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Janet Coit, Assistant Administrator for Marine Fisheries, NOAA

Re: FWS Biological Consultation Opinion Dated May 12, 2022 Pertaining to SpaceX Boca Chica FAA Programmatic Environmental Assessment (PEA)

Dear Sirs and Madams,

This letter serves as a supplement to Save RGV's comments to the Preliminary Environmental Assessment (PEA) submitted on November 1, 2021, concerning impacts of the SpaceX's Launch Facility and launch of the Super Heavy at, and offshore of Boca Chica Beach, Texas. Good cause exists to accept and consider these supplemental comments. First, when submitting our original comments to the PEA, we assumed that the PEA was based upon truthful proposed data that specifically pertains to the Super Heavy. We have learned that parts of the PEA were based on obsolete sound data of less powerful rockets, and not on the Super Heavy. This entire process becomes sham without reliable facts upon which to comment by concerned citizens, but also by consulting agencies. Second, given the extraordinary delays in FAA's issuance of the final Environmental Assessment (EA), we and others should be given leeway to supplement original comments to address newly learned and discovered information, including but not be limited to the Super Heavy's sound impacts on newly listed endangered species. We ask that you consider the following specific information:

NEWLY LISTED SPECIES

Under the proposed test and launch operations was described in the PEA as: (1) Starship landing at the Vertical Launch Area (VLA), on a floating platform in the Gulf of Mexico or the Pacific Ocean, or expended in the Gulf of Mexico or Pacific Ocean, and (2) Super Heavy landing at the VLA, on a floating platform in the Gulf of Mexico, or expended in the Gulf of Mexico. No consideration was given to the impacts of the Space X's Super Heavy operations on the recently

listed endangered species under the Endangered Species Act (ESA). Specifically, the Rice's whale, (formerly designated as the Gulf of Mexico population of the Bryde's whale), and the threatened oceanic Whitetip shark were recently listed as endangered under the ESA. Newly classified endangered species constitutes changed circumstances that would warrant new evaluation of Space X's Super Heavy operations and their impact upon these newly listed species. Focus should be on the construction of offshore platforms for launches, landings, and possible anomalies over the Gulf of Mexico. Rice's whale has been recognized as a distinct species with only an estimated 51 living individuals, making it one of the most endangered whales on earth. The species cannot afford to lose one whale approximately every 15 years because of human activity. Because of the "precarious status" [of the species], NMFS has stated, "[a]ny effects that are expected to reduce the fitness of individuals or result in mortality are of great concern."

The oceanic Whitetip Shark is in the family Carcharhinus Longimanus and is a large pelagic requiem shark inhabiting tropical and warm temperate waters. On January 30, 2018, NOAA Fisheries published a final rule to list this species as threatened under the ESA. It is critically endangered and red listed worldwide. According to a January 2021 study in *NATURE*, which studied 31 species of sharks and rays, the number of these species found in open oceans had dropped by 71% in the last 50 years. The oceanic Whitetip Shark was included in this study.

NMFS has previously stated that noise can harm whales by "hindering their ability to use sound, causing a disruption of their ability to communicate, choose mates, find food, avoid predators, and navigate." The effects of sonic booms from offshore landings and any other noise effects in the Gulf of Mexico upon these newly listed endangered species, has not yet addressed as per the PEA, what effects sonic booms from Super Heavy landings can have on these newly listed endangered species, and must now be evaluated.

Likewise, FAA must also consider the noise and sonic boom impacts from Space X's Super Heavy activities upon the Whitetip shark, which has never been analyzed by FAA and NMFS.
Further, page 16 of FWS' biological and conference opinion (BCO) states:

> A Starship/Super Heavy test operation or launch could fail (referred to as an anomaly). If an anomaly occurs on the launch pad, the result could be fire or the spread of debris. SpaceX expects the debris would be contained within a 700-acre area developed to assess potential effects of debris and debris retrieval within the FAA-approved hazard area, which would be contained within the "all hard checkpoint" area shown in Figure 5 (black dashed area represented as "no personnel"). SpaceX's SN11 anomaly created the largest debris filed [sic] of all launch anomalies to-date and although debris spread outside the launch pad, it was contained to the 700-acre area. Reports of debris further from the VLA are unconfirmed as pieces of SpaceX launch vehicles from SN11. If the debris is from a SpaceX launch vehicle, it is also possible that the debris was carried away in the water and ended up at a further location from the 700-acre debris study area.

We contend that the increased size, thrust, and trajectory of the Starship/Super Heavy, as opposed to the PEA's modeled less powerful rocket, may have even greater significant impact on the Gulf of Mexico marine life not previously addressed.

Also, page 25 of the BCO states:

> For a Super Heavy booster landing in the Gulf of Mexico, predicted overpressure levels range from 0.2 psf to approximately 12 psf. The modeled sonic boom footprint for this scenario is entirely over water. People, located offshore within about 20 miles of the Gulf of Mexico landing site, such as oil rig workers, may hear the sonic boom.

People working in the vicinity of the floating platform during a landing can be notified to expect a sonic boom during a landing of the Super Heavy, which would mitigate their surprise. We posit, however, that marine life cannot be "notified" to "expect" the sonic boom. The BCO and PEA are devoid of addressing the noise impact of sonic booms during the Super Heavy space activities. As such, a full EIS is necessary to analyze these impacts.

SOUND MODELING DATA

The Noise Assessment in Appendix B of the Draft PEA states: "The Super Heavy Booster would use thirty seven (37) Raptor engines that each provide sea-level thrust of about 375 Klbf" which is 187 tons of thrust." However, on October 24, 2021, Musk tweeted that Raptor 2.0 was being developed and would be approximately 245 tons of thrust which is 20% larger than the Super Heavy described in the Draft PEA noise assessment. This tweet was a direct contradiction of what was told to the FAA in the Draft PEA and constitutes approximately 50% or greater increase to sound impacts to the surrounding habitats. A closer look reveals that the sound model for orbital launches was completed in September of 2019. In December 2021, McGregor, TX residents, miles away from the SpaceX facility, where the Raptor 2.0 was being tested, complained of increasingly louder noise that rattled their whole house, accompanied by cracks in swimming pools and windows.

Additionally, the Plume Exhaust Model in Appendix E of the PEA, which was completed in June of 2019, does not state the total thrust but does give the specific impulse of the 31 Raptor Engines. It also provides a detail about mass flow rate which can be solved for thrust and energy = 57 Mega-Newtons. SpaceX updated their website for Starship in late September 2019, which appeared to formalized plans to increase Super Heavy thrust, this time to72 Mega-newtons. This change in thrust is not reflected in the 2019 models, which were used by FWS to determine ecological effects on endangered species. The deficient 2019 models were also used throughout the PEA to describe empirical impacts. These 2019 models are deficient and do not analyze They appear to be deficient the current thrust representations by Musk. New, updated models must be resubmitted and reevaluated.

Save RGV submits that lift off and re-entry thrust of the Starship/Super Heavy at Boca Chica might have a sound attenuation or sound curve of 6 miles on land and 4 miles over water. What are the impacts on the South Bay Coastal Preserve which is only 1.2 KM from the launch pad? This is a most fragile eco-system, essential fish habitat, and marine mammal nursery. Has the Texas General Land Office been consulted in this regard? If so, what models were given to it? Updated, new models, or the outdated 2019 models?

CONCLUSION

Save RGV contends that SpaceX submitted outdated models for sound contours, heat plumes and rocket emissions. If this contention proves true, then the May 12, 2022 FWS BCO is invalid and therefore the Endangered Species Act consultation must be revisited. If the PEA has been submitted to consulting and lead agencies with erroneous data and models, it must be resubmitted to all consulting agencies with appropriate corrections as to the data and models.

The *extent* of impacts is critical to endangered species is also critical. SpaceX, the applicant, must use techniques, based on science and law, to estimate the quantity of endangered species that will be killed, how much habitat will be lost, how many buildings may be damaged due to sonic booms and anomalies, and how many tons of air and water emissions are likely to be generated. FWS and NMFS must reinitiate consultations to determine potential sound impacts on currently listed terrestrial species and newly listed marine species respectively. In light of this additional information FAA conduct a full Environmental Impact Statement before this project can be approved.

Thank you for considering our comments, which we ask be admitted into the record and considered for all intents and purposes in your ensuing final Environmental Assessment. Please acknowledge receipt and we look forward to your response.

Sincerely,

Bill Berg
Agent for Save RGV

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