Advanced Environmental Group, LLC.
Emission Control Technology

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Bonnie Soriano, Chief

Freight Activity Branch

Transportation and Toxics Division

1001 I Street, Sacramento

California 95812

Dear Ms. Soriano,

In response to your letter dated September 3, 2019 regarding the anticipated new regulation and the potential increase in demand for additional capture and control systems beginning in 2021.

1. We at Advanced Environmental Group, LLC have been working diligently providing services to vessels currently calling in Ports of Los Angeles and Long Beach with our AMECS-1 barge. We are finally moving forward to complete AMECS-II for service in LA/LB and AMECS-III in partnership with Lind Marine in Vallejo, Ca. with a grant from the BAAQMD.

   We are also responding to several inquiries including potentially building and delivering an AMECS Barge system for the Port of San Diego, and Port Hueneme to service reefer vessels calling in both of these ports with AMP or Cold Ironing currently not suitable to cover all calls. In addition, we have been working with our technical partners which have the capability to design, build, manufacture, and assemble additional AMECS Barge systems or dock based systems.

Our team includes Ship & Shore Environmental with many years of experience in designing, building emission control systems, Thermal Oxidation technology, and Waste heat recovery systems for many industrial applications. Ship & Shore Environmental, Inc is located in Signal Hill, Ca.

Additional technical partners are Pacific Blue Engineering a control system integrator providing turn-key automation solutions, legacy upgrades with emphasis on safety. Pacific Blue Engineering is located in Signal Hill, Ca

Lind Marine, Inc. is a full-service maritime company providing Tug, Barge, Crane, Dredging, Custom marine manufacturing services for maritime applications. Lind is currently assisting AEG, LLC in building the AMECS -III Barge for the BAAQMD Grant. We plan to deploy AMECS Barge-III in May of 2020 for

testing of roll-on/roll-off (ro-ro) Liquid bulk, (tankers), as well as reefer, cruise, and large container vessels 18,000 teu + we anticipate will enter the west coast market. Lind Marine is located in Vallejo, Ca.

Furthermore, we anticipate beginning of testing on tanker auxiliary engines, as well as capture and control of their boiler emissions while at berth or at anchor. We are also excited to begin testing with our new Spud barge design in the near future. This will allow all vessel fleets to take on bunkers, and stores at berth or anchor, while AMECS is connected capturing and controlling emissions from both auxiliary engines and boilers while adding an additional safety measure to all vessel classes. This will protect ship and barge personnel from falling debris or dislodging containers over on water side on to barge.

The AMECS Spud barge also ads a measure of safety to the liquid bulk vessels as we are not required to be alongside vessel while vessel is loading or unloading cargo. This can also be addressed with a dock mounted system.

2. With respect to Liquid Bulk (Tanker vessels) We have met with engineers, from Exxon Mobil, Plains, Chevron, and BP we have held several symposiums, meetings, tours of current AMECS-1, we hired classification society groups such as DNV, and ABS to provide AEG, LLC with risk assessment analysis consisting of scenarios with AMECS Barge coming along side Tankers while conducting loading and unloading cargo operations, and while connecting to auxiliary and boiler stacks. I am happy to report that after many years of discussions ExxonMobil has vetted our AMECS Barge mounted system and we are confident we can connect to a liquid bulk vessel safely. We are currently going thru some final recommendations and plan to build a new AMECS Barge for deployment in Texas. We plan to use our technical team, all data, experience and lessons learned over the past several years on container vessels, as well as our early testing with capturing and controlling emissions from multiple aux and boiler stacks simultaneously on Break Bulk vessels and complete the design of an AMECS Spud barge for use on tankers.
   We are adding intrinsically safe components and pressurizing our emission treatment system (ETS). We will supply a copy of final product design to your team for review and comment.
   Ro-Ro Vessels produce high emission loads, stacks are relatively easy to connect to from either side of vessel. We feel Ro-Ro's can be a candidate for either a barge-based system or a land/dock-based capture and control system. We feel comfortable our AMECS technology can not only easily reach all Ro-Ro fleets, control emission loads, and be a cost-effective alternative as same system can be used on all other fleets when not utilized for a Ro-Ro service.

3. Yes, AEG team has spoken to and met with several of the class societies, we have reached out to Intertanko, International Maritime Organization, and continue to reach out to local and regional oil companies some receptive while others are cautiously optimistic, and a couple remain resistant. We plan to complete the design and build system for EM and invite these class societies, oil companies to attend testing, demonstration and final implementation of technology. We are also including their valuable input.

4. AEG's current AMECS system has the capability to capture and control emissions from reefer vessel calls utilizing two auxiliary engines. We are currently providing this service for vessels calling in LA/LB for the South American service. Multiple stacks are not an issue as we have proven this can be done safely with a plenum capture system as proven early with breakbulk vessel testing, see SCAQMD report. Tanker auxiliary and boiler funnels come in many different sizes, angles, and shapes as well as have large spark arrestors affixed to each stack. AEG has designed a high temperature sock which fit's over the spark arrestors for control of emissions without any back pressure or undistributed weight on funnels. We feel confident this will be a quick and simple way to connect with great flexibility to vessel as well as AEG crews.

5. We are exploring the possibility of removing diesel generators all together with Solar/battery technology, Hydrogen fuel cells, and electricized technology. We are working with WestGen Power Solution which we had great success with applications installed in Puerto Rico. Also, we are exploring a GHG technology which we feel is promising developed by a professor at Stanford University which we may add on to our existing system/technology with its byproduct of H20 we plan to use in our So2 tower. This is still under development and examining the cost effectiveness of implementing such a technology.

6. Yes, AEG in conjunction with Ship and Shore environmental will be testing SSE Thermal Oxidizer & Waste Heat Recovery system. We feel we may be able to control by physicochemical means of separation by chemical conversion, including thermal or catalytic combustion and chemical oxidation or reduction, adsorption onto a suitable solid adsorbents but concerned we are creating a California regulated hazardous waste with heavy metals which will be difficult and expensive to dispose of and will add to the cradle to grave responsibilities to user and or generator. With this said we are looking at other suitable technologies and feel much progress has been made with alternative technologies which may soon be more cost effective such as Algae Photo Bioreactors generating positive use by products. We are also focused on such technologies as absorption towers, and micro capsules but concerned about waste by product.

7. The technical feasibility is upon us as we have solved this issue with our plenum capture system. This is a duct system with four high temperature hoses attached with light weight connectors affixed to emission capture system or ECS. This allows our emission treatment system to collect emissions from up to four auxiliary and boiler funnels simultaneously. We proved this concept early on during our testing with breakbulk vessels at the Metropolitan Stevedoring Terminal in Port of Long Beach as they often run multiple auxiliary generators during loading and unloading of vessel. In this case it was coal, calcine, and other materials. (see SCAQMD/POLB Demo)

8. If demand grows as expected AEG is positioned with its team members to effectively build and deploy multiple AMECS systems both dock based and barge based wherever needed or required throughout California ports and rail yards. AEG is the only company that has successfully demonstrated we can safely capture and control emissions from 6,000-18,000 teu container vessels, break-bulk at berth or at anchor as well as rail emissions. We are confident we now have the technical expertise to not only meet but exceed the need of industry as Ro-Ro's Tankers, Reefer's are included in upcoming regulation and as it incrementally increases.

9. Based on our current structure AEG plans to deploy five barge-based systems by 2021, with suitable financing we can deploy an additional fourteen systems by 2025, and an additional six systems dock based or barge-based units by 2027-2028 comfortably. The buildout of systems may be increased depending on financing as we are capable of building several systems simultaneously. We have located several suitable flat-deck barges, former single skin tank barges, and construction barges which are readily available throughout the West Coast.

Best regards,

Ruben Garcia

President

Advanced Environmental Group, LLC