook.

4.1 Daily Recordkeeping

The purpose of daily recordkeeping is to record construction activities, including results of continuous visual observations, laboratory/field test data, repairs, problems, and solutions. The daily recordkeeping will include a daily field activity log and a daily test summary report, as discussed below.

4.1.1 Daily Field Activity Log

Construction QA/QC Technicians shall keep a daily log of project activities. At a minimum, the daily log shall include the following:

- Date and project identification
- Field activity and work locations
- Equipment used and personnel assigned
- Work activities monitored and their results
- Record of material sampling and testing activities
- Any variance from standard approved methods and specifications
- Estimated quantities of materials placed and compacted
- Modifications made to drawings and specifications
- Imported materials received
- Actions regarding acceptance/rejection of work
- Weather conditions
- Records of project photographs taken
- Signature of person preparing the log.

Daily logs shall be reviewed by the QA/QC Manager and submitted to the CMC Manager. A sample form of the Daily Field Activity Log is included as Figure 2.

4.1.2 Daily Test Summary Report

A daily Test Summary Report of the field and laboratory tests for the QA/QC of the fill placement will be prepared under the direction of the QA/QC Manager. The Daily Test Summary report will include:

- Locations and results of all field and laboratory tests on compacted fill with pass/fail comment
- Results of all retests for failed tests with remarks showing the corrective action before the retest. If retest also shows rejection, final corrective action shall be noted.

A sample form of daily test summary report is included as Figure 3. Both the daily field inspection report and the daily test summary report shall be reviewed by the QA/QC Manager and be submitted to the CMC Manager.

4.1.3 Nonconformance Report and Resolutions

Each nonconformance affecting the quality of work shall be documented. The results of equipment calibration, results of laboratory analysis, daily field activity logs, and daily test summaries, and internal memoranda can be used as portions of the nonconformance report.

The report shall include:

- Name of individual(s) identifying the nonconformance or originating the report
- Description of the nonconformance
- The corrective action taken and the method(s) used to complete the corrective action
- Responsible individuals for correcting the nonconformance and if necessary, verification of the correction.

Documentation shall be available to the CMC Manager, Contractor, and QA/QC Manager.

4.1.4 Calibration Record

Measuring and testing equipment used in the onsite and/or offsite laboratories shall be calibrated at the required frequency. The calibration program shall provide range, accuracy, and precision of the equipment. Calibration of measuring and testing equipment may be performed internally by the QA/QC Manager using reference standards, or externally by agencies or manufacturers.

Calibration records shall be prepared and maintained for each piece of measuring and test equipment to demonstrate that established calibration procedures have been followed. Calibration records shall be maintained by the respective laboratory managers and the CMC Manger for onsite and offsite laboratory equipment.

4.2 Photographic Documentation

A photographic record shall be prepared as part of the construction control activities. Photographs shall be in color. Photographs shall be taken of construction activities, field test conditions, sampling locations, and final constructed features. Photographs are to be identified by the Sesi Property Closure Project designation, date taken, and a brief description of its content.

The identification may be done individually on the back of the photographs or in an album in which the photographs are mounted.

4.3 As-Built Documentation

At the completion of the closure, final as-built drawings and report and certification of closure shall be prepared by the QA/QC Manager utilizing the records prepared during the closure construction. These drawings and report should be retained as a permanent record of the post-closure configuration and dimensions of the Sesi Property Closure Project features (e.g., vegetative soil cover, low-permeability layer, foundation layer, drainage channels, pipes, and Site revegetation). The as-built report shall be submitted to regulatory agencies for approval to provide certification of the closure. As-built report should be signed and sealed by the QA/QC Manager, a Professional Engineer, or Certified Engineering Geologist, registered in the State of California.

4.4 Record Retention

Field construction documentation shall be collected and retained in the CMC office and be available for regulatory review. These records will provide documentation of how the Sesi Property was closed. Laboratory testing records shall be maintained by each offsite laboratory participating in the construction control program.

Records received at the field office shall be checked by the CMC Manager to verify that the incoming records have been properly identified for filing, are legible, and are in suitable condition for storage. Indexing and filing of records shall be performed only by the CMC Manager.

Record storage shall utilize facilities that provide a suitable environment to minimize deterioration or damage, and to prevent loss. Records shall be secured in binders, placed in folders or envelopes, or otherwise secured for storage in containers (e.g., steel file cabinets). Sign-out sheets shall be maintained so that a record of files removed is available. Access to the onsite records system should be limited to designated personnel.

5.0 LIMITATIONS AND PROFESSIONAL CERTIFICATION

The methodology, procedures, policies, and professional opinions presented in this QA/QC Plan for the Cactus Road Landfill Site located in the Otay Mesa Area of San Diego, were developed by ENV America for the United States District Court, in accordance with generally accepted civil engineering principles and practices. This warranty is in lieu of all other warranties, either express or implied.

The methodology, procedures, policies, and recommendations contained herein should be considered to relate only to the specific project and location discussed herein. ENV America is not responsible for any conclusions or recommendations that may be made by others, unless we have been given an opportunity to review such conclusions or recommendations and concur in writing. Implementing recommendations and compliance actions contained within this QA/QC plan are not within the scope authorize in preparing this plan and accompanying figures.

This QA/QC plant has been prepared for the United States District Court, and for the benefit of Mr. And Mrs. Salim D. Sesi and Signal Landmark, for submittal to the California Integrated Waste Management Board, California Regional Water Quality Control Board, San Diego County Air Pollution Control District, and the Local Enforcement Agency. It may not contain sufficient information for the purposes of other parties or other uses. If any changes are made in the project as outlined in this plan, the methodology, procedures, policies and recommendations contained in this plan shall not be considered valid unless the changes are reviewed and the contents of this plan are modified or approved in writing by ENV America.

The following ENV America professional was responsible for all work associated with this project within the purview of the Professional Engineers' Act of the California Code of Regulations.

S. "Sean" Shahin, P.E.
Principal
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TABLES

TABLE C-1

ACTIVITIES TO BE MONITORED DURING FILL PLACEMENT AND COMPACTION

Activities during fill placement and compaction should include but not be limited to the following:

- Condition of subgrade - subgrade should be free of surface vegetation, but may contain roots. The subgrade should be properly moisture conditioned and scarified prior to placing foundation material.
- Verify that the material is coming from approved stockpile/borrow areas
- Monitor lift thickness
- Verify that all oversize material is removed from the fill by rock-rakes/screens and all clods are broken to required size.
- Observe the effect of compaction equipment on the fill, i.e., roller pad penetration, pumping, cracking, etc.
- Verify uniformity of coverage of compaction equipment especially at fill edges and equipment turnaround area
- Verify bonding between successive lifts. Should surface of previous lift be smooth or show excessive drying and cracking, the lift shall be scarified and moisture conditioned prior to placing next lift
- Verify that top of subgrade has been surveyed and conforms to line and grades show on the Plans
- Verify that the minimum thickness of the final cover layers is achieved.

In addition to observing material placement, the QA/QC Manager shall conduct quality control testing in accordance with the schedule shown in Table 2.

TABLE C-2
SUMMARY OF QUALITY CONTROL TESTING PROGRAM

Test Description, Test Standard	Foundation Layer	Low Permeability Layer	Vegetative Cover Soil	Asphalt Lining
I. Testing Frequency for Soils				
Grain Size Distribution, ASTM D422	2,000 CY/Change of Material	1,000 CY/Change of Material	2,000 CY/Change of Material	
Atterberg Limits, ASTM D4318	4,000 CY/Change of Material	1,000 CY/Change of Material	4,000 CY/Change of Material	
Engineering Classification, ASTM D2487	2,000 CY/Change of Material	1,000 CY/Change of Material	2,000 CY/Change of Material[a]	
Moisture Content, ASTM D2216/D4643	1,000 CY	1,000 CY	1,000 CY	
Moisture Density Relation, ASTM D1557 (Modified Proctor)	2,000 CY/Change of Material. In addition check point every 1,000 CY (minimum of 1 check point per day)	1,000 CY/Change of Material. In addition 1 check point every 500 CY (minimum of 1 check point per day)	2,000 CY/Change of Material. In addition 1 check point every 1,000 CY (minimum of 1 check point per day)	
In-place Density, ASTM D1556 (sand cone)	2,000 CY	2,500 CY or 1 per day	2,000 CY	
In-place Desnity, ASTM D2922 (Nuclear)	500 CY	250 CY	500 CY	
In-place Moisture, ASTM D3017 (Nuclear)	500 CY	250 CY	500 CY	
Hydraulic Conductivity, ASTM D5084 Using Triaxial Cell	NA	1,000 CY	NA	
II. Testing Frequency for Asphaltic Concrete Lining				
Thickness				25 feet
Temperature Check				1 per truck load
III. Acceptance Criteria				
Soil Engineering Classification per ASTM 2487	No particles larger than 6 inches	SC, CL, CH > 100% finer than 1-inch >90% finer than #4 sieve >50% finer than #200 sieve	ML, CL, SC, SM No particles larger than 6 inches	
Percent of Maximum In-place Dry Density per ASTM 1557	90% minimum	90% minimum	90%[b] 85%[c] minimum	
Percent range of Moisture above Optimum per ASTM D1557	0 to + 5%	+ 3% to + 6%	0 to + 5%	
Laboratory Permeability by ASTM D5084 (Triaxial Cell)		$< 1 \times 10^{-6}$ cm/sec		
Asphaltic Concrete Control Temperature				per Table 203-14(A), p. 125 of "Greenbook" + 0.25"
Thickness				

Notes:

(a) Engineering classification of vegetative cover material should be performed based on ASTM D2488 test method.
(b) Lower lift (2 × 6 inches)
(c) Upper lift (6 inches)

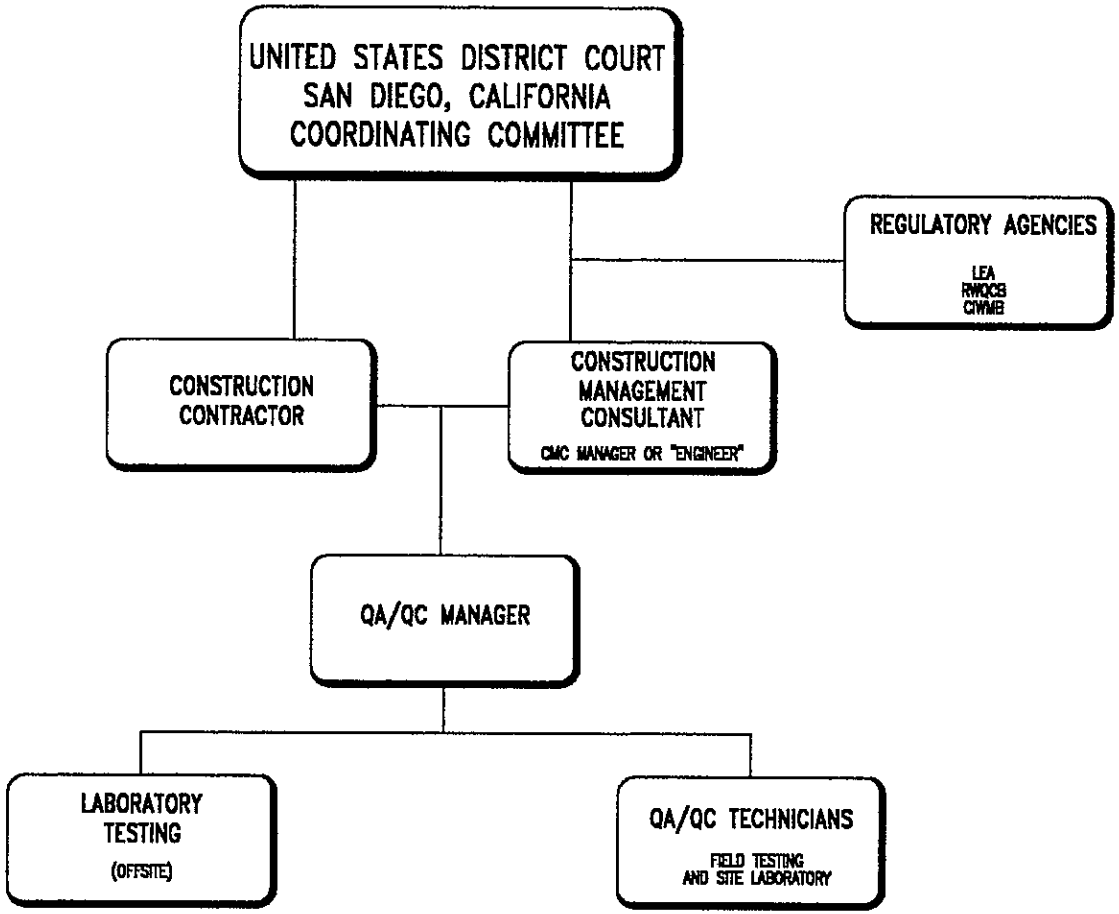
TABLE C-3

NONCONFORMANCE DURING FILL PLACEMENT AND SUGGESTED CORRECTIVE ACTIONS

Common deficiencies during fill placement and suggested corrective actions may include, but not be limited to the following:

Deficiency	Suggested Corrective Action
Poor Subgrade Condition	Additional proof rolling, moisture conditioning, overexcavation and recompaction.
Oversize Particles in Final Cover Material	Additional rock raking, screening and manual labor for oversize particles removal; additional rotomixing for breaking up clods; rejection of material and removal if deficiency not resolved by above.
Gradation (Deficiency of Fines)	Blending with more fine-grained material or rejection and removal at Engineer's recommendation and under Engineer's supervision.
Moisture Content Deficiency	If excessively wet, disc and allow it to air dry or blend with drier material. If dry, add more water. If moisture content nonuniform, disc more thoroughly. Add water if appropriate. Adjust the water truck spray nozzle as appropriate.
Excessive lift thickness	Cut down lift and recompact.
In-place density	Apply additional compactive effort. Adjust moisture content and disc, if appropriate. Reject and remove material, if not corrected by above.
Permeability greater than 1.0×10^{-6} cm/sec for low permeability layer	Blend with finer-grained clay, reprocess and recompact. Apply additional compactive effort and adjust moisture content if necessary. Reject and remove material if not corrected.

FIGURES



ENV AMERICA
ENVIRONMENTAL ENGINEERING, CONSULTING & CONSTRUCTION

FIGURE C-1

QA/QC ORGANIZATION

SESI PROPERTY CLOSURE PROJECT
OTAY MESA, SAN DIEGO

MCU-01-7001 | PROJECT NUMBER | BY | 11/11/98 | APPROVED BY

FIGURE C-2
DAILY FIELD INSPECTION REPORT

ENV AMERICA QA/QC TECHNICIAN:

JOB LOCATION:

CONTRACTOR: SUPERINTENDENT:

REPORT NUMBER: PAGE: OF

DATE: DAY: WORK ORDER NUMBER:

VISITORS:

EQUIPMENT

AREAS WORK BY CONTRACTOR:

CUBIC YARDS OF MATERIAL EXCAVATED: **PLACED:**

TOTAL DENSITY TESTS PASSED: **FAILED:** **CORRECTED:**

REMARKS:

SIGNATURE:

REVIEWED BY:

Figure C-3
Sesi Property Closure Construction
Dilly Test Summary Report

Date	Test No.	Coordinates		Elev. (ft)	Maximum Dry Density (pcf)	Optimum Moisture Content (%)	Field Dry Density (pcf)	Field Moisture Content (%)	Relative Compaction (%)	Test Type	%Finer Than #200	Ave. % Finer Than #200 of Ten Consecutive Tests	BAT Perm. (cm/sec)	Lab Perm. (cm/sec)	Liquid Limit	Plastic Limit	Plasticity Index
		Northing	Easting														

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