MEMO

Discussion/Action
Item #: 7.f

Meeting Date: July 19, 2024

To: Board of Directors
From: Director of Engineering and Compliance, Guy Petraborg
Approved by: General Manager, Felipe Melchor

Subject: Receive Module 7 Phase 3 – Project Update and Cost Report

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RECOMMENDATION: That the Board receive the Module 7 Phase 3 Project Update and Cost Report.

BACKGROUND
On March 24, 2023, ReGen's Board of Directors authorized the General Manager to execute a public works construction contract for the Module 7 Phase 3 – Excavation and Liner Project with Graniterock Construction of Watsonville, CA, in the amount of $7,991,500. An update was provided to the Board in October 2023, detailing various project challenges and delays.

DISCUSSION
Since the October 2023 update, the Module 7 project team has worked through significant challenges both with the project design documents and site conditions encountered during construction. These challenges have led to successive delays and some net cost increases while also resulting in a high quality lining project that exceeds minimum regulatory standards for the protection of human health and the environment. Key project developments include:

1. Project Restart: Construction resumed in April 2024 after the winter wet weather work suspension noted in the October 2023 Board Memo. Before the winter work suspension, a permanent groundwater intercept sub-drain system (on the perimeter of two sides) had been completed and a protective rain cover was placed over the construction site to protect the surface conditions from rain and potential stormwater runoff erosion.
2. Ongoing Design Challenges: Further design inadequacies in the construction documents were experienced since the project restarted. These inadequacies changed the contractor's equipment and sequence plan; and also the project delivery model to be a "design build"-like model where construction issues, design needs, modifications, and related details are worked out between the Contractor, Engineer of Record and the Owner in the field, at the moment to assure appropriate work is defined, construction progress continues, and to deliver a quality constructed product:
    a. As mentioned in the October 2023 memo, the project documents did not adequately represent the existing grades and excavation quantities at the worksite following completion of the Phase 2 excavation work. This significantly impacted the contractor's workplan, equipment needs, and changed the character

of the work. This change in work character delayed the project restart and increased construction expenses.

b. The groundwater subdrain collection system required re-design and expansion to improve capture of perimeter and subsurface groundwater. Module 7 is the first lined module area that has groundwater seepage from two directions. In past lined modules, there was open space present adjacent to the lined module area that allowed ReGen to intercept one of the seepage directions 'upgradient' and prevent it from flowing into the module area. However, Module 7 has a permanent lined slope on that "second" seepage direction. The singular, perimeter groundwater piping subdrain on the two sides of Module 7 did not intercept all of the groundwater in eastern portions of the module area. Fortunately, this was observed in the field by the project team and required redress to achieve long-term functionality. This has not been required for prior modules as the second seepage was controlled separately outside of the lined area previously. The Module 7 subdrain upgrades have resulted in a significant enhancement that will serve the landfill operations that will be necessary for the next 150 to 175 years. The improvements also required a significant increase in pipe installation in May 2024. This included several additional linear collection piping elements under the landfill cell. This piping ensured separation of groundwater from waste (a regulatory requirement) and provides greater protection commensurate with the long-term use of the module.

c. In July 2024, it was identified that LCRS piping quantification was not included in the design documents, causing additional delays and costs associated with supply and installation of the piping. The addition of LCRS piping to the project increases the long-term resilience of the leachate collection network ensuring that it can reliably perform for the life of the landfill.

3. Cost Implications: The financial impacts have increased significantly beyond the interim change order amount reported in October 2023. The current approved contract change orders total $3.7 million. While much of this work was needed to deliver a quality product, it is estimated that approximately $2.5 million dollars +/- $0.3 million dollars is related to inadequate, incorrect or missing construction elements that needed to be delivered under the "design build" model. These elements were not included or not sufficiently described in the original bid package.
4. Current status: The final liner system being delivered is of high quality. The Contractor currently has the majority of the landfill double liner materials in place and is performing the "tie in" to the adjacent Module 6 liner system. The expectation is that the leachate collection pipes will begin installation the week of July 16th. Once the piping is in place, the leachate collection sand and operations layer will be installed.
5. Timeline Extension: The project completion, originally slated for Summer 2024 in our last update, is now projected for late Fall of 2024.

SCHEDULE AND FINANCIAL IMPACTS
The cumulative effect of the challenges faced has resulted in significant schedule and financial impacts:

Original contract price:	$ 7,991,500.00
Current approved contract price:	$11,367,545.36

This represents an increase of about 42% over the project initial contract award amount. These increases stem from necessary changes, work that was present and unavoidable, and additional work related to design errors/omissions and unforeseen site conditions.

To date ReGen has paid $6,325,283 in invoices to Graniterock Construction. There is approximately $6.8 million dollars of remaining costs (including, but not limited to, Graniterock Construction costs) planned to complete the Module 7 construction. These costs are presented in a separate memo for the subsequent Board Agenda item. Please note that the 2024/2025 fiscal year budget includes these forecasted costs and has allocated $7.5 million for the Module 7 project in this fiscal year.

LANDFILL DISPOSAL OPERATIONS IMPACTS
As noted in the October 2023 update, the delays do not significantly impact current landfilling operations that are occurring primarily in Modules 1 to 5 top deck area. With Module 6, sufficient 'airspace' exists in the current lined areas so that waste filling operations can continue albeit in areas that do not include Module 7. There will be a need to revise the progression of the fill sequence plan and temporary access routes as a result of the delay in use of Module 7.

CONCLUSION
The Module 7 Phase 3 – Excavation and Liner Project has faced significant challenges, some unique to Module 7 for the first time in the landfill's history. These issues have been properly addressed and have also resulted in substantial delays and increased costs. As a result, ReGen is receiving a high quality liner project that ensures long-term performance for environmental protection. The project team remains committed to completing the project as efficiently as possible given the unique circumstances encountered in the Module 7 excavation process. The enhanced base liner system is presently being installed. The project team will provide an update after the base liner system has been installed; and then again at the completion of construction which is expected before December 2024.

ATTACHMENTS:

1. March 2023 Board Staff Report - Module 7 Phase 3 project
2. October 2023 Board Staff Report - Module 7 Phase 3 project

MEMO

Discussion / Action
Item #: 9

Meeting Date: March 24, 2023

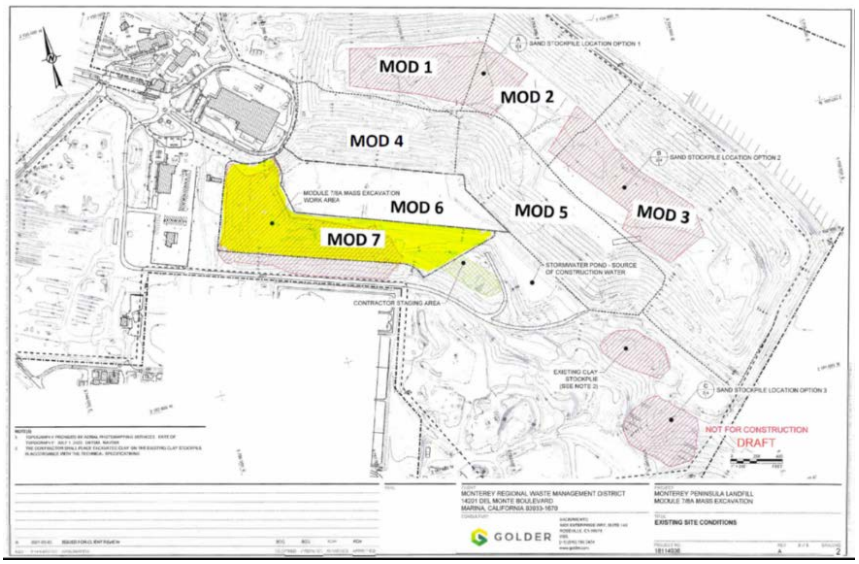
To: Board of Directors
From: Senior Engineer, David Ramirez
Approved by: General Manager, Felipe Melchor

Subject: Award Module 7 Phase 3 – Excavation and Liner Construction Contract to Graniterock Construction of Watsonville, CA in the amount of $7,991,500 (includes 5% contingency)

RECCOMENDATION: That the Board authorize the General Manager to execute a public works construction contract for the Module 7 Phase 3 – Excavation and Liner Project with the qualified low bidder, Graniterock Construction of Watsonville, CA, in the amount of $ 7,991,500 (includes 5% contingency).

BACKGROUND

ReGen Monterey's existing landfill infrastructure is composed of six landfill modules that have been developed over the facility's history since 1965. The Landfill Module 7 is next in line for development of the waste containment system (aka base liner) for that area. With the Board of Director's prior approval, staff has been implementing a phased project to prepare the construction area for lining the Module 7 landfill module (see figure).



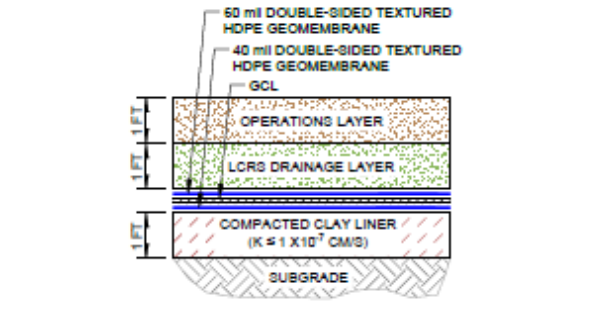
Site development began over 10 years ago when ReGen partnered with the Don Chapin Company to mine quality sand from the existing bluff area in preparation for future landfill development. Through this partnership approximately 80% of the sand was excavated and the District received royalty payments for each ton of processed sand that was sold.

The next stage in site development was the Module 7 Mass Excavation Phase 1 in 2021 where about 320,000 cubic yards of soil was excavated from the Module 7 footprint area. The grading work was completed to an interim elevation that remained above the groundwater table and ensured storm water drainage to appropriate locations.

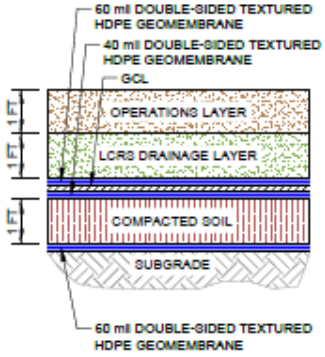
In June of 2022 the Board of Directors authorized staff to contract with David Crye General Engineering Contractors to complete the Module 7 Mass Excavation Phase 2 Project. The scope of Phase 2 was to excavate another 100,000 CY of soil and get the Module 7 footprint area close to final sub-grade elevations planned for liner installation.

The prescriptive CCR Title 27 single composite liner system for Class III landfills like Monterey Peninsula Landfill consists of, from bottom to top, a 2-foot thick low-permeability compacted clay layer, overlain by a 60-mil thick high density polyethylene (HDPE) geomembrane. The prescriptive composite liner system has been used for the base liner systems of Modules 3, 4, 5, and 6. It is a historically common lining system in the industry and requires a relatively uniform source of low-permeability soils (clay) and relatively large quantities of clay (~3,300 cubic yards per acre of liner). In the past, ReGen acquired clay from an off-site source and, to a lesser extent, from onsite excavations for some of the prior lined modules. For the Module 7 area, as the Phase 2 excavation progressed, it became clear that the quantity of clay material being excavated and stockpiled onsite would be insufficient for the Module 7 liner construction. As a result, staff proposed two different Engineered Alternative Designs (EAD) to the California Central Coast Regional Water Quality Control Board. The EADs were developed by the Module 7 Engineer of Record, WSP (Golder Associates). These EADs are regulatorily required to meet or exceed the performance standards set by the prescriptive single composite liner system. CCR Title 27 regulations allow alternate designs to be proposed by the landfill owner/operator in circumstances when it would be unduly expensive or impossible to construct the prescriptive single composite liner system. These are the circumstances present for the Module 7 project and the reason for these two alternative liner systems in the design.

The EAD-A liner system consists of, from bottom to top, a one foot of compacted low-permeability clay layer overlayed by a geosynthetic clay liner (GCL) that is “sandwiched” between two geomembrane layers. The EAD-B liner system requires no low-permeability clay layer and consists of, from bottom to top, a geomembrane layer, a compacted soil layer that is overlain by a GCL that is “sandwiched” between two geomembrane layers. (see figures below)



SCALE N.T.S. 1/37 EAD-A TYPICAL FLOOR LINER SYSTEM



SCALE N.T.S. 1/38 EAD-B TYPICAL FLOOR LINER SYSTEM

DISCUSSION

The EAD-A and EAD-B liner systems were proposed as design solutions due to the lack sufficient onsite clay for the CCR Title 27 prescriptive liner. However, the EAD-A liner system also required one foot of clay to be constructed. Without having an onsite source of clay material, and an offsite source of clay costing more than $2.3 million dollars more, the best option to pursue for Module 7 construction is the EAD-B liner system as a low-permeability clay source is not required for construction. Therefore, staff is recommending that the contract be awarded for design concept EAD-B.

Public bids were solicited by posting the bid documents at the local building exchange and digital plan rooms. A public bid opening occurred at 3pm (Pacific) on February 27, 2023. ReGen received the following three qualified bids from contractors with the necessary experience required by the project specifications to complete the Module 7 work.

BIDDER	EAD-A Bid		EAD-B Bid
Graniterock Construction	$7,072,203.80		$7,610,943.80
Sukut Construction	$8,838,951.60		$9,445,086.60
Wood Brothers, Inc.	$9,753,328.80		$10,215,277.80

Module 7 is expected to provide 3-4 years of landfill filling capacity at current disposal rates before the next planned module construction.

FINANCIAL IMPACT

The first two phases of Module 7 construction were for mass excavation of the liner area. This third phase of the project will consist of final excavation, fine grading, new EAD-B liner system installation, and installation of both leachate and groundwater removal and storage systems. The $6.5 million dollars fiscal year budget ($0.2 million in next fiscal year) was created before the quantity of available clay from Phase 2 Mass Excavation was known. As discussed above, ReGen does not have sufficient clay onsite to build either the prescriptive CCR Title 27 liner or EAD-A liner system. Therefore, the construction of the Module 7 liner will be more expensive than previously projected due to the new EAD-B liner system that became necessary after it was confirmed that there was not sufficient clay soils present onsite. For reference, the engineer's January 2023 estimate for the EAD-B alternative (no clay) was $9.9 million dollars.

Earlier this fiscal year $787,435 was spent on the Phase 2 Mass Excavation work, leaving about $5.7 million remaining in this fiscal year's budget. Graniterock's bid with a 5% contingency is about $7,991,500. The remaining expenses for the project include Electrical and Mechanical infrastructure as well and CQA and CQC reporting. These are estimated to cost approximately $1.2 million, taking the total projected project funding needs to approximately $9,979,000 ($787,435 + $7,991,500 + $1,200,000) over the FY22/23 and FY23/24 time period. While the remaining $5.7 million budget is likely sufficient for the fiscal year timing of expenses, there will be a need for at least a $4 million increase to the planned FY23/24 budget for the Module 7 project(or larger if the timing and/or magnitude of expenses in the current year is less than the remaining $5.7 million budget).

CONCLUSION

Due to the necessity to increase the disposal capacity (aka “airspace”) to continue to offer disposal services for our Member Agencies and customers, staff recommends that the Board of Directors authorize the award of a contract for the construction of the Module 7 Phase 3 – Excavation and Liner with the new EAD-B liner system to the lowest qualified bidder, Graniterock Construction Inc. of Watsonville, CA, for $ 7,991,500. Funds in the amount of about $5.7 million remaining in the FY 2022/23 Budget and $4.2 million estimated for the FY23/24 Budget will be required for the Module 7 project.

MEMO

Consent
Item #: 6

Meeting Date: October 20, 2023

To: Board of Directors
From: Senior Engineer, David Ramirez
Approved by: General Manager, Felipe Melchor

Subject: Receive Module 7 Phase 3 – Project Update

RECCOMENDATION: That the Board receive the Module 7 Phase 3 Project Update.

BACKGROUND

On March 24, 2023 ReGen's Board of Directors authorized the General Manager to execute a public works construction contract for the Module 7 Phase 3 – Excavation and Liner Project with Graniterock Construction of Watsonville, CA, in the amount of $7,991,500.

DISCUSSION

The Module 7 project team is currently addressing various aspects of the Module 7 Phase 3 – Excavation and Liner Project that have slowed the rate of construction progress. Several noteworthy developments have occurred, including most of the engineered fill completion, constructability challenges, and winterization (wet weather) preparation efforts.

1. **Project Progress:** Graniterock Construction has performed the clearing and grubbing required for the liner work and improved their methods of intercepting the groundwater seepage (e.g., dewatering) to allow drying of the saturated subgrade soils in the Module footprint. In addition, Graniterock Construction has completed about 80% of the engineered fill for the project. Onsite soil material that was stockpiled near the southeast corner of the property, as part of the mass grading work done during Phases 1 and 2 of the Module 7 project, was used for the engineered fill construction that has been completed to-date.

   Graniterock is working on completing the permanent groundwater intercept sub-drain system (e.g., underdrain), which is an integral part of managing groundwater levels efficiently during and after the liner construction. This system will collect groundwater from the underdrain system and convey it out from under the liner system to a storm water retention pond located outside of the developed landfill area.

2. **Groundwater Seepage Challenges:** Groundwater seepage challenges were anticipated during construction due in part to having the Module 7 area excavation mostly completed prior to Phase 3 and from experience in Modules 4 and 5 construction. As slopes were

being prepared in the Module 7 footprint, surface soil material near the toe of slope was destabilized (e.g., moved) by groundwater seepage in many locations, thus disturbing 'finished grades' and unsuitable for receiving liner materials. This instability needed to be corrected before construction could continue. The design team engineered a solution that maintains the materials on the slopes by ballasting up the slopes with rock and geotextile fabric. With this engineered solution the slope has been stabilized, allowing work to progress, and continuity with control of groundwater seepage to the permanent underdrain system.

3. **Construction Document Challenges:** The project's construction documents did not illustrate the full extent of the module excavation that had been accomplished as part of the Phase 2 construction activities. Actual ground surface elevations were close to final subgrade elevations and some of the groundwater seepage conditions had been exposed (as opposed to having five (5) or more feet of soil to excavate as illustrated in the construction documents). This was defined early in the project during the contractor's 'layout' activities and contributed to a project delay as it affected the construction equipment and sequencing that the contractor had planned for the excavation and engineered fill construction. As a result, the contractor had to i) demobilize certain equipment to other projects and ii) mobilize a different set of equipment to the site at a later date. During the equipment changeout period the contractor worked with ReGen to assure that minimal costs were incurred as a result of the equipment change. The delay was a couple of months and has resulted in the liner installation to be re-scheduled to early next year and after the wet weather season.

4. **Winterization of Construction Area:** At this point in the project (e.g., mid-October), Graniterock is preparing the construction site for the winter wet weather season. Graniterock has been authorized to supply and install a reinforced plastic sheet cover material to be placed over the exposed subgrade surfaces of the lower (e.g., downgradient) half of the module area. The plastic sheet cover will be placed on both the slope and floor areas of the lower half of the module. The plastic cover will help protect (e.g., minimize) the subgrade surface from erosion and saturation, and to protect the permanent underdrain system from contamination by sediments carried by storm water runoff in the module area. This winterization process is deemed crucial to safeguard that portion of the construction site from potential weather-related disruptions.

   In addition, project construction materials that are stored onsite by the contractor have been protected and covered from the weather elements to ensure that they remain viable and ready for installation after the winter wet weather season has ended.

SCHEDULE AND FINANCIAL IMPACTS

Given the project construction impacts noted above, the project is slated for completion in Summer 2024. The financial impacts of these changes have not been quantified completely given the unknown impacts of groundwater seepage control challenges to the installation of the

of the permanent underdrain system that is currently occurring at this time. The details of the financial impacts will be provided with the January 2024 project update once more is known about the construction progress over the next four (4) to five (5) weeks. Currently, about $228,000 in change orders have been documented on the project with more to be negotiated with Graniterock Construction once the engineered fill, underdrain system installation, and final subgrade excavations are completed.

LANDFILLING IMPACTS

The construction delays and related change to the Module 7 Phase 3 landfill liner completion date does not impact the current landfilling operations plans significantly. Sufficient 'airspace' (e.g., waste disposal capacity) exists in the current lined areas of the landfill to ensure that waste filling operations can continue as planned for more than a year.

CONCLUSION

The Module 7 Phase 3 – Excavation and Liner Project continues to progress, albeit with some challenges related to groundwater seepage management, winterization, and related design refinements. These impacts appear to have been mitigated and the project team is now preparing the construction site for the winter season. The adjusted project completion timeframe is the Summer of 2024. The project team will provide ongoing updates as further progress is made and details are known.