

To: Pat Flood

From: Craig Almanza *CAA*

Date: October 6, 2017

Subject: Former EWS Landfill – Delay of Closure Construction Project

Due to a variety of circumstances, primarily the inability to obtain geomembrane for the project, TDEC will be forced to delay the Former EWS Landfill Closure to the spring of 2018. Below is an overview of the drivers that have caused the delay:

- The recent landfall of Hurricane Harvey has negatively impacted geosynthetic resin manufacturers in the Houston, Texas area. Plastic resin used to produce geosynthetic membrane cannot be brought to the resin plant, or sent out of the resin plant to the geosynthetic sheet manufacturers. This has caused substantial membrane procurement delays and shortages in the marketplace.
- The engineered cap for this facility uses 40-mil. Linear Low Density Polyethylene (LLDPE) as the geomembrane layer. According to geosynthetic sheet manufacturers, production and supply of this material has been severely impacted. Manufacturers estimate that this material will be unavailable until at least January or February of 2018.
- Plastic manufacturers and geosynthetic sheet manufacturers have sent out Force Majeure letters to all of their customers due to the impacts of Hurricane Harvey. These letters state that their ability to produce product is negatively impacted, and as such they cannot guarantee pricing, supply, or schedule.

The above mentioned items have had a negative impact on our planned APWC Closure project. This will cause a delay in our start time and push the project to the spring of 2018. This delay; however, can work to our benefit for the following reasons:

- During the period we are waiting to begin the project, we can add the scheduled 2018 Industrial Waste Cell (IWC) Closure project to the APWC closure construction package and create a single construction package for the entire facility closure. Adding the IWC to the existing package will not take much additional time or effort. An updated construction package can be sent back out to the contractors before the end of 2017 for re-bid as a single project in 2018.
- Because we will be combining two formerly separate construction events into one larger event, we will reduce cost by eliminating one entire mobilization fee for both the earthwork contractor and the geosynthetics contractor.
- Pricing received from the geosynthetic contractors in the 2017 APWC construction bid package was reflective of "Winter Rates" since the work was to take place in the colder months of the year. Winter rates are higher than spring, summer, and fall rates because of the difficulties in deploying and seaming plastic sheet in the winter. Moving the project to the spring of 2018 will result in a cost reduction and overall reduction in the scheduled duration of the project.

- Construction Quality Assurance (CQA) costs would be reduced as well since both projects will be performed in conjunction with one another resulting in an overall decrease in project time. Since CQA oversight is scheduled for the entire duration of the project, shortening the duration of the project will result in cost savings.
- Seaming plastic sheeting in the warmer months results in fewer Quality Assurance (QA) failures and re-work of the seams. This will result in a more efficient project and will reduce time as well as less installation and laboratory testing costs.
- Each contractor who bid on the APWC closure had included a winter break to the schedule (cold weather, holidays, unavailability of geomembrane, etc.). This break, combined with the Force Majeure and uncertainty of plastic sheet production resulted in extending the original projected schedule.
- In delaying the project, the general contractor will not have to maintain the exposed earth work or storm water during the extended duration of the project (as they would have been contractually obligated to do). In re-bidding the project to include the IWC closure, we will eliminate the need for the contractor to manage earth work and storm water for extended periods of time.

I am confident that because we have the IWC interim cap fully in place, a thick stand of grass has been established to minimize erosion, and we have added clay (3 to 5 feet in areas) to the APWC to minimize water infiltration and odors we can keep the landfill stable far into 2018 and beyond.

We have committed to 7-day per week coverage of the site with TDEC personnel who can address any items that require maintenance or repair. Because the interim measures have been successful, and we have the ability to repair any damage that may occur, I am confident that we can continue to manage the landfill as we have for the past several months ensuring that human health and the environment are not impacted. This combined with the Force Majeure, short supply of 40-mil LLDPE, and the higher price of winter work and extended schedule justifies pushing the original construction start date to the spring of 2018.