



# Memorandum

## MONTEREY REGIONAL WASTE MANAGEMENT DISTRICT

Reviewed by: *[Signature]* Date: 6/16/17  
General Manager

DATE: June 16, 2017  
TO: General Manager  
FROM: Director of Engineering & Compliance/District Engineer  
SUBJECT: Contract with Golder Associates, Inc., for Modules 1 & 2 Final Cover – North Slopes Remediation Design Services

**RECOMMENDATION:** That the Board approve a Contract with Golder Associates, Inc., for Modules 1 & 2 Final Cover – North Slopes Remediation Design Services at a Cost of \$59,728.

### BACKGROUND

Annually, between 2006 and 2009, a Final Cover Liner system was constructed on the north facing slopes of Modules 1 and 2. The Final Cover Liner system that was constructed is known as the prescriptive liner in the pre-Subtitle D regulations associated with Modules 1 and 2. This prescriptive final cover liner system consists of the following from “top” to “bottom; a minimum 1-foot thick Vegetative Soil Cover Layer underlain by a minimum 1-foot thick Barrier Layer (compacted low-permeability soil) which is in turn is underlain by a minimum 2-foot thick Foundation Soil Layer.

Since 2010, there have been one or more areas on the north slopes of Modules 1 and 2 where the upper 1-foot thick (minimum) Vegetative Soil Layer has slide downhill. The ‘slip plane’ is located between the Vegetative Soil Layer and the Barrier Layer; and it develops under wet soil conditions typically present during the winter rainy season. The primary causes of the instability, among several other factors, are the surface and subsurface drainage characteristics of the Vegetative Soil Layer materials. The Vegetative Soils are allowing rainfall to infiltrate the surface soil layer and to come in contact with the underlying Barrier Layer (as opposed to allowing downslope drainage) which in turn causes the surface of the clayey soils to become saturated, soften, and loose strength. The instability has affected a number of remote wellheads of the Gas Collection and Control System (GCCS) and has the potential to affect other remote wellheads on the north slope if corrective measures are not implemented. Several of the gas wells have been reconnected by installing an interim header across the upper bench of the north slope.

### DISCUSSION

Staff has retained Golder Associates, Inc. to investigate the field conditions, perform stability analyses, and develop preliminary recommendations for design of remedial measures to mitigate the conditions associated with the slope instability. Board approval of the Golder Associates, Inc. proposal will be required to develop the final design recommendations and construction documents.

State Grant Funds associated with the Disaster Declarations of January and February 2017 may be available and applicable to the mitigation measures required to address the near-surface instability that has been experienced on the north slopes of Modules 1 and 2.

**FINANCIAL IMPACT**

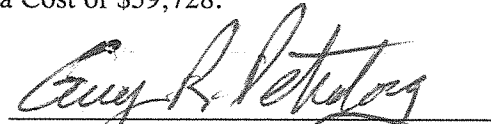
Funds from Cash Reserves will be used for the design services. The cost of the services may be reimbursed should the District be successful in obtaining Grant Funds for both the design and construction of mitigation measures that are deemed to have a long-term maintenance prevention effect.

**STRATEGIC PLAN**

The District's involvement in this matter fits under several general policy directives cited in the District's "Pillars of Sustainability" plan. Principally under the Community and Environment pillars which speak to the protection of Public Health and the Environment and coincide with the purpose of a Final Cover Liner System.

**CONCLUSION**

Staff therefore recommends the Board approve the consulting Contract with Golder Associates, Inc., for Modules 1 & 2 Final Cover North Slopes Remediation Design Services at a Cost of \$59,728.

  
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Guy R. Petrabor, P.E., G.E.

Attachments



May 4, 2017

Project No. P1779295

Guy Petraborg  
Monterey Regional Waste Management District  
14201 Del Monte Boulevard  
Marina, California 93933

**RE: PROPOSAL FOR SLOPE REMEDIATION DESIGN, MODULES 1 AND 2 SLIVER FILL AREA,  
MONTEREY PENINSULA LANDFILL, MONTEREY COUNTY, CALIFORNIA**

Dear Mr. Petraborg:

Golder Associates Inc. (Golder) is submitting this proposal to design remediation measures for the Modules 1 and 2 Sliver Fill Area at the Monterey Peninsula Landfill located in Monterey County California. Our understanding of the project is based on our site meeting on April 21, 2017 and our review of several technical reports for the Sliver Fill project. We have outlined our scope-of-work, schedule and budget for your review and approval.

## PROJECT BACKGROUND

Between 2006 and 2009, the Monterey Regional Waste Management District (MRWMD) steepened the northern exterior landfill slopes of Modules 1 and 2 by constructing a sliver fill of refuse that was subsequently capped with a prescriptive soil final cover. The slopes were steepened from a pre-existing 4H:1V to 5H:1V grade to approximately 3H:1V.

The sliver fill was designed by Vector Engineering (Sliver Fill Design Report, December 2004). Golder understands the Sliver Fill Area was constructed in four phases with each phase constructed as follows:

- The existing final cover materials were removed.
- As designed by Vector, a seepage collection system was to be installed to collect leachate from under the cover along the lower slope segment and convey it to the outer slope. We note that Vector's 2006 and 2007 Construction Quality Assurance (CQA) reports for this portion of the Sliver Fill Area do not provide any discussion about this leachate collection system or include relevant leachate collection system as-built drawings.
- The foundation layer, low-permeability soil cover and vegetative soil layers were constructed over the Modules 1 and 2 refuse with a relatively uniform slope without benches. Subsequent to the completion of the various closure phases, two slope benches were constructed on top of the cover using engineered fill to collect and control surface water drainage.

We understand that in some cases, wood chips were used as a vegetative cover material in place of soil due to an absence of suitable soil resources. In particular, MRWMD staff indicated that the upper portion of the slopes near the boundary of Modules 1 and 2 primarily consisted of wood chips.

In addition, the final cover areas include surface water drains, landfill gas (LFG) wells and buried LFG collection pipes and headers within or below the final cover.

Subsequent to the completion of the Sliver Fill closure, the final cover has been subjected to repeated shallow slope failures during the wet season. We understand that the slope failures are contained in the vegetative cover and/or bench fill above the low-permeability soil layer. In addition, these failures are

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**Golder Associates Inc.**

425 Lakeside Drive

Sunnyvale, CA 94085 USA

Tel: (408) 220-9223 Fax: (408) 220-9224 [www.golder.com](http://www.golder.com)

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generally located along the lowermost slope segment. The 2016-2017 winter season was unusually wet, and accordingly, the shallow slope failures have been considerably more extensive than observed in past wet seasons. Golder also understands that during the 2016-2017 wet season, the slope failures progressed over a period many weeks to months as opposed to one sudden failure episode.

The cause of the repeated slope failures is believed to be a combination of the following:

- Inadequate surface water control leading to water directed over slopes. We understand that MRWMD observed some ponding at drain inlets and subsequent water flow over the slopes. This can lead to excessive saturation of the vegetative cover leading to failure.
- Excessive subsurface seepage along the vegetative cover. The low-permeability layer is impeding vertical percolation and likely contributing to excessive hydraulic pressures in the vegetative cover layer. In areas where wood chips were used, water infiltration may be conveyed rapidly to the lower slopes and exacerbating the adverse infiltration conditions.

Based on our site meeting on April 21, 2017, Golder and MRWMD envision that appropriate remedial measures will consist of a combination of surface water and subsurface seepage control improvements.

## SCOPE-OF-WORK

The overall goal of this project is design remediation measures to prevent future slope failures. We understand that MRWMD desires to implement the remediation measures in phases spanning multiple years provided the regulatory agencies are in agreement. Ideally, the first phase would be constructed this summer.

Based on the discussion above, Golder has prepared the following scope of work, which will include the following tasks.

### *Task 1 – Information Review/Existing Infrastructure Compilation*

Golder envisions that the remedial design will require some redevelopment of the drainage infrastructure over the Sliver Fill Area. This will require identifying the location and types of existing drainage facilities as well as other types of infrastructure, such as the landfill gas collection system.

Golder will compile available information on the locations of the drainage, landfill gas, and leachate infrastructure on the north slope of Modules 1 and 2. We will then complete a field reconnaissance to visually confirm these features. During the field reconnaissance, Golder will also examine the benches for signs of ponding, clogged inlets, or other adverse drainage conditions.

In addition to the field reconnaissance, Golder proposes to log shallow test pits completed on the slope benches. The objective of the test pits is to confirm the depth of engineered fill over the low-permeability soil layer for the purposes of designing an infiltration interception trench. We envision the test pits will be located on the inside edge of the bench and carefully excavated to expose the top of the low-permeability soil layer. The test pits would not be excavated into the low-permeability soil layer. Golder would also obtain samples of the vegetative soil cover/soil bench materials for further classification purposes.

We have assumed that MRWMD would provide a backhoe and operator for the test pits.

### *Task 2 – Conceptual Design*

Golder will prepare a conceptual design for MRWMD's review. The conceptual design will be described in a brief letter report with a site plan showing the location of key improvements and associated cross-sections and details to help convey the proposed remediation concepts. Golder will also prepare a preliminary range of costs associated with the remedial concepts.

As part of the conceptual design, Golder will complete surface water calculations to verify that the proposed revised drainage facilities have sufficient capacity to accommodate the 100-year, 24-hour design storm event.

Golder is not proposing to complete any slope stability analyses based on the assumption that adequate slope stability will be maintained if drainage in the upper vegetative cover soil bench is fill is adequately controlled.

Golder will submit an electronic copy of our draft report in PDF format. We will incorporate MRWMD's comments and submit a final electronic copy of our final report.

### **Task 3 – Construction Documents**

Following the completion of Task 2, Golder will work with MRWMD to define the construction phases including the location, sequence, extent, and approximate cost for each phase. Our construction documents will consist of the following:

- Construction drawings
  - Title Sheet
  - Existing Conditions and Facilities
  - Proposed Phasing and Improvements Plan
  - Sections and Details
- Construction Specifications in CSI format
- Bid Quantities and Engineer's Cost for each phase (assume a maximum of 3 phases)

We have assumed that MRWMD will compile a bid package for bidding. We have not included bidding support or construction quality assurance services as part of the current scope of work.

Our draft construction documents will be submitted in an electronic PDF format. After receiving MRWMD's comments, we will finalize our construction documents and submit one electronic copy and three hard copies.

### **ESTIMATED COST**

The estimated cost is summarized in attached cost tables. Golder proposes to provide the services described above on a time-and-expense basis in accordance with our current rate schedule, which is also attached.

### **OUR WORK WILL BE COMPLETED IN ACCORDANCE WITH THE CONTRACT TERMS BETWEEN GOLDER AND MRWMD DATED DECEMBER 8, 2015 (ATTACHED).SCHEDULE**

We are prepared to begin work after receiving a signed agreement and authorization to proceed. Our proposed schedule is as follows:

- Task 1 – Complete within 4 weeks of initiating work.
- Task 2 – Draft conceptual design within 3 weeks of completing Task 1
- Task 2 – Final conceptual design within 2 weeks of receiving MRWMD's comments
- Task 3 – Draft construction documents – within 3 weeks of completing Task 2
- Task 3 - Final construction documents – within 2 weeks of receiving MRWMD's comments

If this proposal is acceptable, please provide your written authorization to proceed in the space provided on Page 12 of the enclosed agreement and return the signed document to me via electronic mail or facsimile.

Please contact the undersigned if you have any questions or need additional information.

Sincerely,

**GOLDER ASSOCIATES INC.**



Ken Haskell, PE  
Principal/Senior Practice Leader

Enclosures: Cost Tables and Rate Schedule  
Agreement for Engineering Services