SUBMITTAL TO THE BOARD OF SUPERVISORS
COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

4160

FROM: Waste Management Department

SUBMITTAL DATE: June 24, 2010

SUBJECT: Consultant Services Agreement for Badlands and Lamb Canyon Landfills Geotechnical Design and Construction Quality Assurance/Quality Control (QA/QC)

RECOMMENDED MOTION: That the Board of Supervisors:

1. Approve the Consultant Services Agreement for Badlands and Lamb Canyon Landfills Geotechnical Design and Construction between County of Riverside and Geosyntec Consultants; and

2. Authorize the Chairman of the Board to execute the Agreement on behalf of Waste Management Department; and

3. Authorize the General Manager-Chief Engineer to approve payments for additional work within the scope of the contract, not to exceed 10 percent of the original contract amount. (Continued)

Hans W. Kernkamp, General Manager-Chief Engineer

FORM APPROVED COUNTY COUNSEL
BY NEAL R. KIPNIS DATE 6/29/10
Departmental Concurrence

FINANCIAL DATA				
	Current F.Y. Total Cost:	$562,753	In Current Year Budget:	Yes
	Current F.Y. Net County Cost:	$ N/A	Budget Adjustment:	No
	Annual Net County Cost:	$ N/A	For Fiscal Year:	10/11

SOURCE OF FUNDS: Waste Management Department Enterprise Funds

Positions To Be Deleted Per A-30 ☐

Requires 4/5 Vote ☐

C.E.O. RECOMMENDATION:

APPROVE
BY: Alex Gann
Alex Gann

County Executive Office Signature

☐ Consent ☒ Policy

☐ Consent ☒ Policy

Dep't Recomm.: Per Exec. Ofc.:

MINUTES OF THE BOARD OF SUPERVISORS

On motion of Supervisor Ashley, seconded by Supervisor Tavaglione and duly carried by unanimous vote, IT WAS ORDERED that the above matter is approved as recommended.

Ayes: Buster, Tavaglione, Stone, Benoit and Ashley
Nays: None
Absent: None
Date: July 13, 2010
xc: Waste

Kecia Harper-Ihem
Clerk of the Board
By: Deputy

Prev. Agn. Ref.: | **District:** 5 | **Agenda Number:** 12.2

ATTACHMENTS FILED
WITH THE CLERK OF THE BOARD

BACKGROUND:
The Riverside County Waste Management Department (Department) is required to perform geological and geotechnical studies, as well as independent third party construction QA/QC for two upcoming projects referred to as "The Construction of Liner System, Phase 2, Stage 4 (P2S4) Expansion, at the Lamb Canyon Sanitary Landfill" (Lamb Canyon Project) and "The Construction of the Liner System, Canyon 4 Phase 3 (C4P3) Expansion, at the Badlands Sanitary Landfill" (Badlands Project).

The Lamb Canyon Project will expand the size of the disposal area at the Lamb Canyon Sanitary Landfill by approximately 23 acres and the Badlands Project will expand the size of the disposal area at the Badlands Sanitary Landfill by approximately 13 acres, in accordance with the requirements of Title 27 of the California Code of Regulations (CCR), and Subtitle D of the Code of Federal Regulations (CFR). These expansion projects are already permitted by each site's Solid Waste Facilities Permit issued by CalRecycle (formally California Integrated Waste Management Board). Final design details and contract documents for the installation of the geosynthetic liner system are currently being prepared for both projects by the Department. Both of these projects are critical to the Department's ongoing mission to provide adequate long-term disposal capacity to the residents of Riverside County.

In accordance with County Policy H-7, a Request for Proposal (RFP), dated March 25, 2010, was posted to the Purchasing Department's website and noticed in the local newspaper. The Waste Management Department received seven (7) proposals ranging in price from $460,000.50 to $878,049.40.

The consultant proposals were reviewed by an evaluation committee consisting of three individuals experienced in work requested and/or purchasing process. Each committee member reviewed the proposals independently and their reviews summarized by the Assistant Chief Engineer and then reviewed by the Department's General Manager-Chief Engineer. The Department is recommending that the results of the selection committee be used and the award be made to Geosyntec. Geosyntec's proposal was the fourth lowest bid at $562,753 and they scored the highest during the Department's evaluation. The Department believes that the three lower bidders were non-responsive, in that they failed to demonstrate adequate experience or sufficient reference projects within the landfill industry. Furthermore, none of the three lower bidders elected to take the time to visit each site, which is disconcerting given the complexity of both projects.

Attachment: Consultant Services Agreement

CONSULTANT AGREEMENT

The COUNTY OF RIVERSIDE on behalf of the Riverside County Waste Management Department ("COUNTY") and Geosyntec Consultants ("CONSULTANT") agree as follows:

1. **PROJECT:**

The CONSULTANT shall perform services to provide COUNTY with geological and geotechnical services for two projects referred to as "The Construction of Liner System, Phase 2, Stage 4 (P2S4) Expansion, at the Lamb Canyon Sanitary Landfill" (Lamb Canyon Project), and "The Construction of the Liner System, Canyon 4, Phase 3 (C4P3) Expansion, at the Badlands Sanitary Landfill" (Badlands Project) in accordance with COUNTY's Request for Proposal dated March 25, 2010 (attached as Exhibit A) and CONSULTANT's proposal dated April 19, 2010 (attached as Exhibit B). All of these exhibits are attached to and incorporated into this Agreement.

2. **SCOPE OF SERVICES:**

The CONSULTANT shall furnish all tools, equipment, facilities, materials, and labor necessary to perform in a complete, skillful, and professional manner all those services described in Exhibit A and Exhibit B.

3. **TIME OF PERFORMANCE:**

The CONSULTANT shall commence performance of service following execution of this Agreement as mutually agreed upon by the parties; and shall diligently perform the services to full completion.

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4. COMPENSATION

The total amount of compensation paid to the CONSULTANT for all services under this Agreement (including expenses) shall be in the amount of $562,753.00 unless a written amendment is executed by both parties prior to performance of additional services. CONSULTANT agrees that in case of amendments to this agreement extending or modifying services, the costs described in Exhibit B shall remain unchanged for a period of one year from the date of this agreement. This total amount for the required services is broken down as follows:

Service A: Geotechnical Services

a. Service A-1 (Tasks 1-5): Lamb Canyon Project:

Sub-total = $44,159

- The compensation for performing Service A-1, **Task 1** shall be payable based upon the total number of lab testing as described in section F.i.2 of Exhibit A, and by applying the unit cost per test as shown on Attachment F-1 of Exhibit B.
- The compensation for performing Service A-1, **Task 2** shall be payable based upon the total depth, in linear feet, for soil borings as described in section F.i.3 of Exhibit A, and by applying the unit cost per feet as shown on Attachment F-1 of Exhibit B.
- The compensation for performing Service A-1, **Tasks 3-5** shall be payable based on lump sum costs as described in section F.i.4 of Exhibit A, and Attachment F-1 of Exhibit B.

b. Service A-2 (Tasks 1, 3-5): Badlands Project:

Sub-total = $30,662

- The compensation for performing Service A-2, **Task 1** shall be payable based upon the total number of lab testing as described in section F.i.2 of Exhibit A, and by applying the unit cost per test as shown on Attachment F-1 of Exhibit B.

- The compensation for performing Service A-2, **Tasks 3-5** shall be payable based on lump sum costs as described in section F.i.4 of Exhibit A, and Attachment F-1 of Exhibit B.

Service B: Geological Services

a. Service B (Tasks 1-2): Lamb Canyon Project:

Sub-total = $39,053

- The compensation for performing Service B, **Task 1** shall be payable based upon actual days worked during the total estimated task duration of 25 working days, and by applying a daily rate of **$1,168** for performing Geologic Mapping at Lamb Canyon as described in section F.i.1 and Attachment F-1 of Exhibit B.
- The compensation for performing Service B, **Task 2** shall be payable based on lump sum costs as described in section F.i.4 of Exhibit A, and Attachment F-1 of Exhibit B.

Service C: Construction QA/QC Services

a. Service C-1 (Tasks 1-4): Lamb Canyon Project:

Sub-total = $267,881

- The compensation for performing Service C-1, **Tasks 1-2** (As described in Exhibit A) shall be payable based upon the total estimated project duration of **180 working days**, and by applying a daily rate of **$1,014** for construction observation and field testing; and **$181** for project QA/QC management and reports as described in section F.i.1 of Exhibit A, and Attachment F-1of Exhibit B. Consultant Services shall be tracked on a daily basis and compensated in half-day increments, with a minimum of 0.5 workday (1 to 4 hours of service) and a maximum of 1 workday (5 to 8 hours of services). CONSULTANT agrees that in case of amendments to this agreement extending contract services, beyond the estimated project duration of 180 working days, the daily rates of $1,014 and $181 for

Tasks 1 and 2 respectively shall remain unchanged. The CONSULTANT services for the period beyond 180 working days shall be on as needed basis.

- The compensation for performing Service C-1, **Task 3** shall be payable based upon the total number of lab testing as described in section F.i.2 of Exhibit A, and by applying the unit cost per test as shown on Attachment F-1 of Exhibit B.
- The compensation for performing Service C-1, **Task 4** shall be payable based on lump sum costs as described in section F.i.4 of Exhibit A, and Attachment F-1 of Exhibit B.

b. Service C-2 (Tasks 1-4): Badlands Project:

Sub-total = $180,998

- The compensation for performing Service C-2, **Tasks 1-2** (As described in Exhibit A) shall be payable based upon the total estimated project duration of **120 working days**, and by applying a daily rate of **$1,014** for construction observation and field testing; and **$181** for project QA/QC management and reports as described in section F.i.1 of Exhibit A, and Attachment F-1of Exhibit B. Consultant Services shall be tracked on a daily basis and compensated in half-day increments, with a minimum of 0.5 workday (1 to 4 hours of service) and a maximum of 1 workday (5 to 8 hours of services). CONSULTANT agrees that in case of amendments to this agreement extending contract services, beyond the estimated project duration of 180 working days, the daily rates of $1,014 and $181 for Tasks 1 and 2 respectively shall remain unchanged. The CONSULTANT services for the period beyond 180 working days shall be on as needed basis.
- The compensation for performing Service C-2, **Task 3** shall be payable based upon the total number of lab testing as described in section F.i.2 of Exhibit A, and by applying the unit cost per test as shown on Attachment F-1 of Exhibit B.

- The compensation for performing Service C-2, **Task 4** shall be payable based on lump sum costs as described in section F.i.4 of Exhibit A, and Attachment F-1 of Exhibit B.

5. PAYMENT:

For purposes of payment to CONSULTANT, on or about the last day of each month, COUNTY shall determine the corresponding cost of the services as described under Section 4. No payment shall be required to be made when, in the judgment of the COUNTY, CONSULTANT is not proceeding properly. Payment shall be made by COUNTY within 30 days thereafter.

6. LICENSES:

CONSULTANT, its employees, agents, contractors, and subcontractors shall maintain professional licenses required by the laws of the State of California at all times while performing services under this Agreement.

7. GENERAL PREVAILING WAGE:

The CONSULTANT shall comply with all applicable requirements of the California Labor Code. Reference is made to Division 2, Part 7, Chapter 1, Article 2 of the California Labor Code (commencing with Section 1770). By this reference said Chapter 1 is incorporated herein with like effect as if it were here set forth in full. The parties recognize that said Chapter 1 deals with, among other things, discrimination, penalties and forfeitures, their disposition and enforcement, wages, working hours and securing workers' compensation insurance and directly affect the method of prosecution of the work by CONSULTANT and subject it under certain conditions to penalties and forfeitures. Execution of this Agreement by the parties constitutes the CONSULTANT's agreement to abide by said Chapter 1. CONSULTANT certifies that he is aware of the provisions of said Chapter 1 and will comply with them and further constitutes

CONSULTANT's certification as follows: "I am aware of the provisions of Section 3700 of the California Labor Code which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this contract."

General prevailing rate of per diem wages and general prevailing rate of per diem wages for holiday and overtime work, including employer payments for health and welfare, pension, vacation, apprentices and similar purposes for each craft, classification or type of workman needed for execution of contracts under the jurisdiction of the COUNTY have been obtained by the COUNTY from the Director of Industrial Relations of the State of California for the area where the work is to be done. These are on file at the COUNTY's office, and will be made available to CONSULTANT upon request.

COUNTY may request copies of certified payroll for CONSULTANT staff that falls under the provisions of California Labor Code, as interpreted by the COUNTY. CONSULTANT shall produce copies of certified payroll within five (5) working days of written request by the COUNTY.

8. <u>PERMITS AND RIGHTS-OF-ENTRY:</u>

COUNTY will provide any and all necessary permits and rights-of-entry, as required, to perform the proposed services. CONSULTANT will prosecute the work in a manner to minimize inconvenience and any possible hazard to any COUNTY operation. CONSULTANT shall be responsible for the protection of public and private property adjacent to the work and shall exercise due caution to avoid damage to such property.

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9. **INSURANCE:**

CONSULTANT shall maintain in force at all times during the performance of this Agreement insurance policies which have the following minimum coverages: General liability insurance in the amount of not less than $1,000,000 per occurrence, $2,000,000 aggregate; professional liability insurance in the amount of $2,000,000; workers' compensation insurance in accordance with California law; and if motor vehicles are used, not less than $1,000,000 combined single limit motor vehicle insurance for damage to property and injury to persons. These policies shall name "County of Riverside and the Riverside County Waste Resources Management District and their elected or appointed officials, employees, and agents" as additional insureds. Certificates of insurance satisfactory to COUNTY evidencing the maintenance of such insurance coverage shall be required prior to the start of services under this Agreement. COUNTY shall be given notice, in writing, at least thirty (30) days in advance of cancellation, modification or reduction in coverage. All insurance shall be with companies admitted to issue such coverage in the State of California.

10. **CONSULTANT'S LIABILITY:**

CONSULTANT shall defend, save, indemnify and hold COUNTY OF RIVERSIDE and RIVERSIDE COUNTY WASTE RESOURCES MANAGEMENT DISTRICT, its officers, employees, and agents free and harmless from any liability, damage, claim, or action whatsoever (including but not limited to wrongful death) based upon any act or omission of CONSULTANT, its employees, contractors or agents arising out of, relating to or in any way connected with the accomplishment of the work or performance of services under this Agreement, except for an act or omission that is due to the sole active negligence of the COUNTY, its officers, employees or agents. As part of the foregoing indemnity, CONSULTANT agrees to protect and defend at its own expense (including attorney fees)

COUNTY, its officers, agents, and employees in any legal action based upon any such act or omission. For professional services performed hereunder, Consultant's liability shall be to the extent set forth in Section 2782 of the California Civil Code.

11. WORK PRODUCT:

All drawings, logs, and reports prepared by CONSULTANT shall be and remain the sole property of COUNTY.

12. TERMINATION:

This Agreement may be terminated by either CONSULTANT or COUNTY upon written notice to the other party in the event of substantial failure of performance by the other party, or in the event the COUNTY shall elect to abandon or indefinitely postpone the project. In the event the COUNTY abandons or indefinitely postpones the project and gives notice of termination, the COUNTY shall make payment for all services performed to the date of written notice in a total amount which bears the same ratio to the total maximum fee otherwise payable under this Agreement as the services actually performed bear to the total services necessary for performance of this Agreement.

13. INDEPENDENT CONTRACTOR:

CONSULTANT and its employees and agents shall act at all times in an independent capacity with regard to performance of services or work rendered pursuant to this Agreement; and CONSULTANT and its employees and agents shall not act as, shall not be, and shall not in any manner be considered to be agents, officers, or employees of COUNTY. There shall be no employer-employee relationship between COUNTY and CONSULTANT; and CONSULTANT and its employees and agents shall not be entitled to any benefits payable to COUNTY

employees. CONSULTANT is responsible for payment and deduction of all employment-related taxes on CONSULTANT's behalf and for CONSULTANT's employees, including but not limited to all federal and state income taxes and withholdings. COUNTY shall not be required to make any deductions from compensation payable to CONSULTANT for these purposes. CONSULTANT shall indemnify COUNTY for any and all federal or state withholding or retirement payments which COUNTY may be required to make pursuant to federal or state law. The sole interest and responsibility of COUNTY is to assure that the services covered by this Agreement shall be performed and rendered in a competent and efficient manner.

14. GOVERNING LAW; JURISDICTION:

This Agreement shall be governed by the laws of the State of California. Any legal action related to the performance or interpretation of this Agreement shall be filed only in the Superior Court for the State of California located in Riverside, California.

15. ASSIGNMENT:

Neither this Agreement nor any part thereof shall be assigned by CONSULTANT without the prior written consent of COUNTY.

16. NON-DISCRIMINATION:

CONSULTANT shall not discriminate in its recruiting, hiring, promotion, demotion or termination practices on the basis of race, religious creed, color, national origin, ancestry, physical handicap, medical condition, marital status or sex in the performance of this contract, and, to the extent they shall be found to be applicable hereto, shall comply with the provisions of

the California Fair Employment Practices Act (commencing with Section 1410 of the Labor Code), and the Federal Civil Rights Act of 1964 (P.L. 88-352).

Geosyntec Consultants

By _____ Dated: 29 June 2010

Name and Title: BERTRAND PALMER - Vice President

COUNTY OF RIVERSIDE

By _____ Dated: JUL 13 2010

Chairman, Board of Supervisors

MARION ASHLEY

ATTEST:
KECIA HARPER-IHEM, Clerk
By _____ DEPUTY

FORM APPROVED COUNTY COUNSEL
BY: _____ 6/29/10
NEAL R. KIPNIS DATE

RECOMMENDED FOR APPROVAL:

By _____ Dated: 6/29/10

Hans Kernkamp, General Manager - Chief Engineer
Waste Management Department

Attachments:

Exhibit A- Request for Proposal dated March 25, 2010
Exhibit B - CONSULTANT's proposal dated April 19, 2010

PD# 71658/v4

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EXHIBIT A to Consultant Agreement

Riverside County
Waste Management Department

Hans W. Kernkamp, General Manager-Chief Engineer

March 25, 2010
WMARC-150

Request for Proposal (RFP) to Perform Geological and Geotechnical Services
Lamb Canyon and Badlands Sanitary Landfill Sites

The Riverside County Waste Management Department (Department) is inviting your firm (Consultant) to submit a proposal to perform geological and geotechnical services for two projects referred to as "The Construction of Liner System, Phase 2, Stage 4 (P2S4) Expansion, at the Lamb Canyon Sanitary Landfill" (Lamb Canyon Project) and "The Construction of the Liner System, Canyon 4 Phase 3 (C4P3) Expansion, at the Badlands Sanitary Landfill" (Badlands Project).

The Lamb Canyon Project will expand the size of the disposal area at the Lamb Canyon Sanitary Landfill by approximately 23 acres and the Badlands Project will expand the size of the disposal area at the Badlands Sanitary Landfill by approximately 13 acres, in accordance with the requirements of Title 27 of the California Code of Regulations (CCR), and Subtitle D of the Code of Federal Regulations (CFR). Final design details and contract documents for the installation of the geosynthetic liner system are currently being prepared for both projects by the Department.

The Department engineering staff is responsible for coordinating all project tasks including the preparation of project designs and contract documents. The selected Consultant for the required services will be tasked to provide the following three main services:

Service A: Geotechnical Services

Service A-1: Lamb Canyon Project: The Consultant shall provide geotechnical services for the Lamb Canyon Project, including, but not limited to: static and seismic stability analysis for liner subgrade and the corresponding fill plan, field and laboratory soil testing, soil borings, and technical peer review of the contract documents for project construction. At the conclusion of performing all sub-tasks in Service A-1, the Consultant shall prepare and submit to the Department for review and forwarding to the California Regional Water Quality Control Board, Santa Ana Region (CRWQCB-SAR), a comprehensive design report summarizing soil test results and stability analysis results including recommendations for processing and placement procedures for the required engineered fill and any other aspect of construction that may be necessary for slope stability. This comprehensive design report must be prepared and signed by either a California Registered Civil Engineer or a California Registered Engineering Geologist. Estimated time frame for providing Service A-1 is **May to October 2010.**

Service A-2: Badlands Project: The Consultant shall provide geotechnical services for the Badlands Project, including, but not limited to: static and seismic stability analysis for liner subgrade and the corresponding fill plan, geotechnical research of previously conducted geotechnical investigations in the project area, possible field and laboratory soil testing, and technical peer review of the contract documents for project construction. At the conclusion of performing all sub-tasks in Service A-2, the Consultant shall prepare and submit to the Department for review and forwarding to the CRWQCB-SAR a comprehensive design report summarizing stability analysis results and recommendations on processing/placement procedures for the required engineered fill and any other aspect of construction that may be necessary for slope stability. This comprehensive design report must be prepared and signed by either a California Registered Civil Engineer or a California Registered Engineering Geologist. Estimated time frame for providing Service A-2 is also **May to October 2010.**

Service B: Geological Services

Service B: Lamb Canyon Project: The Consultant shall provide geological services for the Lamb Canyon Project including, but not limited to: geologic observation and comprehensive mapping of all slope areas that have been exposed by the recent excavation operations within the P2S4 project area. At the conclusion of services, a final report summarizing project geology, test results, geologic maps, and cross-sections must be prepared, signed and submitted to the Department by either a California Registered Civil Engineer or a California Registered Engineering Geologist. Service B work will be performed for the Lamb Canyon Project only. Estimated time frame for providing Service B is: **May to July 2010.**

This service is not requested for the Badlands Project because the C4P3 expansion area has been already geologically mapped. Past geological reports can be viewed at the Department Headquarters and the Badlands Landfill field office upon request.

Service C: Construction QA/QC Services

Service C-1: Lamb Canyon Project: For the construction phase of the Lamb Canyon Project, the Consultant shall provide a construction QA/QC Manager, technical staff, and construction QA/QC testing equipment and facilities with sufficient resources to pace construction activity and verify conformance with the construction QA/QC plan (Refer to Attachment D – Sample QA/QC Plan). Upon completion of construction, a detailed construction QA/QC final report illustrating conformance with the project specifications must be prepared, signed, and submitted to the Department by either a California Registered Civil Engineer or California Registered Engineering Geologist. Service C-1 work will be performed during the project's construction phase. Estimated time frame for this service for the Lamb Canyon Project is: **Summer 2011 to Spring 2012.**

Service C-2: Badlands Project: For the construction phase of the Badlands Project, the Consultant shall provide a construction QA/QC Manager, technical staff, and construction QA/QC testing equipment and facilities with sufficient resources to pace construction activity and verify conformance with the construction QA/QC plan (Refer to Attachment D – Sample QA/QC Plan). Upon completion of construction, a detailed construction QA/QC final report illustrating conformance with the project specifications must be prepared, signed, and submitted to the Department by either a California Registered Civil Engineer or California Registered Engineering Geologist. Service C-2 work will be performed during the project's construction phase. It is estimated that project construction may be initiated at any time between **November 2010 and July 2011**; in which case, construction of both projects (Lamb Canyon and Badlands) may overlap for some duration or occur concurrently.

In order for a Consultant's proposal to be considered complete, the Consultant must submit the enclosed cost proposal sheets for all service tasks:

- Attachment A for Geotechnical Services at Lamb Canyon (Service A-1) and Badlands (Service A-2);
- Attachment B for Geological Service at Lamb Canyon (Service B); and
- Attachment C for Construction QA/QC Services at Lamb Canyon (Service C-1) and Badlands (Service C-2).

In addition to submitting the enclosed cost proposal sheets, the Consultant may also submit an attachment to the proposal for recommended changes to the outlined scope of services (addition or

deletion), testing, quantities, schedule, and any other information that in the Consultant's opinion may be necessary to adequately complete the project.

A. OVERVIEW OF THE LAMB CANYON PROJECT LOCATION AND PHASING PLAN

i. **Project Location -** The Lamb Canyon Sanitary Landfill is located in Riverside County at 16411 Lamb Canyon Road (Highway 79), Beaumont, CA 92223. The site is located in a portion of Sections 21, 28, and 29, T3S, R1W, SBB&M at latitude 33°52'30" and longitude 117°0'0". Refer to the enclosed Lamb Canyon Sanitary Landfill Vicinity Map (Exhibit A).

ii. **Project Phasing Plan Overview**

This project will be implemented in three phases: design, earthwork excavation, and liner system installation. The details of each phase are described as follows:

1. **Design Phase** - Presently, Department staff are progressing with the design phase of the project and have already completed a conceptual excavation and refuse fill plan (Refer to Exhibit C – Phase 2, Stage 4 Expansion: Conceptual Subgrade Plan and Exhibit D – Phase 2, Stage 4 Expansion: Conceptual Refuse Fill Plan). In order to accommodate any potential changes in the conceptual grading plans or the proposed liner system due to stability analysis, the Consultant shall be required to select the most economical liner system design after reviewing background information and then perform multiple iterations of static and seismic stability analysis for the subgrade and refuse fill plans. If it is determined that results from the stability analysis may be improved by performing further subsurface investigation in the area, the Department may request the Consultant to perform additional soil borings and laboratory testing at the agreed upon unit prices; in addition, the Consultant may be requested to characterize, test, and provide recommendations for the engineered fill placement. Upon completing the preparation of the construction contract documents by the Department, the Consultant shall provide technical review and comments on certain sections in these documents including earthwork, drainage layer, LCRS, geosynthetic material sections, QA/QC plan, and construction details related to the installation of the liner and LCRS system.

2. **Earthwork Excavation Phase** – Previous surfacial geologic mapping for the P2S4 area was conducted in year 2002 as part of the overall Phase 2 expansion geologic investigation and also during an interim earthwork excavation project (approximately 475,000 CY) that was completed in February 2008. Upon request, complete reports for all previous geologic mapping in the area will be made available to the selected Consultant. In August 2008, the Department administered a mass earthwork excavation project within the P2S4 expansion area (approximately 900,000 CY). This mass earthwork excavation project was completed in January 2009, and resulted in a large area of exposed side slopes which will facilitate the required geologic mapping within the project site. All previous excavation projects have resulted in achieving the final design grades within the majority of the areas that fall outside of the proposed liner limits; whereas areas fall within the liner limits were graded up to 5-feet (on all flat surfaces) and 40-feet (on all slope surfaces) from the ultimate design grades (refer to attached Exhibit C). This grading scenario was implemented on the easterly-facing slope and the canyon floor areas; whereas minimal grading operation was implemented within the westerly-facing slope in the project area. The Consultant will be required to perform geologic mapping of all excavated slopes within the P2S4 area and include findings and recommendations in a final report.

3. **Liner System Installation Phase** - Expansion project construction (liner and earthwork) is planned to begin in Summer 2011 and is estimated to require a total duration of 180

working days for completion. The major features of the work to be performed during construction along with approximate quantities are as follows:

a. Earthwork:
   - Excavation – 1.4 million CY
   - Engineered Fill - 250,000 CY
   - Low-Permeability Layer - 17,000 CY (12" thick LPL)

b. Liner Subgrade Preparation and Geosynthetic Liner Installation:
   - GCL - 1 million square feet
   - HDPE - 1.5 million square feet
   - Geotextile - 1.5 million square feet

c. Leachate Collection and Removal System (LCRS):
   - 9" thick layer of 1/2" gravel - 13,000 CY

d. Material Screening and Placement of Protective Soil Layer:
   - 3-inch minus - 33,000 CY
   - 1-inch minus - 26,000 CY

e. Construction of access roadways and surface drainage structures using various construction materials such as asphalt concrete, reinforced concrete, aggregate base and rip-rap stones.

B. OVERVIEW OF THE BADLANDS PROJECT LOCATION AND PHASING PLAN

i. Project Location

The Badlands Sanitary Landfill is located in Riverside County at 331125 Ironwood Avenue, Moreno Valley, CA 92555. The site is located in a portion of Section 32, T2S, R2W; Section 4, 5, T3S, R2W at latitude 33° 56'59" and longitude 117°6'44". Refer to the enclosed Exhibit B - "Badlands Sanitary Landfill Vicinity Map".

ii. Project Phasing Plan Overview

This project will be implemented in three phases: design, earthwork excavation, and liner system installation. The details of each phase are described as follows:

1. **Design Phase** - Presently, Department staff is progressing with the design phase of the project and have completed a conceptual excavation and refuse fill plan (Refer to Exhibit F – Canyon 4 Phase 3: Conceptual Subgrade Plan and Exhibit G – Canyon 4 Phase 3: Conceptual Refuse Fill Plan). In order to accommodate potential changes in the grading and liner system design, the Consultant shall be required to select the most economical liner system design after reviewing background information and then perform multiple iterations of static and seismic stability analysis for the subgrade and refuse fill plan. If it is determined that results from the stability analysis may be improved by performing further subsurface investigation in the area, the Department may request the Consultant to perform soil borings and laboratory testing in project areas of concern. The Consultant may also be requested to characterize, test, and provide recommendations for engineered fill placement. Upon the Department's completion of the construction contract documents, the Consultant shall provide technical review and comments for: specification sections (earthwork, drainage layer, LCRS and geosynthetic material sections only), QA/QC plan, and plan details related to the installation of the liner and LCRS system.

2. **Earthwork Excavation Phase** – No earthwork excavation has begun in the C4P3 expansion area yet. Upon request, complete reports for all previous geological mapping in the area will be made available to the selected Consultant.
3. **Liner System Installation Phase** - Expansion project construction (liner and earthwork) is planned to begin in Winter 2010 and is estimated to require a total duration of 120 working days for completion. The major features of the work to be performed during construction along with approximate quantities are as follows:

   a. Earthwork:
      - Excavation – 549,000 CY
      - Engineered Fill – 379,000 CY
      - Low-Permeability Layer – 4,600 CY (12" thick LPL)

   b. Liner Subgrade Preparation and Geosynthetic Liner Installation:
      - GCL – 556,000 square feet
      - HDPE – 680,000 square feet
      - Geotextile – 680,000 square feet

   c. Leachate Collection and Removal System (LCRS):
      - 9" thick layer of 1/2" gravel – 3,400 CY

   d. Material Screening and Placement of Protective Soil Layer:
      - 3-inch minus – 10,000 CY
      - 1-inch minus – 32,000 CY

   e. Construction of access roadways and surface drainage structures using various construction materials such as asphalt concrete, reinforced concrete, aggregate base and rip-rap stones.

C. PREVIOUS CONSTRUCTION QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC) PLAN

Enclosed herewith under Attachment D, is a sample Construction Quality Assurance and Quality Control (QA/QC) Plan that was used in the previous expansion phase at the Lamb Canyon Sanitary Landfill (P2S3) and will be used to prepare the QA/QC for the upcoming P2S4 expansion and C4P3 expansion projects. As part of Service C, the Consultant will contract with the Department to provide QA/QC services during the construction of the Lamb Canyon P2S4 expansion (Service C-1) and Badlands C4P3 expansion (Service C-2) projects. These services shall include observations and testing of all earthwork activities, all geosynthetic liner installation activities including trench backfill for liner termination and all LCRS work. QA/QC services shall also include testing and inspection of subgrade preparation work for all structures including those for surface drainage, access roads, LCRS, and others as needed. Compressive strength lab testing for concrete structures, as required by the Contract Documents, shall also be included as part of the Consultant's scope of work. Inspection of asphalt, concrete, and base material placement will be performed by Department staff.

D. DEPARTMENT RESPONSIBILITIES

The Department will provide a Project Manager to administer the Contract Documents, and design/construction management staff to document and enforce project specifications, and verify

compliance with all contract requirements in close coordination with the Consultant's staff for each of the five (5) services.

E. SCOPE OF SERVICE

Service A: Geotechnical Services

Task 1 - Laboratory Testing for On-Site Materials

- Perform laboratory maximum dry density and optimum moisture tests (Modified Proctor Compaction Test – ASTM D1557) on samples of soil that may be used as engineered fill material.
- Perform particle size analysis (ASTM D422) on samples of soil that may be used as engineered fill or protective soil.
- Prepare and submit a test summary report to the Department, including all test results and recommendations. The report recommendations shall address the feasibility and necessary processing/placement procedures relating to the use of on-site material as engineered fill or protective soil.

Task 2 - Subsurface Investigation

- If it is determined that further subsurface investigation is required for performing the stability analysis, the Department may request that the Consultant perform subsurface investigation work within areas of concern. The subsurface investigation shall consist of performing soil borings up to a depth of approximately 90 feet in areas where an off-road drill rig will be required. If needed, the Department will provide reasonable grading efforts to construct access roads for soil boring locations. Consultant shall prepare and submit boring logs including, but not limited to: soil classification, geologic data, moisture content, dry density, and blow counts as part of the final stability analysis report.

Task 3 - Design Selection

- The proposed expansion projects shall be constructed in compliance with the pertinent requirements of CFR Title 40 Subtitle D and CCR Title 27. The currently approved bottom and side-slope liner systems approved for both the Lamb Canyon and Badlands landfills may be found in three corresponding Waste Discharge Requirements (WDRs) for the facilities and enclosed as Attachment F. The following is the preferred component listing of the bottom liner system used during the most recent Department expansion project, from bottom to top, that the Department may elect to use in the liner system design:

Bottom Liner System

12" thick LPL ($1x10^{-5}$ cm/sec)
60-mil textured HDPE
Geosynthetic Clay Liner (GCL)
80-mil double textured HDPE
12 oz/sy cushion Geotextile 9" thick drainage layer (≥ 0.1cm/s) (1/2" gravel)
8 oz/sy Geotextile filter fabric
24" thick protective soil layer

The following are the components of the preferred side slope liner system used during the most recent Department expansion project, from bottom to top, that the Department may elect to use in the liner system design:

Side Slope Liner System

Prepared subgrade
Geosynthetic Clay Liner (GCL)
80-mil textured HDPE
16 oz/sy Geotextile filter fabric
24" thick protective soil layer

- The Consultant shall review the approved liner systems and site specific conditions for each site and recommend a design solution for each facility. The recommended design may include design changes that result in the most economical (considering landfill airspace and constructability). Prior to further stability analysis work, the recommended design solution shall be reviewed by and approved by the Department, in advance and in writing. It should be noted that any recommendations that are not currently permitted in the WDRs will need to be processed as a permit revision and may affect the timeframes contained in this RFP.

Task 4 - Stability Analysis

- The interface shear strengths between the different layers of the proposed liner system shall be determined by the Consultant after completion of Tasks 1, 2, and 3.
- The final QA/QC report for the completed P2S3 (Lamb Canyon) and C4P2 (Badlands) expansions will be available for review by the selected Consultant.
- Perform static and seismic analysis of the design side-slopes within the Phase 2, Stage 4 expansion and the Canyon 4 Phase 3 expansion proposed grading limits. Allow for a minimum of 3 iterations to account for potential subgrade changes.
- Perform static and seismic analysis for the liner subgrade as well as the liner system on subgrade. Preliminary cross-sections for the project are enclosed (Refer to Exhibit E – Phase 2, Stage 4 Expansion: Subgrade and Refuse Fill Cross-Sections and Exhibit H – Canyon 4 Phase 3: Subgrade and Refuse Fill Cross-Sections). Once a Consultant is selected, the Department will provide additional cross-sections upon

request. Allow for a minimum of 3 iterations for potential changes to the following: subgrade plan, refuse fill plan, and liner system design.

- Following the completion of the engineering analysis, prepare and submit a final report for each expansion project with geotechnical recommendations for the proposed excavation and refuse fill plans. The report shall include the appropriate maps, cross-sections, design criteria, calculations, and any other necessary supporting documents needed for a comprehensive design and construction of the proposed expansion.
- Provide management and generate final reports for both projects including results, recommendations, findings and documentation.
- Allow for a meeting with CRWQCB-SAR staff, if necessary, to review and/or defend the criteria used in the stability analysis.

Task 5 - Technical Review of Contract Document Details

- Upon the Department's completion of the construction contract documents, the Consultant shall provide technical review and comments for specification sections (earthwork, drainage layer, LCRS and geosynthetic material sections only), QA/QC plan, and plan details related to the installation of the liner and LCRS system.

Service B: Geological Services

Task 1 - Geologic Mapping

- Perform geologic observations, logging, and mapping of all areas in which excavation activities have taken place within the proposed P2S4 grading limits in order to provide a continuous record of geologic conditions.

Task 2 - Project Management & Report Preparation

- Prepare and submit geologic maps and cross-sections documenting observed geologic conditions and provide grading plan recommendations in a final report. Geologic mapping performed for previous excavation operations within P2S4 and for the overall Phase 2 Expansion will be available for review by the selected Consultant. Geologic data from previous mapping studies, which is within the P2S4 grading limits, must be included on the Consultant produced geologic maps.

Service C: Construction QA/QC Tasks

Task 1 - Construction Observation and Field Testing

- Provide full-time observation and field testing for the following activities: engineered fill placement, LPL processing and placement, geosynthetic liner subgrade preparation, material deliveries, liner system installation, drainage layer construction, anchor trench backfill, and protective soil screening and placement in accordance with the QA/QC Plan. Provide part-time observation and field testing for access road and drainage structure construction in accordance with the QA/QC Plan. Tasks shall include, but not limited to; staff, transportation, testing equipment, generating daily reports, weekly meeting attendance, supplies, and per diem costs.

Task 2 - Project QA/QC Management and Reports

- Provide QA/QC management and generate reports as specified in the QA/QC plan. Allow QA/QC manager to attend pre-construction and weekly construction progress meetings.

Task 3 - Laboratory Testing

- Perform and document laboratory testing as specified in the QA/QC plan.

Task 4 - Certification and As-Built Report

- Provide certification of compliance with the technical specifications per the contract documents and preparation of an as-built report for the construction of the Phase 2, Stage 4 expansion at the Lamb Canyon Sanitary Landfill and the Canyon 4, Phase 3 expansion at the Badlands Sanitary Landfill. Separate reports must be created for each expansion project. The reports must be prepared and signed by either a California Registered Civil Engineer or California Registered Engineering Geologist.

F. PROPOSAL CONTENTS

Upon receiving and evaluating proposals, the Department reserves the right to award Service A-1, A-2, B, C-1, and C-2 as separate contracts to various Consultants, or as one contract to a single Consultant. To that end, each proposal must include Attachment A, B, and C (enclosed), and must be completed so that the various services may be reviewed independently.

i. Cost

The total cost for the required services are broken down into the following main categories:

1. ***Unit Cost per Working Day*** – This method of compensation applies to the following tasks: ***Service B - Task 1.1 and Service C - Tasks 1.1 and 2.1.*** Consultant shall provide unit price and subtotals for tasks by submitting the enclosed Attachments B and C as part of their proposal. Proposals must also include a cost breakdown of total personnel hours for each subtask and hourly unit rates for each personnel/billing category. Workday cost shall include, but not limited to; observations, management, meeting attendance, report preparation, transportation, field testing, per diem costs, incidentals, and any other related expenses. Overhead costs and profit shall also be clearly stated. Workdays shall be compensated in half-workday increments corresponding to the hours of services provided as follows:

   Full workday = 5 to 8 hours of services

   Half-workday = 1 to 4 hours of services

   If deemed necessary during the project, service hours in excess of 8 hours/day must be authorized in advance by the Department in writing and will be negotiated based on the Consultant's submitted cost breakdown for personnel overtime rates.

2. ***Unit Cost for Laboratory Tests*** - This method of compensation applies to the following task: ***Service A – Task 1 and Service C - Task 3.*** Consultant shall provide unit price and subtotals for the listed tests by submitting the enclosed Attachment A and C as part of their proposal. Quantities stated in Attachments A and C were determined by approximating quantities for both expansion projects and using test frequencies stated in the enclosed Attachment D - Sample QA/QC Plan. Unit cost for testing shall include, but not limited to; sampling, test, shipping, equipment, transportation, and incidentals. Overhead costs and profit shall also be clearly stated.

3. ***Soil Boring per Foot*** - This method of compensation applies to the following task: ***Service A – Task 2.*** Consultant shall provide unit price and subtotals for boring per foot of depth by submitting the enclosed Attachments A as part of their proposal. The unit cost shall include, but not limited to: sampling, off-road drill rig, testing, materials,

geologic mapping, boring logs, report preparation, backfill, transportation, incidentals, and other related expenses. Proposals must include a unit cost breakdown of total personnel hours, hourly unit rates for each personnel/billing category, equipment, materials, transportation, incidentals and other related expenses. Overhead costs and profit shall be clearly stated.

4. ***Lump Sum*** - This method of compensation applies to the following tasks:

   Design Selection (Service A - Geotechnical Services: Task 3) - Cost shall be a lump sum for design selection and written submittal of selection with corresponding rationale.

   Stability Analysis (Service A - Geotechnical Services: Task 4) - Cost shall be a lump sum for all static and seismic analysis, report preparation and all necessary documents needed for comprehensive design of the proposed expansion. Consultant shall include cost for three (3) iterations in the analysis to accommodate potential changes in the proposed grading plan, refuse fill plan and geosynthetic liner system design.

   Lump Sum for Technical Review of Contract Document Details (Service A – Geotechnical Services: Task 5) - Cost shall be a lump sum for all review and preparation of comments for: specification sections (earthwork, LCRS, drainage layer, and geosynthetic materials), QA/QC plan, and plan details (LCRS and liner system installation).

   Lump Sum for Geologic Project Management & Report Preparation (Service B – Geological Services: Task 2) - Cost shall be a lump sum for all management and report preparation for geologic mapping.

   Lump Sum for In-Plant Sampling and Shipping for Soil/Material Testing (Service C – Construction QA/QC Services: Task 3) - Cost shall be a lump sum for all in-plant sampling and shipping of soil/material testing.

   Lump Sum for Certification and As-Built Report (Service C – Construction QA/QC Services: Task 4) - Cost shall be a lump sum for all QA/QC management, certification, and the specified reports in the QA/QC Plan, including the final As-Built Certification Report.

   Lump sum items must include a cost breakdown of total personnel hours, hourly unit rates for each personnel/billing category. All costs shall be clearly stated and shall include, but not limited to: management, staff, meeting attendance, report preparation, transportation, incidentals, and any other related expenses. Overhead costs and profit shall also be clearly stated.

Estimated quantities provided in the enclosed Attachments A, B, and C are subject to change and are to be used for proposal purposes only. The Department reserves the right to delete, increase, or decrease quantities with no adjustment to the unit price rate submitted by the Consultant. Payments shall be based on actual services/testing performed.

Submitted unit pricing by the consultant shall remain unchanged for the entire project duration. No unit price adjustments will be allowed.

The consultant shall comply with all applicable requirements of the California Labor Code. General prevailing wage is required in this project in accordance with the California Labor Code for Public Works Projects (commencing with Section 1720). General prevailing wage

determinations shall be pursuant to California Labor Code part 7, chapter 1, article 2, sections 1770, 1773, and 1773.1.

ii. Consultant Qualifications & References

Each proposal package shall include a listing of the landfill expansion projects that the consultant has been involved with (preferably projects within California), along with a list of references that can be contacted. Please include name, position, telephone number and e-mail addresses if available.

Each proposal shall completely identify the entire project team, including all company personnel and any subcontractors. These listings shall include all contact information and a brief description of the qualifications and responsibilities of each person and/or entity.

iii. General

All proposals shall be signed by an authorized agent and placed in a sealed envelope clearly marked "Consultant's Proposal." In order to be considered responsive, the proposal must address the Project Scope, the Consultant's Responsibilities, and the following items:

1. The Consultant's understanding of the project and the approach to accomplishing project tasks.
2. Workers' Compensation Insurance as required by California Law.
3. General Liability Insurance ($1,000,000 per occurrence and $2,000,000 aggregate), Professional Liability ($2,000,000), and Motor Vehicle Insurance for damage to property and injury to persons in the amount of not less than $1,000,000 combined single limit. The County requires that the policies be modified by endorsement. The endorsement(s) must have the language "County of Riverside and the Riverside County Waste Management Department and their elected or appointed officials, employees, and agents" as additional insureds. It is not acceptable to the Department to be named as additional insured only on the evidence of coverage certificate.
4. The Consultant's approach to handling any unforeseen difficulties, in particular, delays associated with the work created by either the Department or any regulatory agency.
5. Name of the Project Manager (Service A and B) and the construction QA/QC Manager (Service C) who is a California Registered Civil Engineer and/or California Registered Engineering Geologist.

G. CALENDAR OF EVENTS

Distribution of Request for Proposal	March 25, 2010
Submittal of Proposal	April 19, 2010
Approximate Award of Contract	May 18, 2010

H. EVALUATION CRITERIA AND METHOD OF AWARD

Proposals will be evaluated based on relevant factors, including but not limited to the following, in order of importance:

i. Overall cost to the Department

ii. Consultant's understanding of the project and the approach/methodology to accomplishing project tasks.

iii. Consultant's experience (Credential/Resume and technical capability)

iv. References with demonstrated success with similar work to the Scope of Services

v. Overall responsiveness, including general understanding of the RFP requirements; and clarity, detail, and accuracy of submitted proposal.

The Department reserves the right to withdraw the Request for Proposal (RFP), to reject a specific proposal for noncompliance with the RFP provisions, or not award a contract at any time because of unforeseen circumstances or if it is determined to be in the best interest of the Department. Further, upon receiving and evaluating proposals, the Department reserves the right to award Service A-1, A-2, B, C-1, and C-2 as separate contracts to various Consultants, or as one contract to a single Consultant.

Prior to selecting a Consultant for this project, the Department may require an interview with one or more of the Consultants for the purpose of proposal clarification. In general, the proposal most responsive to the Department's requirements will be selected.

I. CONTRACTUAL DEVELOPMENT

i. Consultants must be registered in the County vendor database in order to be considered eligible for entering into an Agreement with the Department to provide professional services. To register, Consultants may utilize Vendor Self-Registration on the Internet by choosing Vendor Registration/ Bidding Opportunities at ***http://www.co.riverside.us/***.

ii. If a proposal is accepted, the Department will enter into a contractual agreement with the selected Consultant(s). If an agreement cannot be reached with consultant, negotiations with another Consultant shall commence/continue at the discretion of the Department. A sample of a contractual agreement is enclosed (Refer to Attachment E – Sample Consultant Agreement).

iii. The Department may cancel the procurement process at any time. All proposals become the property of the Department. All information submitted in the proposal becomes "public record" as defined by the State of California upon completion of the procurement process. If any proprietary information is contained in or attached to the proposal, it must be clearly identified by the Consultant, otherwise the Consultant agrees that any and all documents provided may be released to the public after contract award.

J. CONSULTANT'S INQUIRIES

Any and all correspondence and inquiries related to this project must be directed to:

LAMB CANYON
Fouad Mina –Engineering Project Manager
Riverside County Waste Management Department
14310 Frederick Street
Moreno Valley, CA 92553
Tel.: (951) 486-3200
Fax: (951) 486-3250
fmina@co.riverside.ca.us

BADLANDS
Andrew Cortez –Engineering Project Manager
Riverside County Waste Management Department
14310 Frederick Street
Moreno Valley, CA 92553
Tel.: (951) 486-3200
Fax: (951) 486-3250
acortez@co.riverside.ca.us

Consultants are encouraged to promptly notify the aforementioned of any apparent inconsistencies, problems, or ambiguities in the Project Scope at least five (5) days prior to the submittal deadline, so that all firms may be provided with a written response to the issues raised by any one firm.

K. PROPOSAL SUBMITTAL INSTRUCTIONS

All proposals must include four (4) hard copies (1 unbound original and 3 bound copies) and one digital copy in PDF format on CD.

ALL PROPOSALS MUST BE RECEIVED NO LATER THAN 5:00 P.M., April 19, 2010.

Faxed or emailed proposals will not be accepted in lieu of original copies by regular mail or hand delivered to the Waste Management Department office.

Sincerely,

for
Hans Kernkamp,
General Manager-Chief Engineer

FM/AMC/AE:jlg/cd/sw

Enclosures:
Attachment A
- Service A-1: Lamb Canyon Geotechnical Services Proposal Cost Sheet
- Service A-2: Badlands Geotechnical Services proposal Cost Sheet

Attachment B – Service B: Lamb Canyon Geological Services Proposal Cost Sheet
Attachment C
- Service C-1: Lamb Canyon Construction QA/QC Services Proposal Cost Sheet
- Service C-2: Badlands Construction QA/QC Services Proposal Cost Sheet

Attachment D – Sample QA/QC Plan

EXHIBIT A to Consultant Agreement

Attachment E – Sample Consultant Agreement
Attachment F – Waste Discharge Requirements
Order No. 01-18 for Lamb Canyon Landfill
Order No. R8-2007-0044 for Lamb Canyon Landfill
Order No. R8-2002-0085 for Badlands Landfill

Exhibit A – Lamb Canyon Sanitary Landfill Vicinity Map
Exhibit B – Badlands Sanitary Landfill Vicinity Map
Exhibit C – Lamb Canyon Phase 2, Stage 4 Expansion: Conceptual Subgrade Plan (2 sheets)
Exhibit D – Lamb Canyon Phase 2, Stage 4 Expansion: Conceptual Refuse Fill Plan (2 sheets)
Exhibit E – Lamb Canyon Phase 2, Stage 4 Expansion: Subgrade and Refuse Fill Cross-Sections (2 sheets)
Exhibit F – Badlands Canyon 4 Phase 3 Expansion: Conceptual Subgrade Plan (2 sheets)
Exhibit G – Badlands Canyon 4 Phase 3 Expansion: Conceptual Refuse Fill Plan (2 sheets)
Exhibit H – Badlands Canyon 4 Phase 3 Expansion: Subgrade and Refuse Fill Cross-Sections (2 sheets)

cc: Cliff Goss, with attachments

Attachment A

Service A-1: Lamb Canyon Geotechnical Services Proposal Cost Sheet
Service A-2: Badlands Geotechnical Services proposal Cost Sheet

EXHIBIT A to Consultant Agreement

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EXHIBIT A ATTACHMENT A Agreement

PROPOSAL COST SHEET

Service A-1: Lamb Canyon Geotechnical Services

Task No.	Description of Work	Unit	Estimated Quantities [1]	Unit Price [2]	Total [2]
TASK NO. 1 - LABORATORY TESTING FOR ON-SITE MATERIALS					
1.1	Particle Size Analysis (ASTM D422) - Eng. Fill	test	5		
1.2	Lab. Modified Proctor -Moisture/Density (ASTM D1557) - Eng. Fill	test	10		
				SUBTOTAL TASK 1 [2]	
TASK NO. 2 - SUBSURFACE INVESTIGATION [3]					
2.1	Soil Borings	feet	200		
				SUBTOTAL TASK 2 [2][3]	
TASK NO. 3 - DESIGN SELECTION [3]					
3.1	Design Selection	Lump Sum	1		
				SUBTOTAL TASK 3 [2][3]	
TASK NO. 4 - STABILITY ANALYSIS [3]					
4.1	Stability Analysis	Lump Sum	1		
				SUBTOTAL TASK 4 [2][3]	
TASK NO. 5 - TECHNICAL REVIEW OF CONTRACT DOCUMENT DETAILS [3]					
5.1	Review of Project Details, Specifications Sections & CQA/QC Plan	Lump Sum	1		
				SUBTOTAL TASK 5 [2][3]	
				Service A-1: Lamb Canyon Geotechnical Services Total Proposal (Tasks 1-5)	

Service A-2: Badlands Geotechnical Services

Task No.	Description of Work	Unit	Estimated Quantities [1]	Unit Price [2]	Total [2]
TASK NO. 1 - LABORATORY TESTING FOR ON-SITE MATERIALS					
1.1	Particle Size Analysis (ASTM D422) - Eng. Fill	test	2		
1.2	Lab. Modified Proctor -Moisture/Density (ASTM D1557) - Eng. Fill	test	2		
				SUBTOTAL TASK 1 [2]	
TASK NO. 2 - SUBSURFACE INVESTIGATION [3]					
2.1	Soil Borings	feet	n/a		
				SUBTOTAL TASK 2 [2][3]	
TASK NO. 3 - DESIGN SELECTION [3]					
3.1	Design Selection	Lump Sum	1		
				SUBTOTAL TASK 3 [2][3]	
TASK NO. 4 - STABILITY ANALYSIS [3][4]					
4.1	Stability Analysis	Lump Sum	1		
				SUBTOTAL TASK 4 [2][3]	
TASK NO. 5 - TECHNICAL REVIEW OF CONTRACT DOCUMENT DETAILS [3]					
5.1	Review of Project Details, Specifications Sections & CQA/QC Plan	Lump Sum	1		
				SUBTOTAL TASK 5 [2][3]	
				Service A-2: Badlands Geotechnical Services Total Proposal (Tasks 1-5)	

NOTES:

(1) "Estimated Quantities" are subject to change and are to be used for proposal purposes only. The Department reserves the right to delete, increase, or decrease quantities with no adjustment to the unit price rate submitted by the Consultant. Payments shall be based on actual service/testing performed. Submitted unit prices shall remain unchanged throughout the project duration.

2) "Unit Price", "Total", and Subtotal Task spaces within in the sheet are to be completed by the Consultant and submitted to the Department.

3) A detailed cost breakdown including, but not limited to; proposed staff positions, hours, rates, equipment, testing, overhead, incidentals, etc. must be submitted for Task 2, 3, 4 & 5

EXHIBIT A to Consultant Agreement

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Attachment B

Service B: Lamb Canyon Geological Services Proposal Cost Sheet

EXHIBIT A to Consultant Agreement

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EXHIBIT A to Consultant Agreement
ATTACHMENT B
PROPOSAL COST SHEET

Service B: Lamb Canyon Geological Services

Task No.	Description of Work	Unit	Estimated Quantities [1]	Unit Price [2]	Total [2]
TASK NO. 1 - GEOLOGIC MAPPING [3]					
1.1	Geologic Mapping	Working Day	25		
				SUBTOTAL TASK 1 [2][3]	
TASK NO. 2 - PROJECT MANAGEMENT & REPORT PREPARATION[3]					
2.1	Project Management & Report Preparation	Lump Sum	1		
				SUBTOTAL TASK 2 [2][3]	
Service B: Lamb Canyon Geological Services Total Proposal (Tasks 1-2)					

NOTES:

(1) "Estimated Quantities" are subject to change and are to be used for proposal purposes only. The Department reserves the right to delete, increase, or decrease quantities with no adjustment to the unit price rate submitted by the Consultant. Payments shall be based on actual service/testing performed. Submitted unit prices shall remain unchanged throughout the project duration.

(2) "Unit Price", "Total", and Subtotal Task spaces within in the sheet are to be completed by the Consultant and submitted to the Department as part of the Consultant's proposal.

(3) A detailed cost breakdown including, but not limited to; proposed staff positions, hours, rates, equipment, testing, overhead, incidentals, etc. must be submitted for Tasks 1 & 2.

EXHIBIT A to Consultant Agreement

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Attachment C

Service C-1: Lamb Canyon Construction QA/QC Services Proposal Cost Sheet
Service C-2: Badlands Construction QA/QC Services Proposal Cost Sheet

EXHIBIT A to Consultant Agreement

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ATTACHMENT C
EXHIBIT A to Consultant Agreement
PROPOSAL COST SHEET

Service C-1: Lamb Canyon Construction QA/QC Services

Task No.	Description of Work	Unit	Estimated Quantities[1]	Unit Price[2]	Total[2]
TASK NO. 1 - CONSTRUCTION OBSERVATION AND FIELD TESTING[3]					
1.1	Construction Observation & Field Testing Services	Working Day	180		
1.2	Nuclear Gauge - In-place Moisture/Density (ASTM D2922)	test	545	Costs to be included in unit price for Task 1.1 - Construction Observation & Field Testing Services	
1.3	Sand Cone - In-place Moisture/Density (ASTM D1556)	test	65		
1.4	BAT Permeability	test	15		
				SUBTOTAL TASK 1 [2][3]	
TASK NO. 2 - PROJECT CQA/QC MANAGEMENT AND REPORTS[3]					
2.1	Project QA/QC Management and Reports	Working Day	180		
				SUBTOTAL TASK 2 [2][3]	
TASK NO. 3 - LABORATORY TESTING					
	Earthwork				
3.1	Particle Size Analysis (ASTM D422 without Hydrometer)	test	45		
3.2	Particle Size Analysis (ASTM D422 with Hydrometer) - Clay	test	20		
3.3	Atterberg Limits (ASTM D4318) - Clay	test	20		
3.4	Lab. Modified Proctor - Moisture/Density (ASTM D1557)	test	28		
3.5	Laboratory Permeability (ASTM D5084)	test	20		
3.6	Gradation of Sand/Gravel Drain (ASTM C136)	test	15		
3.7	Lab Permeability- Drainage Layer (ASTM D2434)	test	10		
3.8	Conc. Cylinders - Compressive Strength (ASTM C39)	test	24		
	GCL				
3.9	Mass per unit area (ASTM D5993)	test	12		
3.10	Moisture Content (ASTM D4643)	test	12		
3.11	Grab Strength/Elogation (ASTM D4632)	test	12		
3.12	Index Flux (ASTM D5887)	test	12		
3.13	In-Plant Geosynthetic Conformance Sampling (GCL, HDPE, & Geotextile)	Lump Sum	1		
	HDPE				
3.14	Thickness (ASTM D5994)	test	17		
3.15	Density (ASTM D1505)	test	17		
3.16	Tensile Strength (ASTM D638)	test	17		
3.17	Asperity Height (GM12)	test	17		
3.18	Puncture Resistance (ASTM D4833)	test	17		
3.19	Carbon Black Content (ASTM D1603)	test	17		
3.20	Carbon Black Dispersion (ASTM D5596)	test	17		
3.21	Destructive Seam Test (ASTM D6392)	test	80		
	Geotextile				
3.22	Grab Tensile Strength/Elongation (ASTM 4632)	test	17		
3.23	Mass per Unit Area (ASTM D5261)	test	17		
3.24	Apparent Opening Size (ASTM D4751)	test	17		
3.25	Permittivity (ASTM D4491)	test	17		
3.26	Purnture Resistance (ASTM D4833)	test	17		
3.27	Static Puncture Strength (ASTM D6241)	test	17		
3.28	Trapezoidal Tear Strength (ASTM D4533)	test	17		
	Interface Shear Testing				
3.29	Interface Direct Shear Testing (Series 1,3,4)	test	6		
3.30	Interface Direct Shear Testing (Series 2)	test	2		
3.31	Shipping for Soil/Materials for Testing	Lump Sum	1		
				SUBTOTAL TASK 3 [2]	
TASK NO. 4 - CERTIFICATION AND AS-BUILT REPORTS[3]					
4.1	As-Built Certification Report	Lump Sum	1		
				SUBTOTAL TASK 4 [2][3]	
Service C-1: Lamb Canyon Construction QA/QC Services Total Proposal (Tasks 1-4)					

NOTES:

(1) "Estimated Quantities" are subject to change and are to be used for proposal purposes only. The provided quantities have been aproximated by using preliminary design information for the expansion and test frequencies from the enclosed Sample CQA/QC Plan. The Department reserves the right to delete, increase, or decrease quantities with no adjustment to the unit price rate submitted by the Consultant. Payments shall be based on actual service/testing performed. Submitted unit prices shall remain unchanged throughout the project duration

(2) "Unit Price", "Total", and Subtotal Task spaces within in the sheet are to be completed by the Consultant and submitted to the Department.

(3) A detailed cost breakdown including, but not limited to; proposed staff positions, hours, rates, equipment, overhead, testing, incidentals, etc. must be submitted for Task 1, 2, & 4.

ATTACHMENT C
EXHIBIT A to Consultant Agreement
PROPOSAL COST SHEET

Service C-2: Badlands Construction QA/QC Services

Task No.	Description of Work	Unit	Estimated Quantities[1]	Unit Price[2]	Total[2]
TASK NO. 1 - CONSTRUCTION OBSERVATION AND FIELD TESTING[3]					
1.1	Construction Observation & Field Testing Services	Working Day	120		
1.2	Nuclear Gauge - In-place Moisture/Density (ASTM D2922)	test	420	Costs to be included in unit price for Task 1.1 - Construction Observation & Field Testing Services	
1.3	Sand Cone - In-place Moisture/Density (ASTM D1556)	test	90		
1.4	BAT Permeability	test	7		
				SUBTOTAL TASK 1 [2][3]	
TASK NO. 2 - PROJECT CQA/QC MANAGEMENT AND REPORTS[3]					
2.1	Project QA/QC Management and Reports	Working Day	120		
				SUBTOTAL TASK 2 [2][3]	
TASK NO. 3 - LABORATORY TESTING					
	Earthwork				
3.1	Particle Size Analysis (ASTM D422 without Hydrometer)	test	40		
3.2	Particle Size Analysis (ASTM D422 with Hydrometer) - Clay	test	10		
3.3	Atterberg Limits (ASTM D4318) - Clay	test	10		
3.4	Lab. Modified Proctor - Moisture/Density (ASTM D1557)	test	40		
3.5	Laboratory Permeability (ASTM D5084)	test	10		
3.6	Gradation of Sand/Gravel Drain (ASTM C136)	test	5		
3.7	Lab Permeability- Drainage Layer (ASTM D2434)	test	3		
3.8	Conc. Cylinders - Compressive Strength (ASTM C39)	test	16		
	GCL				
3.9	Mass per unit area (ASTM D5993)	test	7		
3.10	Moisture Content (ASTM D4643)	test	7		
3.11	Grab Strength/Elogation (ASTM D4632)	test	7		
3.12	Index Flux (ASTM D5887)	test	7		
3.13	In-Plant Geosynthetic Conformance Sampling (GCL, HDPE, & Geotextile)	Lump Sum	1		
	HDPE				
3.14	Thickness (ASTM D5994)	test	8		
3.15	Density (ASTM D1505)	test	8		
3.16	Tensile Strength (ASTM D638)	test	8		
3.17	Asperity Height (GM12)	test	8		
3.18	Puncture Resistance (ASTM D4833)	test	8		
3.19	Carbon Black Content (ASTM D1603)	test	8		
3.20	Carbon Black Dispersion (ASTM D5596)	test	8		
3.21	Destructive Seam Test (ASTM D6392)	test	45		
	Geotextile				
3.22	Grab Tensile Strength/Elongation (ASTM 4632)	test	8		
3.23	Mass per Unit Area (ASTM D5261)	test	8		
3.24	Apparent Opening Size (ASTM D4751)	test	8		
3.25	Permittivity (ASTM D4491)	test	8		
3.26	Puncture Resistance (ASTM D4833)	test	8		
3.27	Static Puncture Strength (ASTM D6241)	test	8		
3.28	Trapezoidal Tear Strength (ASTM D4533)	test	8		
	Interface Shear Testing				
3.29	Interface Direct Shear Testing (Series 1,3,4)	test	6		
3.30	Interface Direct Shear Testing (Series 2)	test	2		
3.31	Shipping for Soil/Materials for Testing	Lump Sum	1		
				SUBTOTAL TASK 3 [2]	
TASK NO. 4 - CERTIFICATION AND AS-BUILT REPORTS[3]					
4.1	As-Built Certification Report	Lump Sum	1		
				SUBTOTAL TASK 4 [2][3]	
Service C-2: Badlands Construction QA/QC Services Total Proposal (Tasks 1-4)					

NOTES:

(1) "Estimated Quantities" are subject to change and are to be used for proposal purposes only. The provided quantities have been aproximated by using preliminary design information for the expansion and test frequencies from the enclosed Sample CQA/QC Plan. The Department reserves the right to delete, increase, or decrease quantities with no adjustment to the unit price rate submitted by the Consultant. Payments shall be based on actual service/testing performed. Submitted unit prices shall remain unchanged throughout the project duration

(2) "Unit Price", "Total", and Subtotal Task spaces within in the sheet are to be completed by the Consultant and submitted to the Department.

(3) A detailed cost breakdown including, but not limited to; proposed staff positions, hours, rates, equipment, overhead, testing, incidentals, etc. must be submitted for Task 1, 2, & 4.

Attachment D

Sample QA/QC Plan

EXHIBIT A to Consultant Agreement

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CONSTRUCTION QUALITY ASSURANCE / QUALITY CONTROL PLAN (QA/QC Plan)

EXHIBIT A to Consultant Agreement

TABLE OF CONTENTS

SECTION 1 - GENERAL

1.1. INTRODUCTION

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

A. Provide quality control procedures and a quality assurance program, which will demonstrate that the Phase 2, Stage 3 expansion design is properly implemented by performing monitoring and testing during construction.
B. Provide a mechanism that allows the evaluation of design changes that occur during construction.
C. Prepare and maintain documentation that can demonstrate the design has been implemented and the performance requirements have been met.
D. Serve as a reference source for personnel performing and monitoring the construction activities.
E. Establish lines of communication and responsibilities of all project personnel.

A *Quality Assurance* (QA) program consists of continuously overseeing the project to confirm that observations and testing procedures are being implemented by qualified personnel as planned; that procedures are in compliance with applicable regulations, standards, and project specifications and drawings; and that all work, including the final product, is appropriately documented, filed, and made readily available for review. A *Quality Control* (QC) program consists of selected tests and observations during construction that assist the Contractor in producing the required quality product. Owing to the similarity of ultimate objective, QA and QC functions for construction projects are typically combined to become the Quality Assurance/Quality Control (QA/QC) Plan. This QA/QC Plan should be used in conjunction with the Plans and Specifications for the construction of Phase 2, Stage 3 expansion at the Lamb Canyon Sanitary Landfill in Riverside County, California.

The Contractor must be aware that QA/QC influences the Contractor's daily operations and can affect the Contractor's progress and profitability; the Contractor should therefore prepare its bid accordingly.

An independent testing laboratory will be responsible for conducting QA tests on geosynthetic samples, such as conformance testing and testing of field seams for peel and shear, and QA tests on low-permeability layer. The laboratory shall be independent of the County, Manufacturer, Lining Subcontractor, or any party involved with the manufacturing or installation of any of the geosynthetics. The QA/QC tests must be conducted using a California-certified independent testing laboratory for soil property analyses and tests.

1.2. SUMMARY OF WORK

The liner system proposed for Phase 2, Stage 3 expansion at the Lamb Canyon Sanitary Landfill consists of individual components, including a low-permeable layer, a geosynthetic clay liner (GCL), flexible membrane liners (FML), geotextiles, a leachate collection and

removal system (LCRS), a protective soil layer, a protective membrane layer, and a surface drainage system. The LCRS includes drainage layer, geotextile filter fabric, and leachate conveying pipes. This document details the type, procedure, and frequency of the QA/QC tests to be performed during construction of the earthwork, geosynthetic liner system, LCRS, and installation of the drainage structures.

Each of the above-mentioned subsystem (component) functions as an integral part of the overall liner expansion system, and consequently must become a finished product during construction. Thus, construction of the entire project will be performed in phases, with each portion completed prior to construction of successive or overlying portions. For this reason, it is necessary to conduct an ongoing QA/QC program during construction to verify a quality end product. Nevertheless, it is the Contractor's responsibility to complete the project in accordance with the Contract Documents; and nothing stated in this document or any testing, inspection or observation by the County or the QA/QC Consultant shall in any way relieve the Contractor of its obligations to properly construct the project in accordance with all of the Contract Documents.

This project is formatted to meet strict Federal and State Code requirements for expansions of landfills as administered by the Regional Water Quality Control Board (RWQCB). RWQCB staff must approve any design and specification revisions.

1.3. RESPONSIBLE PARTIES

The responsible parties for the expansions at the Lamb Canyon Sanitary Landfill are identified below:

Landfill Owner/Operator:
Riverside County, Waste Management Department
14310 Frederick Street
Moreno Valley, California 92553
Phone: (951) 486-3200
Representative: Mr. Hans Kernkamp, P.E.

Project Manager:
Riverside County, Waste Management Department
14310 Frederick Street
Moreno Valley, California 92553
Phone: (951) 486-3200
Representative: Mr. Fouad A. Mina, P.E.

Resident Engineer:
Riverside County, Waste Management Department
14310 Frederick Street
Moreno Valley, California 92553
Phone: (951) 486-3200
Representative: Jeff Gow

QA/QC Consultant
[TO BE SELECTED BY COUNTY]
Phone:
Representative:

1.4. PROJECT ORGANIZATION

The principal functions of the QA/QC team are presented below:

1.4.1. Landfill Owner/Operator

The Owner or the County is the Riverside County Waste Management Department or an authorized County official. Work shall always be subject to approval by the County.

1.4.2. Contractor

The Contractor is the firm or its representatives responsible for the construction activities. Responsibilities of the Contractor include but are not limited to the following:

- Assign duties and supervise the construction crew.
- Manage the day-to-day execution of construction activities in accordance with the Contract Documents and the provisions of this plan.
- Conform to federal, state, and local safety regulations pertinent to the construction work.
- Notify the QA/QC Consultant when materials are received on site so that the receiving monitoring can be performed.
- Immediately report to the County in writing any unexpected field conditions.
- Complete construction records required by this plan.

1.4.3. Project Manager

The Project Manager shall be the person working on behalf of the County having ultimate authority on the project (unless County Board or General Manager-Chief Engineer approval is required). The Project Manager will be responsible for reviewing all design and QA/QC issues that may arise during construction. The approval of the Project Manager will be required prior to any design and/or QA/QC changes.

1.4.4. Resident Engineer

The Resident Engineer serves as the Project Manager's on-site representative. All coordination, reporting, and issues related to non-compliance will be directed to the Project Manager through the Resident Engineer. In addition, the Resident Engineer will participate with the Project Manager and QA/QC Manager in all decisions related to design and QA/QC issues that arise during the course of construction.

1.4.5. QA/QC Consultant

QA/QC Consultant is a party independent from the Owner, Contractor, and the product manufacturers. The QA/QC Consultant shall have authority for QA/QC activities only and shall maintain continuous communication with the Project Manager and Resident Engineer regarding QA/QC activities. The QA/QC Consultant organization will consist of a QA/QC Manager and QA/QC Monitors. The QA/QC Manager has overall responsibility for reviewing and approving QA/QC activities and is responsible for daily direction of QA/QC Monitors and testing laboratories. The QA/QC Monitors conduct observation, sampling, testing and documentation as required by this document and as directed by the QA/QC Manager. This work shall always be subject to consultation with and/or approval from the County.

The work to be done by the QA/QC Consultant as stated in the QA/QC Plan, or any of the other Contract Documents, shall not in any way relieve the Contractor of its own obligations or responsibilities under the Contract Documents.

Along with County staff, the QA/QC Consultant is responsible for observing, inspecting, testing, and documenting activities related to the QA/QC Plan during construction. The role of the QA/QC Consultant is critical to successful control and demonstration of construction procedures and required documentation. Their responsibilities include but are not limited to the following:

- Perform materials receiving, monitoring, 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 on-site or off-site laboratories.
- Report non-conformance, as appropriate, to the Contractor's representatives, if correction can be made during the normal course of work.
- Report non-conformance to the County, if correction cannot be readily achieved to the satisfaction of the QA/QC Consultant, so that resolution can be accomplished by the County.
- Report to the County any activities which are adverse to overall quality and any non-conformance which are recurring, even though resolution is readily achievable.
- Document non-conformance.
- Document the construction monitoring and testing activities and prepare the as-built report.

1.4.6. QA/QC Manager

The QA/QC manager must be a registered civil engineer or certified engineering geologist as stated in Title 27 California Code of Regulations (CCR) §20324. The QA/QC Manager shall serve as the QA/QC Consultant's on-site representative. All QA/QC functions shall be under his direct authority. All coordination, reporting, and

issues related to noncompliance will be directed to the QA/QC Manager. In addition, the QA/QC Manager will communicate directly with the Project Manager in all decisions related to potential design and construction changes and any problems that arise during the course of construction.

The QA/QC Manager will be responsible for overall review of observation, sampling, and testing activities for all earthworks and geosynthetic liner including the LCRS work. Specific duties will include the following:

- Review and have knowledge of all Contract Documents.
- Review of all Contractor submittals and design changes.
- Implementation of the QA/QC Plan, including assigning and managing all QA/QC personnel, reviewing all field reports, and providing engineering review of all QA/QC-related issues.
- Serving as the on-site representative of the QA/QC Consultant.
- All QA/QC Monitors will be familiar with the site and the QA/QC requirements for the project.
- Attendance at all QA/QC-related meetings, including pre-construction, progress, and special meetings, as required.
- Participate in the preparation of the As-Built Plans.
- Coordination of all field-testing, sampling, and laboratory testing, and shipping samples to laboratories.
- Review of the results of field and laboratory testing, and the preparation of appropriate recommendations.
- Review of all QA/QC Monitors' daily reports and logs.
- QA/QC Manager is responsible for observations of on-site activities and/or conditions that could jeopardize the quality or function of the construction, and reporting these to the County and QA/QC Consultant.
- Observation and evaluation of all cut slopes that may be impacted by geologic conditions.
- Confirmation of the quality and engineering characteristics of the subgrade or engineered fill used to support compacted engineered fill.
- Confirmation that the constructed earthworks, geosynthetics, and LCRS conform to the requirements of the Contract Documents.
- Preparation of a weekly summary of QA/QC activities.
- QA/QC Manager is responsible to designate a Senior QA/QC Monitor to act on his behalf at the site during his absence and while operations are ongoing.
- Preparation of the final as-built report on the construction of the project.

1.4.7. QA/QC Monitors

The duties of the QA/QC Monitors include monitoring, testing, logging, and documenting all construction operations. The operations to be monitored include (but are not necessarily limited to) the following:

- Material delivery.
- Unloading and on-site transport and storage.
- All placement operations.

- All joining and seaming operations.
- Conditions of sheets as placed.
- Selection of samples for conformance testing by the independent testing laboratory.
- Marking of samples for conformance testing.
- Repair operations.
- Identification of problems or unusual conditions by reference to the surveyor coordinates.

The QA/QC Monitors shall observe and document all earthwork operations to provide a basis for giving an opinion that construction is carried out in conformance with the Contract Documents. Their duties will include (but are not necessarily limited to) the following tasks:

- Verification of preparation and condition of soil subgrade, including over excavation and replacement with engineered fill.
- Verification that engineered fill is derived from approved sources.
- Visual confirmations that the physical soil properties are consistent with the Contract Documents.
- Identification of deleterious materials or other deficiencies in soil quality and taking action to prevent such materials from being incorporated within compacted engineered fill or permeable layers of the project.
- Monitoring of lift thickness of compacted earthen materials.
- Verifications that proper moisture conditioning and mixing are performed to achieve uniformity of material and compaction requirements.
- Verifications that all oversize material is removed from the native soil or the permeable materials using rock-rakes or screens, and that all clods are broken down to maximum sizes in accordance with the Contract Documents.
- Monitoring construction of the protective soil layer during the contract duration.
- Observation of uniformity and coverage of compaction equipment, especially at edges and turnaround areas.
- Observation of the engineered fill at the beginning of each day, and establishment of requirements for wetting, drying, and/or processing prior to placing additional materials.
- Recover samples for laboratory testing.
- Undertaking of field density tests at the minimum frequencies noted herein, or at any time that a deficiency is suspected.
- Confirmation that the field density and grain size of all compacted engineered fill are in conformance with the Contract Documents and this QA/QC Plan, which will include retests of any previously failed areas.

1.4.8. Surveying

1.4.8.1. Contractor's Surveyors

The responsibilities of the Contractor's Surveyor include the following functions:

- Protection of all primary control points set by the County; any required replacement of these points, due to Contractor negligence, shall be at the Contractor's expense.
- Provision of elevation checks to assure that slopes, elevations, grades, and alignments adhere to the Contract Documents.
- Strict control of the line and grade of subgrade during earthwork operations.
- Perform regular field surveys to provide control, verification, and documentation of the required thickness of various soil layers as shown in the Contract Documents.
- Establishment of secondary control points within the area of work for monitoring of construction progress.
- Completion of As-Built Plan(s) of the constructed surfaces and pipe placements prior to construction of the subsequent layers.
- Placement of cut/fill stakes on slopes, stakes at all pad-slope and slope-bench transitions, and stakes on the perimeters of the earthwork layers.
- Provision for horizontal and vertical location of reference points for geotechnical field testing and sampling.
- Remove all stakes and properly repair all resulting holes in the completed earthwork layers.
- Completion of As-built surveying for the project finished grades.
- Responsibility to immediately report in writing to the Resident Engineer any errors, discrepancies, or omissions that could lead to inaccurate control point placement and seek interpretation or correction prior to proceeding with that portion of work.

1.4.8.2. County Surveyors

The responsibilities of the County Surveyor include the following functions:

- Establishment of primary control points on firm ground, outside the limits of the work, to be used throughout the construction period.
- Verification of the Contractor's work as the County deems appropriate.
- Performance of periodic field surveys to provide a basis for progress payments and for evaluating and documenting that the thicknesses and limits of the earthen layers are consistent with the Contract Documents.

1.4.9. Meetings

Communication between project participants is crucial and includes the exchange of information that 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.

In order to assure a high degree of quality during construction, close coordination between County, QA/QC Consultant, Contractor, and subcontractor(s) is essential. To assist in achieving this objective, the following meetings will be held:

1.4.9.1. Pre-Construction Meeting

Before construction begins, a pre-construction meeting will be held and led by the Project Manager. Attendance at the meeting should include: the County's Resident Engineer, QA/QC Consultant, the Contractor's project manager and other representatives such as superintendents and foremen. Representatives of the regulatory agencies may be invited to attend the meeting. Meeting notes shall be prepared by the County and maintained in the on-site records system. Subcontractor personnel shall attend the meeting as appropriate to their scope of work.

Specific items to be considered at this meeting include but are not necessarily limited to the following:

- Distribute relevant documents to all parties.
- Review of the responsibilities of each party.
- Review of lines of authority and communication.
- Review of work area security and safety protocol.
- Review of methods for documenting and reporting, distributing and filing documents and reports, and processing of shop drawing submittals.
- Review of proposed methods of construction.
- Review procedure for change orders.
- Review procedure for applications for progress payments and processing.
- Establish procedures for correcting and documenting construction deficiencies.
- Review of the project schedule.
- Conducting of a site inspection to discuss work areas, stockpile areas (off the landfill), storage areas, access roads, haul roads, and related items.
- Agree on a specific date and time for weekly progress meetings

The County will document the meeting, and minutes will be distributed to all parties and to the RWQCB. Additions or corrections to minutes shall be submitted within five working days of receipt.

1.4.9.2. Weekly Progress Meetings

A progress meeting shall be held each week. All parties involved shall agree upon the time and date of the meeting during the pre-construction meeting. At a minimum, the Project Manager, Resident Engineer, the QA/QC Consultant, and the Contractor shall attend these meetings. The purpose of the meetings shall be the following:

- The previous week's activities and progress will be reviewed. The Contractor shall submit a written report signed by a representative of the Contractor which shall include, but not be limited to, the number of people and major pieces of equipment under his employment, including subcontractors, work

accomplished by them, weather conditions, and accidents in the previous week.

- Test data will be reviewed.
- Quantities and percentages that indicate the progress of work to date will be discussed and agreed upon. The County's estimate, if different than the Contractor's estimate, shall govern partial payments.
- Scheduled work activities for the next two weeks shall be discussed. The Contractor shall submit a chart for the schedule of work during this period.
- Contractor and subcontractor personnel, equipment, and assignments for the next week will be discussed. The Contractor shall submit a written report signed by a representative of the Contractor, that shall include, but not be limited to, the number of people and major pieces of equipment anticipated under his employment, including subcontractors, and their anticipated accomplishments for the next week.
- Portions of the QA/QC Plan that will be pertinent in the next week shall be discussed.
- Expected Contractor submittals for upcoming work shall be reviewed.
- Problems shall be discussed. The Contractor shall submit a written report, signed by a representative of the Contractor, that shall include, but not be limited to, a description of problem areas (recent, current, and anticipated), any resulting delays and their impact, and an explanation of corrective actions taken or proposed. The Resident Engineer shall document the meetings, and minutes shall be distributed to all parties. Additions or corrections to the minutes shall be submitted within five working days of receipt.

1.4.9.3. Quality Resolution Meeting

The County, Contractor, and the QA/QC Consultant may request a special meeting to discuss activities that adversely affect construction quality and to provide resolution. It is intended that these meetings may 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 possible solutions.
- Implement a plan to resolve the quality-related problem.
- Establish whether change orders are required.

The Resident Engineer will document the meeting and minutes will be distributed to all parties. Additions or corrections to minutes shall be submitted within five working days of receipt.

1.4.10. Documentation and Record Keeping

To provide evidence of satisfactory work performance, all construction stages of future expansions at Lamb Canyon Sanitary Landfill shall be documented. Information shall be recorded on standardized forms or in a bound field logbook.

1.4.10.1. General

The QA/QC Plan requires thorough monitoring and documentation of all construction activities. Therefore, the QA/QC Consultant shall document that all QA/QC requirements have been addressed and satisfied. To provide evidence of satisfactory work performance, all stages of construction shall be documented.

Documentation shall also consist of daily reports, construction problem reports, photographs, design and specification revisions, weekly progress reports, and a final report of the as-built product, supplemented by documentation from all material manufacturers and suppliers. The documentation is to include copies of manufacturer and supplier specification sheets, certification sheets, shop drawings, transportation tickets, and any other pertinent documents. The information shall be recorded on standardized forms and in a bound field logbook.

1.4.10.2. Daily Reports

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

The daily record keeping shall include a daily field observation report, a daily test summary report, a summary of daily meetings with the Contractor and subcontractors, when applicable, observation and data reports, and construction problem reports.

Daily reports by the Contractor and the QA/QC Consultant must be submitted to the County no later than 10:00 AM of the following working day. This is required to meet RWQCB daily report submittal no later than 12:00 PM.

1.4.10.2.1. Daily Field Observation Reports

The QA/QC Monitor(s) shall keep a daily field observation report of project activities.

1.4.10.2.2. Daily Test Summary Report

A daily Test Summary Report of the field and laboratory tests for the QA/QC of the earthwork, geosynthetics, and the LCRS 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 with comments regarding there pass and/or fail status.

- 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.

1.4.10.2.3. Summary of Daily Meetings

The summary of the daily meetings with the Contractor and subcontractor(s), when applicable, shall include the following:

- Date.
- Project name and location.
- Names of parties attending.
- Scheduled activities.
- Items discussed.
- Signatures.

1.4.10.2.4. Construction Problem Reports

These reports identify and document construction problems and solutions. They are intended to document problems involving significant rework, and are not intended to document problems that are easily corrected, unless the problems are recurring. Each report shall include:

- A detailed description of the problem.
- The location and cause of the problem.
- How the problem was identified.
- A solution to the problem.
- Personnel involved.
- Signatures of the QA/QC Manager, Resident Engineer, and Contractor, as appropriate.

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

1.4.10.3. Weekly Progress Reports

The Resident Engineer shall prepare a weekly progress report. This weekly progress report shall summarize the work activities, deficiencies, and corrective actions implemented. It shall also summarize the QA/QC test results.

1.4.10.4. Photographs

The QA/QC Monitor shall prepare a photographic record as part of the construction control activities.

1.4.10.5. Design and Specification Revisions

If revision to the Contract Documents is required during construction, the QA/QC Consultant shall immediately notify the Project Manager. Revisions to the Contract Documents shall become official only after written approval by the County.

1.4.10.6. As-Built Plans

As the work is completed, the Contractor shall prepare final As-Built Plans and the QA/QC Consultant shall prepare a report. The As-Built Plans and the report shall be submitted by the Contractor and the QA/QC Consultant, respectively, to the County.

In preparation for compiling the final As-Built Plans, interim as-built plans shall be updated daily by the Contractor under the direction of the QA/QC Consultant and the Resident Engineer, and by utilizing the records prepared by the Contractor's Surveyors, The As-Built Plans shall be to scale and show the location and elevation, where applicable, of all materials used in construction.

The final report by the QA/QC Consultant shall include a summary of field and laboratory test results; and photographs showing and narrative describing typical construction conditions and procedures used throughout the entire duration of the project.

1.4.10.7. Final Construction Report

At completion of the work, the QA/QC Consultant shall submit a final construction report to the County. The QA/QC consultant is expected to submit final construction report within one week of construction completion in order not to delay the final approval of the project by the RWQCB.

END OF SECTION

SECTION 2 - EARTHWORK

2.1. ENGINEERED FILL CONSTRUCTION

2.1.1. General

The following earthwork requirements are the minimum requirements applicable to the Contractor's earthwork operations used in the construction of this project. The Contractor must strictly comply with these requirements.

a. All materials used or placed to construct the required earthwork in the project must meet or exceed the criteria indicated in this QA/QC Plan and the other Contract Documents. The Contractor shall be solely responsible for the completion of all earthwork in strict accordance with all requirements.

b. Unless otherwise stated in the Contract Documents, equipment used in the excavation, transport, processing, installation and compaction of all materials used in construction of the earthwork part in this project shall be standard of practice grading machinery of known specifications suitable for performing this type of landfill expansion work in a timely, proper, and efficient manner.

c. All clearing, grubbing, stripping and site preparation for the project shall be accomplished to the satisfaction of the QA/QC Consultant and the County.

d. All material considered by the QA/QC Consultant to be unsuitable shall be removed and stored as directed by the County. All materials incorporated as part of compacted engineered fill must be inspected and the QA/QC Consultant must observe placement.

e. Engineered fill shall be placed to achieve final design grades and elevations, and to establish subgrade for geosynthetic liner and surface drainage structures. Generally, on-site soil obtained from within project grading limits may be used for the construction of the compacted engineered fill. Processing may be needed to bring on-site soils into compliance with the project specifications. QC procedures for these materials will include visual verification prior to their use that the materials do not include organic matter, oversize particles (no greater than 6 inches particle size), or other deleterious or unsuitable materials.

f. The ground surface to receive engineered fill shall be prepared to the satisfaction of the QA/QC Consultant and the County; and the engineered fill shall be prepared, placed, spread, mixed, watered and compacted in strict accordance with this QA/QC Plan, Special Provisions, and the other Contract Documents.

g. Prior to the start of engineered fill work, the existing soils on the ground surface shall be scarified, disced or bladed to a depth of six (6) inches until the soils are

uniform and free from uneven features which may prevent uniform compaction. The scarified ground surface shall then be compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM D1557. If the scarified depth is greater than 12 inches, the excess shall be removed and placed in lifts of six to eight inches in thickness. Prior to placement of engineered fill, the ground surface to receive engineered fill shall be inspected and approved by the County and QA/QC Consultant.

h. Suitable and sufficient hauling, processing, grading and compaction equipment shall be continuously utilized to handle the amount of engineered fill being generated and placed. Excavation or hauling equipment shall be shut down temporarily in order to allow time for proper preparation, placement, and/or compaction of engineered fill material. Sufficient moisture conditioning equipment shall be provided by the Contractor with due consideration to the type of engineered fill material, rate of placement, and time of year.

i. Engineered fill material shall be moisture conditioned to 0 to 3 percent above Optimum Moisture Content (or as determined by the QA/QC Consultant) and compacted to a minimum of 90 percent of the maximum dry density, as determined by ASTM D1557.

j. The Contractor shall place engineered fill material only in thin lifts with an un-compacted thickness of no greater than eight (8) inches. Each layer shall be spread evenly, thoroughly mixed, and compacted to obtain a near uniform condition in each layer. In areas of excess lift thickness, the Contractor prior to construction of additional lifts must complete re-grading of the surface to the maximum lift thickness.

k. As determined by the QA/QC Consultant, engineered fill over natural slopes shall be properly keyed into rock or firm material. All transitions shall be stripped of all loose soils prior to placing engineered fill.

l. Where work is interrupted by heavy rains, engineered fill operations shall not be resumed until observations and field tests by the QA/QC Consultant or County indicate in-place fills and/or materials intended for placement are within the limits specified in the Contract Documents.

2.1.2. Testing & Observation

Construction of all earthworks shall be performed strictly in accordance with the Contract Documents and the QA/QC Plan. Construction shall be continuously observed, routinely sampled, and tested by the QA/QC Consultant to confirm compliance with all applicable requirements.

The testing frequency stated in the following table is a minimum. Additional tests will be conducted by the QA/QC Consultant to retest previously failed areas and at any time that, in the opinion of the QA/QC Consultant, additional testing is required and/or a deficiency is suspected. At the discretion of the QA/QC Consultant, retest of previously failed areas will be performed after sufficient re-working of such areas, to warrant a retest, has been performed by the Contractor. Following re-working of a previously failed area, the QA/QC Consultant will perform retest to verify that the requirements of the Contract Documents are satisfied.

Material properties testing of the soils used as engineered fill shall consist of laboratory moisture-density tests in accordance with ASTM D1557. This test shall be conducted when the material changes, based on visual observation of the soils, and/or based on in-place density test results of the compacted fill.

Laboratory and field-testing of engineered fill material shall be performed at the frequency specified in the following table:

TEST	TEST DESIGNATION	TEST FREQUENCY	Project Minimum Value
Field Testing			
In-place moisture/ density (nuclear)	ASTM D2922 and ASTM D3017	Every 1000 cubic yards; a minimum of two per day	90% of Maximum Dry Density and from 0% to 3% above OMC
In-place density and moisture content (sand cone)	ASTM D1556 and ASTM D4643	Every 5,000 cubic yards; a minimum of one per day	90% of Maximum Dry Density and from 0% to 3% above OMC
Visual Soil Classification	ASTM D2488	Continuous	---
Laboratory Testing			
Moisture Density Relationship	ASTM D1557	One every 15,000 cubic yards; or change of Material	---

2.2. Low-Permeability Layer

2.2.1. General

a. The construction of the 12-inch-thick low-permeability layer shall be performed in accordance with all of the Contract Documents. The construction of this layer shall be observed and tested by the QA/QC Consultant for conformance with the physical parameters described in the Contract Documents.

b. Samples of the low-permeability layer shall be taken and tested by the QA/QC Consultant, after screening and processing by the Contractor, in order to verify that material properties are in conformance with the specifications.

c. The QA/QC Consultant shall observe the processing and compaction operations for the low-permeability layer. Construction testing by the QA/QC Consultant for evaluating the in-place condition of the constructed layer shall be carried out as individual sections are completed. **The frequency of tests presented is considered as the minimum**. Additional tests shall be taken and documented by the QA/QC Consultant for retests and at any time that a deficiency is suspected.

d. The Contractor shall supply labor and equipment for preparing test areas as requested by the QA/QC Consultant. When material has not been properly processed, moisture-conditioned, or compacted, as determined by observation or verification testing, such material shall be removed or reworked as necessary to obtain the required relative compaction and moisture content, at the sole expense of the Contractor.

e. All sampling holes used by the QA/QC Consultant for testing, sampling, or observation shall be backfilled by the Contractor with compacted minus 1-inch LPL material. The backfill shall be hand-tamped in 4-inch maximum compacted lifts.

f. It is the Contractor's responsibility to ensure that proper and uniform moisture content, adequate processing and relative compaction of the entire low-permeability layer is achieved. Verification testing performed by the QA/QC Consultant does not relieve the Contractor of his responsibility to ensure uniform moisture content, processing and relative compaction of the entire low-permeability layer.

2.2.2. Material Properties Testing

The following tests shall be performed to verify the physical properties of the materials used in the low-permeability layer. The minimum frequency of testing is indicated in the following table. The tests shall be performed by an Independent Testing Laboratory, on samples recovered in the field by the QA/QC Consultant.

TABLE
TEST FREQUENCY FOR LPL MATERIAL

Test	Test Designation	Project Minimum Value	Processed Clay Material Stockpile	Test Pad	LPL Placement and Compaction
Visual Soil Classification	ASTM D2488	---	Continuous	Continuous	Continuous
Particle Size Analysis (with Hydrometer)	ASTM D422	---	1 per 5,000 cu. yds.	5	1 per 2,500 cu. yds. or per material change
Atterberg Limits	ASTM D4318	---	1 per 5,000 cu. yds.	5	1 per 2,500 cu. yds. or per material change
Moisture-Density Relationship	ASTM D1557	---	1 per 5,000 cu. yds.	2	1 per 5,000 cu. yds. or per material change
In-Place Moisture Content (following moisture conditioning)	ASTM D4643 (microwave)	2% to 4% above OMC	1 per 1,000 cu. yds., minimum 2 per day	---	---
In-Place Moisture and Density (Nuclear)	ASTM D2922 ASTM D3017	95% of Maximum Dry Density and from 2% to 4% above OMC	---	10	1 per 500 cu. yds., minimum 2 per day
In-Place Moisture and Density (Sand Cone)	ASTM D1556 ASTM D4643	95% of Maximum Dry Density and from 2% to 4% above OMC	---	5	1 per 5,000 cu. yds., minimum 1 per day
Field Hydraulic Conductivity	BAT™ Test	$\leq 1 \times 10^{-5}$ cm/sec	---	5	1 per 2,500 cu. yds.
Laboratory Hydraulic Conductivity	ASTM D5084	$\leq 1 \times 10^{-5}$ cm/sec	1 per 5,000 cu. yds.	5	1 per 2,500 cu. yds.

When the field tests are performed, no equipment shall be operated close to the test location that could adversely impact the test results.

2.2.3. Acceptance Criteria

2.2.3.1. Moisture Content and Density

If initial test results indicate a density less than the specified percent of maximum dry density (ASTM D1557) or moisture content outside of the specified limits, the area shall be reworked or the material removed. The reworked area must be retested by the QA/QC Consultant to confirm that it meets the density and moisture content requirements.

2.2.3.2. Hydraulic Conductivity

The QA/QC Consultant may require additional hydraulic conductivity tests in areas where the QA/QC Consultant suspects that the low-permeability layer does not meet the specified hydraulic conductivity. Each portion tested for laboratory hydraulic conductivity will also be tested for field hydraulic conductivity using the BAT™ test close to the laboratory test sample location. BAT™ tests shall be used as an indicator of whether an area will pass the laboratory tests. In no case shall BAT™ testing of areas be used for final acceptance. If the hydraulic conductivity exceeds $1x10^{-5}$ cm/sec as defined by ASTM D5084, the area represented by the test will be considered inadequate, and the material will be removed or reprocessed and re-compacted. Acceptance of the reprocessed area will be based on the results of the retest for laboratory permeability.

2.3. County Acceptance

The Contractor shall retain full responsibility for all earthwork until formal final acceptance by the County. Conditions for formal final earthwork acceptance (by the County) shall include but not be limited to the following:

A. The construction of the entire liner expansion system is properly finished and summarized in writing by the QA/QC Consultant.
B. All required laboratory tests have been completed and summarized in writing by the QA/QC Consultant.
C. All record drawings to be used in the drafting of the final As-Built Plans have been completed.
D. All documentation concerning the earthwork is received from the QA/QC Consultant and Contractor and is approved by the County.

END OF SECTION

SECTION 3 - GEOSYNTHETIC CLAY LINER (GCL)

3.1. GENERAL

Prior to shipment of the GCL material, the Contractor shall provide the County and/or the QA/QC Consultant with the GCL manufacturer's QA/QC certifications for each shipment of GCL. The certification shall be signed by a responsible party employed by the manufacturer such as the Production Manager or Technical Service Manager. The QA/QC certifications shall include:

A. GCL lot and roll numbers (with corresponding shipping information).

B. Certificates of analysis for the bentonite used in GCL production.

C. Manufacturer's test data for raw materials used in GCL production.

D. Manufacturer's test data for finished GCL product.

The County and the QA/QC Consultant will arrange for a meeting with the Contractor prior to the installation of the GCL. Topics for review/discussion shall include, as a minimum, Project Drawings and specifications, approved submittals, and training and qualifications for lining (sub) Contractor's personnel.

The manufacturer shall provide technical supervision and assistance as necessary during the installation of the GCL material. After the installation of the material, the Contractor shall submit to the County written certification that the GCL was installed in accordance with the GCL manufacturer's recommendations, project specifications and drawings and approved submittals.

3.2. GCL MANUFACTURING

The Contractor shall provide the County and the QA/QC Consultant with the following Manufacturer's literature:

A. Materials' specification sheet listing all specified properties measured using test methods indicated in the Special Provisions and other Contract Documents

B. The sampling procedure and results of testing

C. A certification that property values given in the materials specification sheet are guaranteed by the Geosynthetics Manufacturer

The QA/QC Consultant shall verify the following:

A. The property values certified by the Geosynthetic Clay Liner (GCL) manufacturer meet

all of the specifications

B. The measurements of properties by the Geosynthetic Clay Liner (GCL) manufacturer are properly documented and the test methods used are acceptable

C. Verify that the quality control certificates have been provided at the specified frequency for all rolls, and that each certificate identifies the rolls related to it

D. Review the quality control certificates and verify that the certified roll properties meet the specifications.

3.3. GCL DELIVERY

3.3.1. Transportation And Handling

Transportation of the Geosynthetic Clay Liner (GCL) and all handling on-site is the responsibility of the Contractor.

The QA/QC Monitor shall verify the following:

a. The Geosynthetic Clay Liner (GCL) has been protected from ultraviolet light exposure, precipitation, or any other damaging conditions

b. Equipment used to unload the rolls does not damage the Geosynthetic Clay Liner (GCL)

c. Care is used to unload the rolls

d. All required documentation has been received

Upon delivery at the site, the Geosynthetics Subcontractor and QA/QC Monitor shall conduct a surface observation of all rolls for defects and for damage. This observation shall be conducted without unrolling rolls unless defects or damages are found or suspected. The QA/QC Manager shall advise the County if any rolls, or portions thereof, should be rejected and removed from the site because they have severe flaws.

Any damaged rolls shall be rejected and removed from the site or stored at a location, separate from accepted rolls, designated by the County. All rolls that do not have proper Geosynthetic Clay Liner (GCL) manufacturer's documentation shall also be stored at a separate location until all documentation have been received and approved. The QA/QC Monitors shall maintain a log on the Geosynthetic Clay Liner (GCL) received.

3.3.2. Storage

The Contractor and Geosynthetics Subcontractor shall be responsible for the storage of Geosynthetic Clay Liner (GCL) on-site. Storage space should be protected by the Contractor and Geosynthetics Subcontractor from theft, vandalism and damage from vehicles, or from other sources.

The Geosynthetic Clay Liner (GCL) shall be protected from ultraviolet light exposure and from contamination by surface run-off and precipitation. Any Geosynthetic Clay Liner (GCL) so contaminated shall not be used in the construction.

The QA/QC Monitors shall verify that the materials shall not be stored directly on the ground, and that storage of the Geosynthetic Clay Liner (GCL) ensures adequate protection against damage from actions of man, weather, animals, and other sources.

3.4. GCL Conformance Testing

3.4.1. Tests

Upon delivery of the rolls of Geosynthetic Clay Liner (GCL), the QA/QC Manager shall verify that samples are removed and forwarded to the Independent Testing Laboratory for testing to ensure conformance to project specifications.

As a minimum, tests to determine the field characteristics shall be performed on the Geosynthetic Clay Liner (GCL) in accordance with the project specifications.

3.4.2. Sampling Procedures

Samples shall be taken by the Geosynthetics Subcontractor in the presence of the QA/QC Monitor.

Samples shall be taken at a rate of one per lot or one per 100,000 square feet, whichever results in the greater number of samples.

3.4.3. Test Results

The QA/QC Manager shall document all conformance test results from Independent Testing Laboratory, and shall report any non-conformance to the Contractor and Geosynthetics Subcontractor.

For GCL rolls rejected and replaced with new rolls from a different lot, the Contractor shall be responsible for all costs associated with retesting.

3.5. GCL INSTALLATION

3.5.1. Surface Preparation

The Contractor shall be responsible for preparing the supporting subgrade according to the Special Provisions and as needed by the Geosynthetics Subcontractor.

Prior to installation, the Contractor, Geosynthetics Subcontractor, Resident Engineer, and QA/QC Monitors shall verify that:

a. All lines and grades have been verified by a qualified surveyor

b. The supporting surface does not contain stones or other sharp objects that could damage the Geosynthetic Clay Liner (GCL)

c. No soft areas are present that could result in damage to the Geosynthetic Clay Liner (GCL)

d. All construction stakes and hubs have been removed and the resulting holes have been properly filled

e. The Geosynthetics Subcontractor has certified in writing that the surface on which the Geosynthetic Clay Liner (GCL) shall be installed is acceptable

The certificate of acceptance shall be given by the Geosynthetics Subcontractor to the Resident Engineer prior to commencement of Geosynthetic Clay Liner (GCL) installation. The QA/QC Monitor shall have a copy of this certificate before installation of Geosynthetic Clay Liner (GCL) commences in any given area. The subject area shall also be observed by the QA/QC Monitor. The QA/QC Monitor shall have the authority to reject an area even after it has been accepted by the Geosynthetics Subcontractor.

At any time before, during, or after the supporting surface has been accepted, it shall be the Geosynthetics Subcontractor's responsibility to indicate to the QA/QC Monitor any change in the supporting surface condition that may require repair work. The QA/QC Monitor shall also make observations to identify such conditions.

3.5.2. Placement

Field Panel Identification: The Geosynthetics Subcontractor shall provide for County and QA/QC Consultant approval, a Geosynthetic Clay Liner (GCL) panel layout plan before any placement occurs, and it shall be updated daily as the job proceeds. A field panel (sheet) is an area of Geosynthetic Clay Liner (GCL) that is to be placed in the field, such as a roll or a portion of roll cut in the field. The Geosynthetics Subcontractor shall give each field panel an identification code that shall be agreed to and used by the QA/QC Monitors, Resident Engineer, and the Geosynthetics Subcontractor. The QA/QC Monitors shall establish a chart showing correspondence between roll numbers, certification reports, and panel identification

code. The field panel identification code shall be used for all QC records and for the final As-Built Plans.

Field Panel Placement: The QA/QC Monitors shall record the identification code, location, and date of installation of each field panel.

During panel placement, the QA/QC Monitor shall:

a. Verify that field panels are installed at the location indicated in the layout plan, as approved or modified by the County

b. Verify that the surface beneath the Geosynthetic Clay Liner (GCL) has not deteriorated since previous acceptance

c. Verify that the method used to unroll the panels does not cause folds in the Geosynthetic Clay Liner (GCL) and does not damage the supporting surface

d. Verify that there are no stones, construction debris, or other items beneath the Geosynthetic Clay Liner (GCL) that could cause damage

e. Observe and document the Geosynthetic Clay Liner (GCL) as it is placed and record all defects; all repairs are to be made in accordance with the Specifications

f. Verify that equipment used does not damage the Geosynthetic Clay Liner (GCL) or supporting surface by handling, traffic, leakage of hydrocarbons, or by any other means

g. Verify that people working during installation of Geosynthetic Clay Liner (GCL) do not smoke, wear shoes that could damage the Geosynthetic Clay Liner (GCL), or engage in activities that could damage the Geosynthetic Clay Liner (GCL)

h. Verify that the Geosynthetic Clay Liner (GCL)s is properly anchored to prevent movement by the wind, and record the procedure used (Securing pins are unacceptable)

i. Verify that the adjacent panels of Geosynthetic Clay Liner (GCL) are overlapped a minimum of twelve-inches (12") on side slopes and six-inches (6") on canyon floor area.

j. Verify that the direct contact with the GCL is minimized when placing the Geosynthetic Clay Liner (GCL); i.e., the GCL is protected by suitable materials as approved by the Resident Engineer in areas where excessive traffic may be expected

k. Verify that the Geosynthetic Clay Liner (GCL) is cut only with an approved

Geosynthetic Clay Liner (GCL) cutter, and is not torn or ripped

The QA/QC Monitors shall inform the Geosynthetics Subcontractor, the QA/QC Manager, and the Resident Engineer if the above conditions are not met. The QA/QC Monitor shall observe and document the condition of each panel after placement. The QA/QC Monitors shall advise the QA/QC Manager which panels, or portions of panels, should be rejected, repaired, or accepted. Damaged panels or portions of damaged panels that have been rejected shall be marked, and their removal from the work area shall be recorded by the QA/QC Monitors. A Geosynthetic Clay Liner (GCL) panel replacement log shall be maintained by the QA/QC Monitors.

3.5.3. Repairs

Each repaired area shall be documented and located by the QA/QC Monitor for the final As-Built Plans.

3.6. COUNTY ACCEPTANCE

The Contractor shall retain all ownership and responsibility for the Geosynthetic Clay Liner (GCL) until acceptance by County. The Geosynthetic Clay Liner (GCL) shall be accepted by the County when:

A. The installation is finished and summarized in writing by the QA/QC Consultant

B. All construction and materials mentioned in this section have been completed and tested, as appropriate, and summarized in writing by the QA/QC Consultant

C. All required manufacturer's and supplier's documentation have been received and summarized in writing by the QA/QC Consultant

D. All record drawings to be used in the drafting of the final As-Built Plans have been completed and summarized in writing by the QA/QC Consultant

E. The GCL is permanently covered

F. All above documentation and any additional documentation concerning the items mentioned in this section are received from the QA/QC Consultant and Contractor, and are approved by the County.

END OF SECTION

SECTION 4 - FLEXIBLE MEMBRANE LINER (FML)

4.1. FML MANUFACTURING

The Contractor shall provide the County and/or QA/QC Consultant with the FML manufacturer's QA/QC certifications for each shipment of FML. The certification shall be signed by a responsible party employed by the manufacturer such as the Production Manager, or Technical Services Manager. The QA/QC certifications shall include:

A. FML lot and roll numbers (with corresponding shipping information)

B. Manufacturer's test data for the FML product, including all test data for all conformance specifications required by the project specification.

The manufacturer shall provide on-site technical supervision and assistance as necessary during the installation of the FML material. The FML manufacturer and the Contractor, as applicable to each, shall submit for approval by the County the written certification that the FML was installed in accordance with the FML manufacturer's recommendations, project specifications, drawings and approved submittals.

The Contractor shall make arrangements with the FML manufacturer, if requested by the County and/or QA/QC Consultant, to allow the County and/or QA/QC Consultant to visit the manufacturing facility during manufacture of the FML material(s) for this project to observe manufacturing methods and quality control of manufactured materials.

The County and the QA/QC Consultant will arrange for a pre-installation meeting with the FML installation Contractor prior to the installation of the FML. Topics for review/discussion shall include, as a minimum, Project Drawings and specifications, approved submittals, training and qualification procedures for the lining (sub) Contractor's personnel, and demonstration of making field weld(s).

Prior to installation of the FML, a site inspection shall be conducted by the QA/QC Manager and the Contractor to verify measurements and surface conditions to receive the FML.

The Contractor shall provide the County with the following manufacturer's literature:

A. Materials' specification sheet including all specified properties measured using test methods indicated in the specifications, or equivalent

B. The sampling procedure and results of testing

C. A certification that property values given in the materials specification sheet are guaranteed by the FML manufacturer

The QA/QC Consultant shall verify that:

A. The property values certified by the manufacturer meet all of the project specifications

B. The actual test results performed at the manufacturer's Quality Control Laboratory meet all of the project specifications

Prior to shipment, the FML manufacturer shall provide the County and the QA/QC Consultant with a quality control certificate for each roll of FML. The quality control certificate shall be signed by a responsible person employed by the manufacturer. The quality control certificate shall include:

A. Lot and roll numbers and identification

B. Sampling procedures and results of quality control tests; at a minimum, results shall be given for thickness, density, carbon black content, and tensile characteristics, evaluated in accordance with the methods indicated in the specifications or by equivalent methods approved by the QA/QC Consultant and the County

The QA/QC Consultant shall:

A. Verify that the quality control certificates have been provided at the specified frequency for all rolls and that each certificate identifies the rolls related to it

B. Review the quality control certificates and verify that the certified Minimum Average Roll Values (MARV) meet the project specifications.

4.2. FML DELIVERY

4.2.1. Transportation and Handling

Transportation of the FML is and all handling on site is the responsibility of the Contractor.

The QA/QC Consultant shall verify the following items:

a. Handling equipment used on the site is adequate and does not pose any risk of damage to the FML

b. The Geosynthetics Subcontractor's personnel handle the FML with care

c. All documentation required by the Specifications has been received

Upon delivery at the site, the Geosynthetics Subcontractor and the QA/QC Monitor shall conduct a surface observation of all the rolls for defects and for damage. This shall be conducted without unrolling the rolls unless defects or damages are found or suspected. The QA/QC Consultant shall report to the County the rolls, or portions thereof, that should be rejected and removed from the site because they have severe flaws.

Any damaged rolls shall be rejected and removed from the site or stored at a location, separate from accepted rolls, that is designated by the County. All rolls that do not have proper manufacturer's documentation shall also be stored at a separate location until all documentation has been received and approved. An updated log on the FML received shall be maintained by the QA/QC Monitors.

4.2.2. Storage

The Contractor and Geosynthetics Subcontractor shall be responsible for the storage of the FML on site. The County shall provide storage space in one or several locations such that on-site transportation and handling are minimized. Storage space should be protected by the Contractor and Geosynthetics Subcontractor from theft, vandalism, damage from vehicles, or other harm. The QA/QC Monitors shall verify that the materials shall not be stored directly on the ground, and that storage of the FML ensures adequate protection against damage from actions of man, weather, animals, and other sources.

4.3. FML Conformance Testing

4.3.1. Tests

Upon delivery of the rolls of FML, the QA/QC Manager shall ensure that samples are removed and forwarded to the independent testing laboratory for testing to ensure conformance to the specifications.

As a minimum, tests to determine the field characteristics shall be performed on the Flexible Membrane Liner (FML) in accordance with the project specifications.

For each Liner System 1, 2, 3, and 4, at least two-interface shear strength conformance test shall be performed in accordance with the requirements set forth in Section 7 of the Special Provisions. Where optional procedures are noted in the test method, the requirements of the Special Provisions shall prevail.

4.3.2. Sampling Procedures

Unless otherwise specified, samples shall be taken at a rate of one per lot or one per 100,000 square feet, whichever results in the greater number of tests.

4.3.3. Test Results

The QA/QC Manager shall document all conformance-testing results from Independent Testing Laboratory and shall report any non-conformance to the Contractor and Geosynthetics sub-contractor.

For FML rolls rejected and replaced with new rolls from a different lot, the Contractor shall be responsible for all costs associated with retesting of new rolls.

4.4. FML INSTALLATION

4.4.1. Earthwork

Surface Preparation: The Contractor shall be responsible for preparing the supporting subgrade according to Special Provisions and as needed by the Geosynthetics Subcontractor.

Prior to the FML installation, the Contractor, Geosynthetics Subcontractor installer, Resident Engineer, and QA/QC Monitor shall verify that:

a. All lines and grades have been checked by survey

b. The subgrade for the lower FML layer for the bottom floor liner system has been prepared in accordance with the Special Provisions and the Geosynthetics Subcontractor's requirements

c. The surface has been rolled and compacted to be free of surface irregularities, loose soil, and protrusions, and a geotextile, if specified, has been installed

d. The supporting surface does not contain stones that could damage the FML

e. There are no soft areas that could result in FML damage

f. All construction stakes and hubs have been removed, and any holes properly filled

g. The Geosynthetic Subcontractor has certified in writing that the surface on which the FML will be installed is acceptable

The certificate of acceptance shall be given by the Geosynthetics Subcontractor to the County prior to commencement of FML installation in the area under consideration. The QA/QC Monitors shall have a copy of this certificate before installation of FML commences in any given area. The subject area will also be observed by the QA/QC Monitors. The QA/QC Monitor shall have the authority to reject an area even after it has been accepted by the Geosynthetics Subcontractor.

After the supporting surface has been accepted by the Geosynthetics Subcontractor, it shall be the Geosynthetics Subcontractor's responsibility to indicate to the QA/QC Monitor any change in the supporting surface condition that may require repair work. If the QA/QC Monitor concurs with the Geosynthetics Subcontractor, then the QA/QC Monitor shall coordinate the repair of the supporting surface. At any time before, during or after the FML installation, the QA/QC Monitor shall indicate locations that may not provide adequate support to the FML to the Resident Engineer.

Anchor Trench: Care shall be taken when backfilling the trenches to prevent any damage to the geosynthetics. The QA/QC Monitors shall observe the backfilling operation and advise the QA/QC Manager of any problems.

4.4.2. FML Placement

Field Panel Identification: The QA/QC Monitors shall establish a chart showing correspondence between roll numbers, certification reports, and panel identification code. The field panel identification code shall be used for all QC records and for the final As-Built Plans.

Field Panel Placement: The QA/QC Monitors shall record the identification code, location, and date of installation of each field panel.

During panel placement, the QA/QC Monitors shall:

a. Verify that field panels are installed at the location indicated in the layout plan, as approved or modified by the County

b. Observe the panel surface as it is deployed and record all panel defects and disposition of the defects; all repairs are to be made in accordance with the specifications

c. Observe that equipment used does not damage the FML by handling, trafficking, leaking hydrocarbons, or by any other means

d. Verify that the surface beneath the FML has not deteriorated since previous acceptance by the Geosynthetics Subcontractor

e. Verify there are no stones, construction debris, or other items beneath the FML that could cause damage

f. Observe that the FML is not dragged across an unprepared surface; if the FML is dragged across an unprepared surface, it shall be inspected for texture damage and scratches and repaired or rejected as necessary

g. Verify that the method used to unroll the panels does not cause scratches or harmful wrinkles in the FML and does not damage the supporting soil

h. Record weather conditions including temperature, wind, and humidity; the FML shall not be deployed in the presence of excessive moisture, such as fog, dew, or mist; or in high winds and extreme temperatures, as determined by Contractor and approved by the County

i. Verify that people working during the installation of FML do not smoke, wear shoes that could damage the FML, or engage in activities that could damage the

FML

j. Verify that the method used to deploy the panel eliminates wrinkles and that the panels are anchored to prevent movement by wind

k. Verify that direct contact with the FML is limited to the lowest practicable level; i.e., the FML is protected by geotextiles, extra FML, or other suitable materials in areas where traffic may be expected

The QA/QC Monitors shall inform the Geosynthetics Subcontractor, and the QA/QC Manager, if the above conditions are not met.

The QA/QC Monitors shall observe each panel for damage after placement and prior to seaming. The QA/QC Monitors shall advise the QA/QC Manager which panels, or portions of panels, should be rejected, repaired, or accepted. Damaged panels or portions of damaged panels that have been rejected shall be marked, and the QA/QC Monitors shall record their removal from the work area. The QA/QC Monitors will maintain an updated FML panel replacement log.

4.4.3. Field Seaming

The Geosynthetics Subcontractor shall update the layout plan daily as the job proceeds. Prior to seaming, each welding and seaming apparatus shall be tested in accordance with the specifications to determine if the equipment is functioning properly. The QA/QC Monitors shall observe all trial welding operations and record the results. If at any time the QA/QC Monitor observes an operator or seaming apparatus not functioning properly, a test shall be performed on a trial weld. If there are significant changes in temperature, humidity, wind speed or if there is an operational shut down, the trial weld test shall be repeated. Laboratory tests may be carried out at the discretion of the QA/QC Monitors to verify field test results.

During seaming operations the QA/QC Monitors shall verify that:

a. The Geosynthetics Subcontractor has the number of seamers and spare parts agreed to in the pre-construction meeting

b. Equipment used for seaming will not damage the FML

c. The extrusion welder is purged prior to beginning a seam until all the heat-degraded extrudate is removed (extrusion welding only)

d. Seam grinding has been completed less than one hour before seam welding (extrusion welding only)

e. The ambient temperature measured 6 inches above the FML surface is between 40 and 104 degrees Fahrenheit and relative humidity is less than 80%

f. The end of old welds more than 5 minutes old are ground to expose new material before restarting a weld (extrusion welding only)

g. The weld is free of dust and other debris

h. For intersecting T seams, the first seam is ground to a smooth incline prior to welding

i. The seams are overlapped a minimum of 4 inches

j. No solvents or adhesives or free moisture are present in the seam area

k. The procedure used to temporarily hold the panels together does not damage the panels and does not preclude QA testing

l. The panels are being seamed in accordance with the Project Drawings and Specifications or the manufacturers' instructions, using approved proper equipment with gauges giving applicable temperatures

m. The electric generator is placed on a smooth base such that no damage occurs to the FML

n. A smooth insulating plate or fabric is placed beneath the hot welding apparatus after usage

o. The welded FML is protected from damage in heavily trafficked areas

The QA/QC Monitors shall log all appropriate temperatures and conditions, and shall log and report to the QA/QC Manager any instances of noncompliance.

Trial Seam Samples: Samples of trial seams are not removed from installed seams, but are made along side the seaming work area by the Geosynthetics Subcontractor using the same FML sheet and the same installation procedures as for the FML installation itself. As such, they are **nondestructive samples**. Trial seams shall be made on fragment pieces of FML to verify that seaming conditions are adequate. Such trial seams shall be made at the beginning of each seaming period; which will include the start of day, mid-day, and any time equipment is shut down or seaming operation is suspended more than ½ hour for each seaming equipment used that day. Also, each seamer shall make at least one trial seam each day. Trial seams shall be made under the same conditions as actual seams.

The trial seam sample shall be at least 3 feet long. Trial seam sample width shall be 1 foot plus a seam-width, after seaming with the seam centered lengthwise. The seam overlap shall be as per the specifications.

Two specimens, each 1-inch wide, from opposite ends of the trial seam, shall be cut from the trial seam sample by the Geosynthetics Subcontractor. The Subcontractor using a field

tensiometer shall test the specimens respectively in shear and peel. They shall not fail in the seam, and shall satisfy peel and tensile strength requirements. If a specimen fails, the seaming equipment and seamer shall not be accepted and shall not be used for seaming until the deficiencies are corrected and two consecutive successful trial welds are achieved. After completing a successful trial nondestructive sample, the Subcontractor shall cut a 2-foot square remnant from the sample and mark the welder number, date, time, ambient temperature, welder temperature, and speed, and shall submit it to the QA/QC Monitor, who will assign an identification number and enter the information on the nondestructive sample form. The QA/QC Monitors shall document the results of field tests carried out on trial seams.

General Seaming Procedure: Unless otherwise specified, the general seaming procedure to be used by the Geosynthetics Subcontractor shall be as follows:

"Fishmouths" or wrinkles at seam overlaps shall be cut along the ridge of the wrinkle in order to achieve a flat overlap. The cut "fishmouths" or wrinkles shall be seamed, and any portion where the overlap is inadequate shall then be patched with an oval or round patch of the same FML extending a minimum of 6 inches beyond the cut in all directions. All corners of the patch shall be rounded with a one-inch minimum radius.

Panel seaming shall extend the full width of all panels, including material placed in the anchor trench.

Panels shall be planned to eliminate the need for cross seams. All intersecting T seams shall be offset at least two feet, and shall be extrusion-welded where they intersect.

The QA/QC Monitors shall verify that the above seaming procedures are followed, and shall inform the QA/QC Manager if they are not.

4.5. FML Construction Testing

4.5.1. Nondestructive Seam Testing

The Geosynthetics Subcontractor shall perform nondestructive testing on all field seams over their full length using a vacuum test unit, or a spark detector, as applicable. All testing shall be conducted in the presence of the QA/QC Monitor. The area to be tested shall be cleaned of all dust, debris, dirt, and other foreign matter. **The purpose of nondestructive tests is to check the continuity of seams; they do not provide information on seam strength.** Continuity testing shall be carried out as the seaming work progresses, not at the completion of all field seaming. The equipment shall be used for its applicable purpose in accordance with the equipment manufacturer's instructions. Defective and questionable sections shall be clearly marked and repaired as necessary.

For the nondestructive seam testing, the QA/QC Monitor shall:

a. Observe and record all continuity testing and field testing of trial seams

b. Record the location of seam and panel number, date, time, equipment number, QA/QC Monitor, test number, technician's name, weld, sheet and ambient temperatures, and results of all testing

c. Mark the failed areas with a waterproof marker compatible with the lining and inform the Contractor, and Geosynthetics Subcontractor of any required repairs

d. Verify that all testing is completed in accordance with the Specifications

e. Verify that all repairs are completed and tested in accordance with the specifications

4.5.2. Destructive Seam Testing

4.5.2.1. General

Destructive seam tests shall be performed at selected locations on the side slope FML liner and the upper FML of the bottom floor liner. No destructive testing will be performed on the lower FML of the bottom floor liner that acts as a moisture barrier. **The purpose of these tests is to evaluate seam strength**. Seam strength testing shall be done as the seaming work progresses, not at the completion of all field seaming.

Destructive sampling involves samples removed from the installed field seams by the Geosynthetics Subcontractor. Test locations shall be determined at the discretion of the QA/QC Monitors, and the Subcontractor shall not be informed in advance of the locations where the seam samples will be made or will be removed. A minimum of one destructive sample per 500 feet of field seam shall be made. This is a minimum frequency for the entire installation. Frequency of samples may be increased based on performance and as determined by the QA/QC Manager.

Additional samples may be removed if the QA/QC Monitor suspects a seam may not meet project specification requirements.

4.5.2.2. Sampling Procedures

Samples shall be made or removed by the Geosynthetic Subcontractor at locations selected by the QA/QC Monitors as the seaming operation progresses. The QA/QC Monitor shall:

a. Observe the making or removal of samples

b. Mark each sample with an identifying number that contains the seam number; for nondestructive samples, the seam number welded just prior to making a sample will be marked on the sample; for destructive samples, record sample location on the panel layout drawing and enter the information on a log form

c. Record the sample location, weather conditions, and reason sample was made or taken, such as random sample, visual appearance, or the result of a previous failure

d. Mark sample identifying number on FML adjacent to the location where sample was taken

All holes in the FML resulting from destructive seam sampling shall be immediately repaired in accordance with repair procedures described herein. The continuity of the new seams in the repaired area shall be tested according to procedures described herein.

4.5.2.3. Size of Samples

The samples shall have a length of 38 inches and a width of 12 inches plus seam width. Two different types of destructive samples shall be made from this large sample. The first type is two small samples for field-testing. Each of these samples shall be one inch in length with a width of 12 inches plus seam width and shall be taken at opposite ends of the sample. The seam shall be centered parallel to the length.

The second type is the sample designated for laboratory testing that is the portion of seam located between the two small field test samples. The sample for laboratory testing shall be 36 inches long with a width of 12 inches plus seam width. The seam shall be centered parallel to the length. If the field tests on the two 1-inch-long samples pass, the samples for laboratory testing shall be cut into three equal parts and be distributed as follows:

a. One part to the independent testing laboratory for testing

b. One part to the geosynthetics subcontractor

c. One part to the County for archive storage

4.5.2.4. Field Testing

The two 1-inch-wide samples shall be tested in the field for peel adhesion and bonded seam strength (shear) by the Geosynthetics Subcontractor, and shall not fail in the seam, but shall have a film tearing bond. If one or both of the samples fails in either peel or shear, the Geosynthetics Subcontractor can, at his discretion, reconstruct or cap strip the seam between passed test locations, or takes another test sample ten feet from the point of the failed test and repeat this procedure. If the second test passes, the Geosynthetics Subcontractor can either reconstruct or cap strip the seam between the two passed test locations. If subsequent tests fail, the length of seam between passed tests shall be capped as required in the specifications. Repeated failures indicate that either the seaming equipment or the operator is not performing properly and appropriate action shall be taken.

All specimens of a field weld sample tested by the Contractor in the field shall pass. If any specimen fails, the entire sample shall be considered as a failure, and the field weld shall be rejected. In this event, the field seams(s) shall be rejected as being not in conformance with the specifications, and corrective measures shall be implemented.

4.5.3. Laboratory Testing

Once the field tests have passed, a sample will be recovered from between passing field sample locations for testing by the independent testing laboratory. Destructive test samples will be packaged and shipped to the laboratory on the same day the sample is made or removed by the QA/QC Monitors in a manner that will not damage the test sample. The County will be responsible for storing the archive samples.

All destructive field seam specimens tested by the independent testing laboratory (sets of five test specimens are performed) shall allow for one failure out of five tested and the rest shall pass. If two specimens out of five fails, the entire sample shall be considered as a failure, and the field weld(s) performed by the same welding equipment between adjacent destructive samples on either side of the failed sample shall be considered to not be in conformance with the Specifications.
New test samples shall be taken 10 feet on both sides of the failed destructive sample and they shall be tested using the same procedures outlined above. If these new test samples PASS, the weld need only be reconstructed or capped between the 2 passing tests. If either of these new test samples FAIL, the iterative process of sampling as outlined above is repeated until passing test results are observed. In this case, the entire seam between the two successful test samples shall be capped or reconstructed. If capping a field seam is required, the Contractor shall use a cover strip of the same material (and from the same roll if available) and a minimum of 8" in width. The cap strip shall be extrusion welded and tested as required for extrusion welding. In cases involving more than 50 feet of reconstructed or capped seam, the cap-strip seam shall also be tested. In no case shall field-testing of installed seams be used for final acceptance.

Testing shall include peel adhesion and bonded seam strength (shear) (ASTM D4545). At least five specimens each shall be tested for peel and shear. Minimum test values shall be in accordance with the project specifications. The independent testing laboratory shall provide test results within 24 hours after receipt of samples for testing. Certified test results shall be provided within five days. The QA/QC Monitor shall document all test results and shall immediately notify the Geosynthetics Subcontractor in the event of a failed test.

4.6. Defects and Repairs

4.6.1. Identification

All seams and non-seam areas of the FML shall be examined by the QA/QC Monitors for identification of defects, holes, blisters, un-dispersed raw materials, and any sign of contamination by foreign matter. Because light reflected by the FML helps to detect defects, the surface of the FML shall be clean at the time of examination. The Geosynthetics Subcontractor shall clean the FML surface if the amount of dust or mud inhibits examination.

Each suspect location both in seam and non-seam areas shall be tested using the methods described herein, as appropriate. Each location that fails nondestructive testing shall be marked by the QA/QC Monitor, and then repaired and retested by the Geosynthetics Subcontractor. Work shall not proceed with any materials that will cover locations that have been repaired until laboratory test results with passing values have been obtained.

4.6.2. Repair Procedures

Any portion of the FML with a flaw or that fails a nondestructive or destructive test shall be repaired in accordance with the Specifications. The QA/QC Monitor shall locate and describe all repairs on the appropriate forms. Repair procedures include the following:

a. Patching: used to repair large holes, tears, large panel defects, and destructive sample locations that are less than 25 square feet in total area
b. Extrusion: used to repair small defects in the panels and seams

c. Capping: used to repair failed welds or to cover seams where welds cannot be nondestructively tested
d. Removal: used to replace areas with large defects where the preceding methods are not appropriate; also used to remove excess material, such as wrinkles, from the installed FML

4.7. Seam Test Summary

The QA/QC Manager shall summarize documentation of all nondestructive and destructive seam-testing results, including repairs.

d. All construction stakes and hubs have been removed and the resulting holes have been properly filled

e. The Geosynthetics Subcontractor has certified in writing that the surface on which the geotextile shall be installed is acceptable

Prior to installing cushion geotextile on the bottom FML and on the side slopes, the Contractor, Geosynthetics Subcontractor, and QA/QC Monitor shall verify that all installation of FML seaming and repairs has been completed and documented.

The Geosynthetics Subcontractor shall give the certificate of acceptance to the Quality Assurance Manager prior to commencement of geotextile installation for each uncovered portion of FML. The QA/QC Monitors shall have a copy of this certificate before installation of geotextile commences in any given area. The QA/QC Monitors shall also observe the subject area. The QA/QC Monitor shall have the authority to reject an area even after the Geosynthetics Subcontractor has accepted it.

At any time before, during, or after the supporting surface has been accepted, it shall be the Geosynthetics Subcontractor's responsibility to indicate to the County any change in the supporting soil condition that may require repair work. The QA/QC Monitor shall also make observations to identify such conditions.

5.4.2. Geotextile Placement

The QA/QC Monitors shall establish a chart showing correspondence between roll numbers, certification reports, and panel identification code. The field panel identification code shall be used for all QC records and for the As-Built Plans.

Field Panel Placement: The QA/QC Monitors shall record the identification code, location, and date of installation of each field panel.

During panel placement, the QA/QC Monitor shall:

a. Verify that field panels are installed at the location indicated in the layout plan, as approved or modified by the County

b. Verify that the surface beneath the geotextile has not deteriorated since previous acceptance

c. Verify that the method used to unroll the panels does not cause folds in the geotextile and does not damage the supporting surface

d. Verify that there are no stones, construction debris, or other items beneath the geotextile that could cause damage

e. Observe and document the geotextile as it is placed and record all defects; all repairs are to be made in accordance with the Specifications

f. Verify that equipment used does not damage the geotextile or supporting surface by handling, traffic, leakage of hydrocarbons, or by other means

g. Verify that people working during installation of geotextile do not smoke, wear shoes that could damage the geotextile or liner, or engage in activities that could damage the geotextile or liner

h. Verify that the geotextiles are properly anchored to prevent movement by the wind, and record the procedure used (Securing pins are unacceptable)

i. Verify that the adjacent panels of geotextile are overlapped a minimum of 6 inches and properly sewn or welded as required by the Specifications

j. Verify that the geotextile is cut only with an approved geotextile cutter, and is not torn or ripped

The QA/QC Monitors shall inform the Geosynthetics Subcontractor, the QA/QC Manager, and the Resident Engineer if the above conditions are not met. The QA/QC Monitors shall observe and document the condition of each panel after placement. The QA/QC Monitors shall advise the QA/QC Manager which panels, or portions of panels, should be rejected, repaired, or accepted. Damaged panels or portions of damaged panels that have been rejected shall be marked, and the QA/QC Monitors shall record their removal from the work area. The QA/QC Monitors shall maintain a geotextile panel replacement log.

5.5. COUNTY ACCEPTANCE

The Contractor shall retain all ownership and responsibility for the geotextile until acceptance by the County. The geotextile shall be accepted by the County when:

A. The installation is finished and summarized in writing by the QA/QC Manager

B. All construction and materials mentioned in this section have been completed and tested, as appropriate, and summarized in writing by the QA/QC Manager

C. All required manufacturer's and supplier's documentation has been received and summarized in writing by the QA/QC Manager

D. All record drawings to be used in the preparation of the final As-Built Plans have been completed and summarized in writing by the QA/QC Manager

E. All above documentation and any additional documentation concerning the items mentioned in this section is received from the QA/QC Manager and Contractor, and is

approved by the County.

END OF SECTION

SECTION 6 - LEACHATE COLLECTION AND REMOVAL SYSTEM

6.1. LCRS CONSTRUCTION

6.1.1. Piping & Leachate Storage Tank

Piping and leachate tank installations shall be observed and documented by the QA/QC Monitor to verify that the installations are performed in accordance with manufacturer's recommendations and with the requirements of the Contract Documents; and that the grades and locations are consistent with the Contract Documents.

Prior to beginning this construction, the Contractor shall submit to the County descriptive literature about the fusion equipment to be used, and shall submit certification from the pipe installer that the jointing technicians are qualified and experienced in heat fusion joining of specified pipe in accordance with Title 49 CFR 192.285. A minimum of two test joints shall be fused and cut from each pipe size and each SDR prior to beginning of joining that piping system. The test joints shall be visually observed and documented by the QA/QC Monitor and the County in accordance with Title 49 CFR 192.285.

6.1.2. Construction Material

The HDPE pipe and all other construction material suppliers shall provide certification to the County that the delivered materials comply with the pertinent project specifications.

6.1.3. County Acceptance

The Contractor shall retain all ownership and responsibility for the above-mentioned items until final acceptance by the County. The above-mentioned items shall be accepted by the County when:

a. The installation is finished and approved in writing by the QA/QC Manager

b. All construction and materials related to this section have been completed and tested appropriately, and approved in writing by the QA/QC Manager

c. All required manufacturer's and supplier's documentation have been received and approved in writing by the QA/QC Manager

d. All record drawings to be used in the drafting of the final As-Built Plans have been completed and approved in writing by the QA/QC Manager

e. All above documentation and any additional documentation concerning the items mentioned in this section have been received from the QA/QC Manager and Contractor, and have been approved by the County.

6.2. DRAINAGE LAYER CONSTRUCTION

6.2.1. General

Drainage gravel shall be placed in accordance with the requirements of all Contract Documents and shall be observed and tested by the QA/QC Consultant. Tests shall be performed at an independent laboratory.

6.2.2. Material Properties Testing

The suppliers of LCRS drainage gravel shall provide laboratory test results showing compliance with material specifications provided in the Contract Documents. In addition, minimum testing by the QA/QC Consultant shall consist of at least one particle-size analysis (ASTM C136) prior to placement of material and at least one test per 1,000 cubic yards during placement. In addition, at least one test per 2,000 cubic yards test by ASTM D2434 shall be performed on the drainage gravel.

6.2.3. In-Place Properties Testing

The QA/QC Consultant shall observe Contractor's placement operation of LCRS materials. Judgment of density will be based on visual observation of the construction activities and equipment utilized to perform this work

6.2.4. County Acceptance

The LCRS material not complying with the project specified gradations or permeability shall be rejected. The Contractor shall retain all ownership and responsibility for the drainage layer until final acceptance by the County. The drainage layer shall be accepted by the County when:

a. The installation is finished and approved in writing by the QA/QC Manager

b. All required laboratory tests have been completed and approved in writing by the QA/QC Manager

c. All record drawings to be used in the drafting of the final As-Built Plan have been completed and approved in writing by the QA/QC Manager

d. All above documentation and any additional documentation (geotextile and pipe conformance documentation) concerning the drainage layer have been received from the QA/QC Manager and Contractor, and have been approved by the County.

END OF SECTION

SECTION 7 - PROTECTIVE SOIL LAYER

The QA/QC procedures indicated in this section are only intended to assure that the preparation and installation of the materials for the protective soil layer are done in such a manner as to assure that the completed underlying geosynthetic layers are not damaged. Protective soil layer shall be prepared and installed in accordance with the requirements of the Contract Documents.

Important points for QC of materials in contact with geosynthetics include the following:

A. Placement of soils, sand, or other types of earth cover on top of the geotextile shall not be performed until all testing has been performed and accepted, and the liner materials have been surveyed for "as-built" drawings.

B. Placement shall be performed in a manner to eliminate wrinkles. Equipment operators shall be briefed on method of placement relative to thermal expansion and contraction of the FML.

C. Soil material placed on top of the geotextile should be stockpiled and pushed off the stockpile to create a cascading effect of the cover material on top of the geosynthetics; or otherwise, be placed with a front-end loader.

D. Drainage layer and soil from the Protective Soil Layer shall be installed in such a manner that the geosynthetics are not folded or wrinkled by the advancing placement and grading and compaction activities. When placing materials over geosynthetics, materials shall be placed in the direction from the overlying geosynthetics to the underlying geosynthetics.

E. Equipment used for placing soil shall not be driven directly on the geosynthetics. Track-mounted equipment with low ground pressure treads, or low-pressure tires, no larger than a Caterpillar Model D-6 or equivalent, shall be used for spreading. In no case shall equipment be allowed to operate on less than 12 inches of cover over geosynthetic material. The Contractor shall avoid sharp turns, sudden starts or stops, spinning and digging of tracks, or any other operation that could damage the landfill lining system. At no time shall trucks, or any other vehicle with concentrated wheel loads, be permitted to operate on less than 12 inches of compacted cover material placed above the geosynthetics.

F. Gradation of the side slope protective soil layer shall be tested by the QA/QC Consultant every 1,000 cubic yards to verify that the material does not contain any oversize particles greater than 1 inch.

G. Gradation of the bottom floor protective soil layer shall be tested by the QA/QC Consultant every 2,000 cubic yards to verify that the material does not contain any oversize particles greater than 3 inch.

SECTION 9 - REINFORCED CONCRETE STRUCTURES

The QA procedure is intended to assure the final product will achieve, at a minimum, the specified design strength and performance.

The following concrete requirements are the minimum requirements applicable to concrete construction for this project. The Contractor must strictly comply with these requirements and all other pertinent requirements of the Contract Documents.

A. Placement of concrete shall not commence until required mix designs have been reviewed and approved by the County.

B. As deemed necessary by the County, sets of three (3) test cylinders of concrete being placed will be cast and tested by the County or the QA/QC consultant. One of the test cylinders will be tested after 7 days for 70 percent of project-specified design strength. The remaining two cylinders will be tested after 14 days and 28 days (for full strength) respectively.

END OF SECTION

SECTION 10 - PROTECTIVE MEMBRANE

10.1. MANUFACTURING

The Contractor shall provide the County and the QA/QC Manager with the following manufacturer's literature from the membrane manufacturer:

A. A materials specification sheet including all specified properties measured using test methods indicated in the specifications, or the equivalent

B. The sampling procedure and results of testing

C. A certification that property values given in the materials specification sheet are guaranteed by the Geosynthetic's manufacturer

The QA/QC Manager shall verify in writing that:

A. The property values certified by the manufacturer meet all of the project specifications

B. The measurements of properties by the manufacturer are properly documented and the test methods used are acceptable

Prior to shipment, the Contractor shall provide the County and the QA/QC Manager with a quality control certificate from the manufacturer for the protective membrane. A responsible person employed by the membrane manufacturer shall sign the quality control certificate.

10.2. CONFORMANCE TESTING

No conformance testing on protective membrane shall be required unless determined by the QA/QC Manager based on the review of the manufacturer's data. If conformance tests for some test properties are found necessary, the geosynthetics subcontractor shall arrange for cutting the conformance test samples in the presence of a QA/QC Monitor.

10.3. PROTECTIVE MEMBRANE INSTALLATION

The QA/QC Monitors shall record the location, and date of installation of protective membrane panels.

During protective membrane placement, the QA/QC Monitor shall verify that:

A. Field panels are installed at the location indicated in the layout plan, as approved or modified by the County

B. The geotextile underneath has not deteriorated since previous acceptance

C. All testing and repairs of the underlying geotextile have been completed and the QA/QC Consultant has accepted the geotextile installation

D. The final seams are properly sewn and the specified minimum overlap between the seamed panels is maintained.

E. The membrane is properly secured and anchored in the anchor trench at the top and by plywood and sand bags at the toe.

F. The sand bags and ropes for ballasting are properly installed as shown on the installation plan approved by the County and QA/QC Consultant.

G. All repairs as directed in the field are completed in the presence of a QA/QC Monitor.

END OF SECTION

Attachment E

Sample Consultant Agreement

EXHIBIT A to Consultant Agreement

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CONSULTANT AGREEMENT

The COUNTY OF RIVERSIDE on behalf of the Riverside County Waste Management Department ("COUNTY") and XXXXXXXXXX, Inc. ("CONSULTANT") agree as follows:

1. **PROJECT:**

The CONSULTANT shall perform services to provide COUNTY with geotechnical and geological services for Phase 2, Stage (P2S4) Expansion Project at Lamb Canyon Sanitary Landfill in accordance with COUNTY's Request for Proposal dated Month XX, 2010 (attached as Exhibit A) and CONSULTANT's proposal dated Month XX, 20010 (attached as Exhibit B). All of these exhibits are attached to and incorporated into this Agreement.

2. **SCOPE OF SERVICES:**

The CONSULTANT shall furnish all tools, equipment, facilities, materials, and labor necessary to perform in a complete, skillful, and professional manner all those services described in Exhibit A and Exhibit B.

3. **TIME OF PERFORMANCE:**

The CONSULTANT shall commence performance of service following execution of this Agreement as mutually agreed upon by the parties; and shall diligently perform the services to full completion.

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4. COMPENSATION

The total amount of compensation paid to the CONSULTANT for all services under this Agreement (including expenses) shall be in the amount of $X,XXX. unless a written amendment is executed by both parties prior to performance of additional services. CONSULTANT agrees that in case of amendments to this agreement extending or modifying services, the costs described in Exhibit B shall remain unchanged for a period of one year from the date of this agreement. This total amount for the required services is broken down as follows:

a. Service A – Task 1.1 and Service B – Task 1.1:

Sub-total = $XXXXX

The compensation for performing Service A – Task 1.1 and Service B – Task 1.1 (As described in Exhibit A) shall be payable based upon unit cost per working day. Services shall be tracked on a daily basis and compensated in half-day increments, with a minimum of 0.5 workday (1 to 4 hours of service) and a maximum of 1 workday (5 to 8 hours of services. CONSULTANT agrees that in case of amendments to this agreement extending contract services, beyond the initial project duration, the unit cost per working day rates shall remain unchanged.

b. Service A – Task 2: Sub-total = $XXXX

The compensation for performing Service A – Task 2 shall be based on the unit cost per test as shown on Attachment A of Exhibit B.

c. Service A – Task 3: Sub-total = $XXXXX

The compensation for performing Service A – Task 3 shall be based on boring per foot of depth as shown on Attachment A of Exhibit B.

d. Service A – Task 4, Service A – Task 1.2, Service A – Task 5, and Service B – Task 2:

Sub-total = $XXXXX

The compensation for performing Service A – Task 4, Service A – Task 1.2, Service A – Task 5, and Service B – Task 2 shall be on a lump sum basis as shown on Attachments A and B of Exhibit B.

5. **PAYMENT:**

For purposes of payment to CONSULTANT, on or about the last day of each month, COUNTY shall determine the corresponding cost of the services provided for each of the aforementioned items as follows:

- **Payment for Service A – Task 1.1 and Service B – Task 1.1** shall be determined by multiplying the number of half-working days during that month by the respective unit cost per working day.
- **Payment for Service A – Task 2** shall be determined by multiplying the number of laboratory tests performed during that month by the unit cost for that test as shown on Attachment A.
- **Payment for Service A – Task 3** shall be determined by multiplying the linear feet of borings performed during that month by the unit cost per foot of boring depth as shown on Attachments A of Exhibit B
- **Payment for Service A – Task 4, Service A – Task 1.2, Service A – Task 5, and Service B – Task 2** shall be made upon completion of the task in the amount on Attachments A, and B of Exhibit B.

No payment shall be required to be made when, in the judgment of the COUNTY, CONSULTANT is not proceeding properly. Payment shall be made by COUNTY within 30 days thereafter.

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6. **LICENSES:**

CONSULTANT, its employees, agents, contractors, and subcontractors shall maintain professional licenses required by the laws of the State of California at all times while performing services under this Agreement.

7. **GENERAL PREVAILING WAGE:**

The CONSULTANT shall comply with all applicable requirements of the California Labor Code. Reference is made to Division 2, Part 7, Chapter 1, Article 2 of the California Labor Code (commencing with Section 1770). By this reference said Chapter 1 is incorporated herein with like effect as if it were here set forth in full. The parties recognize that said Chapter 1 deals with, among other things, discrimination, penalties and forfeitures, their disposition and enforcement, wages, working hours and securing workers' compensation insurance and directly affect the method of prosecution of the work by CONSULTANT and subject it under certain conditions to penalties and forfeitures. Execution of this Agreement by the parties constitutes the CONSULTANT's agreement to abide by said Chapter 1. CONSULTANT certifies that he is aware of the provisions of said Chapter 1 and will comply with them and further constitutes CONSULTANT's certification as follows: "I am aware of the provisions of Section 3700 of the California Labor Code which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this contract."

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General prevailing rate of per diem wages and general prevailing rate of per diem wages for holiday and overtime work, including employer payments for health and welfare, pension, vacation, apprentices and similar purposes for each craft, classification or type of workman needed for execution of contracts under the jurisdiction of the COUNTY have been obtained by the COUNTY from the Director of Industrial Relations of the State of California for the area where the work is to be done. These are on file at the COUNTY's office, and will be made available to CONSULTANT upon request.

8. PERMITS AND RIGHTS-OF-ENTRY:

COUNTY will provide any and all necessary permits and rights-of-entry, as required, to perform the proposed services. CONSULTANT will prosecute the work in a manner to minimize inconvenience and any possible hazard to any COUNTY operation. CONSULTANT shall be responsible for the protection of public and private property adjacent to the work and shall exercise due caution to avoid damage to such property.

9. INSURANCE:

CONSULTANT shall maintain in force at all times during the performance of this Agreement insurance policies which have the following minimum coverages: General liability insurance in the amount of not less than $1,000,000 per occurrence, $2,000,000 aggregate; professional liability insurance in the amount of $2,000,000; workers' compensation insurance in accordance with California law; and if motor vehicles are used, not less than $1,000,000 combined single limit motor vehicle insurance for damage to property and injury to persons. These policies shall name "County of Riverside and the Riverside County Waste Resources Management District and their elected or appointed officials, employees, and agents" as additional insureds. Certificates of insurance satisfactory to COUNTY evidencing the maintenance of such insurance coverage

shall be required prior to the start of services under this Agreement. COUNTY shall be given notice, in writing, at least thirty (30) days in advance of cancellation, modification or reduction in coverage. All insurance shall be with companies admitted to issue such coverage in the State of California.

10. CONSULTANT'S LIABILITY:

CONSULTANT shall defend, save, indemnify and hold COUNTY OF RIVERSIDE and RIVERSIDE COUNTY WASTE RESOURCES MANAGEMENT DISTRICT, its officers, employees, and agents free and harmless from any liability, damage, claim, or action whatsoever (including but not limited to wrongful death) based upon any act or omission of CONSULTANT, its employees, contractors or agents arising out of, relating to or in any way connected with the accomplishment of the work or performance of services under this Agreement, except for an act or omission that is due to the sole active negligence of the COUNTY, its officers, employees or agents. As part of the foregoing indemnity, CONSULTANT agrees to protect and defend at its own expense (including attorney fees) COUNTY, its officers, agents, and employees in any legal action based upon any such act or omission.

11. WORK PRODUCT:

All drawings, logs, and reports prepared by CONSULTANT shall be and remain the sole property of COUNTY.

12. TERMINATION:

This Agreement may be terminated by either CONSULTANT or COUNTY upon written notice to the other party in the event of substantial failure of performance by the other party, or in the

event the COUNTY shall elect to abandon or indefinitely postpone the project. In the event the COUNTY abandons or indefinitely postpones the project and gives notice of termination, the COUNTY shall make payment for all services performed to the date of written notice in a total amount which bears the same ratio to the total maximum fee otherwise payable under this Agreement as the services actually performed bear to the total services necessary for performance of this Agreement.

13. INDEPENDENT CONTRACTOR:

CONSULTANT and its employees and agents shall act at all times in an independent capacity with regard to performance of services or work rendered pursuant to this Agreement; and CONSULTANT and its employees and agents shall not act as, shall not be, and shall not in any manner be considered to be agents, officers, or employees of COUNTY. There shall be no employer-employee relationship between COUNTY and CONSULTANT; and CONSULTANT and its employees and agents shall not be entitled to any benefits payable to COUNTY employees. CONSULTANT is responsible for payment and deduction of all employment-related taxes on CONSULTANT's behalf and for CONSULTANT's employees, including but not limited to all federal and state income taxes and withholdings. COUNTY shall not be required to make any deductions from compensation payable to CONSULTANT for these purposes. CONSULTANT shall indemnify COUNTY for any and all federal or state withholding or retirement payments which COUNTY may be required to make pursuant to federal or state law. The sole interest and responsibility of COUNTY is to assure that the services covered by this Agreement shall be performed and rendered in a competent and efficient manner.

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14. GOVERNING LAW; JURISDICTION:

This Agreement shall be governed by the laws of the State of California. Any legal action related to the performance or interpretation of this Agreement shall be filed only in the Superior Court for the State of California located in Riverside, California.

15. ASSIGNMENT:

Neither this Agreement nor any part thereof shall be assigned by CONSULTANT without the prior written consent of COUNTY.

16. NON-DISCRIMINATION:

CONSULTANT shall not discriminate in its recruiting, hiring, promotion, demotion or termination practices on the basis of race, religious creed, color, national origin, ancestry, physical handicap, medical condition, marital status or sex in the performance of this contract, and, to the extent they shall be found to be applicable hereto, shall comply with the provisions of the California Fair Employment Practices Act (commencing with Section 1410 of the Labor Code), and the Federal Civil Rights Act of 1964 (P.L. 88-352).

XXXXXXX, Inc.

By _____ Dated: _____

Name and Title: _____

COUNTY OF RIVERSIDE