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**From:** [REDACTED]  
**Sent:** Monday, November 1, 2021 6:47 AM  
**To:** SpaceXBocaChica  
**Subject:** From www.faa.gov: [REDACTED]

This email was sent through the Federal Aviation Administration's public website. You have been contacted via an email link on the following page: [https://www.faa.gov/space/stakeholder\\_engagement/spacex\\_starship/](https://www.faa.gov/space/stakeholder_engagement/spacex_starship/)

Message

I fully support the launch of Starship in Boca Chica by SpaceX. I have lived in Texas for most of my life, and would be proud to see the state host the most important human activity to date. The United States needs the hard working men and women of SpaceX to ensure our future in the 21st century.

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**From:** [REDACTED]  
**Sent:** Monday, November 1, 2021 6:43 AM  
**To:** SpaceXBocaChica  
**Subject:** From www.faa.gov: [REDACTED]

This email was sent through the Federal Aviation Administration's public website. You have been contacted via an email link on the following page: [https://www.faa.gov/space/stakeholder\\_engagement/spacex\\_starship/](https://www.faa.gov/space/stakeholder_engagement/spacex_starship/)

Message

Dear Faa, I request you to provide regulatory approval to Elon Musk's starship, I can 100% assure you that all safety standards are in measure and there are no issues. Please allow his company to conduct their launches as it can be very beneficial for our human species future and space research/travel. Thank you very much

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**From:** [REDACTED]  
**Sent:** Monday, November 1, 2021 6:43 AM  
**To:** SpaceXBocaChica  
**Subject:** From www.faa.gov: [REDACTED]

This email was sent through the Federal Aviation Administration's public website. You have been contacted via an email link on the following page: [https://www.faa.gov/space/stakeholder\\_engagement/spacex\\_starship/](https://www.faa.gov/space/stakeholder_engagement/spacex_starship/)

Message

Let SpaceX launch the startship! As a senior mechanical engineering student I can only say that this would be a huge step for humanity!

---

**From:** [REDACTED]  
**Sent:** Monday, November 1, 2021 6:35 AM  
**To:** SpaceXBocaChica  
**Subject:** From www.faa.gov: [REDACTED]

This email was sent through the Federal Aviation Administration's public website. You have been contacted via an email link on the following page: [https://www.faa.gov/space/stakeholder\\_engagement/spacex\\_starship/](https://www.faa.gov/space/stakeholder_engagement/spacex_starship/)

Message

Please allow SpaceX to fly, this is far too important for humanity.



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**From:** [REDACTED]  
**Sent:** Monday, November 1, 2021 6:30 AM  
**To:** SpaceXBocaChica  
**Subject:** From www.faa.gov: [REDACTED]

This email was sent through the Federal Aviation Administration's public website. You have been contacted via an email link on the following page: [https://www.faa.gov/space/stakeholder\\_engagement/spacex\\_starship/](https://www.faa.gov/space/stakeholder_engagement/spacex_starship/)

Message

Please allow SpaceX to proceed with its launch next week. Out of all human endeavors in history, space exploration might be one of the most, if not the most, important. We are late for it already, we must sprint while the window is open.

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**From:** [REDACTED]  
**Sent:** Monday, November 1, 2021 6:25 AM  
**To:** SpaceXBocaChica  
**Subject:** From www.faa.gov: [REDACTED]

This email was sent through the Federal Aviation Administration's public website. You have been contacted via an email link on the following page: [https://www.faa.gov/space/stakeholder\\_engagement/spacex\\_starship/](https://www.faa.gov/space/stakeholder_engagement/spacex_starship/)

Message

Sending this to show my support for the Starship program.

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**From:** [REDACTED]  
**Sent:** Monday, November 1, 2021 6:24 AM  
**To:** SpaceXBocaChica  
**Subject:** From www.faa.gov: [REDACTED]

This email was sent through the Federal Aviation Administration's public website. You have been contacted via an email link on the following page: [https://www.faa.gov/space/stakeholder\\_engagement/spacex\\_starship/](https://www.faa.gov/space/stakeholder_engagement/spacex_starship/)

Message

Dear FAA, I would like to speak in favor of granting SpaceX permission to launch orbital starship missions for Boca Chica, Texas. I believe that it is our responsibility to our species, our culture and even our Biosphere to move humanity forward, in to space and on to other worlds such as Mars and eventually other bodies in the solar system or eventually even outside our solar system. For people who say we should be spending money on problems here on earth, I say this is working to solve problems here on earth. Backing up our biosphere outside our planet is of huge importance to our continued survival and the survival of the myriad of species we share this world with. Furthermore, if we live in space and inhabit more than 1 world, we become more resilient and resistant to natural disasters and possible extinction or societal collapse. It gives us greater resistance to things like solar flares destroying our power grid and sending us in to a dark age, assuming we have a space stations or colonies that would not suffer from a solar flare akin to the Carrington event knocking out electricity and computers. Finally the extra benefits like Zero G manufacturing and moving industrial pollution off world wherever possible, reducing global warming, development of medical treatments and medicines thought to be impossible to manufacture on the earths surface. Muscle loss treatments, radiation treatments, cancer treatments and even anti aging treatments could be possible with cheap access to space that starship could offer. This could likely be one of the greatest advancements in human history, and would help keep the USA at the fore front of worldwide technological development. Maintaining our technological lead and world leadership for another 50 to 100 years. This is extremely important, lets not mess it up please.

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**From:** [REDACTED]  
**Sent:** Monday, November 1, 2021 6:35 AM  
**To:** SpaceXBocaChica  
**Subject:** From www.faa.gov: [REDACTED]

This email was sent through the Federal Aviation Administration's public website. You have been contacted via an email link on the following page: [https://www.faa.gov/space/stakeholder\\_engagement/spacex\\_starship/](https://www.faa.gov/space/stakeholder_engagement/spacex_starship/)

Message

To whom it may concern, Please allow SpaceX to proceed with their plan for their Starship's first orbital launch attempt. Please grant regulatory approval. Thank you, -Deris

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**From:** [REDACTED]  
**Sent:** Monday, November 1, 2021 11:38 AM  
**To:** SpaceXBocaChica  
**Subject:** From www.faa.gov: [REDACTED]

This email was sent through the Federal Aviation Administration's public website. You have been contacted via an email link on the following page: [https://www.faa.gov/space/stakeholder\\_engagement/spacex\\_starship/](https://www.faa.gov/space/stakeholder_engagement/spacex_starship/)

Message

I'm a resident Texan who cares about our environment and all potential risk receptors to a coordinated rocket launch. After reading through the PEA very carefully, I support the efforts to conduct the launch as soon as SpaceX feels it can adequately prepare for launch.

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**From:** [REDACTED]  
**Sent:** Monday, November 1, 2021 1:38 PM  
**To:** SpaceXBocaChica  
**Subject:** From www.faa.gov: [REDACTED]

This email was sent through the Federal Aviation Administration's public website. You have been contacted via an email link on the following page: [https://www.faa.gov/space/stakeholder\\_engagement/spacex\\_starship/](https://www.faa.gov/space/stakeholder_engagement/spacex_starship/)

Message

To whom it may concern: With the explosion of the SN11 launch earlier this year, debris, much of it toxic, fell roughly five and a half miles away from the launch site. It fell all over the surrounding wildlife refuge and as far away as the resort community of South Padre Island. Previous SN8, SN9 and SN10 launches have also exploded, causing damage to the surrounding areas. A Launch Failure Analysis should Be part of the Environmental Impact Statement (EIS) to assess the risks to public safety as well as risks to proposed infrastructure and operations at the Port of Brownsville, wildlife refuge, populated areas and off-shore activity." Sincerely, James T. Skaggs

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**From:** [REDACTED]  
**Sent:** Monday, November 1, 2021 10:42 AM  
**To:** SpaceXBocaChica  
**Subject:** From www.faa.gov: [REDACTED]

This email was sent through the Federal Aviation Administration's public website. You have been contacted via an email link on the following page: [https://www.faa.gov/space/stakeholder\\_engagement/spacex\\_starship/](https://www.faa.gov/space/stakeholder_engagement/spacex_starship/)

Message

I urge you to issues a Finding of No Significant Impact (FONSI) in response to the SpaceX Boca Chica Programmatic Environmental Assessment (PEA), and to issue SpaceX an experimental permit and/or license for Starship/Super Heavy launches at the Boca Chica Launch Site, or at other locations, as part of its Starship/Super Heavy program. This action will be consistent with statutory requirements and in the best interest of the country and the world.

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**From:** [REDACTED]  
**Sent:** Monday, November 1, 2021 10:26 AM  
**To:** SpaceXBocaChica  
**Subject:** From www.faa.gov: [REDACTED]

This email was sent through the Federal Aviation Administration's public website. You have been contacted via an email link on the following page: [https://www.faa.gov/space/stakeholder\\_engagement/spacex\\_starship/](https://www.faa.gov/space/stakeholder_engagement/spacex_starship/)

Message

I am asking you to approve the Boca Chica launch site and allow SpaceX to continue with its development. I feel this is imperative for these reasons. 1. Regardless of where on the coastline this project executes, the same. 2. For the future of mankind this project needs to move forward. 3. The needs of the many outweigh the needs of a few. Only a few people will be directly impacted by this project and, with compensation, be able to be relocated.



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**From:** Kulm, Steven W (FAA) <[REDACTED]>  
**Sent:** Monday, November 1, 2021 12:15 PM  
**To:** SpaceXBocaChica  
**Subject:** FW: FAA Impeding SpaceX

Forwarding.

Steve Kulm  
Public Affairs Specialist  
Office of Communications | Federal Aviation Administration  
C: [REDACTED] | [REDACTED]

*To ensure timely response, please include our [REDACTED] email on all press inquiries.*

---

**From:** matt <[REDACTED]>  
**Sent:** Sunday, October 24, 2021 9:56 AM  
**To:** 9-ATO-AOC-PressOffice (FAA) <[REDACTED]>  
**Subject:** FAA Impeding SpaceX

Please support the SpaceX efforts to develop and test super heavy at the Boca Chica Starbase, Texas test facility.

Please try to improve the FAA launch flexibility allowing more SpaceX test launches.

China loves it when our FAA impedes SpaceX progress.

Matt Intihar

Sent from my Galaxy Tab

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**From:** Kulm, Steven W (FAA) <[REDACTED]>  
**Sent:** Monday, November 1, 2021 12:15 PM  
**To:** SpaceXBocaChica  
**Subject:** FW: From www.faa.gov: [REDACTED]

Forwarding.

Steve Kulm  
Public Affairs Specialist  
Office of Communications | Federal Aviation Administration  
C: [REDACTED] | [REDACTED]

*To ensure timely response, please include our [REDACTED] email on all press inquiries.*

**From:** [REDACTED] <[REDACTED]>  
**Sent:** Saturday, October 23, 2021 2:09 PM  
**To:** 9-ATO-AOC-PressOffice (FAA) <[REDACTED]>  
**Subject:** From www.faa.gov: [REDACTED]

This email was sent through the Federal Aviation Administration's public website. You have been contacted via an email link on the following page: [https://www.faa.gov/about/office\\_org/headquarters\\_offices/aoc/contact/](https://www.faa.gov/about/office_org/headquarters_offices/aoc/contact/)

Message

I am requesting SpaceX StarShip's first orbital test to be approved as soon as possible because We love to see the technology progress as fast and smooth as possible. I also love to see FAA to improve the approval process to allow SpaceX's proven fast iteration technology development to be approved fast and smoothly. Thanks for considerations.

---

**From:** Kulm, Steven W (FAA) <[REDACTED]>  
**Sent:** Monday, November 1, 2021 12:15 PM  
**To:** SpaceXBocaChica  
**Subject:** FW: From www.faa.gov: [REDACTED]

Forwarding.

Steve Kulm  
Public Affairs Specialist  
Office of Communications | Federal Aviation Administration  
C: [REDACTED] | [REDACTED]

*To ensure timely response, please include our [REDACTED] email on all press inquiries.*

**From:** [REDACTED] <[REDACTED]>  
**Sent:** Saturday, October 23, 2021 7:09 PM  
**To:** 9-ATO-AOC-PressOffice (FAA) <[REDACTED]>  
**Subject:** From www.faa.gov: [REDACTED]

This email was sent through the Federal Aviation Administration's public website. You have been contacted via an email link on the following page: <https://www.faa.gov/space/>

Message

Elon Musk is doing great job as far as i know, he should be also focus on solution for to stop this beautiful land into desert i guess he will know that planting trees can solve this. as far as i know the trees plantation is not easy in the present as the surface of the earth has already become unpleasant for the trees growth. thanks

---

**From:** Kulm, Steven W (FAA) <[REDACTED]>  
**Sent:** Monday, November 1, 2021 12:14 PM  
**To:** SpaceXBocaChica  
**Subject:** FW: SpaceX  
**Attachments:** Draft\_PEA\_for\_SpaceX\_Starship\_Super\_Heavy\_at\_Boca\_Chica.pdf

Forwarding.

Steve Kulm  
Public Affairs Specialist  
Office of Communications | Federal Aviation Administration  
C: [REDACTED] | [REDACTED]

*To ensure timely response, please include our [REDACTED] email on all press inquiries.*

**From:** 1ManShow <[REDACTED]>  
**Sent:** Saturday, October 23, 2021 11:18 AM  
**To:** 9-ATO-AOC-PressOffice (FAA) <[REDACTED]>  
**Subject:** SpaceX

Thanks for reading.



---

**From:** Sid Maddock <[REDACTED]>  
**Sent:** Monday, November 1, 2021 8:49 PM  
**To:** SpaceXBocaChica  
**Subject:** Fwd: Public comment SpaceX Permit Application SWG-2012-00381  
**Attachments:** SpaceX.CWAcomment2.final.pdf

Attached please find a pdf file of a comment I submitted to the U.S. Army Corps of Engineers regarding the SpaceX dredge and fill permit application.

This comment contains pictures at the end of the document that illustrate some of the damages to wind tidal flats caused by SpaceX activities to remove debris from rocket explosions from the Boca Chica facility.

These pictures are submitted to the NEPA administrative record to respond to statements in the FAA's DPEA for SpaceX regarding the impacts of SpaceX activities in algal mat wind tidal flats from removing rocket debris.

Sidney Maddock

Begin forwarded message:

**From:** "[REDACTED]" <[REDACTED]>  
**Subject:** Fwd: Public comment SpaceX Permit Application SWG-2012-00381  
**Date:** November 1, 2021 at 11:37:36 PM EDT  
**To:** Sidney Maddock <[REDACTED]>

Begin forwarded message:

**From:** A M <[REDACTED]>  
**Date:** 20 April 2021 at 11:26:09 PM GMT-4  
**To:** Sidney Maddock <[REDACTED]>  
**Subject:** Fwd: Public comment SpaceX Permit Application SWG-2012-00381

----- Forwarded message -----

**From:** A M <[REDACTED]>  
**Date:** Tue, Apr 20, 2021 at 11:16 PM  
**Subject:** Public comment SpaceX Permit Application SWG-2012-00381  
**To:** <[REDACTED]>  
**Cc:** <[REDACTED]>

Attached please find a pdf file of a public comment I submit on the SpaceX dredge and fill permit application.

Sidney Maddock



Sidney Maddock

April 20, 2021

By Email to: [REDACTED]

Re: SpaceX, Permit Application SWG-2012-00381

Policy Analysis Branch  
Regulatory Division, CESWG-RDP U.S. Army Corps of Engineers  
P.O. Box 1229  
Galveston, Texas 77553-1229

Dear Sir or Madam:

In response to the Public Notice on Permit Application SWG-2012-00381 (“Public Notice”) extending the comment period, I submit these supplemental comments on the proposal of Space Exploration Technologies, Inc. (“SpaceX”) to modify the existing permit at the “vertical launch area” (“VLA”) near State Highway 4, Boca Chica, Texas with “the expansion and addition of test, orbital, and landing pads, integration towers, associated infrastructure, stormwater management features and vehicle parking” (Public Notice: 1).

I. The Corps should conduct a new practicable alternatives analysis

In my first comment letter, I voiced concerns regarding the inadequate practicable alternatives analysis in the FAA’s 2014 EIS. Since I submitted that comment, Blue Origin, a major SpaceX competitor, successfully launched the “New Shepard” rocket booster and capsule; the mission “reached 348,753 feet altitude... about 106 kilometers, above the internationally recognized boundary of space” and then landed – without exploding. (Sheets 2021). Of particular relevance to the Corps practicable alternatives analysis for the SpaceX dredge and fill permit application, “the mission launched from Blue Origin’s private facility in West Texas....” (Sheets 2021). The Blue Origin website shows multiple pictures of rocket launch activities in open arid habitats (Blue Origin 2021). Most importantly, unlike SpaceX, the Blue Origin facility is not located near Boca Chica, surrounded by the Boca Chica State Park, Brazos Island State Park (collectively, “Parks”) the Lower Rio Grande Valley National Wildlife Refuge (“Refuge”), the South Bay Coastal Preserve, and the Las Palomas Wildlife Management Area (Boca Chica Unit).

The recent successful activities of Blue Origin launching a rocket into space demonstrate that there are practicable alternatives for rocket launch activities that do not involve fill of valuable wetlands near the Refuge and Parks. In addition, the Blue Origin pictures show that if there were an explosion with a Blue Origin launch similar to what occurred multiple times at Boca Chica

with SpaceX, the Blue Origin rocket debris would not be falling in valuable habitats used by the threatened Piping Plover and other shorebirds and waterbirds. Also, there would not be significant adverse impacts associated with removing rocket debris from high value mud and algal mat flats at Boca Chica. Contrary to claims of the 2014 FAA EIS, the successes of Blue Origin demonstrate that there are practicable alternatives that do not require SpaceX to fill valuable wetlands and mudflats at Boca Chica. The Corps must conduct a new, independent practicable alternatives analysis. Once it does, the Corps should conclude that due to the existence of practicable alternatives, the Corps must deny the dredge and fill permit.

II. SpaceX's proposed activities would significantly degrade aquatic resources and are not in the public interest.

In my first comment letter I noted that massive uncontrolled explosions have taken place during the last four rocket launches. The explosion of SN 11 on March 30, 2021, which occurred at altitude and not on the launch pad, caused large amounts of debris to fall uncontrollably outside of SpaceX property on to public conservation lands, including high value, ecologically sensitive habitats that are used by the Piping Plover, Wilson's Plover, and Snowy Plover. This is particularly relevant to the Clean Water Act permit process as the FAA's 2014 EIS inaccurately states that "Operation of the vertical launch area and control center would not result in impacts to tidal sand flats or mud flats" (FAA 2014: 4-11). My first comment letter noted the significant adverse impacts to mudflats and algal flats from rocket debris and associated removal activities. As the FAA 2014 EIS is based on inaccurate information, the Corps must independently review the adverse impacts to wetlands, mudflats, and algal mat flats and not rely on the FAA analysis.

I am providing photographs (pp. 6-35) taken after the most recent SpaceX explosion that document adverse impacts associated with the cleanup activities for the rocket debris. These pictures document several critical points that are relevant to the permit review process.

First, some of the debris pieces are smaller and can be retrieved on foot. However, on at least one day, there was a large crowd of SpaceX employees or contractors walking around the flats picking up the smaller debris pieces. These flats where people are walking are in, and next to, habitats that can be used by Snowy Plovers and Wilson's Plovers for nesting. What steps is SpaceX taking to prevent take of nests or chicks from debris cleanup? Even trained, experienced field staff know how very difficult it can be to locate the nests or chicks of small plovers. Trained field staff also are aware of how a step in the wrong place can result in eggs being crushed or that staying too long in an area can result a nest being abandoned or eggs becoming non-viable from exposure to excessive heat. I remain very concerned that if Wilson's Plovers or Snowy Plovers are nesting in the areas to the north and south of the SpaceX VLA – like they have done historically – when there is another explosion, take of nests or chicks is foreseeable. How is SpaceX going to prevent this take? I would stress that even if there is one person out there with field experience, that is not adequate to monitor many people who are walking around focused on cleaning up debris.



Second, there are numerous signs of damage from off-road vehicles being operated on these flats. As the National Park Service noted discussing adverse impacts from illegal ORV use on the Laguna Madre side of Padre Island which shares wind tidal flats similar to those in South Bay:

“Padre Island National Seashore is proposing to restore areas within the park's wind-tidal flats that have been damaged by off-road vehicles. The project would restore the surface hydrology of the tidal flats and allow for recovery of algal mats.

Wind-tidal flats are a very limited and specialized environment existing within a few centimeters of sea-level. As a result, wind-driven seawater moving across the flats is vulnerable to disruption from any change in topography. Vehicles driven on the tidal flats leave deep ruts and ridges in the soft sediment, which alter the natural surface flow of seawater. This damage may last decades, as there is very little wave energy necessary to resuspend and move the sediments.

Benthic invertebrates, such as polychaetes, crustaceans, and insect larvae, are vulnerable to the change in water level, and are often starved of seawaters. Blue-green algal mats, also dependent on the ebbing and flowing of Laguna Madre waters across the flats, provide some of the most productive shorebird feeding grounds. As a result of impacts to the algal flats and invertebrates, shorebirds, such as Reddish egret, Long-billed curlew, American oystercatcher, and the federally-listed Piping plover and Red knot, have lost potential foraging habitat.

A fundamental policy of the National Park Service is to preserve park resources to the extent that the resources will be left unimpaired for future generations. *Tire tracks left behind by vehicles alter the physical, biological, and aesthetic components of these valuable wetlands, and may take years to decades to recover naturally.”*

(NPS accessed 2021)(emphasis added).

It must be stressed that the areas where some of the debris fell are closed to all entry by pedestrians or vehicles of the general public. USFWS signs clearly state “Area Closed Area behind sign closed to protect sensitive wildlife species” and “Sensitive Habitat No Motorized Vehicles Beyond This Point”. Only authorized entry is allowed.

For each of the recent SpaceX explosions at Boca Chica, have SpaceX employees or contractors used vehicles off-road in closed areas without explicit authorization from USFWS every time entry has occurred into the closed areas? That is a simple factual question with a “yes” or “no” answer. Because ORV use in these areas raises significant risk of environmental damage to protected flats habitats, the Corps has a duty to evaluate what actions SpaceX employees or contractors have taken after each explosion to clean up debris, and whether such ORV use will take place in the future.

Second, a photo shows a UTV operating on the flats. I heard that SpaceX had not yet received authorization from USFWS to operate vehicles off-road on the date the picture was taken, though

I have not yet been able to verify that information. While the photo was taken at a distance, it also appears that the UTV is not operating in a dry area.

I understand that later, after this picture was taken, USFWS granted limited authorization for restricted off-road use in “dry” areas. I have not yet seen if there is language memorializing this understanding,<sup>1</sup> so I do not know the precise conditions of the authorization, if it exists, or for how long it exists, or if SpaceX is complying with the authorization. Moreover, such purported authorization from USFWS does not prevent ecological damage to algal flats resulting from such ORV use, nor does not prevent the Corps from having to address such damage as part of the environmental review process. And, even if such authorization is granted for flats if they are “dry,” what does that actually mean in the context of debris removal on wind tidal flats? It appears in several photographs from the tracks sinking into the substrate that off-road vehicles continued to operate in tidal flats – including algal mat flats - that were not “dry.” I continue to strongly question whether it will be possible to conduct cleanup activities without causing significant adverse environmental impacts.

Third, the large debris field raise two related issues that are relevant in another way to the permit review process: is the foreseeable deposition of large amounts of heavy debris from a rocket explosion into valuable publicly owned wetlands and mudflats considered an unpermitted fill activity? Also, if there are efforts to remove the debris that involve digging with shovels or mechanized equipment, would such activities result in the removal of protected wetlands or mudflats that then results in the subsequent discharge of fill materials that are regulated under the Clean Water Act? The pictures show that pieces of the falling debris are penetrating into the ground; that debris is being dug out; and in certain instances, mud or sand are being shoveled onto the flats as part of the debris removal process.

Finally, what is going to happen about the very large pieces of rocket debris that cannot be carried out or cannot be dragged out? What impacts are associated with removing those very large debris pieces?

I am not, in raising this question, saying that dragging out debris will not result in adverse impacts to the tidal flats. In certain instances, there do appear to be large gouge marks associated with dragging out rocket debris pieces and the impacts to sheet flow and algal mats need also need to be considered for this approach.

### III. Conclusion

In my first comment letter, I urged the Corps to deny SpaceX’s application for a dredge and fill permit. The additional information submitted with this comment letter further supports that request for a permit denial.

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<sup>1</sup> Such authorization, if it exists, would require appropriate NEPA and ESA review before such authorization is given, as well as a consistency review under the federal statute governing the Refuge if the ORV use were taking place on the Refuge. If USFWS did grant authorization, did USFWS follow the required environmental review procedures?

Sincerely,

Sidney B. Maddock

Copy: Brian Winton, USFWS (by email)

### References

Blue Origin. <https://www.blueorigin.com/our-mission>. Accessed April 20, 2021.

Chapa, S. “SpaceX Plans to Drill for Natural Gas Near Texas Launchpad”, Bloomberg News, January 22, 2021, retrieved at <https://www.bloomberg.com/news/articles/2021-01-22/spacex-plans-to-drill-for-natural-gas-next-to-texas-launchpad> (accessed January 22, 2021).

FAA (Federal Aviation Administration). 2014. Final Environmental Impact Statement SpaceX Texas Launch Site. May.

National Park Service. Restoration of wind-tidal flats damaged by off-road driving. Accessed at: <https://parkplanning.nps.gov/projectHome.cfm?projectID=56752> accessed April 20, 2021).

Sheets, M. April 14, 2021. “Jeff Bezos’ Blue Origin launches and lands rocket New Shepard, as it prepares to launch people”. CNBC, accessed at: <https://www.cnbc.com/2021/04/14/watch-jeff-bezos-blue-origin-launch-new-shepard-ns-15-livestream.html> accessed April 20, 2021.



















































































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**From:** David Green <[REDACTED]>  
**Sent:** Monday, November 1, 2021 11:16 AM  
**To:** SpaceXBocaChica  
**Subject:** GLO Comments to FAA Draft PEA  
**Attachments:** FAA Draft EA Comments GLO 01NOV2021.pdf; FAA EA Scoping SpaceX 22JAN2021.pdf

Attached please find the GLO's Comments to the Draft Programmatic Environmental Assessment (PEA) for SpaceX Starship/Super Heavy Project in Boca Chica Beach, Cameron County, Texas.

Best regards,  
David

David Green  
Senior Deputy Director  
Coastal Protection Division  
Texas General Land Office  
[REDACTED]



TEXAS GENERAL LAND OFFICE  
GEORGE P. BUSH, COMMISSIONER

November 1, 2021

Federal Aviation Administration  
Commercial Space Transportation  
800 Independence Avenue SW  
Washington, DC 20591  
[spacexbocachica@icf.com](mailto:spacexbocachica@icf.com)

**Re: Comments regarding the Draft Programmatic Environmental Assessment (PEA)  
SpaceX Starship/Super Heavy Project  
Boca Chica Beach, Cameron County, Texas**

Dear Sir or Madam:

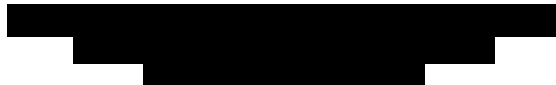
Thank you for the opportunity to comment on the preparation of a PEA for the proposed SpaceX Starship/Super Heavy launch operation at Boca Chica Beach, Cameron County, Texas. The Texas General Land Office (GLO) acknowledges the receipt of the Federal Aviation Administration's (FAA) Section 4(f) of the Department of Transportation Act Consultation letter dated September 16, 2021, which states that GLO has been added to the list of stakeholders in SpaceX's Anomaly Response Plan. The GLO also submitted a Scope of Issues Environmental Assessment letter dated January 22, 2021 to the FAA. While a number of GLO's comments were included in the summary of environmental consequences, it does not appear that the mitigation measures included in the Draft PEA adequately address all of these concerns. Accordingly, GLO requests that the FAA consider all the comments identified in GLO's January 22, 2021, attached hereto.

Thank you for the opportunity to comment. If you have any questions, please direct them to [jesse.solis@glo.texas.gov](mailto:jesse.solis@glo.texas.gov).

Sincerely,

*David Green*

David Green  
Senior Deputy Director  
Coastal Protection  
Texas General Land Office





TEXAS GENERAL LAND OFFICE  
GEORGE P. BUSH, COMMISSIONER

January 22, 2021

Federal Aviation Administration  
Commercial Space Transportation  
800 Independence Avenue SW  
Washington, DC 20591  
spacexbocachica@icf.com

**Re: Comments regarding the Scope of Issues for the Environmental Assessment (EA)  
SpaceX Starship/Super Heavy Project  
Boca Chica Beach, Cameron County, Texas**

Dear Sir or Madam:

Thank you for the opportunity to comment on the preparation of an EA for the proposed SpaceX Starship/Super Heavy launch operation at Boca Chica Beach, Cameron County, Texas. As a state agency, the Texas General Land Office (GLO) is responsible for:

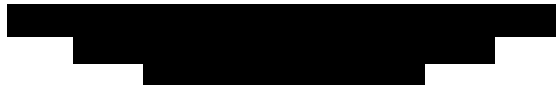
- 1) managing state-owned land, including state-owned submerged land, dedicated to the Permanent School Fund (PSF);
- 2) implementing and enforcing the Texas Open Beaches Act, Texas Natural Resources Code (TNRC) Ch. 61, which protects the public's right to access and enjoy Gulf beaches in our state;
- 3) enforcing the Dune Protection Act, TNRC Ch. 63, which ensures the protection of the dunes along the Gulf of Mexico;
- 4) oil spill response and prevention; and
- 5) the continued implementation of the Coastal Management Program (CMP) and determining whether federal actions are consistent with the CMP.

Given these responsibilities, the GLO has the following recommendations for evaluation in the Environmental Assessment.

*Evaluation of Potential Impacts to State-owned Land*

Impacts to coastal natural resources and uses of public land that limit public access are factors the GLO considers in the management of state-owned submerged land. The GLO requests that any impacts to natural resources on state-owned land, including state-owned submerged land, be identified and reviewed for environmental impacts caused by testing and launch activities.

Secondary impacts such as increased noise, light pollution, and air and water quality impacts on the land and surrounding habitats due to construction and increased vehicular traffic should also be reviewed. The GLO also recommends that the EA address the extent of mitigation necessary to compensate for these impacts. In addition, the GLO requests that the EA evaluate the effects of and mitigation for limitations on public use of state-owned land in terms of access for



scientific research as well as the impacts of limited access to recreational activities such as fishing.

#### *Evaluation of Impacts to Critical Dunes*

The GLO recommends that the EA include a licensed survey of all construction proposed near the vertical launch area, identifying the location of all proposed construction activities and the distance between the proposed construction and mean high tide, the vegetation line, the Dune Protection Line, and the landward limit of the beachfront construction area; the location of proposed and existing structures; and the size of the proposed project area, including proposed roadways and parking areas, for evaluation of potential impacts to access to the public beach and adverse effects to critical dunes, and to determine the need for local permits. In addition to a licensed survey, the GLO requests a grading and layout plan identifying all elevations, existing elevation contours of the project area, and proposed contours for final grade. This information is necessary so the GLO can determine the extent that the critical dune area may be affected by proposed construction activities.

#### *Evaluation of Significant Unavoidable Adverse Impacts and Measures to Avoid, Minimize, and Mitigate Effects of the Proposal*

The GLO recommends that a study to evaluate the need for a comprehensive mitigation plan, including a detailed description of the methods that will be used to avoid, minimize, mitigate, and/or compensate for any adverse effects on dunes or dune vegetation be included in the EA. Critical dunes and dune vegetation as defined by TNRC Chapter 63 exist directly adjacent to the vertical launch area. If dunes or dune vegetation are damaged during construction activities, or due to fire or accidents after construction is completed, from static fire tests, rocket launches, and prototype testing of the Starship/Super Heavy, mitigation would be required. The GLO also requests a study to quantify the direct and indirect loss of coastal natural resource areas consisting of wetlands, tidal flats, emergent high marsh, scrub shrub, mangroves and to identify any reintroduction and restoration measures for said resources. A current habitat characterization of the project area should be included in the EA since launch failures or testing activities may result in explosive anomalies, spreading debris as well as fires that remove or alter habitat. The GLO also requests a Cumulative Impact Assessment of the Boca Chica Launch Site to identify the combined, incremental effects of human activity that may pose a threat to the environment from current and future operations.

#### *Evaluation of and Alternatives to Extensive Closures of the Public Beach and State-owned Land*

The GLO recommends that the EA include a detailed assessment of how increased testing operations that require closure of State Highway 4 will impact the public's ability to use and access the public beach at Boca Chica. Alternatives to and mitigation for continuous requests of primary and backup closure dates and closure cancellations that would cause less of an impact to the public's ability to access and use the public beach and adjacent coastal public lands should be evaluated. An option is to count closure hours as the time State Highway 4 and Boca Chica Beach are publicly scheduled to be closed, unless notice of different hours or a cancellation is given at least 48 hours before the closure is scheduled to begin. The impacts of projected closure hours to access should be evaluated based on scheduled and announced closure, not actual closure, due to frequent schedule changes with inadequate notice to the public and the remote location of Boca Chica Beach. In addition, an evaluation of options for providing adequate notice

to accommodate activities associated with public beach access and road closures should be considered. Metrics to determine how closure hours will be tracked should be evaluated, agreed upon, and provided to the public so there is improved predictability in accounting for daily and cumulative public beach closure hours. The GLO also requests that the EA identify and evaluate the effects on scientific research and recreational use limitations on state-owned submerged land and assess methods of mitigating these effects.

#### *Access by Resource Agencies and Research Organizations*

The GLO recommends that the EA evaluate methods for Texas resource agencies and associated research and other environmental groups to access the public beach and state-owned land to ensure that they can fulfill their obligations during times of limited access and ongoing closures. Resource agencies need to access the Boca Chica area for a number of reasons when it is closed, including addressing emergencies, performing research, and accessing state land. For example, the GLO is charged with Oil Spill Response and Prevention, which entails containment, clean up, and mitigation of oil spills. The EA should include an analysis of the effects of the proposed action on GLO's ability to respond to oil spill emergencies and evaluate procedures for emergency oil spill response during closures. The EA should also evaluate alternatives that would ensure access is provided to the public beach and state-owned land in emergencies that occur during scheduled closures and that would allow research projects to continue during periods with repeated closures.

#### *Protection of Coastal Natural Resource Areas*

The GLO is charged with the continued implementation of the Coastal Management Program (CMP) and determining whether federal actions are consistent with the CMP goals and enforceable policies under 31 Texas Administrative Code (TAC) Ch. 501. This includes the protection of coastal natural resource areas (CNRAs). The GLO requests that the EA identify which CNRAs may be affected by the increased launch and testing operations and planned expansion at the site. Additionally, the EA should identify, evaluate, and document any impacts to CNRAs in the area. CNRAs in Texas include the following: coastal barriers, coastal wetlands, hard substrate reefs, submerged lands, tidal sand or mud flats, waters under tidal influence, coastal historic areas, critical dune areas, coastal preserves, critical erosion areas, oyster reefs, submerged aquatic vegetation, waters of the Gulf of Mexico, coastal shore areas, and Gulf beaches. The EA should also address the impacts of and mitigation for the increased closures for space operations and the required closure of State Highway 4, including impacts to the public's ability to recreationally use and access adjacent coastal preserves such as the Boca Chica State Park and the National Wildlife Refuge as well as National Historic Landmarks in the area. Further, the environmental effects of any space operations in the waters of the Gulf of Mexico should be evaluated. The enforceable policies for the Coastal Management Program under 31 TAC Ch. 501 with regard to the effects to CNRAs should also be considered and addressed, particularly as they relate to development in critical areas, discharge of wastewaters to coastal waters, construction of waterfront facilities and other structures on submerged lands, construction on the beach/dune system, and development within protected areas.

Thank you for the opportunity to comment. If you have any questions, please direct them to [jesse.solis@glo.texas.gov](mailto:jesse.solis@glo.texas.gov).

Sincerely,

*David Green*

David Green  
Senior Deputy Director  
Coastal Protection  
Texas General Land Office

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**From:** Mason Francis <[REDACTED]>  
**Sent:** Monday, November 1, 2021 10:44 AM  
**To:** SpaceXBocaChica  
**Subject:** Let SpaceX Work in Peace

Do not try to restrict or infringe on the progress of SpaceX.

Sent from my iPhone



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**From:** Thomas Humphrey <[REDACTED]>  
**Sent:** Monday, November 1, 2021 7:51 AM  
**To:** SpaceXBocaChica; [REDACTED]  
**Subject:** letter

Dear Ms. Zee,

I am writing a public comment. That I am against SpaceX's continued development in Boca Chica as they harm Boca Chica's fragile ecosystem and vulnerable species. And as SpaceX continues to harm the vulnerable species of Boca Chica they could soon put them on the endangered species list. While my proof for this statement is a quote from The Guardian, "There used to be about a dozen nests dotting the tidal flats on the edge of Boca Chica where the refuge abuts SpaceX's property each spring, but last year the organization found just two pairs of the snowy plovers nesting, he said. This year they only spotted one." How this quote supports my subclaim is it says that one of the vulnerable species is dwindling showing how SpaceX could make the animals of Boca Chica go on the endangered species list.

But as SpaceX continues harming the ecosystem they could destroy it and kill all the vulnerable species and make them extinct. For my proof of this statement is another quote from The Guardian, "The private space race is already causing concern about the potential climate impacts of the fuel needed to propel the rockets. But environmentalists on the ground in south Texas say SpaceX's testing site is having more immediate impacts." How this quote supports my subclaim is that it says that the rocket fuel is causing more damage to the environment than we thought was happening which in turn could make the animals go extinct soon. So it is my belief that our primary concern is to protect life on earth by cutting off SpaceX development.

Another reason to be against SpaceX is that in Boca Chica they are pushing residents out of Boca Chica. Why this would be bad is when all the residents are pushed out of Boca Chica there's no one to stop SpaceX from buying Boca Chica with its low budget. For proof of this claim I have a quote from the article. "Musk pursues incorporation of Boca Chica Village into new city."

"SpaceX's Boca Chica Beach facility's presence in Boca Chica Village residents' lives has been well documented, with several homes in the small community being bought by SpaceX, attempting to expand the site by pushing residents out." How this quote from the article supports my subclaim as it shows me that by pushing out the residents of Boca Chica SpaceX can expand to Boca Chica with no residents left to fund its budget.

For my next argument I believe SpaceX harms the residents of Boca Chica as they are pushing them out of their homes by force and uprooting their lives in Boca Chica. For proof I have a quote from the Space.com's article, saying, "As the scale and frequency of spaceflight activities at the site continue to accelerate, your property will frequently fall within established hazard zones in which no civilians will be permitted to remain, in order to comply with all federal and other public safety regulations," How this supports my claim is that it shows how SpaceX expanding is forcing the residents of Boca Chica to leave for their own safety but is causing the people to uproot their lives by force of the law.

Sincerely,

Thomas

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**From:** Patrick Anderson <[REDACTED]>  
**Sent:** Monday, November 1, 2021 10:57 AM  
**To:** SpaceXBocaChica  
**Cc:** Zee, Stacey (FAA); SpaceXBocaChica  
**Subject:** LRGVSC Comment on Draft PEA for SpaceX Starship Super Heavy Boca Chica  
**Attachments:** LRGV Sierra Club PEA Comment .pdf

The Lower Rio Grande Valley Sierra Club hereby submits this comment regarding the Draft PEA for SpaceX Starship Super Heavy at Boca Chica. Comment is attached.



November 1, 2021

Ms. Stacy Zee, SpaceX PEA  
c/o ICF  
9300 Lee Highway  
Fairfax, VA 22031  
Email: [SpaceXBocaChica@icf.com](mailto:SpaceXBocaChica@icf.com)

Dear Ms. Zee,

The Lower Rio Grande Valley Group of the Sierra Club hereby submits the following comment regarding the Draft Programmatic Environmental Assessment for the Boca Chica Texas SpaceX Starship/Super Heavy Launch Vehicle Program (Draft PEA). This comment was drafted in coordination with the non-profit organization Save RGV, thus contains much of the same content as Save RGV's comment regarding the PEA, however, there may be differences. The Lower Rio Grande Valley Group is a local group of the Texas Lone Star Chapter of the national Sierra Club organization. Most members of the Lower Rio Grande Valley Group reside in the Rio Grande Valley in Cameron County and Hidalgo County.

## **NEED FOR AN EIS AND ACCOUNTING FOR ALL INFRASTRUCTURE, OPERATIONS, AND CUMULATIVE IMPACT (NOT JUST AN EA)**

The FAA's NEPA procedures implementing the National Environmental Policy Act define when a Supplemental Environmental Impact Statement (EIS) is needed, or not. This was cited in the FAA's 2014 SpaceX EIS. [FAA Order 1050.1F, Section 9-2] "A Supplemental EIS is not needed if:

1. "The proposed Action conforms to plans or projects for which a prior EIS has been filed and there are no substantial changes in the Proposed Action that are relevant to environmental concerns."

SpaceX has in fact never launched a Falcon 9 or Falcon Heavy rocket from Boca Chica and now has no plans to do so. It has instead turned its site and activities into something unrecognizable in the original 2014 EIS and Record of Decision (ROD); a large and expanding complex to manufacture, fabricate, assemble and test the Starship and Super Heavy booster rocket in addition to producing fuel and power for the Starship and Super Heavy operations (e.g. power plant, gas extraction, gas delivery, gas treatment, gas liquefaction). The Starship and Super Heavy booster together will be larger than the approved Falcon 9 and Falcon Heavy by an order of magnitude, standing 39 stories tall, with 16 million lbs. of propellants, nearly 50% more than NASA's Saturn V rocket used to launch moon-landing missions. Round-the-clock experimental testing has already increased significantly. SpaceX has enlarged its footprint (and they plan to expand further) by increasing its acreage, its number of buildings, its number of employees and contractors, its hours of beach and refuge closure, and its number of static test firings and pressure tests. All these events significantly increase environmental impacts and none of them were analyzed in the original EIS.

Additionally, in the short time since SpaceX has conducted operations at the Boca Chica site, there have been multiple explosions that disrupted resident's lives, scattered fuel laden rocket debris and caused wildfires that have consumed more than 100 acres of sensitive native habitat on national wildlife refuge land. These serious impacts illustrate how critical it is for the FAA to initiate a new EIS process, and for federal regulators to exercise meaningful, legally required oversight.

2. "Data and analysis contained in the previous EIS are still substantially valid and there are no significant new circumstances or information relevant to environmental concerns and bearings on the Proposed Action or its impacts."

Most of the 2014 data and analysis is now not only invalid but wrong and misleading and significantly out of date by over seven years. The construction, testing and firing of the massive Starship and Super Heavy Booster will have much greater impacts than the rockets approved in the 2014 EIS. Because of the very substantial and significant changes to the

actions taking place at Boca Chica, virtually all the impact analysis in the 2014 EIS is now out of date and inaccurate. Specifically, new analysis needs to be prepared for the significant effects that are occurring, such as noise, light, frequency of events, fires and explosions, larger areas of direct and indirect impacts (most likely to include the towns of South Padre Island, Port Isabel, Long Island Village and the permitted but not yet built liquefied natural gas (LNG) export terminals on the Brownsville Ship Channel namely Texas LNG and Rio Grande LNG, and the proposed Jupiter MLP crude upgrader facility and off-shore VLCC loading terminals, the storage of much more highly volatile rocket propellant that is more explosive, has greater impacts to wildlife, wetlands, vegetation and endangered and threatened species, and increased denial of public access to marine recreation and Boca Chica beach.

Under economic impacts another issue is missing entirely. The latest license for the Starship tests requires \$198 million in third party liability, and federal indemnification for losses beyond that. This is higher than is required for any Falcon 9 or Falcon Heavy launch from Vandenberg AFB or Kennedy/Cape Canaveral, suggesting a far larger risk zone than was included in the FEIS or ROD. This probably doesn't include liability for the potential \$20 billion LNG terminals and LNG tankers that will likely be in the expanded risk zone, nor the proposed Centurion condensate upgrader facility with offshore export loading terminals. This list is by no means comprehensive.

3. "All pertinent conditions and requirements of the prior approval have, or will be, met in the current actions."

The FAA has done an inadequate job in ensuring SpaceX compliance with many of the conditions in its 2014 Record of Decision. One example is the closure of State Highway 4 and Boca Chica beach, which was to be limited to no more than 180 hours per year. Within the first six months of 2021, closures exceeded 225 hours, often with confusing and inadequate prior notifications and last-minute changes, cancellations and revocations. Nevertheless, SpaceX now wants to nearly triple its beach closure "quota" with no opportunity for public discussion and comment. To increasingly deny access to eight miles of public beach, state parkland and national wildlife refuge is a significant human impact and needs to be addressed, particularly as much of the experimental engine and rocket testing could be done at a safer and less public testing location elsewhere. Given the wholly

different purpose of the project, FAA, as part of the Supplemental EIS, needs to revisit the alternatives evaluation.

## TIERED REVIEWS

All elements to SpaceX proposals (identified in 2-1 p. 9) are, according to SpaceX's purpose and need, essential to SpaceX's Starship/Super Heavy operations. However, in the PEA Section 2.1: Proposed Federal Action, it states, *"Detailed information about some of the launch-related infrastructure (e.g., exact location and design) is not currently available."* Therefore, the draft PEA makes assumptions about these unknowns. It also states, *"The FAA may conduct environmental reviews of additional proposed launch and reentry sites if SpaceX further develops proposals. Such reviews may be tiered off this PEA as appropriate."* The practice of FAA "tier reviews" that allows further SpaceX expansion is a loophole that avoids additional environmental review, project scrutiny, and public comment. This loophole of tiered analysis to avoid environmental reviews, has been used since 2014 and it violates the standards of NEPA. It is not a sustainable method of accountability. According to FAA's order 1050.1F, "NEPA compliance and other environmental responsibilities are integral components of that mission. The FAA is responsible for complying with the procedures and policies of NEPA and other environmental laws, regulations, and orders applicable to FAA actions." (p. 1-2).<sup>1</sup>

The FAA should not "tier" reviews simply because information is not currently available from SpaceX. Due to the fact that elements like the power plant, gas treatment, and liquefaction are critical to the development and operations of the Starship and Super Heavy, all elements must be analyzed collectively as opposed to a tiered analysis. Launch/landing locations also need to be determined conclusively. An EIS is needed to determine, with specificity, all of SpaceX's plans and to accurately account for the cumulative impacts of all of SpaceX's proposals of the Starship/Super Heavy program in order to avoid, minimize, and mitigate impacts.

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<sup>1</sup> [https://www.faa.gov/documentLibrary/media/Order/FAA\\_Order\\_1050\\_1F.pdf](https://www.faa.gov/documentLibrary/media/Order/FAA_Order_1050_1F.pdf)

## INCREASED SCOPE & OPERATIONS

### LAUNCH SITES

SpaceX has indicated it is considering additional launch (which includes landing for suborbital missions) and reentry locations for the Starship/Super Heavy program beyond the Boca Chica Launch Site. These launch and reentry locations are in addition to the VLA and should also be considered to be alternatives to launching/landing at the VLA. Thus, the platforms and launch locations should be fully analyzed and their impacts assessed prior to licensing. SpaceX has not planned or provided details of additional/alternative launch/reentry sites. Consequently, SpaceX is negligent in its responsibilities to avoid, minimize, and mitigate impacts of the Starship/Super Heavy program, which violates NEPA standards.

### LAUNCH VEHICLE

PEA Section 2.1.2: Launch Vehicle. This overview appears to be lacking and inadequate per the FAA licensing code Title 14, Chapter III, Subchapter 3, Sections 450.43 Payload Review and Determination; and 450.45. Safety Review and Approval.

The Falcon rockets use the proven Merlin engine, which produces 0.63 MN (146,000 lb<sub>f</sub>) of thrust. The Starship and Super Heavy use the unproven Raptor engine, which can produce approximately 2.3 MN (520,000 lb<sub>f</sub>) of thrust. Thrust on lift-off for the Falcon Heavy is approximately 17.5 MN. Super Heavy, with all 37 engines, will have a maximum lift-off thrust of 74 meganewtons (MN).

#### Comparison between Falcon rockets and Starship rockets

	Falcon9	Falcon Heavy	Starship	Super Heavy
Weight (lbs)	1,100,000	3,400,000		
Thrust at Lift-off (KN)	5,844 KN	17,532 KN	12,000 KN	74,000 KN/
Thrust at Lift-off (Klbf)	1,314 Klbf	3,942 Klbf	2,700 Klbf	16,600 Klbf

*To convert between metric units of thrust, kilonewtons, KN, and non metric units, kilopounds force, Klbf, an [online force unit converter](#) was used.*

The Starship Super Heavy has over four times the thrust of the Falcon Heavy.



The Falcon rockets use RP-1 fuel (similar to jet fuel) and liquid oxygen. The Starship and Super Heavy Rockets use liquid methane and liquid oxygen.

These are very major changes from the 2014 EIS which was for 12 launches per year of the tested, approved, and reliable Falcon rocket (that was actually never even launched at Boca Chica per the 2014 EIS) to an experimental testing, launch and landing program for unapproved rockets. The Super Heavy, with over four times the launch thrust of the largest Falcon, will include expected explosions, twenty Starship launches per year, and fuel and oxidizer tank testing day and night with anticipated explosions once a month. Up to 300 hours of State Highway 4 road closures are anticipated to be required for debris removal from Boca Chica beach and neighboring wildlife refuges due to expected test failures and explosions. Such major changes are not a few tweaks to a running program that can be “tiered” on the EIS, but rather are entirely new programs that require an EIS.

These major changes and many others described in the PEA and discussed below demand the scrutiny of an EIS to make sure that the fragile ecosystems that support a massive variety of wildlife, some threatened and endangered, can thrive within the radically and more threatened habitat caused by their neighbor SpaceX.

PEA Section 1.1 Operational Activities, p.2-2 This section states, “In 2019 SpaceX developed the Starship technology as part of the reusable suborbital launch vehicle classification analyzed in the 2014 EIS.” However, the 2014 EIS only included a possible permit or license for Boca Chica suborbital launch vehicles smaller than Falcon 9. The Super Heavy violates that condition in the 2014 EIS.

A vehicle smaller than, or equal to, the Falcon 9 first stage would carry less fuel and produce equal or less noise and light at launch than the Falcon 9. Such a vehicle would create equal or less of a disturbance to wildlife, fauna and flora, than the Falcon 9 and therefore meet the environmental requisites of the 2014 EIS. It was designed and built for the Starship prototype, and tested outside of the requirements of the original EIS. Any significant environmental impact that will be made by a new addition to what was approved in the 2014 EIS requires a new EIS.

## TANK TESTS

PEA Section 2.1.3.1: Tank Tests. *“SpaceX is proposing to conduct approximately 10 tank tests a month. SpaceX estimates a 10 percent rate of anomalies during tank testing. An anomaly would result in an explosion and the spread of debris.”* If SpaceX is expecting about 10 percent of tests will result in explosions, they are not anomalies. The definition of anomaly is “unexpected event.” Since one explosion is expected a month, will the noise, light, and debris from the explosion all be contained within the property line of SpaceX? If not, there is no reference in the section about discussions and sign-off by the interested parties who represent wildlife welfare and habitats. This may call for an EIS to bring the parties together. Furthermore, given the apparent lack of understanding of the outcome of the tests, it would be prudent for an EIS to be written. Additionally, this indicates additional closures not specified or calculated in the Draft closure proposal.

Section 2.1.3.1 inadequately factors in the cumulative noise, lights, debris, closures, and air quality impacts of the project.

## DESALINATION PLANT

PEA Section 2.1.4.5 p. 31 Desalination Plant. A desalination plant will pump groundwater and inject the waste brine deep underground. The entire plan description for operating the plant is fewer than 200 words, even though it involves the “installation” of two 2950 deep reinjection wells. SpaceX indicates that it will extract water from two new wells and extract water at a rate of 40 gallons per minute (gpm) and inject brine into an injection well at a rate of 15 gpm. It is not indicated if water extraction is the amount for one or both wells. SpaceX also does not indicate how often these operations will occur, nor do they disclose the use of chemicals such as copper and chlorine that are often used in the desalination process. An EIS is needed to assess impacts of these operations including, but not limited to air emissions, water quality, aquifer impacts, sound, and light, in addition to avoiding, minimizing, and mitigating impacts.

## NATURAL GAS PLANT

PEA Section 2.1.4.10 p32 The natural gas “pretreatment” plant for purifying the natural gas that will be used for rocket fuel and other plant needs is described in about 100 words. The power plant and liquefier are likewise very briefly described. SpaceX has not provided design plans, source of natural gas, source of gas delivery, pipeline locations (if using pipelines), or the amount of gas to be processed annually. With regard to pipelines to deliver gas, as reported by

Tech Crunch, SpaceX inquired about reusing a defunct natural gas pipeline running through the Lower Rio Grande Valley National Wildlife Refuge. However, that pipeline was permanently abandoned in 2016, according to the official and state records. The official told TechCrunch that the defunct pipeline now houses fiber optic cable for a University of Texas Rio Grande Valley internet connection.<sup>2</sup>

Details (e.g. location, emissions, design plans, visual impacts, etc.) of purification and liquefaction are not mentioned including, but not limited to, thermal oxidizers, heaters, flares, pipelines, and storage tanks. These elements will have impacts on environmental impact categories identified in the PEA, particularly regarding land use compatibility, air emissions, sound, visual effects, cultural resources, and biological resources. Lacking specificity, the emission total in Table 3-2 (p. 44) is not substantiated nor can it be verified. Without full disclosure of these proposals in an EIS, the impacts cannot be identified and assessed. Additionally, alternatives have not been evaluated.

## POWER PLANT

PEA Section 2.1.4.7 Power Plant: The 250-megawatt power plant that will generate power for activities at all SpaceX facilities, including the VLA, would normally qualify as a major new source of air pollution under the Clean Air Act. Therefore, the impacts of this plant need to be fully disclosed, analyzed, and mitigated to properly comply with NEPA. Alternatives to this proposal are not identified. If it is for electricity, even hundreds of megawatts, the electricity can be provided by SpaceX's electricity provider using the new three phase electric line to be built for SpaceX. Additionally, the source of the natural gas to feed the natural gas turbines for the power plant is not identified. Sourcing of gas is an impact that is potentially significant, especially if it requires pipelines outside the region of influence or requires a route through environmentally protected areas.

## ORBITAL LAUNCHES

PEA Section 2.1.3.4 Orbital Launches: There are several undetermined scenarios proposed by SpaceX, in regard to the exhaust plume. This is a new level of rocket energy discharge and needs a full EIS. SpaceX admits in Appendix G-Exhaust Plume Calculations (pp. 9-10) of the PEA that *"Due to the complexity of how the 31 engines are integrated into the base of the Super*

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<sup>2</sup> <https://techcrunch.com/2021/10/08/the-mystery-of-elon-musks-missing-gas/>

*Heavy vehicle, there is not a simplified method to directly predict the air entrainment and exhaust burnout chemistry for the installed engines. An extensive computational fluid dynamics (CFD) analysis would likely be needed to fully address the entrainment process.”* This is an admitted unknown regarding a fundamental aspect of the entire program. An EIS would provide more confidence in the projections.

PEA Section 2.1.3.4: Orbital Launches. The Draft PEA references SpaceX’s launch manifest is still being developed at this time. To avoid, minimize, and mitigate impacts, a draft schedule is needed to provide the public, federal, state, and local agencies to identify any conflicts in wildlife biological cycles (e.g. migrations, breeding) to ensure that impacts to wildlife are minimized during critical life cycle stages.

PEA Section 2.1.3.4: Orbital Launches. SpaceX states, during unmanned orbital launches that require expending Super Heavy or Starship, that they would not attempt recovery unless they receive reports of large debris. Because SpaceX is claiming their project is needed to achieve National Space Policy goals, FAA and cooperating agencies should ensure that SpaceX be held accountable to National Space Policy goals, one of which is to *“create a safe, stable, secure, and sustainable environment for space activities, in collaboration with industry and international partners, through the development and promotion of responsible behaviors”*.<sup>3</sup> FAA and NOAA must hold SpaceX accountable with regards to debris from intentional and unintentional consequences.

## GROUND CLOSURES

PEA Section 2.1.3.5.1 Ground Closures: For purposes of commenting on the draft PEA, we believe the Texas General Land Office (GLO) recommendation, dated January 22, 2021, during the scoping period for the EA, best describes how closure hours should be calculated. *“An option is to count closure hours as the time State Highway 4 and Boca Chica Beach are publicly scheduled to be closed, unless notice of different hours or a cancellation is given at least 48 hours before the closure is scheduled to begin.”* The ongoing inconsistencies in process, notification, and exceedance of closure hours impede on operations of federal and state land managers, and other stakeholders, who support federal and state agencies in land and wildlife management. An alternative is that workers and contractors to the agencies responsible for the various wildlife refuges are provided with IDs by SpaceX to permit them entry to perform their

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<sup>3</sup> [National Space Policy of the United States of America. December 9, 2020. p5.](#)

tasks. Some contractors travel hundreds of miles for wildlife tasks, which they schedule for an open day, only to learn upon arriving that the highway to their work is closed on very short notice. Such an alternative would be a “good neighbor” gesture and lessen the impact of road closures out of their control.

## SODAR

Section 2.1.3: Operations. This mentions SODAR (sonic detection and ranging), which operates 24/7 and “sends out a short sonic pulse every 15 minutes that can reach 92 decibels (dB) at the source...” This was omitted from the noise impacts section and needs to be addressed as it relates to cumulative impacts on beachgoers, and wildlife. This, along with the continuous lighting, increases the possibility or probability of this area being unsuitable to humans for recreation and unsuitable and discouraging, (if not fatal) to wildlife for their survival.

## SAFETY, HEALTH & CLIMATE

### NEED OF A LAUNCH FAILURE ANALYSIS

The draft PEA does not address the significant concern voiced in the January 22, 2021 FAA public scoping comments regarding the need for a *launch failure analysis* (PEA p. 6) Commenters pointed out the proximity of two LNG facilities (Rio Grande LNG and Texas LNG) at the Port of Brownsville that have been in process prior to SpaceX’s Starship/Super Heavy activity. The Department of Interior commented on the 2017 Written Re-Evaluation stating, “*the construction of the Stargate Building and the three proposed Liquefied Natural Gas Terminals at the Port of Brownsville that have filed for a FERC permit constitutes significant new circumstances and/or information that is relevant to evaluating the cumulative effects of the expanded SpaceX project.*” The response in the Written Re-Evaluation stated, “*The FAA disagrees with the NPS. The Stargate building and Port of Brownsville LNG facility were analyzed in the cumulative impacts chapter of the 2014 EIS. The additional infrastructure SpaceX is proposing to construct in largely the same footprint that was analyzed in the EIS does not substantially change the cumulative impacts analysis in the EIS.*” This was an inaccurate statement. An analysis on the impact to Rio Grande LNG and Texas LNG still remains to be analyzed by the FAA and/or the Federal Energy Regulatory Commission. The 2014 EIS referenced only one LNG project, Gulf Coast LNG Export LLC.

Additionally, a cumulative analysis and launch failure analysis must also include Centurion's/Jupiter MLP's proposed crude upgrading, processing, and export facility that includes marine loading berths 6 miles off shore for the loading of barges and VLCC ships (65,000dwt Panamax sized) at 30,000 barrels per hour. The FAA and SpaceX, in the interest of public safety, must account for worst case scenarios when Starship/Super Heavy explodes during launches and landings. According to the PEA, such "anomalies" are expected (and in fact have already occurred). Without a launch failure analysis, the Port of Brownsville, Port Isabel, South Padre Island, and Long Island Village, as well as the immediately adjacent wildlife refuges and state parks, cannot adequately plan for emergencies. A launch failure analysis is also needed to determine the impacts to the surrounding environment and wildlife.

The Anomaly Response Plan that addresses road closures, based on the prediction of one anomaly per month, assumes that 300 hours/year (PEA p. 9), or 25 hours per anomaly, will be sufficient to clean up the area. Considering the amount of time that it took to clear the March 30, 2021, explosion that involved three Raptor engines, this is likely an underestimation of the time that roads and the beach will have to be closed for anomalies. This is in violation of the Code of Federal Regulations 450.110 Physical Containment, and 450.133 Flight Hazard Area Analysis. Additionally, the definition of the word anomaly is "something that deviates from what is standard, normal, or expected." It is therefore misleading to use the word anomaly to describe potential launch failures, operational failures or explosions that are expected during testing.

## AIR QUALITY/CLIMATE

The Draft PEA does not include the cumulative amount of Green House Gasses (GHG) emissions from auxiliary infrastructure and operations. It should include the total emissions from all proposed launches, landings, testing, as well as emissions from construction, methane venting, the natural gas pretreatment system, the power plant, the desalination plant, vehicular traffic, and road maintenance. These contributing emissions are significant. Consequently, the PEA's greenhouse gas/global warming analysis is inadequate. If one day of the 2018 US total GHG emissions is compared to (their estimate of) the annual SpaceX operations, the SpaceX annual is 0.34%. (PEA Table 3-3. Estimated Carbon Dioxide Equivalent Emissions Comparison).

It should be noted that Port Isabel Junior High is just over six miles away (PEA p. 137). Children's proximity to the SpaceX complex is glossed over in Section 3.15.3.3. A full EIS would



give a more complete analysis of air quality issues for children and others with compromised health issues as well as the cumulative effects of pollutants that tend to be present in areas with lower economic opportunities.

## **ENVIRONMENTAL JUSTICE & SOCIOECONOMICS**

### **BEACH ACCESS**

PEA Section 3.15.4.2 Closing Boca Chica Beach is an environmental justice issue. With a population of 186,738, the 2020 census reports Brownsville residents are 95.2% Hispanic and other minorities. The median income in 2019 dollars was \$38,588, with a poverty rate of 29.3%. For many Hispanic and low-income residents of Brownsville, Boca Chica is “their” beach, as it is closer than the beaches on South Padre Island. It is easily accessible, except for the closure hours, and especially in the summer months and during holiday weekends, when traffic to/from South Padre Island routinely backs-up on State Hwy 48 and State Hwy 100. And most importantly to a low-income community, entrance to Boca Chica Beach is free compared to \$14 (March-Sept., off season \$12) per daily visit to Cameron County Beach Access 5, which allows drive-on visits and best replicates the natural beach experience at Boca Chica. Cameron County Beach Access 6 is free off-season, but requires use of a 4x4 vehicle which is not an available or affordable option for many. The other free SPI Beach Access points located behind the beachfront hotels, are not drive-on beaches and are much more challenging (in-season parking availability near access points is very, very limited) for day visitors. The approximate driving time from Brownsville to Beach Access 5 is approximately 50 minutes during the off-season and at times when there are no traffic back-ups. When traffic backs-up, driving time for the trip could extend to approximately 2.5-3 hours. The conclusion that there are other cost-free public beach access locations within the vicinity of local communities does not accurately and appropriately consider the actual logistics involved in getting to the other beach locations, especially for a low-income minority community. The PEA lists 500 closure hours for launches and tests and an additional 300 closure hours for the clean up of anomalies (predicted to be one per month). Using this plan, the beach will be closed a considerable number of partial days, making the number of days that this Brownsville minority group of residents will be denied beach access very high. Therefore, the proposed action, which includes the closing of State Hwy 4 and Boca Chica Beach, would result in disproportionately high and adverse impacts to

lower income indigenous populations who for generations have relied on access to the waters for economic and familial subsistence.

## IMPACT ON INFRASTRUCTURE

The Draft PEA (PEA Section 3.5, p. 52) authors admit there is structural damage potential due to orbital launch events and predicts the percent of the people from South Padre Island, Laguna Vista, and Tamaulipas, Mexico who will likely file a damage complaint: *KBR assessed the potential for structural damage due to orbital launch events using the potential for structural damage claims. An applicable study of structural damage claims from rocket static firing tests indicates that, based on Maximum Unweighted Sound Level (Lmax), approximately one damage claim will result per 100 households exposed at 120 dB and one damage claim per 1,000 households exposed at 111 dB (Guest and Slone 1972).* SpaceX does not, however, address possible damage to current and proposed infrastructure at the Port of Brownsville and the Brownsville Channel as is required in Code of Federal Regulations § 450.110 Physical containment. Sonic booms, in particular from Super Heavy landings will cause structural damage: *Predicted overpressure levels for a Super Heavy landing range from 2.5 psf to 15 psf. Brazos Island State Park, Boca Chica Bay, Boca Chica State Park, portions of the NWR, Boca Chica Village, and Tamaulipas, Mexico would experience levels up to 15 psf. Boca Chica Beach and the southern tip of South Padre Island are within the 6.0 psf contour. South Padre Island, including residences, Port Isabel, and the Port of Brownsville ship channel are included in the 4.0 psf contour* (PEA p. 57). These psf values cause “regular failures” of glass and plaster at the least, and damage to sinks, roofs, walls and water pipes at the higher levels (PEA pp. 58-9). Significantly, the single bridge from Port Isabel to South Padre Island is not mentioned in the noise damage (long and short term) assessment in Appendix B.

## LOCATION

Section 2.1.1: Location only mentions distances from the Launch and Loading Control Center (LLCC) and the Vertical Launch Area (VLA) to Mexico, which are only 1.3 miles and 2.2 miles respectively. Full analysis of distances to closest points of populated land, (e.g. Matamoros, City of South Padre, Port Isabel, Long Island Village, Laguna Vista, Port of Brownsville), as well as South Bay Coastal Preserve is necessary information. Other necessary information is the distance to the causeway-- most importantly the highest point of the causeway, as well as data

on cumulative vibrational impacts over time from launch, reentry and/or sonic booms and anomalies (explosions). This data should include projected model trajectories of debris to any portion of the causeway, drawbridges, and the ship channel.

## **ECONOMICS**

PEA Section 1.3: One of the purposes of this project is mentioned as benefiting the public interest, yet this entire section only cites U.S. Government goals of space travel and “commercial customers.” As this is taxpayer funded, the vague term *commercial customers* needs clarification. It further states that the goal is to encourage private sector activities through the cost effective delivery of cargo to the moon and Mars. A discussion of the scope of the private sector activities, identification of types of commercial customers, and project cost effectiveness is necessary.

PEA Section 1.4: Public Involvement. (PEA p. 6) There were twice as many negative concerns (than positive) that covered issues of environmental justice, social justice, public safety, constitutional rights, and cultural impacts. The positive comments were potential for jobs and economic gain, innovation in space technology and ideal southerly location. Employment data that shows fully what is or has been the economic and job growth to date, and more importantly, from the local labor force is needed, in addition to realistic projections for economic benefit to the area when costs are factored in.

Airport closures: According to the document (PEA pp. 23-4), there is the possibility of airport closures. Is Brownsville ready to relinquish control of its flight schedule to an outside company? Will airlines want to relocate here (to our newly expanded airport) if they know that SpaceX can mandate an airway closure and idle planes, or force flight cancellations?

PEA Section 2.1.3.5.1: SpaceX identifies that the Brownsville Shipping Channel would be temporarily restricted during launches. SpaceX does not provide an estimate on the amount of time of restrictions of activity in the shipping channel. If the shipping channel restrictions undergo a similar process and procedure to what has occurred with road closures (e.g. last minute cancellations, rescheduling, etc.), potential economic impact could result. An EIS is needed to identify the cumulative socioeconomic impact on the businesses (current and proposed) and operations at the Port and the Channel, and other economies such as charter fishing operations, and commercial fishing operations as well as tour boat operations,

recreational fishing and all recreational, commercial and science research activities conducted in the bodies of water that are adjacent to and/or are enjoined by the channel.

Additionally, a cumulative analysis of socioeconomic impacts in a new EIS is needed to assess the impacts on:

- 3.14.4.1:Energy Supply and Consumption: SpaceX has not demonstrated they can source their own natural gas, let alone in enough quantities for their operations and in the time period of which they will operate at Boca Chica. SpaceX has not defined the total amount of natural gas they will use for their cumulative operations. It is more plausible that SpaceX will require the sourcing of gas via a pipeline connection or use of their own pipeline from Eagle Ford Shale region or elsewhere. An EIS is needed with a full disclosure of the amount of resources used to examine socioeconomic impacts.
- An EIS is needed to examine the number of new employees, available housing, the impact to the housing market, gentrification, and the pricing out of low income residents from housing and neighborhoods. Gentrification and pricing out of low income residents has been identified by the Brownsville Commissioners and Cameron County Commissioners.

## **ECOLOGY AND WILDLIFE**

2.1.1 Location: The location description is mischaracterized. The majority of adjacent surrounding land is part of the Lower Rio Grande National Wildlife Refuge, and also fails to mention the proximity of the South Bay Ecological Preserve, and near the lower Laguna Madre. The omission of protected lands surrounding the Boca Chica Launch Site undermines the recognized importance and presence of the ecology and habitat that are protected. Regulatory decisions regarding SpaceX's proposals must bear in mind and account for these protected lands surrounding SpaceX's Boca Chica Launch Site. Figure 2-2 further mischaracterizes the location. The image predates much of SpaceX's development. Current and closer aerial imagery should be used to reflect the current state of habitat and development. Considerable habitat damage has occurred since the current image was taken, most of which has been in the period between the previous EIS and the multiple addendums and Written Re-Evaluations were implemented.

Section 2.1.1 inadequately describes features of the ecosystems as it states the location is characterized as having “salt flats” and low dunes. Salt flats are dried up desert lake beds. There are no salt flats at this location and the dunes are relatively high, as some can block the view of the LLCC. Tidal flats are rich in marine vegetation and support a wide range of life and are considered critical habitat. To correct these misconceptions of the local ecosystems, an EIS should be done.

The EPA has designated aquatic habitats at the site as Aquatic Resources of National Importance, which brings with it special procedural requirements for Clean Water Act, Section 404 permit review. This would seem to suggest that the impacts of the proposed actions may be significant as well, suggesting in turn that the FAA should prepare an EIS.

On page 99 of the PEA it is stated that, *“The Proposed Action would adversely affect approximately 11 acres of piping plover critical habitat in the floodplain....Unit TX-1 is 7,217 acres, and the total designated piping plover critical habitat in all of Texas is 71,053 acres. Thus the amount affected by the Proposed Action (11 acres) would make up a small percentage of all available piping plover critical habitat. Accordingly these impacts are not considered significant as the habitat loss represents only a small percentage of similar habitat located within the floodplain.”* This is a narrow view of the impacts on floodplains as it does not take into account the compounding of the problems for migratory and nesting birds created by the disturbances from light and noise from the whole of operations at SpaceX. The piping plover is listed as a threatened species and their habitat is also classified as critical. Both circumstances consequently mean that any impact to the piping plover, or their habitat, is significant. Impacts to the piping plover and their habitat must be avoided.

PEA Section 3.9.3.1 and 3.9.3.2 Surface Water and Ground Water: The construction will cause *“increased turbidity in surface waters that may smother fish eggs, aquatic insects, and oxygen producing plants, increase water temperatures, and reduce oxygen levels. Use of construction equipment could result in release of contaminants (e.g., leaks, drips, and spills of petro-chemicals) that could reach nearby waterways and adversely affect water quality. SpaceX would implement its Spill Prevention, Control, and Countermeasures (SPCC) Plan”*. The SPCC should be included in its entirety in an EIS. Any permit requirements applicable should also be summarized and included. Additionally, the frequency of water sampling by TCEQ Texas Surface Water Quality should be defined.

In section 3.14.4.2 Natural Resources, it is stated that “*SpaceX uses groundwater for various operations and for personnel use at the facilities. Potable water would either be delivered by truck or pumped from an existing on-site well at the VLA. SpaceX would install water distribution lines to distribute the potable water from the water tower to the facilities to provide potable water to the area. The existing well at the VLA would draw water from the Gulf Coast Aquifer (the Chicot Aquifer).*” The Chicot Aquifer in the Houston area has been pumped intensively which has resulted in “significant water-level declines” (<https://setgcd.org/maps/>). The south end of these aquifers are already briney, mostly due to oil and gas development. At what increased rate will land subsidence occur with the increased pumping? Where is the equation that has been calculated for that proportional rate? In the original 2014 EIS, personnel levels were expected to be a single shift of 30 full-time employees working 8:00 to 5:00 except for during launch operations when there would be more. It was stated that between 2016 and 2025 the number would be 130-250. The plan for potable water to “be delivered by truck to a holding tank at the VLA or pumped from a well on the property” and the plan for a “septic system (that) would consist of a mobile above ground processing unit and holding tank” needs reevaluation for the greatly increased, multiple-shift work force. Only with an EIS, can the impact of water resource use, including Brownsville’s municipal sources, by SpaceX operations be adequately analyzed.

Disturbance of the Rio Grande Alluvium. Alluvial soils are important as they remove sediments and nutrients flowing in the adjacent water. They can also remove other contaminants from rivers and improve water quality for downstream communities. SpaceX says this won’t be affected by pile driving, however, the PEA insufficiently analyzes this issue.

The disturbance to wildlife is downplayed in the discussion of “noise-induced startle response” (PEA pp.113-114). While it is acknowledged that, “A startle response from nesting birds can result in broken eggs or cause immature young that are not flight-capable to flee the nest. Repeated nest failures could eventually trigger desertion of a nesting area.” The issue is not resolved since, “There are no mitigation measures currently available to reduce the chances of noise-induced startle responses but monitoring of select species could determine if noise was responsible for reduced reproductive success.” It then speculates that “Noise from the Proposed Action would not be expected to cause a significant impact because the noise events are infrequent and short-term and would not result in impacts at the population level.” The words *infrequent* and *short term* downplay the effects, especially when other negative effects of increased lighting and road traffic are added to the day-to-day conditions.



In the Starship Noise Assessment for Operations at the Boca Chica Launch Facility found in Appendix B of the Draft PEA it states, *“As mentioned, DNL is necessary for policy. The next two metrics (L<sub>Amax</sub> and SEL) are A-weighted and provide a measure of the impact of individual events. Loud individual events can pose a hearing damage hazard to people and can also cause adverse reactions by animals. Adverse animal reactions can include flight, nest abandonment, and interference with reproductive activities. The last two metrics, OASPL or L<sub>max</sub> (the maximum overall sound pressure level), for individual events; and spectra, may be needed to assess potential damage to structures and adverse reaction of species whose hearing response is different from that of humans. Reported levels are A-weighted unless otherwise noted.”* (p. 3 *Starship Noise Assessment for Operations at the Boca Chica Launch Facility*; 8/18/2021) What is not even addressed is the effect of the shock wave that will occur from the launch of the Starship. Since the integrated Starship/Super Heavy will be twice the power of the Saturn V, that would make the “noise” at launch 230 decibels. At 190 decibels a shock wave occurs. This is not noise. Sound of this magnitude will deafen anything living in the area, and for animals, deafening is fatal. An EIS is needed to assess the adverse reaction of all species.

In the PEA Appendix E Section 4(f), p. 5-6, the FAA states that it is seeking input regarding the effect of road closures and other access restrictions and noise levels on the NWR. Unless an EIS is completed, how will this NWR assessment be implemented?

Section 2.1.3.7: SpaceX has not coordinated closely with USFWS and TPWD for debris removal to ensure minimal damage to the tidal flats. Previous debris removal of failed Starship landings has resulted in damage to refuge areas, particularly in tidal flats. This has demonstrated either a lack of an anomaly response plan, or a failure in implementation. In coordination with applicable agencies and organizations, an anomaly response plan that includes restoration strategies for damaged areas should be completed and included in an EIS. An EA without this plan fails to identify avoidance, minimization, and mitigation of impacts to the ecology and wildlife of the surrounding NWRs, violating NEPA.

Section 3.10.3.2 references the Marine Habitats and Wildlife impact assessment. This only addresses activities related to downrange recovery or landing of rockets in the Gulf of Mexico. The Essential Fish Habitat Assessment completely ignores the adjacent South Bay, which

provides EFH for a wide range of commercially/recreationally important fish and shellfish. It is also considered to be a nursery area for Atlantic bottlenose dolphins.

Section 3.10.4.1: An EIS is needed for SpaceX proposals particularly regarding impacts to wildlife from construction expansion of the VLA and construction of launch related infrastructure such as the power plant, LNG plant, and desalination plant and impacts on wildlife. The claim that SpaceX construction would be short term is not accurate as evidenced from non-stop construction operations since initial ground breaking at the Boca Chica site. Currently, it has been reported that increased traffic (e.g. SpaceX employees, workers contracted with SpaceX, visitors, etc.) and traffic exceeding the speed limit has led to an increase of wildlife mortality on State Hwy 4. An EIS is needed to account for all construction and operations, including a timeline of SpaceX proposals. Cooperating agencies should identify avoidance and mitigation strategies, as well as implement a plan for enforcement. To the north and south of State Hwy 4 is the Lower Rio Grande National Wildlife Refuge that provides habitat for federally Threatened or Endangered species. Without specifics of design plans and construction timelines, SpaceX's claim that construction impacts on habitats and wildlife are anticipated to be less than significant and that construction under the proposed action have a similar negligible impact is not substantiated.

In reference to contracting a qualified biologist for pre/during/post construction monitoring (Section 3.10.5), SpaceX does not identify who or what entity would be contracted. The Lower Rio Grande Valley Sierra Club recommends USFWS and TPWD be consulted and be responsible for selecting the qualified biologist (Coastal Bend Bays and Estuaries has been used in the past). Furthermore, the monitoring, documentation, and data particularly during bird migration season, needs to be openly shared with USFWS, TPWD, and openly published and accessible to the public.

3.12.4: Environmental Consequences: The determination that the *“Proposed Action is not expected to result in significant land use impacts because the Proposed Action is consistent with existing uses of land, would not change land use, and would occur according to existing plans and procedures”* is not substantiated due to inadequate and missing information about proposed infrastructure and operations. An EIS is needed to determine compatibility of land use and environmental consequences. For instance, the gas treatment and liquefaction (LNG) infrastructure and operations are not fully detailed. Potential land use conflicts arise with the source of gas and delivery of gas to the power plant and LNG facility which would likely require

a pipeline to go through either the Lower Rio Grande Valley National Wildlife Refuge, Boca Chica State Park, or Laguna Atascosa National Wildlife Refuge.

Section 3.9.4.3 p. 95: The determination that *“the Proposed Action includes all practicable measures to minimize harm to wetlands that may result from construction”* is erroneous and not substantiated. As stated in the PEA, *“Construction activities could also affect adjacent wetlands through ground disturbance activities and use of construction equipment”* is a recognition that all practicable measures to minimize impacts have not been taken. In fact, it is admitted to in the PEA that the USACE has not yet completed its evaluation of SpaceX’s proposed impacts and wetland mitigation pursuant to CWA section 404(b)(1) Guidelines (40 CFR 230) and section 404q.

PEA Section 3.10.4.1. Terrestrial Habitats and Wildlife. It is stated that the 2014 EIS speed reduction measures will be implemented to mitigate construction vehicle strikes and fatalities with wildlife. Unfortunately, the situation has gotten worse as vehicular traffic has increased. Roadkill events need to be quantified based on what has occurred so far with the current amount of vehicular construction traffic.

## ALTERNATIVES

The PEA should examine more alternatives, rather than just the “all or nothing” alternatives. One of the other alternatives that should be included in an EIS is moving the *testing of Super Heavy* to a designated large rocket testing site, such as Provo, Utah or Stennis AFB in Mississippi. The latter is where the Saturn V rocket was tested, and where the Space Launch Systems (SLS) rocket is currently being tested. Another alternative should include test launching Super Heavy offshore or from Cape Canaveral. Noted is a reference in Appendix A, page 3, indicating that NASA has already completed an environmental assessment for launching the Starship Super/Heavy at KSC “NASA.2019. Environmental Assessment for the SpaceX Starship and Super Heavy Launch Vehicle at Kennedy Space Center (KSC).<sup>4</sup> Alternatives considered are only those pertaining to launches/landings. Alternatives to minimize impacts of other operations have not been considered. SpaceX’s proposed operations include elements that are identified as necessary for their launch operations (identified in Table 2-1 p. 9) including, but not limited to, the power plant, and gas treatment and liquefaction. Alternatives to avoid, minimize and mitigate impacts from such elements of SpaceX operations have not been

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<sup>4</sup> [https://ntrspublic.grc.nasa.gov/main/20190919\\_Final\\_EA\\_SpaceX\\_Starship.pdf](https://ntrspublic.grc.nasa.gov/main/20190919_Final_EA_SpaceX_Starship.pdf) p256

considered. These elements to operations need more analysis to determine impacts and alternatives, particularly the source and delivery of natural gas for the power plant and natural gas treatment and liquefaction but also for other elements such as the desalination plant.

Other elemental alternatives not considered to reduce impact is off site parking lots and use of shuttle busses, carpools or vanpools. These alternatives would mitigate impacts to runoff, aquatic habitats, ongoing issues with traffic, violation of speed limits, and wildlife mortality on State Hwy 4. The proposed parking lot could potentially impact 14 acres of seagrasses that lie within 1 km to the north. Parking lot construction could result in increased sediment loading to Boca Chica Bay, potentially resulting in increased light attenuation on the seagrass beds. Seagrasses are highly sensitive to reductions in light availability. Dunton et al (2003) recommended no dredging within 1 km of seagrass beds in Laguna Madre.

## **LAWS AND REGULATIONS**

- Table 2-1 lists elements of the proposed action. SpaceX has already been constructing some of the infrastructure prior to approval of this PEA. As one example, SpaceX has been violating this by continuing to build infrastructure including a 450 foot integration tower. NEPA is very clear that project construction cannot begin (“irretrievable and irreversible commitment of resources”) until the environmental review is done. SpaceX must be held accountable for any and all NEPA violations for unapproved/permitless construction.
- SpaceX must be prohibited from operating in the Boca Chica / refuge area. 40 CFR1501.3 requires a full Environmental Impact Statement (EIS) because SpaceX’s activities violate strictly enforced federal law, the Refuge Improvement Act, which mandates that no use of the refuge is allowed if it is incompatible with purposes of refuge, which is conservation of lands for the benefit of wildlife. SpaceX’s activities are incompatible with the Refuge and must be disallowed altogether. Additionally, the Department of Transportation Act requires the consideration of natural resources during project development. 23 U.S.C. § 138 Federal regulations state that a constructive use of property protected by Section 4(f) occurs when a project does not incorporate land from a Section 4(f) property, but the project’s proximity impacts are so severe that the protected activities, features, or attributes that qualify the property for protection under

Section 4(f) are substantially impaired. Substantial impairment occurs only when the protected activities, features, or attributes of the property are substantially diminished. 23 C.F.R. § 774.15 identifies potential causes of constructive use include shifts in user population because of direct use of bordering properties, and/or non-physical intrusions such as noise, air pollution, or other effects that would substantially impair the resource's use." Constructive use is occurring around the SpaceX site with regards to accessibility to Boca Chica Beach, South Bay Coastal Preserve, Lower Rio Grande NWR, and Palmito Ranch Battle Field, and declining nesting of certain bird species in NWR areas near SpaceX as documented by the Coastal Bend Bays and Estuary Program. Section 4 (f) requires all possible planning to minimize harm resulting from the use; this has not been practiced, documented, or evidenced on the behalf of SpaceX or in the PEA. Furthermore, an accurate determination of impact is not achievable due to lacking information on elements of SpaceX's operations, and has thus failed to avoid, minimize, and mitigate impacts. A true and accurate finding of effects of SpaceX's proposals under Section 4(f) and Section 106 is not possible. In all of the foregoing, FAA is overstepping its statutory authority in making a compatibility determination. That is a call that only USFWS can make, not the FAA.

- The Endangered Species Act: the scope of activities vastly exceeds that to which the original biological opinion responds, since that opinion was issued for regular launches of a smaller, proven rocket only, not one in its testing and development phases, when explosions and failures are expected.
- Texas Open Beaches Laws are being violated. *Texas Constitution. Art. 1 sec. 33; 61 Tex. Nat. Res. Code Sec. 61.011: The public has an unrestricted right to use and a right of ingress to and egress from a public beach.* Closure of Boca Chica beach and State Highway 4 for SpaceX activities, deprives the public of the use of the beach, and therefore is in violation of the constitutional rights of the people of the State of Texas. Closures are also violations of Section 4(f) of Department of Transportation Act of 1966. Letters to the FAA from the Department of the Interior, dated January 10, 2014 and October 7, 2020 identifies the ongoing issues and lack of avoidance with regards to constructive use relating to closures.

- Part of the existing facility lies within Coastal Barrier Resources System Unit T12. Therefore, if this existing project includes any Federal funding, it would violate the Coastal Barrier Resources Act (CBRA). Similarly, if any Federal funding is involved in the current proposed expansion, it too would violate the Coastal Barrier Resources Act. Finally, FAA's statement that SpaceX intends to use the site to meet what it claims are official US space program goals, suggests that SpaceX intends to use the site to accomplish US government funded missions, which would appear to violate the CBRA. Violations may include federal funding of \$14.4 million.<sup>5</sup>
- Even more egregious, the PEA explicitly states that it is SpaceX's intent to participate in FEMA's National Flood Insurance Program (NFIP) (3.9.4.4 Floodplains; p. 98; 1st complete paragraph; 2nd sentence). Note that, *in particular*, the CBRS is intended to restrict the ability to obtain National Flood Insurance in CBRS units. The PEA must be revised to reflect this, and FAA must acknowledge that it is unacceptable for SpaceX to pursue Federal flood insurance for portions of the project that are on, or would be on, CBRS units. Regarding the following assertions, as stated in 3.9.4.4 p98: *"The design engineer will certify that the design elevation will withstand the depth and velocity of 100-year flood events (hydrostatic and hydrodynamic loads), any potential increase in wind load, or any other relevant load factors. Compliance with the NFIP as well as county regulations would ensure that the construction will have no significant impacts on floodplain storage and base flood elevations"*. This is not possible. The close proximity to the Gulf of Mexico shoreline and the extremely low topography surrounding the site, virtually guarantee significant damage to the existing and proposed facilities during future tropical storms, due to storm surge and overwash.
- 2.1.3.4 (p. 17): States SpaceX *"would develop appropriate sampling protocols and water quality criteria in coordination with the Texas Commission on Environmental Quality (TCEQ)"*. This is not the legal process as outlined in Texas Administrative Code Chapter 307. It is TCEQ, not SpaceX, that is responsible for sampling and water quality criteria. However, SpaceX would be required to monitor discharge in accordance to permit conditions as mandated by TCEQ. SpaceX determining their own protocols regarding sampling and water quality criteria is not in accordance with Texas Administrative Code.

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<https://spacenews.com/blue-origin-rocket-lab-spacex-ula-win-space-force-contracts-for-rocket-technology-projects/>



In the absence of design plans of elements of their proposals, a full accounting and disclosure of what the stormwater pollutant load might be is lacking. An EIS is needed to account for all elements which include various types of industrial activities.

- The USACE public notice for SpaceX's current application for a Clean Water Act Section 404 permit suggests that SpaceX's application may not be compliant with CWA Section 404(b)(1) Guidelines. SpaceX has not demonstrated required avoidance and minimization of impacts to aquatic habitats. They have not demonstrated required consideration of alternatives. They have not demonstrated that their proposal is the Least Environmentally Damaging Practicable Alternative (LEDPA), as required by the Guidelines. Nor have they provided the public with any information regarding proposed mitigation for unavoidable impacts to aquatic habitats.
- Considerations regarding alternatives are inadequate and have not been analyzed to the fullest extent as required by 2 U.S.C. 4332(E), 40 C.F.R. 1501.5(2), 40 C.F.R. 1501.5(4), Section 102(2)(E) of NEPA.

## **OMISSIONS**

The following documents were referenced, but not provided in the PEA. Without access to these documents, the public can only speculate as to their existence and efficacy, and therefore makes them unenforceable.

1. Anomaly Response Plan
2. Security Plan
3. Fire Mitigation and Response Plan
4. Applicable Site Plans
5. Facility Design and Lighting Plan
6. SpaceX Roadway Closure and Traffic Control Plan
7. Flight Package Safety Data
8. Closure Notification Plan
9. Speed Monitoring Plan (at construction and operations site)
10. The Communication Process, or Plan, with the GLO, TPWD, and USFW for Debris Removal
11. Spill Prevention, Control, and Countermeasures (SPCC) Plan

12. Mitigation Plans for identified filling or destruction of wetlands
13. Stormwater Pollution Prevention Plan (SWPPP)
14. Safety Risk Analysis (missing from Draft EA)
15. Hazard Risk Analysis (missing from Draft EA)
16. Identification of the emergency response team. (Are public resources used? if so, what is the cost to Cameron County?)
17. The Letter of Agreement which outlines procedures and responsibilities applicable to operations including notification of launch activity; communication procedures prior to, during, and after a launch; planning for contingencies/emergencies; NOAA issuance; and any other measures necessary to protect public health and safety.

Lacking the proof of existence, creation, or updates to the aforementioned plans, the prevention, response, avoidance, minimization, or mitigation to impacts cannot adequately be determined. Additionally, phrases used such as “to the extent practicable” makes plans and operations unenforceable, such as found in the PEA’s light plan. These phrases are vague, lack detail, and are open to interpretation. Due to the lack of the inclusion of the aforementioned plans and language in reference to the plans, an EIS is needed.

Thank you for holding this important Public Hearing and giving the public an opportunity to comment on the Draft PEA.

Respectfully,

Patrick Anderson, Chair  
Lower Rio Grande Valley Sierra Club

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**From:** Sid Maddock <[REDACTED]>  
**Sent:** Monday, November 1, 2021 7:57 PM  
**To:** SpaceXBocaChica  
**Cc:** Bryan Winton  
**Subject:** Maddock comments on SpaceX DPEA  
**Attachments:** SpaceX.MaddockDPEA.final.pdf

Dear Ms. Zee:

Attached please my comments on the SpaceX Draft Programatic EA.

Sidney Maddock

Sidney Maddock



Via email to: [SpaceXBocaChica@icf.com](mailto:SpaceXBocaChica@icf.com)

November 1, 2021

Ms. Stacey Zee  
Federal Aviation Administration  
SpaceX PEA  
c/o ICF, 9300 Lee Highway  
Fairfax, VA 22031

Dear Ms. Zee:

I submit the following comments to the Federal Aviation Administration (“FAA”) in response to the “Draft Programmatic Environmental Assessment for the Starship/Super Heavy Launch Vehicle Program at the SpaceX Boca Chica Launch Site in Cameron County, Texas (2021)(“DPEA”).

The existing and proposed rocket testing, launch, and landing facilities will adversely impact nationally significant wetlands and mudflats, as the existing and proposed facilities are just outside of the nearby Lower Rio Grande Valley National Wildlife Refuge (“Refuge”) and Brazos Island State Park Boca Chica State Park and Brazos Island State Park (“Parks”). The SpaceX activities are incompatible with and directly threaten the integrity of the Refuge and Parks due to a wide range of direct and indirect adverse impacts to listed and unlisted species and nationally significant shorebird and waterbird habitats. Also, the significant SpaceX closures forced on the Parks and Refuge result in violations of Section 4(f).

The DPEA raises particular concerns regarding compliance with the requirements of the National Environmental Policy Act (“NEPA”). The DPEA fails to disclose the direct, indirect, and cumulative impacts of the proposal as required by NEPA. Critical issues are addressed in a conclusory manner without adequate references to support the claim or are not addressed at all. Most fundamentally, the FAA’s action to approve SpaceX constructing a major industrial facility to test, launch, and retrieve one of the world’s biggest rockets next to nationally significant shorebird habitats clearly would be a major federal action significantly affecting the human environment. The FAA should prepare an environmental impact statement (“EIS”) if it intends to proceed with issuing any additional launch approval to SpaceX.

I focus my comments on the threatened Piping Plover (*Charadrius melodus*) and other shorebirds or colonial waterbirds and briefly address other issues. My comments are based on field research on nonbreeding Piping Plovers that I started in 2002, including visits to the Refuge

to conduct research three different winters and another fall. I am a co-author of 5 different peer reviewed published articles on nonbreeding Piping Plovers and I also have worked with breeding shorebirds and colonial waterbirds.

## 1. The Alternatives Analysis is Unduly Narrow

The FAA continues to display inappropriate deference to SpaceX and adopts an alternatives analysis that is unduly narrow. This undue deference is not new. As I noted in a previous comment to the FAA, the FAA alternatives analysis in the 2014 EIS was drafted in a manner that inappropriately favored selection of the Boca Chica Site. (FAA: 2014 at 2-26 – 2-31).

In the DPEA, the FAA devotes about a page and a half to the alternatives that were considered but eliminated from further consideration. DPEA at 34-35. The DPEA states that “SpaceX determined that the action alternatives must meet the following criteria:” DPEA at 34. The FAA, not SpaceX, should determine the suitable criteria for the selection of alternatives.

The DPEA lists 5 factors. One is particularly telling. The FAA notes:

**“Proximity to SpaceX’s Starship/Super Heavy Manufacturing and Production Facilities** – To minimize delay during the program development and operational phases, Starship/Super Heavy test and launch operations must be located near Starship/Super Heavy manufacturing and production facilities” DPEA at 35 (bold in original).

This factor makes a mockery of NEPA’s alternatives analysis requirement by ensuring that there are no other suitable alternatives to Boca Chica. The FAA should require an analysis that takes a hard look at other alternatives including existing launch facilities that are far more suitable than a 44 acre inholding surrounded by a National Wildlife Refuge and Parks.

## 2. Impacts on the Piping Plover

I am particularly concerned about the FAA’s lack of acknowledgement in the DPEA and Biological Assessment (“BA”) of the significant importance of the Boca Chica area<sup>1</sup> to the threatened Piping Plover and the FAA’s inaccurate review of the impacts of the rocket activities on the Piping Plover.

### A. Importance of Boca Chica to the Piping Plover

The FAA’s inadequate review of the importance of the Boca Chica area to piping plovers is long standing. The 2014 EIS has one page (2014:3-75) that briefly discusses general information about the Piping Plover and just three sentences on surveys at Boca Chica Beach, “Boca Chica Flats” and South Bay. One page is a map of the (2014: 3-76) of the Piping Plover Critical Habitat. In addition, there is less than a page in total of discussion (2014: 4-61 – 4-62) in the

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<sup>1</sup> As used in this letter, “Boca Chica area” includes the Boca Chica beach as well as the flats that are south and north of Highway 4.

Environmental Consequences section. One significant claim of the FAA deserves to be highlighted: “Based on recent migratory and wintering surveys for piping plovers conducted within the Lower Laguna Madre region in south Texas, the piping plover is not known to use the areas within the ROI in large numbers (Zdravkovic and Durkin 2010)” (2014: 4-62). “ROI” is defined as “Region of Influence” (2014: xii).

In previous comments submitted within the last year, I raised significant concerns about problems with the 2014 EIS discussion of impacts on the piping plover. The 2014 EIS purported to rely on the conclusions of Zdravkovic but did not even accurately cite the conclusions of Zdravkovic and Durkin (2011), who note: “South Bay also supported significant concentrations of Piping Plovers, with 59 birds during migratory surveys and 30 during winter surveys” (2011: 12). Table 1 lists migrating Piping Plover survey results including 59 at “South Bay”, 2 at “Boca Chica, Gulf Beach”, 5 at “Boca Chica Flats”, and 23 at “Mouth of the Rio Grande” (2011: 13). Table 2 lists wintering Piping Plover survey results including 30 at “South Bay”, 0 at “Boca Chica, Gulf Beach”, 11 at “Boca Chica Flats”, and 0 at “Mouth of the Rio Grande”. Zdravkovic and Durkin stated that there were “significant concentrations” of Piping Plovers at South Bay while the 2014 EIS claimed they found that the Piping Plover is “not known to use the areas within the ROI in large numbers.” The 2014 EIS clearly misrepresents the findings of Zdravkovic and Durkin. In addition, the FEIS downplays, in the Environmental Consequences analysis (2014: 4-62), other Piping Plover survey results which found much higher numbers of Piping Plovers in the area (2014 EIS at 3-75).

Based on surveys that I and others have done, the Boca Chica/South Bay/flats south of HWY 4 area historically is one of the most important areas in the world for wintering Piping Plovers. During a February 23, 2009 survey for Environment Canada, I observed 239 Piping Plovers using the flats of the South Bay area (Maddock 2010). For Piping Plovers, that is an extremely large number. Most of those Piping Plovers that were counted that day were visible in one area while they were feeding during one continuous scan of the spotting scope. In addition, due to running out of time to complete the survey that day, I was not able to cover all visible available habitat to the south; it is likely Piping Plovers were missed during my count. It also should be noted that those birds were seen in an area that is less than two miles long. Contrary to the claims of the FAA EIS, the South Bay/Boca Chica Beach/Flats south of Highway 4 area has extraordinary value for wintering Piping Plovers.

I am not the only one to observe large numbers of Piping Plovers in this area. During 3 nonbreeding seasons, Zonick (2000) studied Piping Plovers along the Texas Gulf Coast at 18 sites including two sites at South Bay. At the South Bay East study site, for abundance, he found a mean of 22.6 Piping Plovers and a maximum of 254 Piping Plovers. It is unclear why FAA would not have included the Zonick data in its analysis.

Based on the Piping Plover surveys I have done at South Bay and elsewhere in Texas, as well as the studies of others in Texas and elsewhere, it can be very difficult to obtain an accurate number for Piping Plovers at a particular site, especially if a limited number of surveys are done or the person doing the survey is not experienced. While Piping Plovers have very high fidelity to a wintering site (Gratto-Trevor et al. 2011), the Plovers can move frequently between the habitats



at the site (Cohen et al. 2008). A range of factors can influence habitat use including water level and human disturbance. In the South Bay area, I observed Piping Plovers fly between the Gulf beach and interior flats and also between the interior flats north and south of Highway 4. It may appear to be easy to drive along the Boca Chica beach counting Piping Plovers. However, because of the large expanse of habitat and the challenging substrate, the interior flats north and south of Highway 4 are one of the most difficult spots to survey accurately of the hundreds of sites that I have surveyed for wintering Piping Plovers. It is not surprising that a single day count of part of the area could provide a result that is not accurate for the area because of significant detection difficulties for this challenging area.

Despite the data and other information I have provided to the FAA in previous comments about SpaceX, the DPEA and BA still contain many of the same errors as the original 2014 EIS. For example, the BA notes:

“Based on recent migratory and wintering surveys for piping plovers conducted within the Lower Laguna Madre region in south Texas, the piping plover is not known to use areas within the action area in large numbers (Zdravkovic and Durkin 2011).”

BA at 64. I pointed out to the FAA how the 2014 EIS misrepresented Zdravkovic and Durkin (2011), yet the FAA commits the same error yet again in the BA, which is concerning. In addition, the DPEA ignores the data from Maddock (2010) and Zonick (2000), data that give a more accurate picture of the importance of the area to piping plovers.

I recently obtained a copy of Newstead and Hill (2021), which examines the Piping Plover population abundance, trend, and survival at Boca Chica from 2018-2021. I understand this analysis has been provided to the FAA. This analysis further underscores the importance of the Boca Chica area to wintering piping plovers and raises serious concerns about the current status of the plovers wintering at Boca Chica.

## B. Human Disturbance Associated with the Rocket Activities

After the Piping Plover was listed federally under the provisions of the ESA, there was an increased understanding of how human disturbance could adversely affect productivity which in turn influenced if the population was increasing or decreasing. Across the breeding range, in areas with high disturbance, there were efforts to manage that disturbance in many ways by installing symbolic fencing around nesting areas to keep humans away from nests and chicks, limiting or prohibiting dogs, not allowing feral cat colonies to be located near nesting areas, restricting or prohibiting recreational off-road vehicle use, prohibiting fireworks displays near nesting areas, as discussed in the Piping Plover (*Charadrius melodus*) Atlantic Coast Population Revised Recovery Plan (USFWS 1996) and other conservation documents issued by the USFWS.

The BA repeatedly makes statements regarding disturbance that minimize the impacts of the proposed rocket activities to piping plovers without providing appropriate supporting documentation:

“The small amount of critical habitat that would be affected by the Proposed Action would not affect the recovery of the species. There is other habitat nearby that the piping plover could use.” BA at 64.

The FAA does not indicate what “habitat nearby” means, nor does the FAA provide any data to support the claim that piping plover “could use” other “habitat nearby.” Gratto-Trevor et al. (2011) showed high fidelity of Piping Plovers to their wintering site, and Gibson et al. 2018, quoted below at length, discuss how piping plovers at high disturbance sites have lower annual survival rates, and that while “site fidelity was slightly lower in disturbed areas relative to less disturbed areas, fidelity to their non-breeding grounds was high”.

“Noise associated with the engines and pre-launch operations may cause individuals to disperse from the area prior to being affected by the heat plume.” BA at 65.

No data are presented to support this claim for piping plovers.

“In addition, human presence and vehicular traffic is already prevalent within the project area since Boca Chica Beach is a popular recreational area.” BA at 65.

As someone who actually did Piping Plover surveys at Boca Chica beach and the interior flats south and north of HWY 4, I can say that while I have observed low or moderate human disturbance levels at Boca Chica beach, I have not seen even low human disturbance during the surveys I did of the interior flats south or north of HWY 4. People are not ordinarily walking around out in the mud flats as sinking deep in mud is neither easy nor particularly fun. Disturbance levels associated with observed rocket cleanup activities are much higher than what occurred prior to SpaceX, as shown by the photographs of cleanup activities that I will be submitting to the record.

“Noise from launch operations would extend into piping plover habitat and most likely temporarily displace piping plovers. However, these impacts would be short term as noise levels associated with testing and launch operations would last a few minutes.” BA 65.

No data are provided to support the conclusion that any displacement of piping plovers would be “temporary.” As noted above, the Newstead and Hill (2021) analysis suggests the FAA’s claims on this critical issue are inaccurate.

Based on a previous ESA section 7 consultation between the USFWS and National Aeronautics and Space Administration for proposed launches at the Wallops Flight Facility, Virginia, and potential effects to piping plovers, the USFWS concluded that launches were not likely to jeopardize the continued existence of the piping plover (NASA 2005).

BA at 64. This conclusion fails to acknowledge that the USFWS had a concern that take would occur of piping plovers as a result of launch activities. This is a significant omission that once again raises concerns about the integrity of the analysis.

Over the last 15 years, there has been a growing understanding by agencies, scientists, and resource managers of the risks posed by human disturbance to nonbreeding Piping Plovers and an increased effort to address the adverse impacts caused by such disturbance. In a study of Piping Plovers wintering on Atlantic Coast beaches, Gibson et al. (2018) note:

“Our study provides evidence that anthropogenic disturbance is negatively associated with body condition, non-breeding demographic rates (e.g., local population growth rates), and annual demographic processes (e.g., survival) for piping plovers. During the non-breeding season, the southeastern Atlantic Coast hosts > 50% (relative to postbreeding abundance) of critically endangered Great Lakes breeding population of piping plovers, with > 30% occurring within our study system (Gratto-Trevor et al. 2012). Thus, anthropogenic disturbance in this system may disproportionately influence the population trajectory or sustainability of the Great Lakes piping plover population. Although site fidelity was slightly lower in disturbed areas relative to less disturbed areas, fidelity to their non-breeding grounds was high, and largely similar to estimates of breeding site fidelity (Cohen et al. 2006; Cohen and Gratto-Trevor 2011; Catlin et al. 2015). Therefore, management objectives based on the expectation that piping plovers will move to better non-breeding habitats if their current habitat is disturbed will not be successful, despite the apparent benefits to survival of moving. However, management actions that identify and limit anthropogenic access to critical foraging or roosting areas during the nonbreeding season may increase functionally available habitat, and potentially improve body condition and survival rates of non-breeding piping plovers. Annual survival rates at certain wintering sites were extremely low for piping plovers ( $S < 0.50$ ) relative to published estimates of true survival ( $S = 0.71\text{--}0.76$ ; LeDee et al. 2010; Cohen et al. 2006; Catlin et al. 2015). Additionally, because new individuals consistently recruit into these low survivability sites, these areas apparently remain attractive sinks to piping plovers. Thus, conservation actions may be required to reduce the impact of these sink habitats on overall population dynamics. Finally, the associations among non-breeding conditions, body condition, and demography highlight the importance of non-breeding habitats on annual population dynamics of a migratory species. Conservation strategies focused solely on breeding season dynamics for migratory species are potentially not accounting for some of the mechanisms influencing individual demographic rates and, ultimately, population trajectory.”

Gibson et al. considered pedestrians, dogs, and vehicles as potential sources of disturbance, so it is not exactly comparable to launching, landing, and blowing up rockets. What type of disturbances actually are worse for the Piping Plover however, remains to be answered, despite the original EIS being released in 2014. In addition, the Gibson et al. study is important as it provided evidence that human disturbance is associated with body condition and survival rates for non-breeding Piping Plovers. It also is very important for the observation that low survivability sites may continue to have recruitment of piping plovers and remain population sinks. Thus, if there were take of Piping Plovers due to SpaceX activities, such take could go undetected based just on surveys for overall numbers.

### C. Inadequate Piping Plover monitoring effort

The SpaceX funded Piping Plover monitoring effort is not adequate to identify and address impacts associated with SpaceX activities on the threatened Piping Plover. The current monitoring methods cannot answer all the relevant questions that need to be addressed. These flaws are compounded by arbitrary and increasing access restrictions that make it almost impossible to carry out adequate field research activities.

I have reviewed the Pre-Construction Species Monitoring Survey report (Hicks et al. 2015) as well as two later reports by Hicks et al. (2017, 2020) and have multiple serious concerns about the methodology and implementation of the monitoring effort:

1. “Each survey, covered a specified route, took place over 1-2 days, and was separated by ca. 8 days to avoid autocorrelation.” (Hicks et al. 2015 at 1). The report also states “[a]ctual survey routes tracked the water’s edge, while avoiding damage to algal flats.” (At 2). In the context of existing habitat conditions at South Bay Route and the Las Palomas survey routes where the water’s edge quickly can move over a mile in response to wind driven water levels over the flats, I do not understand how these statements are consistent. I have seen the area of standing water over a mile to the north of HWY 4 and other times a mile to the south against the HWY 4 and the nearby upland vegetation line, depending on the wind direction, wind intensity, and amount of time the was blowing. Either a survey route was followed, or it was not. As discussed below, this issue influences the detection levels of Piping Plovers using the area.
2. The area of South Bay where I saw the largest number of Piping Plovers during my February 23, 2009, Piping Plover survey (Maddock 2010) is not included in the monitoring transects or even close to a monitoring transect. This raises concerns about the adequacy of the survey transect locations to accurately represent Piping Plover use of the area.
3. The “Las Palomas” and South Bay survey routes “were surveyed by all-terrain-vehicle (ATV), given the large areas and inaccessibility of the area by truck.” Hicks et al. 2015 at 2. It is unclear from the report from the biologists if ATV use may have resulted in disturbance that flushed Piping Plovers and affected the number of Piping Plovers that was observed.
4. It is unclear if practical limitations on ATV use - to keep the ATV from getting stuck in muddy substrate in South Bay and Las Palomas - allowed the observer to get close enough to detect Piping Plovers in the area. I used an ATV for only one survey on the South Bay flats and I kept having to leave the ATV in drier areas and walk, sometimes hundreds of yards from the ATV, through the sinky muddy areas to get safely close enough to the feeding Piping Plovers for accurate observation with a spotting scope. After that one experience I didn’t use an ATV again at South Bay. The possibility of increased total coverage distance on the ATV was outweighed by concerns about much lower detectability levels for Piping Plovers in the area.

5. The report notes that “[g]iven our optics, we were usually able to identify target species within a 150m radius of the actual route traveled and thus a significant portion of each 500m[squared]quadrat was sampled with our protocol.” Hicks et al. 2015 at 4. Depending on the type of habitat the Piping Plovers are using in South Bay, that statement may not be accurate. During one survey of South Bay that I walked, I observed a flock of Piping Plovers resting between the curled-up pieces of desiccated (dry) algal mat. These Piping Plovers were almost invisible even with the high-power Swarovski spotting scope that I use: only the tops of the heads of a few birds were visible. And unless Piping Plovers resting under similar conditions were disturbed by the ATV, the birds probably would not be visible at 75m and it is highly unlikely they would be observed at 150 meters unless the observer was highly skilled, knew exactly where to look, took the time to look carefully, and carefully approached the resting Piping Plovers to get a more accurate count.
6. The report notes that the observer looked for banded Piping Plovers and recorded band information. Early Piping Plover banding efforts used unique or non-unique combinations of a color flag, metal band, and color bands or spit or triple split bands. More recently, most banders (other than the Great Lakes and SUNY) have gone to using a flag on the upper leg (tibia) with an alphanumeric code, with some of those banders also using color bands and some not using any bands on the lower legs (tarsus). The coded flags are much more difficult and often take more time to read accurately, and even old-style flags/band combinations are difficult to read accurately on wintering Piping Plovers at more than about 40-45 yards. The level of detection of banded Piping Plovers and accurate observation of the bands/codes will be influenced by how far the observer is away from the bird. 50 to 150 meter observation distances are clearly not adequate to detect and read most Piping Plover flags/color bands under field conditions.
7. “These preliminary surveys yielded observations of banded Piping Plovers and Red Knots within the impact area (Figs 2-3) that were excluded from the main statistical analysis presented in the Results, but are nonetheless noteworthy.” At 4. It would have been much more helpful to have an analysis that includes counting of unbanded Piping Plovers, banded Piping Plovers (with color flags/bands recorded), and Piping Plovers that could not be fully scanned for color bands. Such an approach would have allowed a more accurate estimate of the population of Piping Plovers of the area using modeling efforts.
8. The survey transects received dramatically different levels of monitoring efforts, with interior flats survey routes north (South Bay and Boca Chica routes) and south of HWY 4 (Las Palomas Route) being subject to much lower levels of observer effort than the survey route out on Boca Chica beach. In the 2016-2017 surveys, the beach survey route was surveyed 20 times between December 2, 2016 and June 7, 2017. Over the same period, the Boca Chica-South Bay and Las Palomas survey routes each were surveyed 7 times. (2017: at 3, 2). In the 2017 surveys, which were conducted between July 17, 2017 and September 25, 2018, the beach was surveyed 20 times and the Las Palomas, South Bay, and Boca Chica routes each were surveyed 3 times (2018 at 3, 2). In 2020, between August 1 and November 25, 10 surveys were conducted on the beach, 4 surveys were

conducted on the Las Palomas route (south of HWY 4), and only 1 survey was conducted on the Boca Chica and South Bay routes (Berg et al. 2020).

9. The USFWS, in a comment letter to FAA, notes:

“Although monitoring sites established in the general area may be of great learning experience for undergraduate studies at the University of Texas at Brownsville, the pre-construction and operational monitoring must follow peer reviewed protocols. Protocols and monitoring should be developed and monitoring conducted by experts within the field, as findings of the baseline monitoring will lead to adaptive management decisions by the Service, SpaceX, and FAA.

During the original consultation, SpaceX agreed to hire two biologists. These biologists would be Refuge- hired employees, located at the Refuge, and would monitor and collect data outlined in the BO for the life of the project. The University of Texas at Brownsville was asked to do pre-construction baseline studies until the biologists could be hired. The hiring of the biologist has not occurred, because FAA states it was an agreement between the Refuge and SpaceX, not FAA. Additional biological monitoring needs are necessary to collect vegetation data associated with larger rocket engines and different fuel type associated with tests, launches and releases of any kind. We recommend FAA reconsider funding the biologists as SpaceX proposed.”

(FAA 2020a, Attachment 1, Service #5). As I have noted above, based on my extensive experience conducting wintering Piping Plover surveys, the South Bay area is a particularly challenging area to conduct such surveys. The use of undergraduates to conduct monitoring efforts is not commensurate with the complexity of the area and the importance of accurate monitoring efforts to addressing SpaceX impacts.

10. Under the monitoring conducted by Hicks et al., there was no banding of Piping Plovers in the project area; no use of radio-telemetry transmitters to track Piping Plover movements inside or outside of the project area; and no use of a control area which would allow comparisons to the study area. Using these methods before and after the initiation of rocket activities would have cost more money than the limited monitoring effort that was performed. However, these methods would have allowed more accurate analyses of apparent number, survival, detectability, and disturbance issues that are related to better understanding the impacts of rocket activities.

I am not questioning the integrity or effort of the biologists who have done the monitoring studies. Rather, I am questioning whether SpaceX has given the biologists who are conducting the monitoring effort sufficient funds, adequate access, and enough time to allow them to properly and accurately address the impacts of SpaceX on Piping Plovers and other shorebirds. If SpaceX provides inadequate funding, we should not be surprised that the existing monitoring activities do not adequately address the significant issues raised by the rocket activities.

Despite the concerns I have raised, I would note that Hicks et al., based on their surveys, observe that Piping Plovers have “congregated in three areas of special significance” and all of those areas are near SpaceX facilities:

“In Fig 1.6 we mapped results from all surveys between 2015-2020, which indicates that larger congregations of target species are congregated in three areas of special significance, given their proximity to the launch site, as well as the control and building sites: 1) the mudflats located immediately north of the Launch Site is a site of high density of wintering Piping Plovers and spring-breeding Snowy Plovers; 2) south of the launch site is also an area of high density of Piping Plovers and Snowy Plovers; and 3) the area of mudflats north of the Control Site is an area of high density Red Knots, Piping Plovers and Snowy Plovers (Fig. 1.6).”

(Hicks et al. 2020: 8). At least two of these three areas are relatively close to the launch site and within the area that could be adversely impacted by the launch activities; depending on the distance of the debris field, it is possible that the third area also may be impacted, given the report of a piece of debris from SN11 falling five miles from the launch site.

#### D. Inadequate review of direct, indirect, and cumulative impacts of SpaceX rocket activities

To date, there has been an inadequate environmental review of the adverse environmental impacts from SpaceX’s activities involved in constructing, moving, launching, flying, and landing rockets and the impacts associated with cleaning up rocket crashes and explosions from the Boca Chica rocket facility. There is a multi-decade history that undoubtably establishes that launching rockets into space is an inherently dangerous activity. Yet, FAA’s 2014 EIS, only spends a few pages discussing the possibility of rocket explosions and the adverse environmental impact of such explosions. The FAA, while it notes that a launch failure may occur, dismisses the possibility of a crash as “unlikely” 5 different times (2014 EIS at 2-15, 4-41, 4-57, 4-73, 481).

In contrast, the actual activities of SpaceX at Boca Chica demonstrate a unique ability to have spectacular launch failures. It is noteworthy that 8 of the recent launches or tests have resulted in the destruction of the rocket. Wikipedia (2021). Of particular concern, are the four most recent massive uncontrolled explosions that have taken place.

The wide area covered by debris from failed launches raises significant concerns about adverse environmental impacts. The explosion of SN 11 on March 30, 2021, which occurred at altitude and not on the launch pad, merits particular attention, as large amounts of debris uncontrollably fell outside of SpaceX property on to public conservation lands, including high value, ecologically sensitive habitats that are used by the Piping Plover, Wilson’s Plover, and Snowy Plover.

A video available on-line at YouTube shows numerous debris pieces from SN11 scattered in the VLA area, including some massive pieces of the rocket, as well as pieces scattered to the north of



the VLA (RGV Aerial Photography 2021a). Another post, accompanied with an aerial photograph, states that the “furthest piece of Starship SN11 (visible) made it as far as ~ 817m (red box) at SpaceX South Texas Launch Site” RGV Aerial Photography 2021b). In addition, according to a report, a piece of explosion debris from SN11 was recovered five miles away from the launch facility. “One bystander found a piece of the charred rocket about five miles outside the Boca Chica facility. ‘Found this...tank insulation? #SN11 It came from the sky, is warm, and smells like fuel of some sort,’ reads a post shared to Twitter with a photo of them holding part of the fallen rocket” (Liberatore 2021).

In the context of the South Bay area, significant adverse impacts from SpaceX activities may include:

The FAA stated in the 2014 EIS that “Launch activities would have minimal impacts to vegetation from potential fire. Fires are unlikely since launch activities would occur over concrete pads with no surrounding vegetation” (FAA 2014: 4-65). In 2019, the FAA noted in an Addendum to the Written Re-evaluation that:

“During a small hop test in July 2019, a brush fire occurred near the launch pad. The fire was an unexpected incident and the SpaceX operations team notified the Brownsville Fire Department to assist with the incident. Given the pre-established safety zone for the hop test, there were no public safety concerns. The 2014 EIS characterized the potential for wildfires as low, but did state fires could occur from an explosion on the pad or an unplanned anomaly. SpaceX has implemented fire mitigation measures to reduce the risk of another wildfire. These mitigation measures are described in SpaceX’s draft *Fire Mitigation and Response Plan* (Fire Plan; August 2019; attached).”

(FAA 2019b: 1). The DPEA notes “Changes to terrestrial habitat structure might occur from fire in small areas adjacent to the launch mount and landing pad. Vegetative land cover in these areas is classified as barren or grasslands, both of which would recover quickly post-fire. “ DPEA at 112.

However, the ecological impacts to the Refuge and Parks of fires from rocket explosions and the procedure to address fires from explosions are much more complex than what the FAA has disclosed in its review documents. As USFWS has noted in public comments submitted to the FAA:

“On July 25, 2019, a burn occurred after a rocket test. It occurred at approximately 11:30 pm and burned about 10 to 15 acres of Boca Chica State Park, a property owned by TPWD but managed by the Service. The Refuge was not notified until the next day and by that time, the fire was smoldering and flared up and had burned approximately 130 to 135 acres more. Fire engines had gone off road and had gotten stuck causing damage to refuge lands. On August 2019, 6.2 acres were burned and debris was scattered on Refuge lands. Firefighters were not allowed to enter the area for three hours because of the type of fuel that was used.”

(FAA 2020a: Service #4). First, note that firefighters were not allowed to enter the area for three hours “because of the type of fuel that was used.” The USFWS comment raises very significant concerns about toxic contamination of Refuge and Park lands including wetlands and mudflats. Why is SpaceX allowed to use *any* hazardous chemicals that would result in discharges to and contamination of high value Refuge or Park lands?

Second, what risks do such toxic contaminants pose to shorebirds and waterbirds? Snowy Plovers, Wilson’s Plovers, and Piping Plovers feed on invertebrates that are found on or just under the surface of the mud flats, algal mat flats and wetlands surrounding the VLA. If contamination poses a risk to humans, what is SpaceX going to do to protect the area’s wildlife and how are they actually going to clean up contamination?

Third, the fire engines “got stuck causing damage to refuge lands.” At first, it is hard to believe someone actually would take a fire engine (or fire engines, plural?) into an area and get stuck, especially the wetlands/mudflat areas around the VLA which are commonly known to be very soft and hazardous to vehicles. But this actually raises a serious question about how SpaceX realistically can respond to fires, given that SpaceX has knowingly chosen to launch rockets into an area that is surrounded by thousands of acres of publicly owned or managed high value mudflats, algal mat flats, and wetlands. As discussed below, 2021 demonstrated that SpaceX rockets are going to explode and crash. If SpaceX can’t launch their rockets in a manner that doesn’t damage Refuge and Park lands, SpaceX shouldn’t be allowed to launch rockets at Boca Chica.

The 2014 EIS states that “Operation of the vertical launch area and control center would not result in impacts to tidal sand flats or mud flats” (FAA 2014: 4-11). I previously submitted detailed comments where I noted the FAA’s statement is inaccurate, based on adverse impacts to Refuge or Park lands from rocket launch explosions. SpaceX is launching massive rockets to very high altitudes from the Boca Chica facility. If rocket debris land in the Refuge or Parks, the debris may land in locations where it is very difficult to clean up and remove the debris without causing additional environmental damage. In many areas, a person can’t just drive a truck out to pick up the debris.

Perhaps sensing the clear inadequacies of the EIS considering more recent on the ground SpaceX experiences cleaning up rocket debris from crashes, the FAA gives slightly more attention to this issue in the DPEA. However, the discussion still has significant errors or omissions. The FAA claims, in discussing “anomalies,” – the destruction of the rocket – that:

“Anomalies would not result in a permanent incorporation of Section 4(f) properties. A Starship/Super Heavy anomaly could result in an explosion on the launch pad, which would spread debris. Debris would be expected to be contained within the flight hazard area established for the mission. In the event of an anomaly, a limited number of SpaceX staff would enter the debris field and conduct an initial evaluation. Following the initial evaluation of the area, SpaceX would coordinate with applicable landowners or public land-managing agencies (e.g., TPWD and TGLO) prior to cleanup, in order to minimize damage to sensitive resources in accordance with SpaceX’s Anomaly Response Plan. The

method of debris removal would be assessed on a case-by-case basis and would be coordinated with applicable landowners or public land-managing agencies. SpaceX would consult TPWD and/or USFWS prior to any activity that may impact sensitive wildlife habitat. SpaceX would enter Section 4(f) properties on foot as much as possible and coordinate the use of vehicles with applicable landowners or land-managing agencies to minimize impacts. SpaceX would perform an initial assessment of the debris to geotag and pick up debris by hand. Once the parking lot is constructed, SpaceX would not allow employees to park along SH 4 near the VLA. SpaceX would attempt to remove all debris by hand and carry out on foot. If SpaceX could not remove debris by hand, SpaceX would coordinate the use of equipment or vehicles with applicable landowners or public land-managing agencies. SpaceX would not use motorized vehicles on the mud flats and would stay within established paths. SpaceX would continue to use an Alaskan freight sled to remove larger pieces on foot. TPWD has approved this method to minimize impacts to resources.”

As discussed below, these claims are inconsistent with SpaceX’s documented cleanup activities as well as what is known about impacts to listed species and algal mats. For example, the DPEA states above that vehicles “would not use motorized vehicles on the mud flats” yet as documented in pictures of and emails regarding cleanup activities and fire prevention activities that is exactly what SpaceX has done.

FAA further claims in the DPEA:

Occupancy of the Section 4(f) properties would be short term, and there would be no permanent or residual effects to the properties lasting beyond the occupancy. Both algal flats and lomas typical of the surrounding area can recover naturally after disturbances similar to those that would be expected from debris and removal activities associated with any anomalies. For example, the public has regularly driven on and across Boca Chica State Park and other surrounding areas for decades, without causing any permanent adverse impacts.... Restoration with respect to algal flats may include grooming of tracks with the use of hand tools and ambient soils to prevent further impacts, removing fill, establishing the proper slope within the tidal range, and inoculating the soils with a mixture of the dominant algal species following methods proposed by the U.S. Department of Interior (U.S. Department of the Interior 2021, Lee and Lee 2000, Suzuki 2004).

For the FAA to compare the impacts of driving on an algal mat flat to driving on a sand beach is a ridiculous comparison to anyone who is familiar with the sensitivity of algal mats (and also ignores extensive data about the adverse impacts of beach driving), and the FAA does not provide data to support the claim that natural disturbances are similar to the removal of thousands of pounds of rocket debris using dozens of people and off-road vehicles. Likewise, I request that the FAA specifically provide a detailed list to date all “restoration” efforts that SpaceX has implemented to restore the functions and values of algal mat flats that were damaged by “restoration” activities and the measurements that demonstrate the actual success of such

activities. A few SpaceX employees going around with a shovel to try to fill in a few holes where debris landed is not adequate to address the widespread damage that occurred to the algal mats.

Of particular concern is that the DPEA does not acknowledge the unproven nature and limitations that the DOI acknowledged about algal mat restoration in the report cited by the FAA in the paragraph above. The DOI notes:

The project proponents acknowledge, however, that restoration of wind-tidal flats has not previously been attempted within Padre Island National Seashore, and restoration of wind-tidal flats in the surrounding area has never been attempted. A literature search revealed that very few restoration projects of wind-tidal flats have been conducted in the United States, Canada, and Japan. Those projects that were undertaken focused on man-made habitats, rather than natural habitats. Though **there are no established or standard methods to restore this type of wetland**, NPS has considerable knowledge and tools that have been used for similar restoration

DOI at 6 (bold added). A surprise is the first example offered by DOI in the next sentence is a beach “restoration” project at Cape Hatteras National Seashore. I live on Hatteras Island and am familiar with the beaches here due to the piping plover surveys I have done here, and I am very surprised to see that project on a high energy sandy beach is considered helpful to a project involving a very different habitat type: a low energy wind tidal algal mat mud flat. Yet again, however, the DPEA makes a critical point purporting to show how SpaceX will address known impacts – this time about restoring algal mat flats – and fails to acknowledge that at least one of the cited sources mentions the experimental, unproven nature of the restoration proposal.

Much of the South Bay area near the launch area as well as the area south of Hwy 4 is a muddy substrate that is so sinky that it is not possible in certain areas or under certain conditions for an ATV, UTV, an automobile or truck even using four-wheel drive to travel across that substrate without getting deeply stuck in the mud. Anyone with experience operating a vehicle in coastal Texas knows the risks of traveling in these habitats. Yet SpaceX employees apparently have not learned about the habitats in which they have chosen to work. A satellite image released by the USFWS in response to a FOIA request shows, at 26.003382 -97.158092, the gps location for “SpaceX stuck Vehicles”. The file date on the saved file is “4-21-2019” which is five years since the 2014 EIS was issued. In a comment letter from USFWS to the FAA in response to the draft written re-evaluation, the USFWS noted “On April 22, 2019, SpaceX employees went off-road and got a golf cart stuck in the tidal flats on Refuge land. They attempted to remove the golf cart and in doing so got an additional truck and forklift stuck in the same area. The Refuge was not immediately contacted. Damage accrued to sensitive mudflats which provide shorebird habitat.” FAA 2020a, quoting USFWS Comment). It is extraordinary that SpaceX would allow vehicles to travel out into these locations. Such activities demonstrate at best a basic lack of understanding of the ecology and geology of the area and at worst a complete disregard for the environmental values of the area.

Issues regarding adequacy of debris and chemical contamination response are complicated considerably by the fact that depending on the location and a range of factors such as wind

direction, wind speed, amount of time that the winds may be higher, and water levels and flows in the Rio Grande, the flats north and south of the VLA can be dry or slightly wet one day with no standing surface water and under several inches or more of water the next day. It is hard enough to recover debris if it is a moist mudflat. What happens if there is 6' of water on the flat. How will the contaminants be remediated if they seep into the mudflats or algal mat flats? I did field work for Virginia Tech, which was a contractor for USFWS in the National Damage Resource Assessment Process, assessing the impacts of the Deepwater Horizon oil spill on Piping Plovers, so I have seen the considerable difficulties associated with the cleanup activities. What may sound like a good "plan" in theory can face considerable difficulties when it comes time to execute the plan in the field.

Issues regarding damage from the cleanup of exploded SpaceX rockets are not hypothetical. In a March 9, 2020, email from the USFWS to SpaceX, released in response to a FOIA request, the USFWS noted:

"Would it be possible to meet you at Boca Chica this Thursday sometime to take a look at the debris removal from the refuge/Boca Chica State Park, from the February 28, 2020 10pm explosion?

I would like to assess the level of impact to the vegetation and alkaline flats resulting from dragging the debris to the road.

When we met on-site (Monday, March 2, 2020 at 10:30am), we viewed the 3 pieces of metal debris, and recommended that the 2 smaller pieces (closest to the road), be dragged out carefully over the vegetation, and that the largest piece be cut into pieces and removed by helicopter, as was originally recommended by you, Randy. On Friday, March 6, 2020 at about 4:15pm I received a call from you stating the helicopter option was not going to be feasible due to high winds, uncertainty of debris weight, and because additional refuge lands would be needed for the helicopter to take off/land from, and because bird nesting has already begun, this would likely cause an unacceptable level of disturbance. So, during this call, I gave you permission to proceed with using a winch truck or cable to drag the pieces of debris from within the refuge. I viewed this 'cheaper' 'faster' option as beneficial to both Space-X and the refuge because of the unneeded attention the debris was causing. The rationale was to expedite the removal, before bird nesting occurred in the vicinity of the debris.

Now that there have been 2 explosions, with debris both times in pretty much the same area, I want to meet with you and discuss remedies for the damage to vegetation and ruts created in the alkaline flats. I would also like to see the refuge cable fence damaged during the removal process repaired."

(Email from Bryan Winton, USFWS, to Randy Rees, SpaceX and others, March 9, 2020). Likewise, in 2021, the USFWS noted:

"SpaceX rocket debris falling onto the Refuge has damaged the sensitive wind tidal flats. And, the vehicles or machinery used to retrieve rocket debris have created ruts and caused other damage that interrupts water sheet flow across these flats... Anomalies resulting in explosions on November 20, 2019, February 28, 2020, and December 9, 2020

resulted in debris scattered onto refuge managed lands. Retrieval methods damaged the sensitive alkaline flat and refuge cable fencing installed to protect the area from disturbance.

(USFWS 2021: 2). The cited USFWS documents provide evidence not only of the damage caused by SpaceX activities but also the difficulty associated with cleaning up the mess and the additional damage caused by cleanup activities. What happens when SpaceX launches a rocket and the debris lands at a greater distance where a winch truck or cable are not able to be used? What happens when SpaceX launches a much larger rocket, and it crashes? The 2014 EIS does not acknowledge such damage. And the subsequent FAA Reevaluations also do not adequately address these environmental impacts. In response to the USFWS comments, FAA only states:

**“FAA Response:** We appreciate these comments. The FAA and SpaceX look forward to discussing a damage assessment protocol with you. SpaceX is open to working with you to establish compensation for Refuge damages caused by SpaceX anomalies. Please reach out to Matt Thompson of SpaceX at [REDACTED]

This response is inadequate from the standpoint of the environmental review processes that are required under federal law.

I am particularly concerned that any vehicles that are used to recover crash debris or that travel into the flats near South Bay or the flats south of Highway 4 without an understanding of the area could travel over and damage ecologically significant algal mat flats. This type of habitat is very valuable to feeding Piping Plovers; is very easily damaged by ORV activity; and takes years if not decades to recover. For this reason, the Department of the Interior, National Park Service, Padre Island National Seashore does not allow any recreational vehicle use on the bay side mud flats and algal mats at the Laguna Madre side of the barrier island. How will the USFWS protect valuable algal mat substrates if a huge rocket explodes during launch or landing and a large amount of rocket debris is scattered across algal flats habitats? It isn't possible to operate a vehicle on algal mat flats without impacting the algal mat, and the DPEA does not adequately address this critical issue. Damage to the algal mats clearly is incompatible with the purposes for which the Refuge and Parks were founded. As SpaceX cannot prevent such damage from occurring when cleanup activities occur in these habitats, this significant, foreseeable impact should be reason to deny the launch license.

### 3. Impacts of hurricanes on SpaceX rocket activities

A photograph of the VLA with a nearby fence suggests the area appears to have been elevated to approximately the height of the surrounding fence, possibly around 6 to 8 feet above ground level. This facility is only about 3/10<sup>th</sup> to 4/10<sup>th</sup> of a mile away from the Gulf of Mexico, and while there are dunes, the facility is almost directly open to the path of storm surge waters due to the HWY 4 access to the Gulf beach. In addition, there are multiple industrial buildings associated with SpaceX activities in Boca Chica Village.

The Gulf of Mexico is known for high levels of hurricane activity. Unfortunately, hurricanes in the Gulf can result in a 10 to 20 foot storm surge and associated waves that destroy almost all human built structures that are in the path. Larson (1999) provides a detailed account of the Galveston hurricane of 1900. In one neighborhood, the tide was 15.2' deep during the storm and "still rising" (Larson 1999: 189). From my work doing nonbreeding Piping Plover surveys, I regrettably have come face to face with the horrendous impacts hurricanes can cause, having seen the impacts from multiple storms including Hurricane Ike on the Bolivar Peninsula, TX, which destroyed most of the homes in the town of Gilchrest, TX. Ike was a Category 2 storm when it hit, not a Category 4 or 5. Almost all people who have lived through such hurricanes say that they "can't believe" how horrible the devastation is, and they "never thought it would happen" to them.

From the picture of the launch pad area, it appears a 15 to 20 foot storm surge would destroy the launch pad and associated facilities. Such a storm surge is foreseeable if a major hurricane hit the Boca Chica area. NOAA has released National Storm Surge Hazard Maps which depict storm surge inundation and risk for Category 1-5 hurricanes. National Storm Surge Hazard Maps – Version 2, at <https://www.nhc.noaa.gov/nationalsurge/> (accessed April 3, 2021). The Corps, FAA, and USFWS should very carefully review the NOAA inundation level maps for the VLA and the buildings in the Boca Chica area from a Category 3, 4, and 5 hurricanes. It is important to note that the SLOSH model used by NOAA "Does not model the impacts from waves" and "There may be waves on top of the surge." NOAA, "Storm Surge Frequently Asked Questions," <https://www.nhc.noaa.gov/surge/faq.php> (Accessed April 3, 2021). Thus, there would be additional wave impacts in addition to the surge impacts that have to be considered in addressing hurricane damage levels. Based on both historical information and computer modeling by NOAA, it is foreseeable that the storm surge from a major hurricane could severely damage or destroy the VLA and associated SpaceX industrial and buildings in Boca Chica Village. The CWA and NEPA permit process should fully evaluate the storm surge and wind impacts from various strength hurricanes to the SpaceX facilities; any hazardous or toxic wastes as well as non-toxic debris that would be discharged from storm surge or high winds associated with hurricane landfall; and any steps that would be necessary to conduct cleanup activities from the damage caused by a hurricane.

#### 4. Impacts of erosion and sea level rise on rocket activities

I live on a barrier island off the mainland of North Carolina. An area about two miles from my house has lost over 1,000 feet of ocean beach to erosion in the last 130 years. Over the years I have done winter Piping Plover surveys and returned to sites in subsequent winters, I have seen high erosion levels in many other areas. In addition, erosion levels are increasing in areas due to sea level rise. Even if the VLA somehow manages to stay above the rising sea level, HWY 4, the road to the SpaceX launch facility, will be subject to overwash and inundation much sooner due to its low elevation. The SpaceX Boca Chica facilities remind me of another area on the Gulf where I did Piping Plover surveys, specifically the areas of Grand Isle and the area near Port Fourchon, LA. A long, elevated bridge that cost of millions of dollars had to be constructed to replace the low elevation LA 1 road which was becoming increasingly unusable from flooding



events. LA 1 reminds me of HWY 4 near Boca Chica Village, where I have seen water a few feet from the roadway on days with a hard north wind. Likewise, beach renourishment projects costing millions of dollars had to be constructed to protect properties and infrastructure in those areas in LA that I am mentioning. For both the road and the beach renourishment projects in LA, taxpayer funding was used. In the future, what activities will have to be taken to protect the SpaceX facilities? How will those activities affect Piping Plover habitats, which rely on dynamic coastal forces to maintain habitat characteristics? Will there be efforts to stabilize the area around the SpaceX VLA and control area using seawalls, rip rap, or beach renourishment? At Wallops Island, Virginia, which also is a rocket launch site, NASA has undertaken shoreline “restoration” and beach renourishment activities that include the reconstruction of a beach, berm, and dune that will help to absorb and dissipate wave energy before it nears NASA infrastructure, and a rock seawall embedded within the dune that will protect against the most severe energy (USFWS 2016). I am very concerned that SpaceX is embarking on a path that eventually will result in huge sums of taxpayer money having to be spent to protect a private industrial facility that never should have been built in such a very high risk coastal location.

5. Impacts of rocket activities on public access to the Parks and Refuge and violations of Section 4(f).

The FAA has gone from purportedly authorizing 180 hours per year of road/refuge closures discussed in the EIS, to 300 hours per year as discussed in a Project Revaluation, and now is proposing 800 hours per year (500 for nominal operation plus 300 for “anomalies”) DPEA at 19-25. It is extraordinary that a private corporation with a 50 acre inholding can force state parks and a National Wildlife Refuge to close, not only to the general public, but also even to U.S. government officials who work on and manage the refuge for the U.S. Fish and Wildlife Service.

My previous comments noted how SpaceX has not followed the procedure to issue and implement closure orders.

These concerns include: The Cameron County Commissioners Court first is supposed to issue a closure order then SpaceX closes the area. However, there are reports of SpaceX or local law enforcement closed the area before the time authorized in the Cameron County closure authorization. On Thursday, March 11, 2021, “Police/security began turning people away at 10:48 a.m. today (despite the closure notice saying it wouldn’t begin until 12:00 p.m.). The beach has been closed since 10:48 a.m. Whether you say it reopened after that, and is now closing again, it was effectively closed since 10:48 a.m” (Newstead 2021).

In response, the Texas General Land Office forwarded the email to the Cameron County Commissioners Court. An attorney with the Court responded:

“As we have discussed in the past, the road closure cannot begin until the time period specified by the Judge’s Order. Based on the wording of the complaint, it appears as if it might have either been our deputies or SpaceX personnel, though I tend to believe it was SpaceX personnel.

If it was our deputies, please inform them of the order and not to do this again in the future, even if they are directed to by SpaceX. And if SpaceX pushes back, please have them contact me so I can explain to them the criminal implications of obstructing a highway without legal authority. I have discussed this issue at great length with the DA's office and anticipate the prosecutors will be ready to take any appropriate action if necessary."

Email from Daniel Lopez to Luis Mendieta and others, March 12, 2021. The existence of these problems in March, 2021, suggests that SpaceX does not take the closure procedures seriously.

Second there are significant concerns regarding the manner in which closures are calculated. The DPEA states:

For purposes of the PEA, the FAA defines an operational closure as follows:  
A closure begins when local law enforcement, under the direction of an order from the Cameron County Commissioners Court, shuts down SH 4 and Boca Chica Beach for a tank test, wet dress rehearsal, static fire engine test, or launch. A closure ends when the operation is completed and local law enforcement opens SH 4 and Boca Chica Beach. The FAA does not have a direct role in approving road and beach closures. Therefore, closures that are planned but not implemented (e.g., Cameron County revokes the closure) do not meet the FAA's definition of a closure for this PEA. For an operation requiring a closure, SpaceX would coordinate with Cameron County under the authority granted in the 2013 Memorandum of Agreement between the TGLO and Cameron County (TGLO 2013). (DPEA at 19-20).

The major problem with FAA's interpretation is that it underestimates the effect on the public of the announced closures so that the actual number of closure hours appears to be much lower than how the public acts under real world conditions. When the Cameron County Commissioners Court issues a time for a closure, that is the time the public follows. No one is going to take the time to drive to Boca Chica Beach when they know a particular time for a closure has been announced – say 12:00 p.m. to 8:00 p.m. – when there has been a formal closure announcement. Effectively, for the public, the area has been closed for that 8 hour period of time, even if SpaceX delays the closure of the area or does not go forward with the launch.

It is important to emphasize that I am not raising concerns about only a few minutes of difference in the total closure amounts. There is a major discrepancy between USFWS and SpaceX closure hour calculations. As noted by the USFWS, "In 2019, the USFWS recorded over 1,000 closure hours and SpaceX reported a total of 158 hours" (USFWS 2021: 2). Letter from Manuel "Sonny" Perez III Complex Refuge Manager, South Texas Refuge Complex, and Charles Ardizzzone, Project Leader, Texas Coastal Ecological Services Office, USFWS, to Daniel P. Murray, Manager, Safety Division, Federal Aviation Administration (January 22, 2021).

The FAA has a duty under NEPA to address the closure procedures and measurements. But for the FAA launch authorization, these closures would not occur. The FAA cannot continue to accept unsubstantiated or inaccurate SpaceX claims about closure amounts.

6. To Comply with NEPA, the Corps must prepare an Environmental Impact Statement to analyze the environmental impacts of SpaceX's activities.

The National Environmental Policy Act (NEPA) is "designed to prevent agencies from acting on incomplete information and to 'ensure that important effects will not be overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast.'" *Sierra Club v. U.S. Army Corps of Engineers*, 295 F.3d 1209, 1214 (11th Cir. 2002) (quoting *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989)) (internal quotation marks omitted). NEPA obligates the Corps to prepare an Environmental Impact Statement if "any significant environmental impacts might result" from the issuance of a permit. *Sierra Club v. Peterson*, 717 F.2d 1409, 1415 (D.C. Cir. 1983); 42 U.S.C. § 4332(2)(C). To evaluate whether a potential impact is "significant," the Corps should analyze both the context in which the proposed action would take place and the intensity of its impact. 42 U.S.C. § 4332(2)(C). "Considering context is critical because the significance of an action can vary based on the setting and surrounding circumstances." *Am. Rivers v. Fed. Energy Regulatory Commission*, 895 F.3d 32, 49 (D.C. Cir. 2018).

"Intensity" concerns "the severity of impact." 40 C.F.R. § 1508.27(b). NEPA regulations prescribe several factors that can make a proposed project significant from an intensity standpoint, including the following:

- "Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, ... wetlands... or ecologically critical areas;"
- "The degree to which the effects on the quality of the human environment are likely to be highly controversial;"
- "The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks;"
- "The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration;"
- "Whether the action is related to other actions with individually insignificant but cumulatively significant impacts;"
- "Whether the action will violate other environmental statutes;"
- "The degree to which the action may ...cause loss or destruction of significant scientific, cultural, or historical resources;" and
- "The degree to which the action may adversely affect an endangered or threatened species or its [critical] habitat."

40 C.F.R. § 1508.27. In assessing the context and intensity of a proposed action, the Corps must consider all related actions together. In other words, "[l]arge projects may not be artificially segmented into smaller ones for the purpose of avoiding NEPA or minimizing the appearance of adverse environmental impact." *Colony Fed. Sav. & Loan Ass'n v. Harris*, 482 F. Supp. 296, 302 (W.D. Pa. 1980). As the regulations state, "[s]ignificance cannot be avoided by terming an action temporary or breaking it down into small component parts." 40 C.F.R. § 1508.27(b)(7).

As discussed above in extensive detail, SpaceX's proposed activity meets every one of these criteria, due to significant adverse impacts to a range of listed and sensitive species, public Refuge and Park lands, habitats of national importance, and recreational access limitations

associated with increasing SpaceX closures. The FAA must prepare an EIS that evaluates the entire SpaceX project at Boca Chica.

## 7. Conclusion

The Boca Chica area is a nationally significant shorebird habitat. The construction and operation of a massive industrial facility to assemble and launch one of the world's largest rockets into space is fundamentally incompatible with one of the most incredible shorebird wintering areas in the United States. The FAA should not grant a permit for the SpaceX Starship/Superheavy launch vehicle program at Boca Chica.

Sincerely,

Sidney B. Maddock

Copy: Brian Winton, USFWS (by email)

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**From:** MailCenter\_VA01  
**Sent:** Monday, November 1, 2021 11:24 AM  
**To:** SpaceXBocaChica  
**Cc:** MailCenter\_VA01  
**Subject:** Mail Center Document Services  
**Attachments:** DHR\_Health.pdf

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ENVIRONMENTAL SPECIALIST  
900 LEE HIGHWAY  
FAIRFAX, VA 22031

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October 26, 2021

Federal Aviation Administration (FAA) c/o ICF  
Attn: Ms. Stacey Zee  
Environmental Specialist  
9300 Lee Highway, Fairfax, VA 22031

Dear Ms. Zee:

DHR Health would like to express our enthusiastic support of SpaceX's application to the Federal Aviation Administration (FAA) to conduct Starship orbital launch operations from Starbase in Cameron County, Texas.

We see many parallels between the way SpaceX conducts business and the way our health system does. Since opening our doors in the Southern Texas region in 1997, we have been committed to excellence, investing hundreds of millions of dollars to bring the most advanced health care services to our patients and eliminating the need for our community to travel hundreds of miles to receive the health care they need and deserve. Most recently, DHR Health was designated as a Level I Trauma center, the highest designation possible, and the first and only in the region to reach this milestone. This is the same mentality that SpaceX has, consistently pushing the bounds of technology in order to accomplish things previously thought impossible.

Another parallel between DHRHealth and SpaceX is the spirit of giving back to the community. We have supported our communities through our employees, who have given over 50,000 hours of community service since 2013, by raising millions of dollars for the Renaissance Cancer Foundation and the HOPE Family Health Center, a charitable free clinic for the indigent, and by directly giving back over \$8 million in philanthropic activity and donations. Similarly, SpaceX has positively impacted the local community through educational opportunities for students, employee volunteer and outreach events, and wildlife conservation efforts.

Finally, both DHRHealth and SpaceX have become job staples in the community. Our health system employs over 5,000 people locally, and Starbase is rapidly approaching that number with 1,500 employees in just a few short years. This has a massive economic impact, fostering opportunities and stimulating economic growth throughout the region.

We are thrilled to have SpaceX as a part of the community, and excited about all the future growth the company could bring to Cameron County. We fully trust that SpaceX will continue their efforts to limit environmental impact and look forward to having them as a historic partner in the region. For these reasons, we request that the FAA please approve SpaceX's application. Please do not hesitate to reach out to me if I can provide additional information at [REDACTED] or by email at [REDACTED]

Very Respectfully,

A handwritten signature in black ink, appearing to be "H. A.", is written over the typed name.

---

**From:** MailCenter\_VA01  
**Sent:** Monday, November 1, 2021 7:25 AM  
**To:** SpaceXBocaChica  
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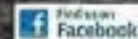
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# TEA PARTY IN SPACE



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EDUCATING THE PUBLIC ON LIMITED GOVERNMENT, FISCAL RESPONSIBILITY, AND FREE MARKETS IN U.S. SPACE POLICY

Ms. Stacey Zee  
SpaceX PEA  
c/o ICF  
9300 Lee Highway  
Fairfax, VA 22031

October 28, 2021

Ms. Zee

Thank you for allowing our organization to comment. The greatest accomplishment of the United States of America is the participation of the citizens in all levels of government. Public hearings are the cornerstone of the People's Republic. It is a great honor to be a part of history, a history that will start today as we reach for the heavens on a daily basis. Space Exploration Technologies, Space X, is the harbinger of that coming day, where routine travel from Earth to other points in the solar system and beyond becomes common place.

Today's assessment is about the environment. Our fragile Earth, our home, a pale blue dot in the vastness of a void so great, one can only say with solid assurance, every answer we seek is 'out there'. Those in all disciplines of science point to space to study what ails our planet and seeks solutions. The plans of SpaceX at Boca Chica bring our nation, and of course humanity as a whole, accelerated answers to our everyday problems, including what and how to keep our Earth a functioning "Gala".

We must weigh our concerns about local environmental impact to the lofty problems of geopolitics. Who will be first to settle the Moon or Mars? China, through its actions, does not hide its desire to use the Moon as a military asset. A long-sought goal of every modern military is a weapon called, mass driver. Launching a projectile from 203,000 miles to any point in the United States would jeopardize not only the wildlife and exotic plant life around Boca Chica, but anywhere within our borders, and all life as we know it. Our entire ecosystem is a target.

The SpaceX stated goal is to ensure a multi-planet species. It is in the best interest of the freedom loving United States to do whatever it can as a government entity, as a people, to assist in this goal. Boca Chica is 'ground zero' for the future of our planet. So often is the case that government is more a hinderance than a help. It is up to the Federal Aviation Administration to not allow itself to be such a hinderance to national security, private investment, or simply advancement of American exceptionalism.

TEA Party in Space, TPIS, for more than eleven years has assisted in advancing the principles of limited government and private entrepreneurial investment in U.S. space policy. Our work to change ITAR allowed the commercial satellite launch industry to return to the U.S., an industry that SpaceX now thrives. TPIS can only ask the FAA to heed the Republic's founding principles of limited government, and let SpaceX carry our great nation into the next chapter of our evolution. A chapter that may just solve many of our environmental concerns.

A true attest

Gary Anderson  
National Coordinator & Director of Operations

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**From:** JASON NORWOOD <[REDACTED]>  
**Sent:** Monday, November 1, 2021 7:11 PM  
**To:** SpaceXBocaChica  
**Subject:** My support for SpaceX

To whom it may concern,

I totally support the SpaceX project and adding starbase to the map of Texas. I know SpaceX is great for the community of South Texas and especially Brownsville. I'll be at there are some environmental concerns, space it seems to do all they can to adhere to the rules and stipulations. SpaceX is such a forward thinking company and futuristic in its own right, yes we don't even know what the rules and guidelines should be. This doesn't mean we should block progress! There's plenty of room in South Texas to grow together with SpaceX South Padre Island Brownsville Harlingen McAllen, can you even imagine what it will be like in 10 years? Well I'll tell you one thing, I bet Elon has imagined Starbase and the valley's future together alongside with the EPA, FAA, Surfrider Foundation 🌊 and many other environmental groups. Additionally, NASA has inspired so many kids and adults alike to not only to reach for the stars, but take a minute and look up at the stars 🌠 More rules and regulations are not the answer. Let's make education, equality, progress and the freedom to take calculated risk a priority in South Texas. Let's work with SpaceX and learn together not limit one another.

Have you ever seen a kids face when he looks up at a real rocket?  
Pure joy and amazement 🚀  
That's how I feel too.

Jason Norwood

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**From:** Jerry Schafer <[REDACTED]>  
**Sent:** Monday, November 1, 2021 11:42 AM  
**To:** SpaceXBocaChica  
**Subject:** NextDecade Comments on FAA's Draft Programmatic Environmental Assessment for SpaceX Starship/Super Heavy Project at the Boca Chica Launch Site  
**Attachments:** PEA\_NEXT Comments\_(11.1.21) IVDW.pdf

To Whom It May Concern,

The attached document is hereby submitted in response to the Federal Aviation Administration's ("FAA") Draft Programmatic Environmental Assessment ("PEA") on the SpaceX Starship/Super Heavy Project at the Boca Chica Launch Site in Cameron County, Texas, and "potential alternatives and impacts ... affecting the quality of the human environment."

Note: The concerns we expressed during the scoping period on January 22, 2021, were not largely incorporated into the Draft PEA. We ask that the FAA give thorough consideration to the concerns raised in the attached document as the final PEA and any follow-on environmental impact statement is developed.

Please acknowledge receipt of this email.

Respectfully,

Jerry Schafer  
Director, Regulatory and Permitting

NextDecade Corporation  
[REDACTED]  
[REDACTED]

[REDACTED]  
[REDACTED]



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November 1, 2021

**RE: FAA Draft Programmatic Environmental Assessment (PEA) for the SpaceX Starship/Super Heavy Launch Vehicle Program – Rio Grande LNG Comments**

To Whom It May Concern:

We are writing in response to the Federal Aviation Administration's ("FAA") Draft PEA on the SpaceX Starship/Super Heavy Project at the Boca Chica Launch Site in Cameron County, Texas, which was signed on September 16, 2021. The public review and comment period has been extended by the FAA until November 1, 2021.

We understand that the FAA has utilized a "Programmatic" Environmental Assessment ("EA") given that the proposed Starship/Super Heavy launch operations from the SpaceX Boca Chica Launch Site will be conducted on a recurring basis and that each launch operation is likely to result in substantially similar impacts. According to guidance issued by the Council on Environmental Quality ("CEQ"), the Programmatic EA "must [therefore] provide sufficient detail to foster informed decision-making that reflects broad environmental consequences from a wide-ranging federal program."<sup>1</sup>

NextDecade previously submitted comments on January 22, 2021, in response to the FAA's December 22, 2020, announcement that the agency was holding a public scoping period to determine the scope of issues for analysis in the Draft PEA. In these previous comments, we suggested that particular focus be placed on: (1) frequency and scope of launch operations and consistency with maximum number of launches assessed in the FAA's June 2014 final EIS; (2) Emergency response and planning; (3) offshore area clearing and facility closures; and (4) storage and handling of propellant fuel.

Upon review of the Draft PEA, many of these issues would seem to require further clarification or analysis. In fact, with the exception of the concern stated in Section 1.4, "Closure of public areas such as local roads and Boca Chica Beach," it does not appear that the FAA accounted for NextDecade's expressed concerns in the Draft PEA at all.

Of particular concern, the Chapter 1 Introduction of the Draft PEA includes the statement that "SpaceX does not have the full details of all its planned operations at this time." If the FAA cannot analyze the full environmental impacts because the full details of SpaceX planned operations are not yet known, then it is unclear how this Draft PEA can "foster informed decision-making that reflects broad environmental consequences from a wide-ranging federal program[.]" as required by CEQ. It also is unclear how the FAA can evaluate the scope of impacts in this EA and reach a finding of no significant impact, and presents serious challenges to the safe and efficient construction and operation of critical infrastructure in the region. The frequency and scope of launch operations assessed in the Draft PEA have clearly exceeded those contemplated in the 2014 EIS, illustrating the ineffectiveness to date of "tiering" environmental reviews by the FAA. In effect, the analysis in the 2014 EIS and this draft PEA demonstrate that SpaceX and FAA are improperly and artificially segmenting this Federal action into

<sup>1</sup> [https://www.energy.gov/sites/prod/files/2016/05/f31/effective\\_use\\_of\\_programmatic\\_nepa\\_reviews\\_18dec2014.pdf](https://www.energy.gov/sites/prod/files/2016/05/f31/effective_use_of_programmatic_nepa_reviews_18dec2014.pdf)

smaller components to escape the full application of NEPA and a hard look at significant impacts. In light of this, the FAA must complete an EIS and provide complete details of all planned SpaceX operations so that a thorough and meaningful environmental review may be conducted at this stage, upon which stakeholders can base sound decisions.

As stated in our January 22, 2021, comments, the plans and conclusions of multiple federal agencies and community stakeholders as they relate to the safe coexistence of SpaceX with Rio Grande LNG were formulated in reliance on the FAA's statements regarding the "maximum 12 annual launch operations ... including launches of the Falcon 9, a maximum of two Falcon Heavy launches, and/or associated mission rehearsals and static fire engine testing, through the year 2025."<sup>2</sup> Section 2.1.3.3 of the Draft PEA states that "SpaceX is proposing to conduct up to 20 Starship suborbital launches annually." Section 2.1.3.4 of the Draft PEA states that "SpaceX is proposing to conduct up to five Starship/Super Heavy orbital launches annually." Therefore, launch operations that could potentially hinder the construction and operation of Rio Grande LNG have more than doubled from 12 to 25. In light of this increased activity, we strongly suggest that a launch failure analysis for the Starship/Super Heavy Project should be performed by the FAA.

Of specific concern with the increased annual launch activity is the ambiguity related to the impact on the Brownsville Ship Channel (BSC) (sometimes wrongly referred to in the 2014 FEIS and the Draft PEA as the Brownsville "Shipping" Channel). The 2014 FEIS stated categorically that the BSC "would not be affected by the closure." This has now changed in the Draft PEA. Section 2.1.3.5.1 of the Draft PEA states, "The Brownsville Shipping Channel would be temporarily restricted during orbital launches and some suborbital launches, but not restricted during tank tests, wet dress rehearsals, or static fire engine tests." The Draft PEA arbitrarily concludes without any meaningful analysis that this impact is insignificant.

For instance, by way of comparison, Section 3.8.3.2.1 of the Draft PEA states the following about parks and management areas, including beaches:

The proposed launch activities related to Starship/Super Heavy would have temporary, intermittent impacts on the access and availability of the parks and management areas identified as Section 4(f) properties.

And then goes on to explain:

The closures for Starship/Super Heavy operations would occur on an intermittent basis, up to 500 hours per year, and would be temporary. Additional environmental review will be required should the FAA learn from Cameron County that it will close its roads and beach access in excess of 500 hours. Assuming normal availability of the Section 4(f) property, the proposed closure hours would result in the Section 4(f) property being closed to the public up to 11.4 percent of the year.

Despite these impacts to Section 4(f) properties, FAA concludes:

Based on the temporary and short duration of the closures, the FAA has made a preliminary determination that the scheduled closures associated with launch

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<sup>2</sup> [https://www.faa.gov/about/office\\_org/headquarters\\_offices/ast/environmental/nepa\\_docs/review/launch/spacex\\_texas\\_launch\\_site\\_environmental\\_impact\\_statement/](https://www.faa.gov/about/office_org/headquarters_offices/ast/environmental/nepa_docs/review/launch/spacex_texas_launch_site_environmental_impact_statement/)

operations of the Proposed Action would not substantially impair the activities, features, or attributes that qualify the state parks, historic resources, and Preserve for protection under Section 4(f) within the study area.

The Draft PEA does not even contain this level of analysis for the BSC, which at least based on the Draft PEA presumably also would be closed for 500 hours annually, which amounts to approximately 11% of the entire year. This is not insignificant for BSC-dependent industries like Rio Grande LNG, and there is no justification for such a conclusion in the Draft PEA.

Even more problematic, however, is the FAA's failure to devote even this level of analysis anywhere in the Draft PEA on the impacts related to the BSC. Nowhere in the Draft PEA does FAA provide a hard look at the impacts to the Port of Brownsville (the "Port"), the fishing, commercial and recreational users in the area, and companies like NextDecade that rely on access to the BSC.

Despite this significant omission, the FAA concludes that "the Proposed Action does not involve activities anticipated to adversely affect existing economic activity, income, employment, population, housing, sustenance, public services, and social conditions." As part of its justification for reaching this arbitrary conclusion, FAA states that "SpaceX operations would not result in the closure of any public airport during the SpaceX operation, nor would it so severely restrict the use of the surrounding airspace as to prevent access to an airport for an extended period of time." Yet the Draft PEA completely ignores the impacts to the Port and other entities that would use the BSC. Certainly, SpaceX would consider it a significant impact if its own operations were impeded. For example, Section 2.1.3.4 of the Draft PEA states "If a Super Heavy landing occurred downrange in the Gulf of Mexico on a floating platform, Super Heavy would be delivered by barge to the Port of Brownsville and transported the remaining distance to the Boca Chica Launch Site over the roadways." If these SpaceX activities and uses of the Port were impacted due to the operation of a nearby facility that caused similar closures of the BSC, SpaceX would demand a thorough analysis.

Additionally, Draft PEA Section 2.1.3.5.2 Waterway Hazard Warnings states the "proposed action would not require shipping lanes to be altered or closed." Given that the previous section states the BSC *would* be temporarily restricted, this suggests the BSC was not treated by the FAA as a waterway or shipping lane in the Draft PEA. Given the potential for up to twenty suborbital launches per year and the uncertainty as to whether the BSC would be restricted or not and for how long, the FAA should work with SpaceX to clarify these impacts. Rio Grande LNG (and the BSC more broadly) stands to suffer an unknown economic burden brought about by SpaceX disruption to shipping in the BSC.

"An environmental assessment that fails to address a significant environmental concern can hardly be deemed adequate for a reasoned determination that an EIS is not appropriate." *Foundation on Economic Trends v. Heckler*, 756 F.2d 143, 154 (D.C. Cir. 1985). As the Court of Appeals for the D.C. Circuit recognized in 1985, "[s]imple, conclusory statements of 'no impact' are not enough to fulfill an agency's duty under NEPA." *Id.* Here, the FAA has made conclusory statements regarding the "nominal" effect of ground closures and restrictions on the BSC without adequately addressing or explaining why these impacts will not be significant.

Moreover, the FAA and SpaceX inappropriately segmented the analysis of the facility from the 2014 EIS to this Draft PEA; and now for any future activities FAA and SpaceX are seeking to do the same in this

Draft PEA by avoiding an analysis of the direct, indirect and cumulative impacts of nominal closures of the BSC. Based on the history of this project since 2014, and the SpaceX statements about future development in the draft PEA, the FAA cannot simply kick down the road the required hard-look analysis, and make a finding of no significant impact “because the full details of SpaceX planned operations are not yet known.”

Rio Grande also notes that conspicuously missing from the draft PEA is a meaningful cumulative impacts analysis. The Council on Environmental Quality has long recognized, and continues to recognize, the importance of analyzing direct, indirect, and cumulative impacts.<sup>3</sup> The same can be said of the FAA.<sup>4</sup> “Cumulative effects are effects resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of who undertakes the other actions.”<sup>5</sup>

The Court of Appeals for the D.C. Circuit has held that

a meaningful cumulative impact analysis must identify (1) the area in which the effects of the proposed project will be felt; (2) the impacts that are expected in that area from the proposed project; (3) other actions—past, present, and proposed, and reasonably foreseeable—that have had or are expected to have impacts in the same area; (4) the impacts or expected impacts from these other actions; and (5) the overall impact that can be expected if the individual impacts are allowed to accumulate.

*Del. Riverkeeper Network v. F.E.R.C.*, 753 F.3d 1304, 1319 (D.C. Cir. 2014) (internal quotations omitted) (citing *Grand Canyon Trust v. FAA*, 290 F.3d 339, 345 (D.C. Cir. 2003)). “To satisfy ‘hard look’ review, an agency’s cumulative impacts analysis must contain ‘sufficient discussion of the relevant issues’ and be ‘well considered.’” *City of Boston Delegation v. F.E.R.C.*, 897 F.3d 241, 253 (D.C. Cir. 2018) (citing *Myersville Citizens for a Rural Community, Inc. v. F.E.R.C.*, 783 F.3d 1301, 1324-25 (D.C. Cir. 2015)).

In *Delaware Riverkeeper*, the D.C. Circuit found that FERC’s cursory statement that the connected pipeline projects were “not expected to significantly contribute to cumulative impacts in the Project area” did not satisfy the cumulative impacts test as enunciated in *Grand Canyon Trust*. *Id.*

The same is true here: the Draft PEA does not satisfy the *Grand Canyon Trust*’s cumulative impacts test. SpaceX estimates 500 hours of closures per year, which amounts to more than twenty full days of closure per year. The BSC and the Port tenants, including Rio Grande LNG and other businesses that critically depend on the BSC, will surely be impacted by over twenty full days of closures due to SpaceX launches. But the Draft PEA does not even acknowledge the presence of Rio Grande LNG or other Port tenants, let alone any impacts on the Port or BSC. Overall, the Draft PEA does not take a “hard look” at the effects of SpaceX’s operations and does not contain a “sufficient discussion” of relevant issues regarding potential impacts to the BSC and Port tenants. Thus, the Draft PEA’s cumulative impacts analysis is inadequate.

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<sup>3</sup> See, e.g., National Environmental Policy Act Implementing Regulations Revisions, 86 Fed. Reg. 55,757, 55,762 (Oct. 7, 2021), <https://www.govinfo.gov/content/pkg/FR-2021-10-07/pdf/2021-21867.pdf>.

<sup>4</sup> See, e.g., U.S. DEPT. OF TRANS., FED. AVIATION ADMIN., Order 1050.1F, Environmental Impacts Policies and Procedures (2015), [https://www.faa.gov/documentLibrary/media/Order/FAA\\_Order\\_1050\\_1F.pdf](https://www.faa.gov/documentLibrary/media/Order/FAA_Order_1050_1F.pdf).

<sup>5</sup> 86 Fed. Reg. 55,757 at 55,762.

Also missing from the Draft PEA is NextDecade's concern about the storage and handling of propellant fuel. To repeat the concern from our January 22, 2021, comments: energy infrastructure projects in South Texas have been subjected to appropriate regulatory scrutiny to ensure compliance and consistency with standards maintained by the Pipeline and Hazardous Materials Safety Administration and the National Fire Protection Association ("NFPA"), among others. While it is standard practice that facilities that store and utilize flammable liquids be required to model vapor cloud dispersion and design for blast overpressure, it is unclear to what extent NFPA reviews have been required of the SpaceX facility. It is also unclear what Process Safety Management guidelines have been incorporated in the design of the storage facility to accommodate requisite fuel quantities and conditions. Given the potential for now even larger quantities of fuel to be stored at the Boca Chica Launch Site, further modeling, review, and approval protocols must be applied to ensure the health and safety of the local community.

As set out in the Rio Grande LNG final EIS,<sup>6</sup> the construction schedule for Rio Grande LNG contemplates carefully integrated and phased interruptions based specifically on information provided by SpaceX to the FAA pertaining to the 2016-2025 period. FERC has approved our project siting, construction and operations, based on these representations by the FAA and SpaceX. It is our continuing expectation that any alterations to the SpaceX launch program will result in no greater impacts to Rio Grande LNG or the community than contemplated in the 2014 SpaceX EIS, including through restrictions to the BSC. Upon review of the Draft PEA, the concerns stated above and repeated from our January 22, 2021, comments suggest the FAA needs to clarify certain aspects of SpaceX's proposed operations and the Final PEA should include indication of the FAA's plan for further analysis in the form of a Notice of Intent to prepare an Environmental Impact Statement ("EIS").

Respectfully submitted,

A handwritten signature in blue ink, appearing to read 'Ivan Van der Walt', with a stylized flourish at the end.

Ivan Van der Walt  
Chief Operating Officer

---

<sup>6</sup> [https://www.ferc.gov/sites/default/files/2020-05/FEIS-volume-I\\_0.pdf](https://www.ferc.gov/sites/default/files/2020-05/FEIS-volume-I_0.pdf)

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**From:** [REDACTED]  
**Sent:** Monday, November 1, 2021 8:57 PM  
**To:** SpaceXBocaChica  
**Subject:** No Space X Starship Project/Super Heavy

Hello,

My name is Alex and I am concerned about the Space X and the Starship/Super Heavy Project. Boca Chica is the ancestral and sacred site of the Carrizo Comecrudo Tribe of Texas. As these are their lands, they should be consulted about these projects and their leadership should be followed. Especially since the FAA isn't doing their due diligence, not here or the places they are going to.

Elon Musk's obsession with colonizing space is a legacy of his ancestors that has been taking place for over 500 years. These projects and expansion impact the people, the animals, the air, the waters, and the lands. We support the Carrizo Comecrudo Tribe of Texas and allies in our demands to stop Space X and any further colonization of the earth and space.

Thank you,  
Alex Obregon

---

**From:** [REDACTED]  
**Sent:** Monday, November 1, 2021 3:38 PM  
**To:** SpaceXBocaChica  
**Subject:** No Space X Starship Project/Super Heavy

Hi, my name is Chloe and I am concerned with Space X and the Starship/Super Heavy Project. Boca Chica is the ancestral and sacred site of the Carrizo Comecrudo Tribe of Texas. As these are their lands, they should be consulted about these projects and their leadership should be followed. Especially since the FAA isn't doing their due diligence, not here or the places they are going to.

Elon Musk's obsession with colonizing space is a legacy of his ancestors that has been taking place for over 500 years. These projects and expansion impact the people, the animals, the air, the waters, and the lands. We support the Carrizo Comecrudo Tribe of Texas and allies in our demands to stop Space X and any further colonization of the earth and space.

Sent from ProtonMail mobile

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**From:** Patricia Rubio <[REDACTED]>  
**Sent:** Monday, November 1, 2021 7:27 PM  
**To:** SpaceXBocaChica  
**Subject:** No to space x expansion

My name is Patricia Rubio and I am opposed to the proposed Space X expansion at Boca Chica Beach. It would be detrimental to the health and well being to the community and ecosystems.

We need to stop this man from his disgusting obsession to destroy this earth.

Thank you,

Patricia Rubio



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**From:** Patricia Rubio <[REDACTED]>  
**Sent:** Monday, November 1, 2021 7:32 PM  
**To:** SpaceXBocaChica  
**Subject:** No to space x

Pre-composed message to FAA:

To the Federal Aviation Administration:

I am writing in opposition to SpaceX's proposed Starship/Super Heavy Launch Vehicle expansion project on Boca Chica Beach.. The SpaceX expansion project would be incredibly detrimental not only to the wildlife habitat and wetland ecosystems around it, but to the nearby communities of Brownsville, South Padre Island, and Port Isabel as well. This project will require a massive scale of new industrialization that includes a rocket launch pad, gas power plants, desalination plant, gas drilling and more near residential communities, between wildlife refuges, and at a public beach. Not to mention, the explosive rocket launch operations are less than six miles away from two highly flammable proposed liquefied natural gas (LNG) and a pre-existing gas pipeline. An accident on the scale of the Starship/SuperHeavy launch vehicle would be a devastating catastrophe for the Laguna Atascosa Wildlife refuge, the Lower Rio Grande Valley Wildlife refuge as well as for nearby communities of color and endangered species like the ocelot and aplomado falcon. At the very least the FAA should conduct a comprehensive Environmental Impact Statement because of the size and scale of SpaceX's new launching operations. This Environmental Assessment is extremely inadequate, because it only evaluates an "initial mission profile," and does not address:

- The FFA claims that SpaceX's mission to launch larger rockets in pursuit of National Space Policy goals, which were updated by Trump in 2020. These policy goals should be evaluated by the new Biden Administration, and actually reflect whether space exploration is in the interest of the public rather than private corporations seeking to profit.
- The already damaged land and wildlife that SpaceX has already caused.
- SpaceX's rocket launching schedule results in beach closures that would further strip away people of color's rights to fish and recreate at Boca Chica Beach by up to 800 hours per year, about an entire month.
- Elon Musk, using his social media platforms to attract outsiders to displace a historically marginalized people of color community. Already, longtime residents are being forced away from their beach and homes, and it doesn't help when outsiders, attracted by Elon Musk and his social media presence, displace residents by moving here or give comments and opinions when they've never even been to the region.
- SpaceX has never consulted with the Carrizo/Comecrudo Tribe of Texas, who have ancestral ties to the region, about operations. Under the United Nation's Free, Prior, and Informed Consent, SpaceX should not be authorized without consultation and consent of the Tribe.

Additionally, the FAA should have to redo their regulatory process to accommodate the Spanish-speaking population because the public hearings and materials are not translated. About 80% of the Rio Grande Valley community, which is directly impacted by SpaceX, speaks primarily Spanish at home. The FAA should not allow SpaceX to continue to expand to launch the Starship/Super Heavy vehicle at Boca Chica Beach because the potential for further wildlife and land damage along with the potential explosions it could cause is just not safe for the residents of the area and is not safe for the environment.

Sincerely,

Patricia Rubio

[Sent from Yahoo Mail on Android](#)

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**From:** [REDACTED]  
**Sent:** Monday, November 1, 2021 12:32 PM  
**To:** SpaceXBocaChica; Zee, Stacey (FAA)  
**Cc:** [REDACTED]  
**Subject:** Please Do Not Approve Space X Boca Chica plans

Ms. Stacey Zee, RE: SpaceX PEA

c/o ICF, 9300 Lee Highway, Fairfax, VA 22031

To: E-mail: [REDACTED]

Dear Ms Zee,

I hope that I am on time to send my letter. I am writing to provide comment on the FAA's Draft Programmatic Environmental Assessment for the SpaceX Starship Super Heavy Project at the Boca Chica Launch Site. I am very concerned about the current state of development and activities which have already had major negative impacts and which were never evaluated in the original EIS, making this new plan to EXPAND that activity and infrastructure even more alarming. The Boca Chica area, including the Lower Rio Grande Valley National Wildlife Refuge, several Texas State Parks and the South Bay Coastal Preserve – is an ecological gem, yet it is being treated by SpaceX as if it were a wasteland. This expansion plan essentially seeks to sacrifice a publicly-owned natural resource area of hemispheric importance for a private company. I just read an informative article by the American Bird Conservancy, and the following quote is quite alarming:

"The American Bird Conservancy (ABC) is deeply concerned about the facility's impacts on wildlife habitat and species listed under the Endangered Species Act (ESA), including the federally Threatened [Piping Plover](#) and [Red Knot](#), and the Endangered Northern [Applomado Falcon](#)...The SpaceX facility in Boca Chica is surrounded by federal and state public lands used by hundreds of thousands of individual birds of many different species throughout the year..."

Boca Chica is an especially vital place for migratory birds that pass through there to rest and refuel so they can successfully continue and complete their migratory journeys. Also, the area contains all five seagrass species that occur in Texas, mostly fringed by dense and probably the most well-established stands of black mangrove in the state. These stands of mangrove also have considerable importance to nesting waterbirds, such as the Roseate Spoonbill. The Piping Plover, listed as Threatened under the Endangered Species Act, is one of the many species being negatively impacted by the ongoing construction of the SpaceX Starship Super Heavy Project and launch site. According to a recent analysis, the population of Piping Plovers has declined by over 50% at the site in only three years since the onset of testing and launch activities. This is an alarmingly rapid decline for a species that is already under increasing risk of extinction.

An objective Environmental Impact Assessment should be made:

- To address cumulative impacts that have yet to be recognized by the Federal Aviation Administration and SpaceX, such as fuel transport and storage at the facility, as well as massive proposed infrastructure projects including a 250 MW power plant, a natural gas plant and liquefier, and a desalination plant.
- A launch failure analysis should be part of the Environmental Impact Statement (EIS) to assess the risks to public safety and risks to the proposed infrastructure and operations at the Port of Brownsville and off-shore.
- The Federal Aviation Administration should examine more alternatives, rather than just the “all or nothing” alternatives. One of the other alternatives that should be included is moving the testing of Super Heavy to a designated large rocket testing site, such as Provo, Utah or Stennis AFB in Mississippi. The latter is where the Saturn V rocket was tested, and where the Space Launch Systems (SLS) rocket is currently being tested. Another alternative should include launching Super Heavy offshore or from Cape Canaveral.
- The Clean Water Act, Section 404 specifies the consideration of alternatives to the proposed action of filling or dredging of wetlands. SpaceX has provided no alternatives or other measures necessary to protect public health and safety.
- Construction is anticipated to permanently fill 17.16 acres of wetlands, and the filling of 25.8 acres of floodplain. No alternatives or mitigation has been provided by SpaceX.
- The Draft Programmatic Environmental Assessment mentions that noise and shock waves (far-field overpressure) may break windows on SPI and Port Isabel. If that can happen 5 miles away from the launch site, what will be the effects on birds, reptiles & small mammals that are a half mile or less from the launch site? The launch site is surrounded by national wildlife refuge and state park land.

With these and many other serious concerns in mind, I therefore must ask why is the SpaceX Starship Super Heavy Project and launch site being expanded, even though some of the infrastructure has yet to be approved by the Federal Aviation Administration (FAA). This is not a suitable site for such a volatile and damaging industry to operate. Now that this site is no longer out of sight and out of mind, I ask that the FAA NOT approve this proposed SpaceX expansion scheme. Instead, I ask that the FAA move to better regulate and greatly reduce operations there so that they abide by the original approval stipulations which SpaceX has sadly repeatedly violated without sufficient repercussions.

Awaiting Your Prompt Response,

Monica Gutierrez-Quarto

[REDACTED]

Email: [REDACTED]

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**From:** Christos Sotirelis <[REDACTED]>  
**Sent:** Monday, November 1, 2021 10:58 AM  
**To:** SpaceXBocaChica  
**Subject:** Public comment on Draft Programmatic Environmental Assessment for the SpaceX Starship/Super Heavy Launch Vehicle Program at the SpaceX Boca Chica Launch Site in Cameron County, Texas  
**Attachments:** TSPA Space X RGV Comment.pdf



**Captain Christos Sotirelis**  
**President**

NOVEMBER 1, 2021

**Captain Steven A. Nelson**  
**Vice-President**

**Comments of the Texas State Pilots' Association on the Draft Programmatic Environmental Assessment for the SpaceX Starship/Super Heavy Launch Vehicle Program at the SpaceX Boca Chica Launch Site in Cameron County, Texas**

We appreciate the opportunity to comment on the Draft Programmatic Environmental Assessment for Space X Starship/Super Heavy Launch Vehicle Program.

The Texas State Pilots' Association represents 189 State Pilots, including the Brazos-Santiago Pilots, commissioned by the Governor of the State of Texas to guide vessels to and from its ports in Texas in a safe and efficient manner. We protect the public interest along the waterways and shorelines of our great state not only by facilitating waterborne commerce on oceangoing vessels engaged in domestic and international trade, but by staying involved in all aspects of the marine transportation system including those of a regulatory nature. It is in that spirit, that we must voice our concern on this matter.

Commercial traffic on any ship channel in Texas moves 24 hours a day, 365 days a year. Any interruption in that flow of commerce will have a tremendous impact on the local, regional, national, and international economies by disrupting supply chains upstream and downstream. We have already seen the impact to consumer supply chains with the recent back log of ships at the Ports of Long Beach and Los Angeles, and the recent blocking of the Suez Canal. We are certain that any disruption in the flow of traffic that is suggested in this draft PEA would have a similar effect on customers and terminal operators at both the Port of Port Isabel and the Port of Brownsville.

Additionally, throughout Texas we have a major concern with the precedent that would be set with a non-user of a waterway having the ability to shut down that waterway. A closure of this nature not only impacts business at our ports, but restricts ALL users of waterways in Texas and potentially, any other port in the country.

We do not and cannot support closure of the Brownsville Ship Channel to accommodate SpaceX operations when it has such a devastating and negative impact on the region. All local, regional, national and international economies that extend from and rely on the Port of Brownsville, the Port of Port Isabel, and the Brownsville Ship Channel would be negatively affected. We are also deeply concerned about future impacts on the many waterways in Texas if similar situations arise in other regions.

The Texas State Pilots' Association respectfully urges the agencies involved, especially the U.S. Coast Guard, to intervene to ensure the disruptive and potentially dangerous SpaceX launch port closures do not take place.

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**From:** John & Barbara <[REDACTED]>  
**Sent:** Monday, November 1, 2021 4:44 PM  
**To:** SpaceXBocaChica  
**Subject:** Public Comment on FAA SpaceX Draft PEA  
**Attachments:** SpaceX Scoping Comment NextDecade 012221 (1).pdf; Rio Grande LNG response to Port Isabel and Save RGV letters 20210326-5109(14939835).PDF; Rio Grande LNG 05-06-2021 response to Sierra Club and Save RGV request for SpaceX related permit suspension 20210506-5091(14955340).PDF; Save RGV lawsuit press release (1).pdf; 2021.10.11 SaveRGV's OP Court Stamped.pdf

## **2) The need for an updated Launch Failure Analysis and related coordination of relevant Emergency Response Plans and Resources.**

An updated and calibrated Launch Failure Analysis is essential to the development of adequate Emergency Response Plans and relevant to the risk/benefit of the SpaceX Boca Chica Starship project.

A long range projection within the Analysis would be helpful in establishing realistic limits to the growth of the project in terms of the area available for site expansion and the expected nature and pace of the operations (manufacturing, testing, launches, and landings etc.).

Also, an itemized list and mapping of high risk areas such as the proposed Rio Grande LNG, Texas LNG, and JupiterMLP Heavy Condensate Upgrader Facility and similar already existent operations plus HAZMAT storage tank farms and such is needed a) to map out where the departing and return rocket flights would post the most risk and b) to what operations and facilities should be included in the coordination of Emergency Response plans.

Those operations and facilities finding themselves at high risk from launch, flight, and/or landing failures might appreciate having a voice in the development of the final PEA or EA.

Concerns about the adequacy of the outdated Launch Failure Analyses were expressed in the first round of public comments in January 2021, concerns apparently not addressed in the Draft PEA.

**Let's take a look at one of the projects concerned about the expansion of the SpaceX Boca Chica:** NextDecade's Rio Grande LNG project. Which was among those expressing concern regarding the proposed expansions of the SpaceX operations in question. Especially in terms of Rio Grande LNG's 01-22-2021 public comment to the FAA and its 03-27-2021 and 05-06-2021 letters to FERC regarding its Emergency Response Plans relative to the SpaceX project.

NextDecade's 01-22-2021 comment to FAA (attached below) primarily expresses NextDecade's eagerness to meet with and work with the SpaceX Emergency Response Team and calls upon FAA to limit the SpaceX potential threats to its proposed and already FERC permitted Rio Grande LNG project and the LNG tanker ship traffic that will result from that project.

In contrast to NextDecade's eagerness to work with the SpaceX Emergency Response team, it has avoided working with Port Isabel (and South Padre Island) on its Emergency Response and Cost Sharing Plans. In its brief 03-26-2021 response to a letter from Port Isabel calling on FERC to halt work on the Rio Grande LNG project until Rio Grande updates its Emergency Response and Cost Sharing Plans on the basis of the continued expansion of the SpaceX project, Rio Grande LNG claims that its existent Plans are compliant with its 11-22-2019 FERC permit. It also claims that Port Isabel had previous opportunities it passed up to participate in the development of the Plans. Its 03-26-2021 letter to FERC is available at [https://elibrary.ferc.gov/eLibrary/filelist?accession\\_num=20210326-5109](https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20210326-5109) and attached below.

And in its longer 05-06-2021 letter to FERC regarding Save RGV's and Lower Rio Grande Sierra Club's similar request for FERC to halt the Rio Grande LNG project pending a Launch Failure Analysis and corresponding Rio Grande LNG Emergency Response Plan update, Rio Grande LNG argued that FERC must disregard the request and that it is up to FAA to determine the potential impacts of the expanded SpaceX operations on the Rio Grande LNG project. Quote:

... The Commission [*ie, FERC*] cannot undertake a supplemental NEPA analysis based on speculation and hyperbole, while a sister agency, the FAA, is itself tasked with evaluating the environmental aspects of the proposed action under its jurisdiction.

Indeed, FAA may well assess that the mitigating actions imposed by the Commission on the Terminal in the FEIS requirements remain appropriate, notwithstanding any proposed changes to the SpaceX launch program. The Commission has required, and RGLNG has accepted, specific mitigating actions during construction and operations such as (1) positioning onsite workers in areas that are unlikely to be impacted by failed rocket launch debris, and (2) monitoring rocket launches to enable workers, in the event of a rocket launch failure, to shut down or reduce operations, to take mitigating action to minimize potential releases or cascading effects, and to shelter in place. These actions will apply regardless of the type of SpaceX vessel launched or its destination.

And:

2. The FAA is the proper forum to consider potential impacts of SpaceX's launch program changes on the Terminal.

The FAA is currently in the early stages of its NEPA review for SpaceX's Starship and Super Heavy proposed launch program changes. *The FAA has completed scoping for its analysis, and its March 2021 scoping report identified safety issues related to launching in proximity to LNG facilities as a concern that would be addressed in its analysis. [emphasis added]*

NEPA requires that the FAA consider the environment that could be affected by the SpaceX proposal and its alternatives, and that FAA's analysis must include reasonably foreseeable environmental trends and planned actions in the area.

Thus, *since the Commission has already authorized RGLNG to construct and operate the Terminal, the Terminal's presence on the landscape will be part of the affected environment that the FAA must address in its new NEPA analysis of the revised SpaceX launch program. [emphasis added]*

My reading of this is that NextDecade's Rio Grande LNG's position is that the SpaceX FAA PEA or EA must bend around the Rio Grande LNG project EA and FERC permit rather than Rio Grande LNG having to make any accommodations to the revised SpaceX Boca Chica project. In addition, Rio Grande LNG position seems to be that its existent Emergency Response Plan should be assumed to be adequate unless found otherwise by FAA.

In which case, all will be good.

In the meantime, NextDecade -- incorporated in November 2010 but not yet successful in putting shovel to ground on any of its proposed projects anywhere -- wants nothing getting in the way of it making its initial Rio Grande LNG FID, enacting its site lease agreement with the Port of Brownsville, preparing the site for construction, and getting as much built as fast as it can to make its first penny of LNG revenue.

FAA, FERC, and SpaceX may not agree with NextDecade's position on this. None of them may agree with my reading of NextDecade's position.

My concern is not the correctness of my understanding but rather the health and safety of the people living in, working in, and visiting the area at risk from the way projects such as Rio Grande LNG, SpaceX Boca Chica, Texas LNG, and the

JupiterMLP projects are rolled out here. Plus the risks posed to the endangered and protected areas of habitat, the plants and critters inhabiting the areas of habitat, the binational migratory corridor running through the Laguna Madre South Texas Border area, and the migratory bird routes converging in the area.

NextDecade expected the issues related to its Rio Grande LNG project and the expansion of the SpaceX Boca Chica project to be addressed in the FAA's Draft PEA. Others expected the same.

I stand with NextDecade and the others concerned about the safety and/or environmental (including climate change and environmental justice as well as native habitat protection and preservation issues) involved in all this.

I have no suggestions for how FAA is to resolve all this before issuing a Final PEA or EA but call on FAA to address the Launch Failure Analysis update issue and the jurisdictional conflicts between NextDecade and SpaceX prior to issuing a Final PEA or EA.

Due to the complexities involved, I strongly recommend that FAA bypasses a Final PEA and move on to a Environmental Impact Statement followed by another round of public comments before preparing and issuing a Final Environmental Assessment.

Especially since SAVE RGV has filed a lawsuit 10-11-2021 in Cameron County 445th District Court contesting the legal basis for the Cameron County beach closures for SpaceX Boca Chica's convenience. If successful, the lawsuit will probably limit the scope of the SpaceX Boca Chica SpaceX operations. A copy of the 10-11-2021 Save RGV Press Release on the lawsuit is attached below. The 24 page Open Beaches legal petition is attached below and available at [Microsoft Word - 2021.10.07 SaveRGV's OP .docx \(thomsonreuters.com\)](https://fingfx.thomsonreuters.com/gfx/legaldocs/gkvlgxweqpb/2021.10.11%20SaveRGV's%20OP%20Court%20Stamped.pdf)  
<https://fingfx.thomsonreuters.com/gfx/legaldocs/gkvlgxweqpb/2021.10.11%20SaveRGV's%20OP%20Court%20Stamped.pdf>

Thank you for your consideration of my comments.

John Young, MS (Psychology), MSW (Social Work), Retired  
San Benito TX

- Active member of Save RGV from LNG since May 2014
- Registered FERC Intervenor opposed to the originally paired Rio Grande LNG and Rio Bravo Pipeline projects since 05-25-2016 ([http://elibrary.ferc.gov/idmws/file\\_list.asp?accession\\_num=20160609-5280](http://elibrary.ferc.gov/idmws/file_list.asp?accession_num=20160609-5280))
- Registered FERC Intervenor opposed to Enbridge's Rio Bravo Pipeline Company's Rio Bravo Pipeline project since 06-26-2020 ([https://elibrary.ferc.gov/eLibrary/idmws/file\\_list.asp?accession\\_num=20200626-5079](https://elibrary.ferc.gov/eLibrary/idmws/file_list.asp?accession_num=20200626-5079))



CAUSE NO. 2021-DCL-05887

SAVERGV,	§	IN THE DISTRICT COURT OF
Plaintiff	§	
	§	
v.	§	CAMERON COUNTY, TEXAS
	§	Cameron County - 445th District Court
TEXAS GENERAL LAND OFFICE;	§	
GEORGE P. BUSH, IN HIS OFFICIAL	§	_____ JUDICIAL DISTRICT
CAPACITY AS THE TEXAS LAND	§	
COMMISSIONER; and	§	
CAMERON COUNTY,	§	
Defendants	§	
	§	

### PLAINTIFF'S ORIGINAL PETITION

TO THE HONORABLE JUDGE OF THIS COURT:

COMES NOW Plaintiff SaveRGV ("Plaintiff" or "SaveRGV") and files this original petition, seeking a declaration that certain sections of the Texas Open Beaches Act that allow for the closure of public beaches for space flight activities—specifically, Texas Natural Resources Code Sections 61.011(d)(11) and 61.132—violate the Texas Constitution. For support, SaveRGV respectfully offers the following:

#### I. DISCOVERY CONTROL PLAN

1. Plaintiff intends that discovery be conducted under Level 2 of the Texas Rules of Civil Procedure. Tex. R. Civ. P. 190.3. Plaintiff affirmatively pleads that this action is not governed by the expedited-actions process in Texas Rule of Civil Procedure 169, because Plaintiff seeks nonmonetary relief. Tex. R. Civ. P. 47(c) & 169.

#### II. CASE OVERVIEW

2. The voting public and their elected representatives have long recognized Texans'

essential right to access Texas public beaches.

3. The Texas Open Beaches Act (the “Act”), Tex. Nat. Res. Code §§ 61.001-.254, was passed by the State Legislature in 1959, codifying the public’s right to free and unrestricted access to public beaches along the Gulf Coast. The Act is one of the nation’s strongest and most effective set of laws protecting public beach access.
4. In 2009, Texas voters adopted an amendment to the Texas Constitution, acknowledging that the public, “individually and collectively, has an unrestricted right to use and a right of ingress to and egress from a public beach.” Tex. Const. art. I, § 33(b). Further, the public’s constitutional right “is dedicated as a permanent easement in favor of the public.” *Id.* Finally, the Constitutional Amendment allowed the Texas Legislature to “enact laws to protect the right of the public to access and use a public beach and to protect the public beach easement from interference and encroachments.” *Id.* § 33(c).
5. Until recently, the Open Beaches Act was the legislative mechanism that implemented and ensured the public’s constitutional right to access Texas public beaches. *See* Tex. Nat. Res. Code § 61.011(a) (affirming that it is the public policy of the State that the public shall have unrestricted use of all state-owned beaches along the Gulf of Mexico). That is, the Open Beaches Act “guards the right of the public to use public beaches against infringement by private interests.” *Severance v. Patterson*, 370 S.W.3d 705, 719 (Tex. 2012).
6. In 2013, however, the Texas Legislature passed House Bill No. 2623, which amended the Texas Open Beaches Act to allow the closing of public beaches “for space flight

activities.” 83<sup>rd</sup> Leg., R.S., ch. 152, 2013 Tex. Gen. Laws 589 (now, Tex. Nat. Res. Code §§ 61.001(4-a), 61.011(d)(11), and 61.132).

7. Relying on these new provisions of the Texas Open Beaches Act, Defendants Cameron County, Texas General Land Office, and Texas Land Commissioner George P. Bush have allowed for the closure of Boca Chica Beach—a public beach, along the Gulf of Mexico, in Cameron County—for as many as 450 hours per year, to allow a private corporation, Space Exploration Technologies Corp. (“SpaceX”), to conduct an array of activities related to the launching of spacecraft or other launch vehicles.
8. Plaintiff SaveRGV is an organization of individuals who reside in the Rio Grande Valley and who, until recently, enjoyed regular use of Boca Chica Beach. Save RGV’s members are among those in the Boca Chica community who have been impacted by Cameron County’s frequent public beach closures and the closure of the only highway that accesses the beach, to allow SpaceX to conduct its activities.
9. SaveRGV, therefore, seeks a declaration from this Court, declaring that certain sections of the Texas Open Beaches Act—particularly, those sections that allow for public beach closures for space flight activities—are unconstitutional.
10. Save RGV further requests a declaration from this Court that GLO’s amendment to its Rule 15.32, adopted pursuant to House Bill 2623’s revisions to the Open Beaches Act, and certifying the County’s dune protection and beach access plan, is invalid.
11. Similarly, Save RGV requests a declaration from this Court that the Memorandum of Agreement between GLO and Cameron County, adopted pursuant to House Bill 2623’s revisions to the Open Beaches Act, is also invalid.

12. Finally, Save RGV requests a declaration from this Court, declaring invalid any orders by Cameron County commissioners court, authorizing the Cameron County Judge to order the closure of Boca Chica Beach and/or State Highway 4, to allow for space flight activities.

### **III. PARTIES**

13. Plaintiff SaveRGV is a Texas non-profit corporation that advocates for environmental justice and sustainability and the health and well-being of the Rio Grande Valley community. SaveRGV also promotes the conservation and protection of wildlife habitat and the natural areas of the Rio Grande Valley, including by defending the public's right to access Boca Chica Beach.

14. Defendant Texas General Land Office ("GLO") is a government agency responsible for implementing certain provisions of Section 61.132 of the Open Beaches Act. *See, e.g.* Tex. Nat. Res. Code § 61.132(f) (authorizing the GLO to deny certain beach or access point closure requests by counties, enter into a memorandum of agreement with the commissioners court of a county to govern beach and access point closures, and adopt rules to govern beach and access point closures made under this section). In 2014, the GLO adopted an amendment to its Rule 15.32, certifying as consistent with state law the amendments to Cameron County's Dune Protection and Beach Access Plan; the approved amendments to the County's Plan allowed for closure of the public beach and associated access points. 31 Tex. Admin. Code § 15.32; 39 Tex. Reg. 2575 (2014). The GLO further entered into a Memorandum of Agreement with Cameron County regarding the closures of Boca Chica Beach, which authorized the County to

order the closure of the Beach and the only highway that provides access to the public beach. The GLO may be served with process through Commissioner George P. Bush at its principal place of business and mailing address, 1700 N. Congress Ave., Austin, Texas 78701.

15. George P. Bush is the Texas Land Commissioner (the “Commissioner”) and is charged with “strictly and vigorously enforce[ing] the prohibition against encroachments on and interferences with the public beach easement.” Tex. Nat. Res. Code § 61.011(c). The Commissioner also possesses the authority to promulgate rules, consistent with the policies established in the Open Beaches Act, related to the closure of beaches for space flight activities. *Id.* § 61.011(d)(11). The Commissioner may be served with process at his principal place of business and mailing address, 1700 N. Congress Ave., Austin, Texas 78701.
16. Cameron County possesses the authority to close the Boca Chica Beach and access to the Beach, via Section 61.132 of the Texas Natural Resources Code—one of the statutory provisions that is the subject of this declaratory judgment action. The County has used this authority on multiple occasions throughout 2019, 2020, and 2021. The County may be served with process through County Judge Eddie Trevino, Jr. at his principal place of business and mailing address, Cameron County Court House, Oscar C. Dancy Building, 1100 E. Monroe Street, Suite 218, Brownsville, Texas, 78520, under the authority of Texas Civil Practice and Remedies Code Section 17.024(a).

17. In a declaratory judgment action alleging a statute is unconstitutional, as here, the

Texas Attorney General must be served with a copy of the proceeding and is entitled to be heard. Texas Attorney General Ken Paxton may be served with process at his principal place of business and mailing address, Office of the Attorney General, P.O. Box 12548, Austin, Texas 78711.

#### **IV. JURISDICTION AND VENUE**

18. This Court has jurisdiction under the general jurisdictional authority provided by Article V, Section 8 of the Texas Constitution and Texas Government Code Sections 24.007 and 24.008.
19. Venue is mandatory in this Court under Section 15.015 of the Texas Civil Practice and Remedies Code.

#### **V. FACTUAL AND LEGAL BACKGROUND**

##### ***Overview of Texas Beach Access Laws***

20. Texas laws and the Texas Constitution protect the right of the public to access Gulf Coast beaches. Indeed, the Texas Supreme Court has recognized that “the public has an important interest in the enjoyment of the public beaches.” *Severance v. Patterson*, 370 S.W.3d 705, 713 (Tex. 2012). And, thus, Texas has “the most comprehensive public beach access laws in the nation.” *Id.* at 733 (J. Medina, dissenting).
21. The Texas Legislature passed the Texas Open Beaches Act in 1959, ensuring public access to the shoreline along the Gulf Coast. More specifically, the Act assures that the public, individually and collectively:
- shall have the free and unrestricted right of ingress and egress to and from the state-owned beaches bordering on the seaward shore of the Gulf of Mexico, or if the public has acquired a right of use or easement to or over

an area by prescription, dedication, or has retained a right by virtue of continuous right in the public, the public shall have the free and unrestricted right of ingress and egress to the larger area extending from the line of mean low tide to the line of vegetation bordering on the Gulf of Mexico.

Open Beaches Act, 56<sup>th</sup> Leg., 2d C.S., ch. 19, 1959 Tex. Gen. Laws 108; Tex. Nat.

Res. Code § 61.011(a).<sup>1</sup>

22. To protect these rights, the Act prohibits local governments and individuals from impeding the public's access to the protected public beach areas: "It is an offense against the public policy of this state for any person to create, erect, or construct any obstruction, barrier, or restraint that will interfere with the free and unrestricted right of the public, individually and collectively, lawfully and legally to enter or to leave any public beach." Tex. Nat. Res. Code § 61.013(a).

23. In the event of a violation of this prohibition, the Act allows a county attorney, district attorney, or criminal district attorney, or the attorney general at the request of the Commissioner of the GLO to enforce the Act and enjoin, remove, or prevent any improvement, maintenance, obstruction, barrier, or other encroachment on a public beach, or to prohibit any unlawful restraint on the public's right of access to and use of a public beach or other activity that violates the Act. Tex. Nat. Res. Code § 61.018(a).

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<sup>1</sup> The original version has the same text, but the sentence structure was different. It read: "shall have the free and unrestricted right of ingress and egress to and from the state-owned beaches bordering on the seaward shore of the Gulf of Mexico, or such larger area extending from the line of mean low tide to the line of vegetation bordering on the Gulf of Mexico in the event the public has acquired a right of use or easement to or over an area by prescription, dedication, or has retained a right by virtue of continuous right in the public." The Act was codified, without substantive change, in 1977 as Chapter 61 of the Natural Resources Code. 65<sup>th</sup> Leg., R.S., ch. 871, 1977 Tex. Gen. Laws. 267.

24. Subchapter D of the Act is titled, “County Regulation of Public Use of Beaches,” and authorizes the commissioners court of a county bordering on the Gulf of Mexico or its tidewater limits to regulate certain enumerated activities, such as motor-vehicle traffic on beaches, the possession of animals and glass containers on the beach, and swimming. *Id.* § 61.122(a)-(d). All traffic regulations must be consistent with the policies of Section 61.011 (granting the public free and unrestricted right of access to public beaches). *Id.* §§ 61.122(e), 61.022(b).

25. Finally, relevant to this case, the Open Beaches Act instructs that “each county that contains any area of public beach within its boundaries shall adopt a plan for preserving and enhancing access and use of public beaches.” Tex. Nat. Res. Code § 61.015(a). These “beach access and use plans” must be consistent with the policy statement in Section 61.011 (granting the public free and unrestricted right of access to public beaches) and Chapter 63 of the Natural Resources Code (relating to the protection of dunes) and must be submitted to the Commissioner of the GLO for certification as to compliance with state law. *Id.* § 61.015(b).

26. In 2009, Texas voters voted, overwhelmingly,<sup>2</sup> to amend the Texas Constitution to guarantee public beach access in the Texas Bill of Rights. Tex. Const. art. I, § 33.<sup>3</sup>

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<sup>2</sup> Out of more than 1 million votes cast, 76.92% were in favor of adding Open Beaches protection to the Texas Constitution. Legislative Reference Library of Texas, HJR 102, 81<sup>st</sup> R.S., <https://lrl.texas.gov/legis/billsearch/amendmentdetails.cfm?legSession=81-0&billtypeDetail=HJR&billNumberDetail=102&billSuffixDetail=&amendmentID=647>.

<sup>3</sup> Texas State Representative Richard Raymond, who wrote the bill that became the ballot measure, explained:



27. This constitutional amendment provides: “The public, individually and collectively, has an unrestricted right to use and a right of ingress to and egress from a public beach. The right granted by this subsection is dedicated as a permanent easement in favor of the public.” Tex. Const. art. I, § 33(b).
28. Significantly, the constitutional amendment allows the Legislature to “enact laws to *protect* the right of the public to access and use a public beach and to *protect* the public beach easement from interference and encroachments.” Tex. Const. art. I, § 33(c) (emphasis added).
29. Both the Open Beaches Act and the constitutional provision guaranteeing the public’s right to use and access Texas public beaches reiterate and codify well-established rights; they do not create new rights. Texas residents have, since time immemorial, enjoyed free and unrestricted access to the Gulf Coast beaches, and the Open Beaches Act and the constitutional amendment are intended to acknowledge and protect the public’s free and unrestricted access to those public beaches.
30. The Act and the constitutional amendment define public beaches by recognizing two criteria: physical location and right of use. *Severance*, 370 S.W.3d at 714.
31. “Wet beaches,” or those areas from the mean low tide to mean high tide, are all

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Someday, if some big corporation wanted to get a piece of South Padre Island, or Galveston Island, or Mustang Island, that the way the law stood, they could try to go lobby the legislature. So I thought, if we take this law, and put it into the Constitution, it would take two thirds of the legislature to approve it, and it would have to be put before the voters, and they would have to approve it.

Melissa Galvez, *A Constitutional Right to the Beach?: Prop 9*, Houston Public Media (October 20, 2009), <https://www.houstonpublicmedia.org/articles/news/newslab/2009/10/20/17580/a-constitutional-right-to-the-beach-prop-9/>.

owned by the State, and so the public always has the right to use those beaches. *Id.*

32. “Dry beaches,” or the area from mean high tide to the vegetation line, are sometimes privately owned. If a dry beach is privately owned, then, it may nevertheless fall within the definition of a “public beach” if the State establishes a right to public use—a public easement. *Id.* at 715.

33. “Public beach,” for purposes of the Act and the constitutional amendment, thus, includes wet beaches, State-owned dry beaches, and private property on dry beaches where a public easement has been established. *Id.*

### ***House Bill 2623***

34. In May 2013, the State Legislature passed House Bill 2623, titled, “An Act relating to the authority of certain counties and the General Land Office to temporarily close a beach or beach access point.” 83<sup>rd</sup> Leg., R.S., ch. 152, 2013 Tex. Gen. Laws 589 (now codified at Tex. Nat. Res. Code §§ 61.001(4-a), 61.011(d), & 61.132).

35. The key provisions of House Bill 2623 are found in the newly created Section 61.132, “Closing of Beaches for Space Flight Activities.” Tex. Nat. Res. Code § 61.132.

36. Section 61.132 is limited in its application. It applies only to “a county bordering on the Gulf of Mexico or its tidewater limits that contains a launch site the construction and operation of which have been approved in a record of decision issued by the Federal Aviation Administration following the preparation of an environmental impact statement by that administration.” *Id.* § 61.132(a).

37. For those areas that fall within the description in Section 61.132(a), the county commissioners court may close a beach or access points to the beach to allow for

launching of a vehicle or spacecraft. *Id.* § 61.132(c); *see also* Tex. Civ. Prac. & Rem. Code § 100A.001 (defining “launch,” “launch vehicle,” “spacecraft,” “space flight activities,” & other relevant terms).

38. If the commissioners court orders the closure of a beach or access to the beach to allow for a launch, the commissioners court must comply with the county’s beach access and use plan, adopted and certified by the GLO under Section 61.015 of the Open Beaches Act. Tex. Nat. Res. Code § 61.132(e). And it must comply with the dune protection plan, adopted and certified under Chapter 63 of the Natural Resources Code. *Id.*
39. Also relevant to this case, the statute allows the GLO to enter into a memorandum of agreement with the commissioners court of a county to which the statute applies to govern beach and access point closures. *Id.* § 61.132(f)(2).
40. Pursuant to mechanisms provided for in House Bill 2623, Cameron County has been closing Boca Chica Beach and State Highway 4 to allow SpaceX, a private corporation, to conduct tests, rocket launches, and other space flight activities near the Beach.

### ***Boca Chica Beach Closures***

41. Boca Chica Beach is a roughly 8-mile stretch of sandy, undeveloped, public beach, located in Cameron County, about 20 miles east of Brownsville. It lies between the Rio Grande delta and the lower Laguna Madre. The Beach provides the public free use and enjoyment of an undeveloped, pristine, secluded sanctuary along the Gulf Coast.

42. The Beach is a part of the Lower Rio Grande Valley National Wildlife Refuge, and is thus protected by both state and federal authorities. The Refuge provides the public with a number of free wildlife-dependent recreation, such as fishing, wildlife observation, photography, environmental education and interpretation. It falls within the Open Beaches Act's definition of a public beach, Tex. Nat. Res. Code § 61.001(8), and within the definition of "public beach" found in Article I, Section 33 of the Texas Constitution. Tex. Const. art. I, § 33(a).
43. Boca Chica Beach is accessed by Texas State Highway 4—also known as the Boca Chica Highway—which runs east-west, terminating at the Gulf. This is the only road that reaches Boca Chica Beach.
44. In August 2013, the Cameron County commissioners court amended its Dune Protection and Beach Access Plan to provide for the closure of Boca Chica Beach and access points on a primary or backup launch date. The closures are subject to GLO approval only if they occur on certain summer weekends and holidays.
45. The amended plan was incorporated into GLO's regulations after GLO certified the plan as consistent with state law. 39 Tex. Reg. 2575 (2014) (explaining that the updated plan enables the County to foster development of a launch site); 31 Tex. Admin. Code § 15.32(d).
46. Also in 2013, Cameron County and the GLO entered a Memorandum of Agreement ("MOA") pursuant to Section 61.132(f)(2) of the Natural Resources Code, the terms of which allow the temporary closure of Boca Chica Beach and its access points for space flight activities.

47. In May 2014, the Federal Aviation Administration (“FAA”) published a final environmental impact statement (“EIS”), and in July 2014, it published its record of decision (“ROD”), approving permits that authorize SpaceX to conduct operations and launches of various launch vehicles, including its “Falcon rockets” on privately-owned property near Boca Chica Beach.<sup>4</sup> Cf. Tex. Nat. Res. Code § 61.132(a).
48. The FAA’s ROD contemplated that SpaceX would close the Boca Chica Beach for up to 180 hours per year for purposes of its launching activities. The MOA includes no limit on the number of hours per year that the Beach may be closed.
49. Notably, the law Cameron County and the GLO were already implementing in 2013 and 2014, when they entered into their MOA and amended the Dune Protection and Beach Access Plan, states: “This section applies only to a county bordering on the Gulf of Mexico or its tidewater limits that contains a launch site the construction and operation of which have been approved in a record of decision issued by the Federal Aviation Administration following the preparation of an environmental impact statement by that administration.” Tex. Nat. Res. Code § 61.132(a). The adoption of the Memorandum of Agreement between the Cameron County Commissioners Court and the GLO, Cameron County’s amendments to its Beach Access and Dune Protection Plan, and the GLO’s certification of those amendments, all took place before the FAA’s record of decision and were thus premature, under Section 61.132

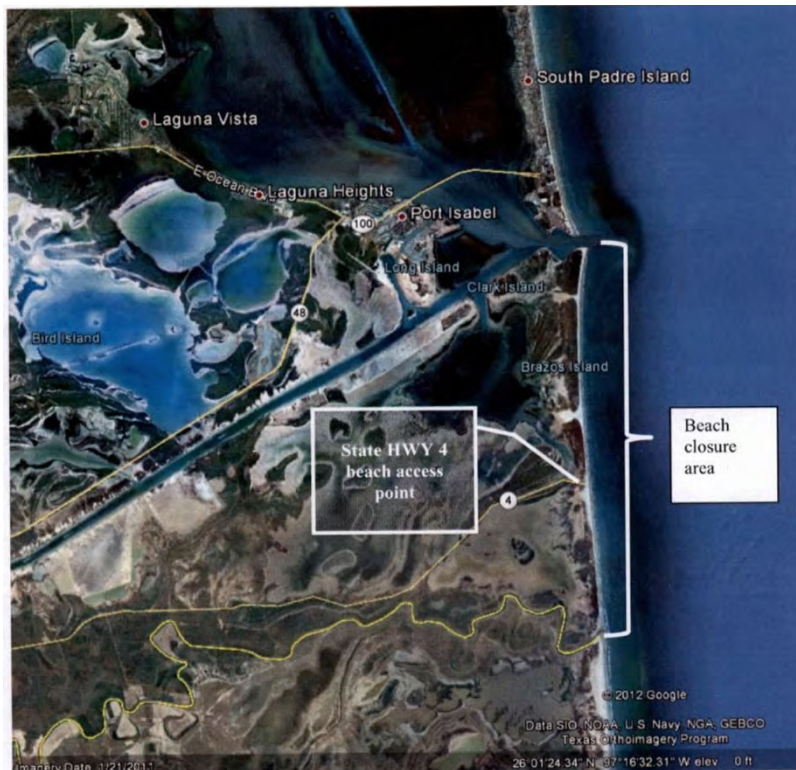
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<sup>4</sup> SpaceX since changed plans and decided to conduct “Starship” test operations and orbital launches at this site. See *History of the SpaceX Starship Super Heavy Project*, Federal Aviation Administration (last modified Nov. 20, 2020 at 12:29 PM), [https://www.faa.gov/space/stakeholder\\_engagement/spacex\\_starship/history/](https://www.faa.gov/space/stakeholder_engagement/spacex_starship/history/).

of the Natural Resources Code.<sup>5</sup>

50. In March 2019, the Cameron County Commissioners Court authorized the Cameron County Judge to execute any and all necessary or appropriate notices or orders of temporary closures of State Highway 4 and/or the beach at Boca Chica Beach in connection with space flight activities.

51. In 2019, Cameron County began closing Boca Chica Beach and the State Highway 4 access point to the Beach for SpaceX activities. This was accomplished via Orders by the County Judge.



**Figure 1**  
**Aerial image depicting the State Highway 4 beach access point and the corresponding stretch of beach closed for each SpaceX-related closure.**

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<sup>5</sup> The MOA was adopted in September 2013. Cameron County adopted its amendments to its beach access and dune protection plan on August 15, 2013. And the GLO certified the amendments to the County's plan and incorporated the amended plan into its rules on April 9, 2014.

52. According to the MOA, beach closure requests from an applicant such as SpaceX are considered timely if submitted to the County, with a copy to the GLO, at least 14 days before the earliest proposed closure date. The requisite notice, however, was almost never provided before the County ordered closure of the Beach and/or Highway 4. Sometimes, notice was provided to the public mere hours before Boca Chica Beach was closed. According to an internal tracking document maintained by GLO, in July 2021, most notices were sent to GLO less than one day before the announced closure date.
53. An example of a typical beach closure illustrates how the County arbitrarily authorizes the denial of public access to Boca Chica Beach. On March 8, the Cameron County Judge issued a notice and order, announcing Boca Chica Beach would be closed on March 9 from 12:00 p.m. until 8:00 p.m., with “alternate” dates of March 10 and/or March 11.<sup>6</sup>
54. The County issued another notice and order that same day, announcing the closure of the beach on March 10, with March 11 and/or March 12 as “alternate” dates.
55. Ultimately, the Beach was closed on March 9, 10, and 11. According to local residents, on March 11, the Cameron County sheriff closed the Beach at about 11:00 a.m., and the Beach was not re-opened until about 9:00 p.m. that evening, exceeding the 12:00 p.m. until 8:00 p.m. time span announced in the County Judge’s notice.
56. This scenario is a typical one, since the County began closing the Beach or access to

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<sup>6</sup> Cameron County posts its beach closure orders online at <https://www.cameroncounty.us/announcements-press-releases/>.

the Beach, for purposes of SpaceX's space flight activities.<sup>7</sup>

57. There is no official record keeping track of the number of hours the County has closed the Beach and/or Highway 4 since the County began allowing the closures. In fact, there have been reports by residents that sometimes SpaceX closes the Beach on its own, without the County's official approval, or otherwise changes its plans at the last minute and exceeds the announced closure times.

58. A conservative estimate of the number of hours that Boca Chica Beach was closed or inaccessible in 2021, thus far, based on the notices of closure provided by the County is over 500, with a beach or access point closure occurring on over 100 separate days.<sup>8</sup>

59. The federal U.S. Fish and Wildlife Service has calculated that State Highway 4 has been closed for more than 1000 hours in both 2019 and 2020, or about 42 days total per year, and is on a similar pace this year. Further, the closures often occur during peak recreational hours, denying the public access to the Beach for recreational purposes.

### ***Impacts to Plaintiff***

60. Several of SaveRGV's members reside, recreate, use, and otherwise regularly access

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<sup>7</sup> The lack of adequate notice of closures has led one local non-profit organization engaged in scientific research on the Texas Coast to attempt to track beach closures so they can try to find some pattern to the closures so as to identify any time they may make a trip to Boca Chica without wasting their time. *See SpaceX Launch Site Brings Controversy to Texas Town*, 60 Minutes Overtime (Aug. 17, 2021), <https://www.cbsnews.com/news/spacex-launch-site-boca-chica-texas-60-minutes-plus/>.

<sup>8</sup> The Coastal Bend Bays and Estuaries Program tracked all County notices of Beach and/or State Highway 4 closures between January 2021 and August 2021, and calculated the number of closure hours to be 473 for this span of time.



Boca Chica Beach. These members have all been impacted by the frequent closure of the Beach and of the State Highway that provides the only access to the Beach.

61. For instance, one member of SaveRGV has worked tirelessly on behalf of the organization to advocate, protect, preserve, and conserve native habitat and wildlife, accessibility to parks and native landscapes, and general environmental quality of the Rio Grande Valley, including but not limited to areas at the Laguna Atascosa National Wildlife Refuge, the Lower Rio Grande Valley National Wildlife Refuge, and Boca Chica Beach. The frequent Beach closures and State Highway 4 closures have resulted in limiting his ability to continue his conservation and preservation work at the Beach and surrounding area.
62. Another member owned a home in Boca Chica Beach Village, having purchased it in 2005. Her home was just over one mile from Boca Chica Beach. When the Beach closures began in earnest, it impacted her ability to use and enjoy her home, and it impacted her ability to use and enjoy the Beach. The impacts to her livelihood and her quality of life, caused by the frequent Beach closures, led her to sell her property and move elsewhere.
63. Another member visits—or rather, used to visit—the Beach approximately once every month. As a member and former president of the Frontera Audubon Society, he visited the Beach, in part, to see birds. Boca Chica is one of the best places to see a number of wading birds and shore birds, including 3 species of plovers, black skimmers, red knots, and brown pelicans.
64. This same member of SaveRGV also regularly visited Boca Chica to observe the

native plants in the area; the only known stand of red mangrove in Texas is on Boca Chica, at the mouth of the Rio Grande, and this member frequently guides visitors to observe this mangrove stand.

65. He is also a frequent visitor of the Lower Rio Grande Valley National Wildlife Refuge and is the current president of the Friends group for the Refuge, which includes most of Boca Chica. And sometimes he visits Boca Chica Beach simply to enjoy its primitiveness and tranquility, look for shells, and any evidence of nesting sea turtles. Boca Chica is a nesting beach for the endangered Kemps Ridley turtle.
66. SaveRGV members have almost entirely stopped visiting Boca Chica Beach because it is closed so often, and it is impossible to accurately predict when it will be closed.<sup>9</sup>
67. These and other members of SaveRGV have been impacted by the frequent closures of the Beach and of the only road that provides access to the Beach.
68. Boca Chica Beach is one of the few, undeveloped, free public beaches in the area, and the frequent denial of access to this Beach has impacted SaveRGV's members' ability to use and enjoy this unique public beach. These members have come to rely on their guaranteed right to access and use the Beach, and they have structured their activities and even their livelihoods in a manner that allows them to use and enjoy the Beach frequently and regularly.

69. On several occasions, members of SaveRGV have attempted to visit the Beach, only

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<sup>9</sup> SaveRGV is not a membership organization, but is led, guided, and funded by persons who also recreate in, reside near, and otherwise regularly use the Boca Chica Beach, and SaveRGV has standing to sue on their behalf.

to be turned away by local law enforcement enforcing the County's closure of the Beach or of State Highway 4. The frequent Beach and State Highway closures have had an adverse impact on the activities and the livelihoods of SaveRGV's members, who rely on their right to freely access Boca Chica Beach.

70. In other words, the changes to the Open Beaches Act that were effected by House Bill 2623 have resulted in the denial of SaveRGV members' access to Boca Chica Beach, a public beach, in direct contravention of the constitutional amendment, overwhelmingly approved by Texas voters, guaranteeing the right to use and access public beaches.

## **VI. REQUEST FOR DECLARATORY RELIEF**

**First Claim: Section 61.132 of the Texas Natural Resources Code is unconstitutional, on its face, because it violates the public's constitutional right to use and access public beaches.**

71. Plaintiff SaveRGV repeats and incorporates by reference herein the allegations of paragraphs 1 through 70 of this Petition as if fully set forth herein.

72. Section 61.132 of the Natural Resources Code is titled "Closing of Beaches for Space Flight Activities."

73. This section authorizes the commissioners court of a county<sup>10</sup> to temporarily close a public beach or access points to the public beach in the county for space flight activities. Tex. Nat. Res. Code § 61.132(c). The county must obtain prior approval

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<sup>10</sup> Section 61.132 specifies that Section 61.132 only applies to counties "bordering on the Gulf of Mexico or its tidewater limits that contain[] a launch site the construction and operation of which have been approved in a record of decision issued by the Federal Aviation Administration following the preparation of an environmental impact statement by that administration."

from the GLO to close a public beach on certain summer weekends and holidays, as provided in subsection (d) of the statute. *Id.* § 61.132(d).

74. Article I, Section 33, of the Texas Constitution acknowledges the public’s unrestricted right to use and a right of ingress to and egress from a public beach. This right is dedicated as a permanent easement in favor of the public.

75. Section 61.132, authorizing a county to close a public beach for space flight activities, is in direct conflict with the Texas Constitution’s guarantee that the public shall have the *unrestricted* right to use and access a public beach.

76. Further, while the Texas Constitution acknowledges that the Legislature may enact laws related to public beach access, those laws should “protect the right of the public to access and use a public beach and to protect the public beach easement from interference and encroachments.” Tex. Const. art. I, § 33(c).

77. A law, such as Section 61.132, allowing the routine closure of a public beach and of the only road that provides access to the public beach is in direct contravention of “protect[ing] the right of the public to access and use a public beach.” Rather than protecting public beach access, this law plainly interferes with, encroaches on, and impedes public beach access.

78. Section 61.132’s beach closure provisions interfere with the public access easement because the public cannot access the beach if it is closed “for space flight activities.”

79. Accordingly, SaveRGV requests declaratory judgment that Section 61.132 of the Texas Natural Resources Code is unconstitutional because it irreconcilably conflicts with Article I, Section 33 of the Texas Constitution, which guarantees the public an

unrestricted right to use and access Texas public beaches.

**Claim 2: Sections 61.132 and 61.011(d)(11) of the Texas Natural Resources Code are unconstitutional, as applied, because Boca Chica Beach is a public beach, and the public has a constitutionally guaranteed right to access the Beach.**

80. Currently, Section 61.132 of the Open Beaches Act is being applied in such a manner as to deny the public access to Boca Chica Beach.

81. Boca Chica Beach is a “public beach,” as defined by the Open Beaches Act and by Article I, Section 33 of the Texas Constitution.

82. Section 33 guarantees the public’s right to access a public beach. Therefore, the closure of Boca Chica Beach and the only access road thereto, under the authority of Section 61.132 of the Open Beaches Act, violates the Texas Constitution.

83. The GLO has applied Section 61.011(d)(11) by certifying and adopting, via its rules, Cameron County’s amended Beach Access and Dune Protection Plan, which allows unlimited beach closures. The GLO’s adoption of the County’s amended Plan, as authorized by Section 61.011(d)(11) of the Open Beaches Act, violates the Texas Constitution and the guarantee of the public’s right to access public beaches.

84. Accordingly, SaveRGV requests declaratory judgment that Sections 61.132 and 61.011(d)(11) of the Texas Natural Resources Code, as applied to Boca Chica Beach, violate Article I, Section 33 of the Texas Constitution.

85. Similarly, SaveRGV requests declaratory judgment that the GLO’s amendment to its Rule 15.32, adopted pursuant to House Bill 2623’s revisions to the Open Beaches Act, and certifying the County’s dune protection and beach access plan, is invalid and violates the Texas Constitution, as applied.

86. SaveRGV also requests declaratory judgment that the Memorandum of Agreement between GLO and Cameron County, adopted pursuant to House Bill 2623's revisions to the Open Beaches Act, is invalid and violates the Texas Constitution.

87. Finally, SaveRGV requests a declaration from this Court, declaring invalid the Cameron County commissioners court order, authorizing the Cameron County Judge to order the closure of Boca Chica Beach and/or State Highway 4, to allow for space flight activities, as it violates the Texas Constitution.

**Claim 3: Section 61.011(d)(11) of the Texas Natural Resources Code is unconstitutional on its face.**

88. Section 61.011(d)(11) of the Natural Resources Code provides as follows: "The [GLO] commissioner shall promulgate rules, consistent with the policies established in this section, on the following matters only . . . the closure of beaches for space flight activities." Tex. Nat. Res. Code § 61.011(d).

89. Authorizing the closure of public beaches for space flight activities, via promulgation of state agency rules, violates the guarantee of public beach access in Article I, Section 33 of the Texas Constitution.

90. Accordingly, SaveRGV requests declaratory judgment that Section 61.011(d)(11), allowing for closure of public beaches via promulgation of state agency rules, is unconstitutional because it irreconcilably conflicts with Article I, Section 33 of the Texas Constitution, which guarantees the public an unrestricted right to use and access Texas public beaches.

**VIII. REQUEST FOR ATTORNEY'S FEES**

91. Plaintiff SaveRGV requests recovery of its attorney's fees and costs that it incurs in pursuit of the declaratory relief it seeks here, as authorized by Section 37.009 of the Civil Practice and Remedies Code.

## **IX. PRAYER**

92. Plaintiff SaveRGV prays this Court render judgment:

- a. declaring Section 61.132 of the Texas Natural Resources Code unconstitutional because it irreconcilably conflicts with Article I, Section 33 of the Texas Constitution, which guarantees the public an unrestricted right to use and access Texas public beaches;
- b. declaring Sections 61.132 and 61.011(d)(11) of the Texas Natural Resources Code, as applied to Boca Chica Beach, unconstitutional because they violate Article I, Section 33 of the Texas Constitution;
- c. declaring Section 61.011(d)(11) of the Texas Natural Resources Code, allowing for closure of public beaches via promulgation of state agency rules, is unconstitutional because it irreconcilably conflicts with Article I, Section 33 of the Texas Constitution, which guarantees the public an unrestricted right to use and access Texas public beaches;
- d. declaring the GLO's amendment to its Rule 15.32, certifying the County's dune protection and beach access plan, invalid because it violates the Texas Constitution;
- e. declaring the Memorandum of Agreement between GLO and Cameron County, adopted pursuant to House Bill 2623's revisions to the Open Beaches Act, invalid

because it violates the Texas Constitution;

- f. declaring invalid the Cameron County commissioners court order, authorizing the Cameron County Judge to order the closure of Boca Chica Beach and/or State Highway 4, to allow for space flight activities, because it violates the Texas Constitution;
- g. awarding SaveRGV its costs and attorneys' fees; and
- h. granting SaveRGV such other relief, including supplemental and injunctive relief, to which it may show itself entitled.

Respectfully submitted,

/s/ John Bedecarre

John Bedecarre

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[REDACTED]

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*Counsel for Plaintiff SaveRGV*



# **SaveRGV files lawsuit to vindicate Texans' constitutional right to access public beaches**

## **The Texas Constitution is Being Violated Texans' right to unrestricted access to use and enjoy Boca Chica Beach must be protected**

### **FOR IMMEDIATE RELEASE...**

**Brownsville, Texas October 8, 2021**

Save RGV today filed a lawsuit to vindicate the constitutional right in Texas to access public beaches.

SaveRGV takes this action in response to the constant, unpredictable, and unprecedented closures of Boca Chica Beach taking place since 2019. This public beach is being closed pursuant to an amendment to the Texas Open Beaches Act allowing counties along the Gulf Coast to close a beach for space flight activities.

"This isn't rocket science," said Jim Chapman, a Board member of the local non-profit group SaveRGV. "The Texas Constitution is crystal clear. In Texas, access to public beaches cannot be restricted. No one, not even the legislature, can take that right away."

SaveRGV is a Texas non-profit corporation that advocates for environmental justice and sustainability and the health and well-being of the Rio Grande Valley Community. SaveRGV also promotes the conservation and protection of wildlife habitat and the natural areas of the Rio Grande Valley, including by defending the public's right to access Boca Chica Beach.

The Bill of Rights to the Texas Constitution guarantees the public shall have the free and unrestricted right to access and use public beaches. In violation of these guarantees, the legislature passed a law in 2013 that lets Gulf-Coast counties close beaches for space flight activities with no articulable limits. The law has essentially given away Boca Chica Beach to a private corporation.

"This lawsuit is about a special-interest law that directly conflicts with the Texas State Constitution" said Bill Berg, another SaveRGV board member.

For more information contact:

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SaveRGV

[REDACTED]  
[REDACTED]

Mary Angela Branch  
SaveRGV

[REDACTED]  
[REDACTED]



**VIA ELECTRONIC FILING**

March 25, 2021

Ms. Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, D.C. 20426

**Re: Rio Grande LNG, LLC  
Docket No. CP16-454-000  
Response to Letters from Save RGV dated March 15, 2021 and from the City of Port Isabel  
dated March 23, 2021**

Dear Ms. Bose:

On May 5, 2016, Rio Grande LNG, LLC ("RGLNG") filed an application with the Federal Energy Regulatory Commission ("FERC") for authorization pursuant to Section 3(a) of the Natural Gas Act ("NGA") to site, construct, and operate a natural gas liquefaction facility and liquefied natural gas ("LNG") export terminal in Cameron County, Texas, along the north embankment of the Brownsville Ship Channel (the "Rio Grande LNG Project").

On November 22, 2019, FERC issued an order authorizing the construction and operation of the Rio Grande LNG Project (the "Order"). On January 23, 2020, FERC denied requests for rehearing of the Order. On January 19, 2021, FERC denied requests for rehearing of the Order related to design changes approved on August 13, 2020.

Rio Grande would like to clarify several statements contained in two letters posted this week to Docket No. CP16-454-000: one from Save RGV dated March 15, 2021 and one from the City of Port Isabel dated March 23, 2021. Both letters relate to concerns with the proximity of SpaceX and the expanded operations at the Boca Chica launch and testing facility to three (3) planned LNG export facilities: Annova LNG, Rio Grande LNG and Texas LNG.





These clarifications are as follows:

- For the USCG Waterway Suitability Assessment (WSA) reviews in both 2015 and 2016, which assessed Annova LNG, Rio Grande LNG and Texas LNG jointly, City of Port Isabel representatives were invited but no representative from Port Isabel attended the reviews.
- In 2019, in preparation for the Emergency Services Gap Analysis to be performed in development of the Cost Sharing Plan, a Rio Grande consultant (AcuTech) scheduled meetings on behalf of Rio Grande with multiple responding agencies in Cameron County. Although not a responding agency, the Port Isabel San Benito Navigation District (Port Isabel) was contacted as a courtesy, given their cooperation agreement with The Port of Brownsville. The Port Isabel Port Director was requested and agreed, during scheduling their meeting, to extend an invitation to the City of Port Isabel representative to attend as well. The invitation was extended on behalf of NextDecade but was declined by the City of Port Isabel's office. The meeting proceeded as scheduled on August 6, 2019 with only the Rio Grande HSSE Director, Rio Grande's Safety & Security Consultant, and the Port Isabel Port Director in attendance at the Port Isabel San Benito Navigation District offices.
- In the Emergency Services Gap Analysis conducted in August 2019, Rio Grande consulted with the Brownsville Fire Department, Port of Brownsville Police Department, Cameron County Sheriff's Department, Cameron County Office of Emergency Management, and the Cameron County / City of Brownsville Hospital System in connection with this thorough gap analysis. The Cameron County Fire Marshal was not consulted since this entity is also not a responding agency to any Terminal incident.
- To receive FERC construction approval for initial site preparation on March 6, 2020, Rio Grande was required to comply with FERC Order Conditions 53 and 54, which relate to the development of the Emergency Response Plan (ERP) and Cost-Sharing Plan respectively. Rio Grande demonstrated compliance with these Order Conditions with the filing of Implementation Plan Volume 2 on November 22, 2019 and supplemented by FERC data request responses filed on January 22 and February 14, 2020. As required by Order Conditions 53 and 54, Rio Grande continues to report progress on the development of its ERP and Cost-Sharing Plan at 3-month intervals, most recently with the public FERC filing on February 22, 2021.
- Finally, as an additional prerequisite to receive FERC construction approval for initial site preparation on March 6, 2020, Rio Grande was required to comply with FERC Order Condition 46, which required Rio Grande to develop and implement procedures to monitor rocket launch activity and to position onsite construction crews and plant personnel in areas that are unlikely to be impacted by rocket debris of a failed launch during initial moments of rocket launch activity from the Brownsville SpaceX facility. Rio Grande demonstrated full compliance with this Order Condition with the filing of Implementation Plan Volume 2 on November 22, 2019, which included procedures for positioning of onsite construction crews and plant personnel with reference to any guidance from the FAA to the public regarding SpaceX launches.



This filing is being served on each person on the official service list for this proceeding.

If you have any questions, please contact Jerry Schafer at [REDACTED]

Respectfully submitted,

/s/ Ivan Van der Walt

Ivan Van der Walt  
Senior Vice President, Engineering & Construction

Krysta De Lima  
General Counsel and Corporate Secretary

cc: Jerry Schafer, NextDecade LNG, LLC  
Gertrude Johnson, FERC  
Brady Dague, FERC  
Ghanshyam Patel, FERC  
David Wochner, Esq., K&L Gates LLP



### **CERTIFICATE OF SERVICE**

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated this 25<sup>th</sup> day of March 2021.


/s/ Dimitri Tagaropulos

Dimitri Tagaropulos  
*Associate General Counsel*  
NextDecade Corporation

Document Content(s)

RGLNG Letter March-25-2021.PDF.....1

K&L GATES

David L. Wochner  
Practice Area Leader - Policy and Regulatory  


May 6, 2021

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F  


Ms. Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, D.C. 20426

*Re: Rio Grande LNG, LLC, Docket No. CP16-454-000  
Rio Bravo Pipeline Company, LLC, Docket No. CP16-455-000  
Response to Request to Suspend Permits and Issue Order Conditions*

Dear Ms. Bose:

On November 22, 2019, Rio Grande LNG, LLC ("RGLNG") and Rio Bravo Pipeline, LLC ("Rio Bravo") received authorization (the "Order") from the Federal Energy Regulatory Commission (the "Commission" or "FERC") to construct and operate the RGLNG and Rio Bravo Project ("Project").<sup>1</sup> The Commission's granting of the Order followed its review of the Project in a final environmental impact statement ("FEIS") in April 2019.<sup>2</sup> RGLNG's portion of the Project includes construction and operation of liquified natural gas ("LNG") export facilities in Cameron County, Texas (the "Terminal").

In a March 25, 2021 filing by Save RGV, and in a March 31, 2021 filing by the Lower Rio Grande Valley Sierra Club ("Sierra Club"), the organizations requested that the Commission suspend RGLNG's authorization and issue new or revised conditions to address potential operational changes at a nearby SpaceX Boca Chica launch facility.<sup>3</sup>

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<sup>1</sup> *Rio Grande LNG, LLC and Rio Bravo Pipeline Co., LLC*, 169 FERC ¶ 61,131 (2019) ("Order").

<sup>2</sup> Final Environmental Impact Statement for the Rio Grande LNG Project, Docket Nos. CP16-454-000 and CP16-455-000 (April 2019) ("FEIS").

<sup>3</sup> Lower Rio Grande Valley Sierra Club Request for Permit Suspension, Docket Nos. CP16-454, CP16-116, and CP16-480, Accession No. 20210401-5017 (Mar. 31, 2021) ("Sierra Club Request"); Save RGV Request for Permit Suspension, Docket Nos. CP16-454, CP16-480, and CP16-116, Accession No. 20210325-5013 (Mar. 25, 2020) ("Save RGV Request").

Sierra Club and Save RGV claim that the Commission's prior analyses for SpaceX rocket launches in the FEIS are no longer accurate given SpaceX's announcement that it is seeking changes to its launch program to accommodate Starship and Super Heavy launch vehicles.<sup>4</sup> Sierra Club and Save RGV contend that the Commission should therefore suspend the Terminal authorization until the Commission can determine, through new launch failure analyses, whether these launch vehicles poses significant risks to the Terminal.<sup>5</sup>

Sierra Club and Save RGV requests to the Commission are misguided. As described below in further detail, the Sierra Club and Save RGV filings must be disregarded by the Commission for the following reasons:

- (i) The legal standard for when an agency (here, the Commission) must supplement the analysis it has performed under the National Environmental Policy Act ("NEPA") is not satisfied because there is no major federal action remaining to occur and there are no significant new circumstances or information relevant to environmental concerns and bearing on the Order or its impacts<sup>6</sup>;
- (ii) The FAA is the proper forum for Sierra Club and Save RGV to express their concerns, not the Commission, which has no outstanding action since issuing the Order; and
- (iii) Sierra Club and Save RGV have requested that the Order be suspended, which would be an unnecessary and disproportionate action.

**1. The legal standard for supplementing a NEPA analysis by the Commission is not satisfied.**

In determining whether there is a duty to supplement a NEPA analysis, agencies must first look at whether a major federal action remains to occur and "the value of the new information to the *still pending decision making process*."<sup>7</sup> If there is no remaining or ongoing major federal action, there is no duty to supplement the NEPA analysis.<sup>8</sup>

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<sup>4</sup> Save RGV Request at 2; Sierra Club Request at 2.

<sup>5</sup> Save RGV Request at 2; Sierra Club Request at 5. Sierra Club requested new or revised conditions be issued to RGLNG and Texas LNG, but not Annova LNG, ostensibly because Annova LNG announced that it was discontinuing its proposed project on March 22, 2021. On April 15, 2021, the Commission issued an order vacating Annova LNG's FERC authorization. See *Annova LNG Common Infrastructure, LLC*, Order Vacating Authorization, Docket No. CP16-480-000 (issued Apr. 15, 2021).

<sup>6</sup> 40 C.F.R. § 1502.9(d)(1).

<sup>7</sup> *Marsh v. Or. Natural Res. Council*, 490 U.S. 360, 371-72, 374 (1989) (emphasis added) (supplementation appropriate because, with federally funded construction of a dam only one-third completed, major federal action remained).

<sup>8</sup> See *Norton v. Southern Utah Wilderness Alliance*, 542 U.S. 55, 73 (2004) (supplementation to address evidence of increased off-road vehicle use not required because there was no remaining or ongoing major federal action to occur following land use plan approval).



Here, the Commission has already taken the relevant major federal action: the Commission's issuance of the Order authorizing RGLNG to construct and operate the Terminal. Neither Sierra Club nor Save RGV identify any major federal action pending before the Commission which could justify a supplemental NEPA analysis, because there is none.

The remainder of the Commission's involvement in overseeing the Terminal's construction and operation relates to its administrative oversight of compliance with the Order and Commission regulations. Such ministerial actions do not trigger a NEPA review.<sup>9</sup> Nor is any major federal action present simply because the Order governs subsequent Project development activities.<sup>10</sup>

In addition to failing to meet the requisite legal standard, Sierra Club and Save RGV have not raised any significant new circumstances or information relevant to environmental concerns bearing on the proposed action.

As an initial matter, an agency's decision to supplement its NEPA analysis is subject to the "rule of reason."<sup>11</sup> Supplementation is not required every time new information comes to light, otherwise agency decision-making would be rendered "intractable, always awaiting updated information only to find new information outdated by the time a decision is made."<sup>12</sup> Applying this rule of reason, an agency need not supplement its analysis based on new information or circumstances when the effects are not reasonably foreseeable<sup>13</sup> or are remote or highly speculative.<sup>14</sup>

Moreover, an agency is only required to prepare a supplemental NEPA analysis if the new information "provides a seriously different picture of the environmental landscape" than what was considered in the existing NEPA analysis.<sup>15</sup> In this regard, an agency's continuing obligation to

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<sup>9</sup> See e.g., *Center for Biological Diversity v. Salazar*, 706 F.3d 1085, 1096 (9th Cir. 2013) (noting that "post-project-approval functions are the type of monitoring and compliance activities that ... do not trigger NEPA's requirements").

<sup>10</sup> See, e.g., *Western Organization of Resource Councils v. Zinke*, 892 F.3d 1234, 1243 (D.C. Cir. 2018) (the agency's action "thus terminated with the plan's approval, and there was no duty to supplement the EIS after that point. . . . [and i]t did not matter that the plan continued to govern actions that took place after that approval."). See also *Greater Yellowstone Coal. v. Tidwell*, 572 F.3d 1115, 1123 (10th Cir. 2009) ("That the Forest Service retains discretion to amend the permit does not alone lead to the conclusion there is ongoing major federal action or major federal action to occur.").

<sup>11</sup> *Marsh*, 490 U.S. at 373.

<sup>12</sup> *Id.*

<sup>13</sup> See 40 C.F.R. § 1508.1(g) (defining effects or impacts to mean changes to the human environmental from the proposed action that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action).

<sup>14</sup> See *Blue Ridge Environmental Defense League v. Nuclear Regulatory Com'n*, 716 F.3d 183, 189 (D.C. Cir. 2013).

<sup>15</sup> *City of Olmstead Falls, Ohio v. F.A.A.*, 292 F.3d 261, 274 (D.C. Cir. 2013); see also *Blue Ridge Environmental Defense League*, 716 F.3d at 196 ("New and significant information presents a seriously different picture of the environmental impact of the proposed project from what was previously envisioned." (internal quotation marks omitted)).

consider new information that comes to light after it issues its NEPA document “extends only to new information or circumstances regarding environmental impacts that may not have been appreciated or considered” when the NEPA document (in this case, the FEIS for the Terminal) was prepared.<sup>16</sup>

Here, the new circumstances and information that Sierra Club and Save RGV raise relate to the mere announcement of potential changes that may, at some future date, eventually come through FAA action which, as described below, will necessarily include consideration of the proposed SpaceX changes on the Terminal. The Commission cannot undertake a supplemental NEPA analysis based on speculation and hyperbole, while a sister agency, the FAA, is itself tasked with evaluating the environmental aspects of the proposed action under its jurisdiction.

Indeed, FAA may well assess that the mitigating actions imposed by the Commission on the Terminal in the FEIS requirements remain appropriate, notwithstanding any proposed changes to the SpaceX launch program. The Commission has required, and RGLNG has accepted, specific mitigating actions during construction and operations such as (1) positioning onsite workers in areas that are unlikely to be impacted by failed rocket launch debris, and (2) monitoring rocket launches to enable workers, in the event of a rocket launch failure, to shut down or reduce operations, to take mitigating action to minimize potential releases or cascading effects, and to shelter in place.<sup>17</sup> These actions will apply regardless of the type of SpaceX vessel launched or its destination.

Sierra Club also briefly claims that supplemental analysis is warranted because Elon Musk announced on Twitter that “SpaceX is building floating, superheavy-class spaceports for Mars, moon & hypersonic travel around Earth,” with possible launches from an oil rig retrofitted into a floating spaceport off the South Texas coast that could affect LNG tankers.<sup>18</sup> SpaceX has not submitted any application to the FAA for any licenses or permits relating to floating spaceports off the South Texas coast. Musk’s tweet epitomizes the type of speculative actions and impacts that the rule of reason is intended to address, and cannot be the basis of any supplemental action by the Commission.

## **2. The FAA is the proper forum to consider potential impacts of SpaceX’s launch program changes on the Terminal.**

The FAA is currently in the early stages of its NEPA review for SpaceX’s Starship and Super Heavy proposed launch program changes. The FAA has completed scoping for its

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<sup>16</sup> *N. Idaho Com’ty Action Network v. U.S. Dep’t of Transp.*, 545 F.3d 1147, 1155 (9th Cir. 2008); see also *Marsh*, 490 U.S. at 375 (requiring a supplemental NEPA analysis only if the new information is sufficient to show environmental effects “in a significant manner or to a significant extent not already considered”).

<sup>17</sup> *Id.*

<sup>18</sup> Sierra Club Request at 4.

analysis, and its March 2021 scoping report identified safety issues related to launching in proximity to LNG facilities as a concern that would be addressed in its analysis.<sup>19</sup>

NEPA requires that the FAA consider the environment that could be affected by the SpaceX proposal and its alternatives, and that FAA's analysis must include reasonably foreseeable environmental trends and planned actions in the area.<sup>20</sup>

Thus, since the Commission has already authorized RGLNG to construct and operate the Terminal, the Terminal's presence on the landscape will be part of the affected environment that the FAA must address in its new NEPA analysis of the revised SpaceX launch program. Since, as described above, the Commission has no pending decision in respect of the Terminal, it need not undertake its own supplemental NEPA analysis, much less duplicative analysis stemming from a third party's proposal to a separate federal agency that is already being analyzed by that agency. NEPA certainly does not require such a "volley" of federal reviews, the impact of which could result in *ad infinitum* environmental reviews as new projects emerge in proximity to the original project after it has been authorized by the responsible federal agency.

Sierra Club and Save RGV have already filed comments on the SpaceX docket at FAA,<sup>21</sup> and therefore have ample opportunity to voice their concerns with that agency under that NEPA review, which necessarily must take into account the now-prior authorization of the Terminal by the Commission as it considers SpaceX's request. It is the FAA which must now consider the impacts of the proposed SpaceX changes on the Terminal; not the other way around.

### **3. Suspending the Order would be an unnecessary and a disproportionate action.**

In addition to the above, Sierra Club and Save RGV have proposed an unnecessary and disproportionate action from the Commission by suggesting that the Commission suspend the Order.

Suspending the authorization today would not address the alleged, speculative safety concerns raised by Sierra Club or Save RGV as there is no ongoing or imminent construction or operation at RGLNG's Terminal that could be affected by the proposed launch vehicle changes. In addition, the FEIS provides for adequate mitigation measures during construction, once those activities commence.

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<sup>19</sup> Scoping Summary Report for the Draft Environmental Assessment for the SpaceX Starship/Super Heavy Launch Vehicle Program at the SpaceX Boca Chica Launch Site in Cameron County, Texas at 3, (March 2021) available at [https://www.faa.gov/space/stakeholder\\_engagement/spacex\\_starship/media/SpaceX\\_Starship\\_Super\\_Heavy\\_Boca\\_Chica\\_Scoping\\_Summary\\_Report.pdf](https://www.faa.gov/space/stakeholder_engagement/spacex_starship/media/SpaceX_Starship_Super_Heavy_Boca_Chica_Scoping_Summary_Report.pdf).

<sup>20</sup> See 40 C.F.R. § 1502.15.

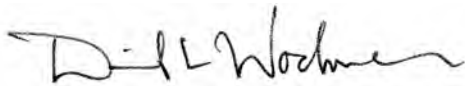
<sup>21</sup> Save RGV, *et al.*, *Scoping Comments on FAA Programmatic Environmental Assessment SpaceX* (Jan. 22, 2021), available at <https://www.sierraclub.org/sites/www.sierraclub.org/files/sce/lower-rio-grande-valley-group/Regulatory-Comments/FAA%20SpaceX%20Scoping%20Comment.pdf> (last visited May 4, 2021).

Moreover, the FAA has only just begun its analysis of SpaceX's application and must complete its environmental review and safety analysis prior to issuing any launch licenses or experimental permits to SpaceX. The Starship and Super Heavy vehicles are not permitted to launch until this process is complete.

\* \* \* \* \*

For the foregoing reasons, RGLNG respectfully requests that the Commission consider the information provided herein and reject the Save RGV's and Sierra Club's requests.

Best regards,

A handwritten signature in black ink, appearing to read "D. L. Wochner". The signature is fluid and cursive, with a long horizontal stroke at the end.

David L. Wochner  
*Counsel for Rio Grande LNG, LLC*

cc: Krysta De Lima, Rio Grande LNG  
Jerry Schafer, Rio Grande LNG  
Gertrude Johnson, FERC

### **CERTIFICATE OF SERVICE**

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated this 6th day of May 2021.

/s/ Jennifer L.B. Abbey

Jennifer L.B. Abbey  
*Counsel for Rio Grande LNG, LLC*

Document Content(s)

Rio Grande LNG Resp. to Req. to Suspend Permits.PDF .....1

January 22, 2021

**RE: Response to Request for Public Comments**

To Whom It May Concern:

We are writing in response to the Federal Aviation Administration's ("FAA") request for public comments on the SpaceX Starship/Super Heavy Project at the Boca Chica Launch Site in Cameron County, Texas, and "potential alternatives and impacts ... affecting the quality of the human environment." Reference is also made to that letter to the FAA, dated July 3, 2020, and signed by multiple interested parties - including NextDecade Corporation ("NextDecade") - concerning the SpaceX Boca Chica Launch Site.

We understand that the FAA is undertaking the License Review Process and the Environmental Review Process to assess a range of issues and concerns related to public safety, national security, foreign policy, insurance requirements, and potential environmental impacts.

Additionally, we understand that FAA is utilizing a "Programmatic" Environmental Assessment ("EA") given that the proposed Starship/Super Heavy launch operations from the SpaceX Boca Chica Launch Site will be conducted on a recurring basis and that each launch operation is likely to result in substantially similar impacts. According to guidance issued by the Council on Environmental Quality ("CEQ"), the Programmatic EA "must [therefore] provide sufficient detail to foster informed decision-making that reflects broad environmental consequences from a wide-ranging federal program."<sup>1</sup>

In light of SpaceX testing and other activities at the Boca Chica Launch Site, which are already causing near-daily closures of area recreational facilities and roadways (including, for example, every day this week)<sup>2</sup> and appear to be expanding significantly, we appreciate FAA's consideration of the below which pertain to the safe and secure construction and operation of NextDecade's fully permitted Rio Grande LNG facility to be constructed in the nearby Port of Brownsville, as well as to the sustainment of the human environment and indigenous flora and fauna for those who live, work, and recreate in Cameron County, Texas.<sup>3</sup>

It is important that SpaceX be required to provide regular and reliable information regarding its planned operations at the Boca Chica Launch Site. This will ensure the safe and efficient construction and operations of critical infrastructure in the region, including Rio Grande LNG. As it relates to the FAA's scoping of issues for analysis in the draft EA, we suggest that particular focus be placed on: (1) frequency and scope of launch operations and consistency with maximum number of launches assessed in the FAA's June 2014 final EIS; (2) emergency response and planning; (3) offshore area clearing and facility closures; and (4) storage and handling of propellant fuel.

NextDecade's Rio Grande LNG project was the subject of an extensive, multi-year, multi-agency review pursuant to the National Environmental Policy Act of 1969 ("NEPA"). The entirety of the Rio Grande LNG NEPA review, which was managed by the Federal Energy Regulatory Commission ("FERC"), was

<sup>1</sup> <https://www.energy.gov/sites/default/files/2016/09/16-effective-use-of-programmatic-nepa-reviews-06dec2014.pdf>

<sup>2</sup> <https://www.cattiredcommunity.org/spaces/>

<sup>3</sup> <https://www.ferc.gov/about/offices/office-of-the-associate-commissioner/office-of-environmental-needs/docs/nextdecade/starship/super-heavy-launch-site-environmental-impact-statement.html>  
<https://www.ferc.gov/about/offices/office-of-the-associate-commissioner/office-of-environmental-needs/docs/review-launch-house-in-latest-launch-site-environmental-impact-statement-media-final-BO-PA-18-spaces-on.pdf>



conducted after the SpaceX environmental impact statement (“EIS”) had been completed and made public. Indeed, the plans and conclusions of multiple federal agencies and community stakeholders as they relate to the safe coexistence of SpaceX with Rio Grande LNG were formulated in reliance on FAA’s statements regarding the “maximum 12 annual launch operations ... including launches of the Falcon 9, a maximum of two Falcon Heavy launches, and/or associated mission rehearsals and static fire engine testing, through the year 2025.”<sup>4</sup>

For example, as set out in the Rio Grande LNG final EIS,<sup>5</sup> the construction schedule for Rio Grande LNG contemplates carefully integrated and phased interruptions based specifically on information provided by SpaceX to the FAA pertaining to the 2016-2025 period. FERC has approved our project siting, construction and operations, based on these representations by FAA and SpaceX. It is our expectation that any alterations to the SpaceX launch program will result in no greater impacts to Rio Grande LNG or the community than contemplated in the SpaceX EIS.

There is little doubt that the U.S. Space Program – and the agencies and companies that support it – contribute significantly to enhancing our national security, not to mention national pride and patriotism, and we appreciate the FAA’s characterization of its own goals as they relate to commercial space transportation: “encourage, facilitate, and promote.” However, to permit boundless extension of the radius of impact of SpaceX’s experimental activities in South Texas without sufficient consideration of the substantial potential impacts on international commerce and community safety and vitality would be inconsistent with the authority delegated to FAA under the Commercial Space Launch Act of 1984, as amended and codified.

For the past several years, the FAA has collaborated with federal agencies to ensure SpaceX may safely coexist with other industries and communities, and we are confident the FAA will uphold its standard of constructive stakeholder engagement in response to this latest Starship/Super Heavy proposal.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read "Ivan Van der Walt", is written over a light blue horizontal line.

Ivan Van der Walt  
Senior Vice President

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<sup>4</sup> [https://www.faa.gov/about/office\\_org/headquarters\\_offices/ast/environmental/nepa\\_docs/review/launch/spacex\\_texas\\_launch\\_site\\_environmental\\_impact\\_statement/](https://www.faa.gov/about/office_org/headquarters_offices/ast/environmental/nepa_docs/review/launch/spacex_texas_launch_site_environmental_impact_statement/)  
<sup>5</sup> [https://www.ferc.gov/sites/default/files/2020-05/FEIS-volume-I\\_0.pdf](https://www.ferc.gov/sites/default/files/2020-05/FEIS-volume-I_0.pdf)





## **Background**

NextDecade is a liquefied natural gas (“LNG”) development company focused on LNG export projects. NextDecade is developing the largest LNG export solution linking Permian Basin and Eagle Ford Shale natural gas to the global LNG market. NextDecade’s marquee project, Rio Grande LNG, is to be constructed on a 984-acre site on the north embankment of the Brownsville Ship Channel. NextDecade’s common stock is listed on the Nasdaq Stock Market under the symbol “NEXT.” NextDecade is headquartered in Houston, Texas.

NextDecade and its stakeholders – including but not limited to global LNG customers, U.S. gas producers, midstream companies, vendors, contractors, shareholders, and employees – have an interest in the outcome of the FAA’s proceedings in this matter.

Rio Grande LNG comprises the largest privately funded infrastructure project in the State of Texas. The project will be constructed pursuant to a lump-sum turnkey engineering, procurement, and construction contract executed with Bechtel Oil, Gas, and Chemicals in May 2019. Bechtel is the world’s leading LNG EPC contractor, having constructed more than 30 percent of the liquefaction capacity in the world, including seven liquefaction trains to-date on the U.S. Gulf Coast.

Rio Grande LNG is expected to contribute more than \$35 billion to U.S. GDP during the construction phase, and more than \$550 million per year during operations. At full scale, the facility will be capable of producing 27 million metric tonnes of LNG per year for export to markets around the world. Rio Grande LNG will create thousands of direct and indirect jobs during construction and ongoing operations, driving increased revenues to local businesses in Cameron County and throughout the Rio Grande Valley. In addition to maximizing local hiring, NextDecade has committed to enhancing youth education, utilizing local training facilities, promoting safe work environments, and supporting improvements to the Brownsville Ship Channel.

## **FERC NEPA Review**

LNG facilities in the United States are subject to extensive federal and state regulatory standards. To satisfy NEPA requirements, FERC evaluated the potential environmental impacts of Rio Grande LNG in an environmental impact statement (“EIS”) issued in April 2019. In addition to the FAA, several other agencies cooperated with FERC in the preparation of the EIS: U.S. Army Corps of Engineers, U.S. Coast Guard, Pipeline and Hazardous Materials Safety Administration, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, National Park Service, National Oceanic Atmospheric Administration (National Marine Fisheries Service), and U.S. Department of Energy.

Cooperating agencies – including the FAA – have jurisdiction by law or special expertise with respect to resources potentially affected and thus participated in the NEPA analysis of Rio Grande LNG. As part of the NEPA analysis, the FAA assisted FERC in “evaluating impacts on and from the SpaceX rocket launch facility in Cameron County ... Specific recommends [were] included [in the final EIS] to address potential impacts from rocket launch failures on [Rio Grande LNG].”

In March 2017, and as requested by FERC, NextDecade filed a third-party analysis of “potential future space launch missions at the SpaceX ... launch site.” This analysis was completed by ACTA, Inc., a recognized subject matter expert in the evaluation of a range of safety hazards and risks from launch vehicle debris, blasts, and toxic gases, for the FAA, U.S. Department of Defense, the National



Aeronautics and Space Administration (“NASA”), and a variety of international companies and agencies. The ACTA analysis considered a full range of launch vehicles that met the threshold criteria for realness and relevance at the time and concluded that the risk (including likelihood and consequence) of a potential launch failure leading to an impact to the Rio Grande LNG facility boundary or the Brownsville Ship Channel was insignificant.

Additionally, a Letter of Recommendation issued in December 2017 by the U.S. Coast Guard featured consideration of SpaceX-related safety and security matters through consultation with “a variety of stakeholders including representatives from the Brownsville Navigation District, Port Isabel – San Benito Navigation District, local facility security, the Brazos Santiago Pilots Association, and Signet Maritime.”

At the conclusion of the extensive NEPA review, FERC issued an order granting authorization under Section 3 of the Natural Gas Act to site, construct, and operate the Rio Grande LNG facility.

### **Frequency and Scope of Launch Operations and Planned Interruptions**

The FAA completed a final EIS pertaining to the SpaceX Boca Chica Launch Site in June 2014. The EIS covers a 10-year period from 2016 to 2025 and “assesses a maximum of 12 annual launch operations during this time period, which would include orbital and suborbital launches.” The FAA notes that SpaceX had not, at the time, “identified proposed operations beyond this time ... As necessary, for any activity that is outside the scope of [the] EIS and falls under the FAA’s purview, a new or supplemental NEPA analysis would be conducted.”

As noted above, the entirety of FERC’s NEPA review of NextDecade’s Rio Grande LNG project was conducted in the years following the completion of the SpaceX EIS. The plans and conclusions of multiple federal agencies and community stakeholders as they relate to the safe coexistence of SpaceX with other interests were formulated, relying on FAA’s statements regarding the “maximum 12 annual launch operations ... including launches of the Falcon 9, a maximum of two Falcon Heavy launches, and/or associated mission rehearsals and static fire engine testing, through the year 2025.”<sup>6</sup>

Additional interruptions due to unplanned experimental events may cause our EPC contractor, operations staff, and other personnel to take shelter with an unknown frequency, resulting in substantial impact to cost and schedule, as well as potential interference with vessel operations. We request the FAA consider the potential consequential effect to other industries should SpaceX be permitted to meaningfully exceed previously disclosed maximums.

### **Other Considerations**

It is important that SpaceX be required to provide regular and reliable information regarding its planned operations at the Boca Chica Launch Site. This will ensure the safe and efficient construction and operations of critical infrastructure in the region, including our Rio Grande LNG facility.

### ***Emergency Response and Planning***

In accordance with various federal standards and to ensure the safety and security of our personnel, NextDecade has established an Emergency Response Plan (“ERP”) which accounts for all anticipated

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<sup>6</sup> [https://www.faa.gov/about/office\\_org/headquarters\\_offices/ast/environmental/nepa\\_docs/review/launch/spacex\\_texas\\_launch\\_site\\_environmental\\_impact\\_statement/](https://www.faa.gov/about/office_org/headquarters_offices/ast/environmental/nepa_docs/review/launch/spacex_texas_launch_site_environmental_impact_statement/)

events, including those resulting from planned rocket launch and recovery efforts. As a good corporate citizen, SpaceX must include industrial interests within impact zones in emergency response planning. Reliable communications will help to minimize disruption to industrial and marine activities in the region and mitigate potential impact to the liability of the federal government due to indemnification by the federal government for losses above \$3.1 billion.<sup>7</sup> FAA should note that NextDecade's Health, Safety, Security, and Environment ("HSSE") team is keen to engage with SpaceX counterparts to promote the health and safety of the human environment and sustainment of indigenous flora and fauna.

#### *Offshore Area Clearing and Facility Closures*

On the day of a launch, Boca Chica Beach and portions of State Highway 4 are closed to the public. While closures are only on to the south of the Brownsville Ship Channel and do not impact the Channel itself, such closures have become near-daily (including, for example, every day this week) and have indeed disrupted access to recreational facilities frequented by those who live, work, and recreate in Cameron County. As part of a coastal management plan, SpaceX was to develop a plan for clearing offshore areas to ensure public health and safety. Clearing activities include boat patrol and helicopter sweeps conducted by the U.S. Coast Guard. Increased scope and frequency of SpaceX's disruptive activities may also have implications for the extent and duration of offshore area clearing.

#### *Storage and Handling of Propellant Fuel*

Energy infrastructure projects in South Texas have been subjected to appropriate regulatory scrutiny to ensure compliance and consistency with standards maintained by the Pipeline and Hazardous Materials Safety Administration and the National Fire Protection Association ("NFPA"), among others. While it is standard practice that facilities that store and utilize flammable liquids be required to model vapor cloud dispersion and design for blast overpressure, it is unclear to what extent NFPA reviews have been required of the SpaceX facility. It is also unclear what Process Safety Management guidelines have been incorporated in the design of the storage facility to accommodate requisite fuel quantities and conditions. Given the potential for now even larger quantities of fuel to be stored at the Boca Chica Launch Site, further modeling, review, and approval protocols must be applied to ensure the health and safety of the local community.

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<sup>7</sup> [https://www.ferc.gov/sites/default/files/2020-05/FEIS-volume-I\\_0.pdf](https://www.ferc.gov/sites/default/files/2020-05/FEIS-volume-I_0.pdf)

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**From:** John & Barbara <[REDACTED]>  
**Sent:** Monday, November 1, 2021 5:37 PM  
**To:** SpaceXBocaChica  
**Subject:** Public Comment on FAA SpaceX Draft PEA

### **3) The need for regulatory oversight the potential toxicity of the expanding SpaceX operational aspirations**

The SpaceX Boca Chica operation is an industrial manufacturing, assembly, and testing as well as a launch and landing site building its own rocket fuel and HAZMAT (Hazardous Materials) storage tanks, with its own on site power generators.

It plans to drill for natural gas in nearby lease sites too close to Gulf and South Bay waters and vulnerable protected habitat sites for reliable spill containment measures.

At the least, it should qualify for LEED certification at the Platinum level before it's allowed to expand its operations any further (<https://www.usgbc.org/help/what-leed>).

Forewarned is forearmed. Check out:

"NASA's Costly Toxic Legacy: Space Agency Faces at Least \$1.9 Billion in Environmental Liabilities," Doug Messier, 01-19-2021, Parabolic Arc, <http://www.parabolicarc.com/2021/01/19/nasas-costly-toxic-legacy-space-agency-faces-at-least-1-9-billion-in-environmental-liabilities/#more-77343>

Which cites "Environmental Liabilities: NASA's Reported Financial Liabilities Have Grown, and Several Factors Contribute to Future Uncertainties," US Government Accountability Office, 01-15-2021, <https://www.gao.gov/products/gao-21-205>

Which is in line with "NASA spent millions over decades trying to clean toxic waste at Michoud site. It's still there.," Mark Schleifstein, 04-09-2021, The Times Picayune, [https://www.nola.com/news/environment/article\\_6cfeef1a-90bc-11eb-a158-4fdb371e078a.html](https://www.nola.com/news/environment/article_6cfeef1a-90bc-11eb-a158-4fdb371e078a.html)

Beyond assurance, we need vigilant and substantive protection from the SpaceX Boca Chica operation developing into a toxic Superfund Site with devastating impacts on our local population, economy, and protected areas of natural habitat (including the Laguna Atascosa National Wildlife Refuge).

Unfortunately, the information relevant to these concerns in the FAA SpaceX Draft PEA are inadequate for most anyone trying to picture the scope of the proposed PEA and the impacts it could have within and beyond its present project site and scope of operations.

In 2018, NextDecade paid \$15 thousand for the "Design and Fabrication of a Table-Top Liquefied Natural Gas Demonstration Station" to better communicate the location and design of its Rio Grande LNG project.

A contoured map with small three dimensional artist renditions of the structures involved in the proposed, expanded SpaceX project would likewise be helpful, each numbered and described in layperson terms in a printed guide to the project and each of its parts.

Thank you for your consideration of my comments.

John Young, MS (Psychology), MSW (Social Work), Retired

## San Benito TX

- Active member of Save RGV from LNG since May 2014
- Registered FERC Intervenor opposed to the originally paired Rio Grande LNG and Rio Bravo Pipeline projects since 05-25-2016 ([http://elibrary.ferc.gov/idmws/file\\_list.asp?accession\\_num=20160609-5280](http://elibrary.ferc.gov/idmws/file_list.asp?accession_num=20160609-5280))
- Registered FERC Intervenor opposed to Enbridge's Rio Bravo Pipeline Company's Rio Bravo Pipeline project since 06-26-2020 ([https://elibrary.ferc.gov/eLibrary/idmws/file\\_list.asp?accession\\_num=20200626-5079](https://elibrary.ferc.gov/eLibrary/idmws/file_list.asp?accession_num=20200626-5079))

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**From:** Brazos Santiago Pilots <[REDACTED]>  
**Sent:** Monday, November 1, 2021 11:21 AM  
**To:** SpaceXBocaChica  
**Subject:** Public comment on Space X PEA  
**Attachments:** CU Space X comments.pdf

Good afternoon Ms. Zee,

Please find the attached public comment regarding the SpaceX PEA.

Thank you,  
Chris Urbanovsky  
Vice President  
Brazos Santiago Pilots



## Brazos-Santiago Pilots, LLC

Serving the Ports  
of  
Brownsville & Port Isabel, Texas



November 1, 2021

Ms. Stacey Zee, SpaceX PEA

c/o ICF

9300 Lee Highway, Fairfax, VA 2203

**Re: Programmatic Environmental Assessment for the SpaceX Starship/Super Heavy Launch Vehicle Program at the SpaceX Boca Chica Launch Site in Cameron County, Texas**

Dear Ms. Zee,

My name is Chris Urbanovsky and I am the Vice President of the Brazos Santiago Pilots. We have 85 years of service to the Port of Brownsville, Port Isabel, Cameron County, and the State of Texas with safeguarding the waterways and its tributaries while navigating large oceangoing vessels to and from sea. The FAA oversees aeronautical traffic, and we have found ourselves in an unfamiliar situation of aeronautical/marine traffic conflict. My comments are in regards to questions we feel have not been answered or addressed pertaining to the users of the Brownsville ship channel.

Up to now with past Space X operations we have experienced channel closures while fueling rockets, static test, and the actual test flights. We'd like to say that we recognize the big picture of what Space X means to the U.S. and possibly the whole world. They have brought lots of job opportunities and attention to the RGV and will continue to do so. All that being said the Brazos Santiago Pilots are very weary of the impact they could also have on the many residents and long-established businesses of the RGV and elsewhere.

The question nobody can seem to answer is who has ultimate authorization for closing the Brownville ship channel. This is a public waterway and is being shut down for a private entity. These closures cost

customers and the port lots of time and money. To expand on that we would like to know the long-term impact for businesses that utilize the Brownsville ship channel with these closures.

It is also in our experience and with the information that has been provided to us from SpaceX relating to the hazardous navigation zones, we feel that the channel closures are not necessarily required, and we would like to see the channel closures ceased. We feel that safe navigation can be maintained in conjunction with SpaceX flights. These illustrations regarding safe navigation zones in our professional opinion and extensive local knowledge of existing topography and weather observations are grossly inaccurate and need to be examined, evaluated, and discussed before allowing Space X to move forward with their executions.

In closing, the Brazos Santiago Pilots have some very troubling concerns for the future of the ports and its users, and it is our goal to be able to communicate and resolve these concerns so that both SpaceX and the many ship channel users can continue to grow and thrive in the RGV together safely.

Thank you for your time and hearing our interest.

Sincerely,

A handwritten signature in black ink, appearing to read 'C. Urbanovsky', with a long, sweeping horizontal line extending to the right.

Capt. Christopher R. Urbanovsky

Vice President

Brazos Santiago Pilots

Commissioned Pilots for the State of Texas



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**From:** Brazos Santiago Pilots <[REDACTED]>  
**Sent:** Monday, November 1, 2021 7:02 AM  
**To:** SpaceXBocaChica  
**Subject:** Public comment on Space X Starship/Super Heavy Boca Chica Launch Site  
**Attachments:** Space X FAA PEA.pdf

Ms. Zee

Attached is s public comment from the Bras Santiago Pilots regarding SpaceX Starship/Super Heavy at Boca Chica Launch Site.

Best Regards,  
Captain Jonathan P. Willett  
Presiding Officer  
Brazos Santiago Pilots



## Brazos-Santiago Pilots, LLC

Serving the Ports  
of  
Brownsville & Port Isabel, Texas

November 1, 2021

Ms. Stacey Zee, SpaceX PEA,

c/o ICF

9300 Lee Highway, Fairfax, VA 2203

**Re: Programmatic Environmental Assessment for the SpaceX Starship/Super Heavy Launch Vehicle Program at the SpaceX Boca Chica Launch Site in Cameron County, Texas**

Dear Ms. Zee,

We appreciate the forum to comment on the Draft Programmatic Environmental Assessment for Space X Starship/Super Heavy Launch Vehicle Program. I am Captain Jonathan P. Willett, Presiding Officer of the Brazos Santiago Pilots. We are Commissioned Pilots for the State of Texas tasked with maneuvering deep draft vessels in and out of the Port of Brownsville and the Port of Port Isabel since 1936.

I recently received an email from the Port of Brownsville regarding potential impacts that could affect, and not limited to, the Brownsville Ship Channel, but also all users of the waterway. The list of users includes Commercial Traffic, Shrimping Traffic, Fishing, Tourism, General Public, and more.

Commercial traffic on the Brownsville Ship Channel moves 24 hours a day, 365 days a year. Any interruption in that flow of commerce will have a huge impact on the local and regional economy, along with national and international economies, further disrupting supply chains upstream and downstream. We have already seen the impact of consumer supply chains with the recent back log of ships at the Ports of Long Beach and Los Angeles, and the recent blocking of the Suez Canal. We are certain that any disruption in the flow of traffic that is suggested in this draft PEA would have a similar effect on customers and terminal operators at both the Port of Port Isabel and the Port of Brownsville.

Local fishing and shrimping industries rely on the channel to not only catch product in the channel but also to bring it to market. Local and international shrimp boats bring their catches to market, supplying customers with wild caught shrimp also transit the channel. Local companies use the ship channel and the ports of Brownsville and Port Isabel for tourism providing Dolphin tours, Eco tours and Port tours, the general public also uses the water way for recreational fishing and entertainment. Even our local people fish the waterway to provide for their families.

There is a further concern with the potential ground closures that are proposed in the draft PEA. Our region has been taking massive steps forward to bring new industry, working with State schools to train its local citizens for accommodating and attracting industry to the Port of Brownsville and the Port of Port Isabel. Allowing one single company to close the channel and Port of Brownsville property will stifle the Port's ability to attract new industry in our region affecting the ability for continued growth. The proposed closures will have devastating effects on the thousands of current and potential new users.

Our concern continues to grow with the precedence that would be set with a for profit, nonuser of a waterway to be able to shut down other businesses at the Port of Brownsville, the Port of Port Isabel, and ALL users of the waterway, but any other Port in the country that is economically vital to national and international commerce.

In summary, The Brazos Santiago Pilots support the cutting-edge technologies SpaceX brings to the world and the Rio Grande Valley; however, we do not and cannot support their operations when it has such a devastating and negative impact on this region and all economies that extend from and rely on the Port of Brownsville, the Port of Port Isabel, and the Brownsville Ship Channel, local, regional, national, and international. We hope that moving forward Space X and ALL users of Port of Brownsville, the Port of Port Isabel, and the Brownsville Ship Channel can coexist harmoniously and prosperously without one having the ability to supersede the others.

Sincerely,

A handwritten signature in black ink, appearing to be 'J. Willett', with a stylized, elongated horizontal stroke extending to the right.

Capt. Jonathan P. Willett

Presiding Officer

Brazos Santiago Pilots

Commissioned Pilots for the State of Texas

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**From:** Troy Messick <[REDACTED]>  
**Sent:** Monday, November 1, 2021 9:32 AM  
**To:** SpaceXBocaChica  
**Subject:** Public comment on Starship/Super Heavy launch operations

Dear Ms. Zee,

I wanted to provide public comment in support of SpaceX's application for license or permits for their Starship/Super Heavy launch operations in Cameron County, Texas.

I whole-heartedly support their application for three reasons:

\* I believe it is in our national interest to inspire the public--and especially students--of the value of science and technology. We are a nation that has pushed the boundaries of exploration and science to develop technology that has powered our economy. We should encourage and sustain the efforts of SpaceX in continuing to develop cheap and efficient and reusable space industry technology. This platform technology could be the basis for launching scientific instrumentation, for example, more advanced Hubble or James Webb telescopes. These technologies can alter our understanding and appreciation of the universe and our place in it.

\* I believe that the benefits of the technology outweigh potential harms to the environment. It is often hard to predict how technology can impact our lives. But just as the development of nuclear technology has decreased carbon emissions and greenhouse gases from fossil fuels, the greater good and progress needs to be put ahead of the short-term environmental harms that may be caused in developing the technology. Specific to the technology that SpaceX is building is the goal to have reusable rockets that can be used multiple times. This prevents waste and is less costly to the environment in terms of the materials and resources needed. I have reviewed the Programmatic Environmental Assessment and feel that SpaceX has carefully considered ways that it plans to mitigate those potential environmental harms.

\* I believe that economic benefits are important for the region, the country, and the world as a whole. First, SpaceX is an important employer in the region and jobs are dependent upon SpaceX being able to continue research and development. Second, SpaceX has been able to create new markets for networking and data communication through its Starlink satellite constellation that it is still being built. They have been able to do so by dramatically decreasing the cost of commercial space transportation. These include benefits to rural locations in the United States because they do not have the internet infrastructure. Lastly, the technology being developed at Boca Chica can have a dramatic impact around the world and make businesses possible that we have heretofore not conceived of. Whether it be space tourism or ultra quick flights to locations around the world, this technology could be a driver of global economic growth. And the United States would benefit economically from this technology.

I strongly urge the **expedited** approval of their application and the granting of their permit or license to continue development of this important technology.

Sincerely,  
Troy Messick, Ph.D.  
Upper Darby, Pennsylvania

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**From:** John Bumgarner <[REDACTED]>  
**Sent:** Monday, November 1, 2021 1:27 PM  
**To:** SpaceXBocaChica  
**Subject:** Public comment regarding the Draft Programmatic Environmental Assessment for the SpaceX Starship/Super Heavy Launch Vehicle Program

Hello, I would like to add a comment in support of the Draft Programmatic Environmental Assessment for the SpaceX Starship/Super Heavy Launch Vehicle Program. I am a US citizen, and I think that it is imperative that our government and other organizations balance access to space as well as protecting our local environment and all of our limited resources here on Earth. I was very pleased to read that the Draft PEA appears to take a deliberate and thorough approach to addressing the potential environmental impacts of SpaceX Starship operations at Boca Chica.

I particularly support the Draft PEA approach to implement this review at a Programmatic level that can be used for future activities and evaluated and modified as necessary to allow innovation and improvements as future opportunities arise.

I also strongly feel that the benefits of this activity vastly outweigh any mitigated environmental impacts, especially the economic benefits to the local area, the technological and strategic benefits to NASA and the US, and the inspirational benefits to all of humanity for future exploration and scientific discovery.

I support the issuance of either a FONSI or Mitigated-FONSI as described in the Draft PEA, as I feel that the activities and mitigations described will adequately protect the environmental resources.

Thank you,

John Bumgarner

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**From:** Ashley G Hodge <[REDACTED]>  
**Sent:** Monday, November 1, 2021 9:09 AM  
**To:** SpaceXBocaChica  
**Subject:** Public Comment

Good morning,

I'm writing this email to voice my concerns about the SpaceX construction. I am wildlife biologist currently attaining a master's in Texas and have spent time working in Florida. In both states, I learned about the impacts our space exploration has on our environment. The quest to answer questions we've pondered for centuries is one of extreme interest, and with our fast-paced advance in technology, dreams we thought we'd never achieve are in reach. With that said, in order for us to continuously explore space, we need a home base. We cannot be successful in space exploration if we continue to ignore our current planet and the impacts we have.

It's been well documented here in Texas that when SpaceX launches rockets, debris scatters on important wildlife refuges. This is unacceptable. Our wildlife are not infinite. If we do not take actions to protect them and their necessary habitats and healthy ecosystems, then our dreams of exploring deep space can be dashed. Without a healthy planet, we cannot pursue the ends of the universe. Our planet must come first. Action needs to be taken against companies that refuse to do their part, especially when there's mountains of evidence showing the damage being inflicted. Without taking action, future companies will see that they too can ignore important environmental regulations.

Please take myself and other biologists, ecologists, etc. opinions into deep consideration. We dedicate our lives to these matters, and our voices must be elevated during times when wildlife are being heavily impacted. I hope to see the right actions taken, and our wildlife protected.

All the best,

**Ashley G. Hodge**

Graduate Research Assistant

Caesar Kleberg Wildlife Research Institute

Texas A&M University – Kingsville

Cell. [REDACTED]

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**From:** Jared Margolis <[REDACTED]>  
**Sent:** Monday, November 1, 2021 9:38 AM  
**To:** SpaceXBocaChica  
**Subject:** Center for Biological Diversity Comments on SpaceX Draft PEA and BA  
**Attachments:** 10-28-21 SpaceX Comment Letter (final).pdf

Good morning,

Attached please find a comment letter submitted by the Center for Biological Diversity regarding FAA's Draft Programmatic Environmental Assessment and Biological Assessment for the SpaceX program at Boca Chica. A hard copy of the letter has been sent to: Ms. Stacey Zee, SpaceX PEA, c/o ICF, 9300 Lee Highway, Fairfax, VA 22031, along with a USB key containing all of the exhibits accompanying these comments, and we ask that these documents be included in the administrative record for this matter. Due to the size of the attachments, I am not providing them by email; however, if it would be of assistance I could try emailing them using several separate emails, or place them in a shared drive that you can access - please let me know if that would be helpful. Thank you –

Sincerely,

Jared M. Margolis  
Senior Attorney | Endangered Species Program  
Center for Biological Diversity  
[REDACTED]

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November 1, 2021

*Submitted via email and certified mail (w/ attachments on USB drive)*

Ms. Stacey Zee  
SpaceX PEA, c/o ICF  
9300 Lee Highway  
Fairfax, VA 22031  
SpaceXBocaChica@icf.com

**Re: Center for Biological Diversity Comments on FAA's Draft Programmatic Environmental Assessment and Biological Assessment for SpaceX**

Thank you for the opportunity to comment on the Draft Programmatic Environmental Assessment (DPEA) and Biological Assessment (BA) for the SpaceX Starship/Super Heavy Launch Vehicle Program at Boca Chica, TX. These comments are submitted on behalf of the Center for Biological Diversity (the Center) and our over 1.7 million members and online activists dedicated to the protection of endangered species and wild places.

While the Center is certainly not opposed to space exploration, we are concerned about the impacts of SpaceX's activities at the Boca Chica site, particularly given the sensitive ecosystems and imperiled species that are directly affected by the proposed activities. The Federal Aviation Administration (FAA) has a duty to ensure that SpaceX's exploratory efforts do not come at the expense and undue sacrifice of our current home and the wildlife that relies on the habitat in the Boca Chica area; yet, the FAA has failed to take the requisite hard look at the proposed use of the Boca Chica Launch Site for Starship/Super Heavy launch operations, and has failed to require SpaceX to implement reasonable measures to mitigate its impacts and ensure that endangered wildlife will not be jeopardized by the SpaceX Launch Vehicle Program.

As set forth below, the FAA's failure to fully consider and ensure adequate mitigation for the full range of impacts associated with the proposed action—including the impacts to wildlife refuge lands and protected wildlife, as well as the tremendous use of energy and releases of methane that contribute to the current climate crisis—render the FAA's analyses inadequate, arbitrary and capricious, in violation of the National Environmental Policy Act, the Endangered Species Act, the National Wildlife Refuge System Administration Act, the Migratory Bird Treaty Act, and the Department of Transportation Act.



## **I. Violations of the National Environmental Policy Act**

### **A. The FAA Must Prepare an EIS**

The National Environmental Policy Act (NEPA) requires all agencies of the federal government to prepare an environmental impact statement (EIS) for all “major Federal actions significantly affecting the quality of the human environment.”<sup>1</sup> To determine whether a proposed action significantly affects the environment and thus requires an EIS, the lead federal agency may first prepare an environmental assessment (EA).<sup>2</sup> An environmental assessment must provide sufficient evidence and analysis to determine whether to prepare an EIS.<sup>3</sup> The lead agency must take a “hard look” at the relevant environmental concerns and alternatives to the proposed action.<sup>4</sup> If an environmental assessment concludes that there are no potentially significant impacts to the environment, the federal agency must provide a detailed statement of reasons why the project’s impacts are insignificant and issue a finding of no significant impact (FONSI).<sup>5</sup> However, if an agency action may have significant impacts on the environment, then an EIS must be prepared.<sup>6</sup>

Since 1979 and until the Trump Administration, the CEQ NEPA regulations required that the “significance” of an agency action be evaluated through a consideration of the context and intensity of the proposed action. Despite recent regulatory changes that have attempted to withdraw the CEQ regulations regarding “significance” (which are now being challenged in court and that CEQ has recently indicated it is revisiting), the nature of the impacts of a project on the environment must still be deemed relevant to whether the project is “significant” for purposes of NEPA. Where, as here, the proposed activity will undoubtedly have significant adverse impacts on sensitive habitats and listed species, a full EIS is required.

Indeed, the longstanding NEPA regulations required agencies to consider ten “significance factors” in determining whether a federal action may have a significant impact, thus requiring an EIS.<sup>7</sup> Among other factors, agencies have considered the beneficial and adverse impacts of the action, the effect on public health and safety, unique characteristics of the geographic area impacted (such as park lands, wetlands, or ecologically critical areas), the degree to which possible effects are highly controversial, uncertain, or involve unique or unknown risks, cumulatively significant effects, whether the proposed action will violate any laws or standards

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<sup>1</sup> 42 U.S.C. § 4332(2)(C).

<sup>2</sup> 40 C.F.R. § 1508.9.

<sup>3</sup> *Id.*

<sup>4</sup> *Id.* See also *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989).

<sup>5</sup> 40 C.F.R. § 1508.13.

<sup>6</sup> *Id.* § 1501.4.

<sup>7</sup> See prior version of 40 C.F.R. § 1508.27 set forth in 43 Fed. Reg. 56003 (Nov. 29, 1978), 44 Fed. Reg. 874 (Jan. 3, 1979).

of environmental protection, and whether it may adversely affect an endangered or threatened species.<sup>8</sup>

The FAA’s decision to prepare an EA rather than an EIS for the proposed use of the Boca Chica site for Starship/Super Heavy launch operations is inconsistent with the requirements of NEPA and calls into question whether the agency truly understands the scope of what SpaceX plans to do at the Boca Chica site, and the incredible environmental harm that is likely to occur – and indeed has already occurred – to an area that provides essential habitat for wildlife, including protected migratory birds and sea turtles. SpaceX activities not only have the potential for significant adverse environmental impacts, but those impacts would occur in essential habitat areas (including designated critical habitat) with unique characteristics that are easy to destroy, and very difficult to replace. Furthermore, such activities would certainly have cumulative impacts on the area and the climate, and recent correspondence from the U.S. Fish and Wildlife Service (FWS) indicates that the impacts of the SpaceX activities to the surrounding habitat is not only detrimental to several species, but is highly controversial given that SpaceX has been operating in violation of the prior Biological Opinion and Incidental Take Statement for the facility, which has led to the take of protected wildlife in violation of the ESA.<sup>9</sup>

The FAA itself acknowledges that the construction and operation of the project would result in adverse impacts from noise, light, traffic, heat and debris from rockets (that can explode and cause wildfires), and is therefore likely to adversely affect several ESA-listed species, including piping plovers, red knots, northern aplomado falcons, gulf coast jaguarundi and ocelots, as well as Kemp’s ridley, loggerhead, green, hawksbill, and leatherback sea turtles, requiring formal ESA consultation with FWS. That admission alone undermines any argument that the impacts of the project are not “significant” for purposes of NEPA. Furthermore, the DPEA acknowledges the potential for significant environmental harm from SpaceX activities due to the unique and/or unknown risks of rocket launches (including “anomalies”), further undermining any argument that an EA alone is sufficient.

Put plainly, there can be no doubt that the proposed SpaceX activities at the Boca Chica site would have significant environmental impacts, requiring an EIS. The Boca Chica site is a small property surrounded by some of the most important habitat for migratory birds in the U.S. As the U.S. Fish and Wildlife explains, the Lower Rio Grande Valley Refuge (LRGV) — directly adjacent to the Boca Chica launch site — “is considered one of the most biologically diverse

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<sup>8</sup> *Id.*

<sup>9</sup> See Letters from Manuel “Sonny” Perez III, Complex Refuge Manager, South Texas Refuges Complex, U.S. Fish & Wildlife Serv. & Charles Ardizzone, Project Leader, Texas Coastal Ecological Service Office, U.S. Fish & Wildlife Serv. to Daniel P. Murray, Manager, Safety Division, Federal Aviation Administration dated Oct. 2, 2020, Dec. 14, 2020, and Jan. 22, 2021 (attached hereto).

regions in North America.”<sup>10</sup> During migration, species from the Central and Mississippi flyway converge on this area, making it an essential stopover for migratory birds. However, much of the habitat in the region has been lost, relegating these birds to remnant tracts. The Lower Rio Grande Valley National Wildlife Refuge was established in 1979 specifically to connect and protect these isolated tracts of habitat. And the Boca Chica tract of the NWR is “an important link of the Lower Rio Grande Valley ‘Wildlife Corridor’.”<sup>11</sup> Not only does the Boca Chica tract provide habitat for migratory birds, such as ESA-listed piping plovers and red knots, but it “is one of the few places where the Kemp’s Ridley sea turtle, the most critically endangered sea turtle in the world, comes ashore to nest on refuge beaches in the spring and summer.”<sup>12</sup>

Other lands in the vicinity of the SpaceX facility that the FAA acknowledges would be impacted by SpaceX activities likewise provide important habitat for wildlife, including federally listed species. For example, the Laguna Atascosa NWR provides habitat for the endangered ocelot, jaguarundi, and northern aplomado falcon as well as threatened and endangered sea turtles and shorebirds.<sup>13</sup> It is also a “premier bird-watching destination with more recorded species of birds than any other refuge in the National Wildlife Refuge System.”<sup>14</sup> The Service explains that “today, there is an expanded emphasis [at Laguna Atascosa] that includes endangered species conservation and management for shorebirds.”<sup>15</sup> The refuge also provides habitat for the largest population in the United States of ocelots, “making it the center for conservation and recovery efforts for this endangered cat.”<sup>16</sup> The nearby South Bay Coastal Preserve, with its wind-tidal flats, shallow depths, associated vegetation, and unique location likewise “provides excellent feeding, resting and wintering habitat for numerous types of migratory bird species.”<sup>17</sup>

Simply put, the area surrounding the SpaceX facility at Boca Chica is not some wasteland that can be sacrificed for a private corporation’s aspirations of interstellar travel, as Elon Musk appears to believe.<sup>18</sup> Rather, it is a biologically diverse and essential habitat area for many species, including imperiled migratory birds and sea turtles. For the FAA to suggest that an EIS is not warranted for permitting SpaceX to launch the largest rockets known to humankind—

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<sup>10</sup> [https://www.fws.gov/refuge/Lower\\_Rio\\_Grande\\_Valley/about.html](https://www.fws.gov/refuge/Lower_Rio_Grande_Valley/about.html)

<sup>11</sup> [https://www.fws.gov/refuge/Lower\\_Rio\\_Grande\\_Valley/visit/boca\\_chica\\_beach.html](https://www.fws.gov/refuge/Lower_Rio_Grande_Valley/visit/boca_chica_beach.html)

<sup>12</sup> *Id.*

<sup>13</sup> See Laguna Atascosa NWR Comprehensive Conservation Plan, available at <https://www.fws.gov/doiddata/dwh-ar-documents/1266/DWH-ARZ000415.pdf> (attached hereto).

<sup>14</sup> [https://www.fws.gov/refuge/Laguna\\_Atascosa/about.html](https://www.fws.gov/refuge/Laguna_Atascosa/about.html)

<sup>15</sup> *Id.*

<sup>16</sup> *Id.*

<sup>17</sup> <https://tpwd.texas.gov/landwater/water/conservation/txgems/southbay/index.phtml>

<sup>18</sup> In a “SpaceX Update” (May 7, 2020 Via Microsoft Teams), which was released via a Freedom of Information Act request, Mr. Musk is quoted on a slide which shows two large pieces of rocket debris in high value wetlands as stating “We’ve got a lot of land with nobody around, and so if it blows up, it’s cool. – Elon Musk, 2018” (attached hereto).”

which may explode causing catastrophic harm to adjacent habitat, and require the burning and/or venting of methane, a potent greenhouse gas—along with ancillary facilities including a desalination plant, power plant, LNG pretreatment system, and other energy intensive infrastructure, with the related noise, lighting, traffic, and other construction and operational harms, is simply ludicrous, and certainly the very definition of arbitrary and capricious agency action.

It also remains entirely unclear why the FAA now believes that an EA is sufficient when it previously prepared an EIS for SpaceX's activities at the Boca Chica facility, particularly given that the proposed activities are even more environmentally damaging than what was previously considered, with larger rockets and more infrastructure. And the issuance of a prior EIS does not provide any basis for an EA/FONSI for the proposed new use of the site for Starship/Super Heavy launch operations. While supplemental EA's *may* have been warranted for prior proposed changes to the SpaceX operations, the new proposed uses of the Boca Chica site are much different from the past use due to the difference in rocket size and technology and the addition of infrastructure including a power plant and desalination plant. Moreover, FAA's regulations implementing NEPA define when a Supplemental EIS is needed or whether an EA will suffice. This was referenced in the 2014 Record of Decision for SpaceX operations at Boca Chica (FAA Order 1050.1F, Sec. 902), which specifically stated that a supplemental EIS is not needed only if one of the following three conditions applies:

- The proposed Action conforms to plans or projects for which a prior EIS has been filed and there are no substantial changes in the Proposed Action that are relevant to environmental concerns;
- Data and analysis contained in the previous EIS are still substantially valid and there are no significant new circumstances or information relevant to environmental concerns and bearings on the Proposed Action or its impacts;
- All pertinent conditions and requirements of the prior approval have, or will be, met in the current actions.

SpaceX's activities proposed use of the Boca Chica site for Starship/Super Heavy launch operations do not meet any of these conditions. SpaceX is seeking to conduct activities that were not planned and included in the 2014 EIS, which only authorized up to 12 launches of Falcon 9 or Falcon Heavy rockets each year. The use of the site for Starship/Super Heavy launch operations – including up to 20 launches per year – and additional infrastructure is therefore a substantial change to the use of the area.

It is also evident that SpaceX has not complied with all of the pertinent conditions and requirements of the prior approvals, and that there is new information relevant to environmental

concerns regarding SpaceX's operations at Boca Chica. As FWS noted in its January 22, 2021, letter to the FAA<sup>19</sup>:

Since 2014, SpaceX has undertaken activities not covered in FAA's 2014 EIS which addressed only 12 launches per year, not continual experimentation related to the Starship/Super Heavy proposal as is currently being carried out. SpaceX activities not covered include a higher frequency of road closures extending well beyond 180 hours, large explosions from reported anomalies, the appearance of significantly large staffing, 24/7 operations, traffic, and construction activities not analyzed in the 2014 EIS. In addition, SpaceX rocket debris falling onto the Refuge has damaged the sensitive wind tidal flats. And, the vehicles or machinery used to retrieve rocket debris have created ruts and caused other damage that interrupts water sheet flow across these flats. Two SpaceX incidents on July 25, 2019 and again in August 2019 resulted in wildfires of 130-acres and 10-acres respectively burned through coastal prairie and dune habitats on refuge managed land. Anomalies resulting in explosions on November 20, 2019, February 28, 2020, and December 9, 2020 resulted in debris scattered onto refuge managed lands. Retrieval methods damaged the sensitive alkaline flat and refuge cable fencing installed to protect the area from disturbance.

FWS further found that:

Due to operations by SpaceX, the FWS's ability to maintain the biological integrity, diversity and environmental health of Refuge resources, as well as our ability to ensure the viability of the six wildlife-dependent recreational uses, has been significantly diminished at the Boca Chica tract. This occurs by preventing or constraining public access year-round, hampering biological and monitoring studies including sea turtle patrols, sea turtle cold-stunning responses, hampering refuge management and law enforcement patrol, increased observations of road mortality of wildlife at all hours of daytime and nighttime, damage to sensitive habitats such as the wind tidal flats and to the salt prairie from explosions and fires, as well as adversely impacting nesting habitat for sensitive species.<sup>20</sup>

Hence, even if SpaceX were not seeking to drastically expand its activities at the Boca Chica site – resulting in additional environmental harm – a supplemental EIS would have been necessary because mitigation measures previously committed to were not being carried out and significant

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<sup>19</sup> Letter from Manuel "Sonny" Perez III, Complex Refuge Manager, South Texas Refuges Complex, U.S. Fish & Wildlife Serv. & Charles Ardizzone, Project Leader, Texas Coastal Ecological Service Office, U.S. Fish & Wildlife Serv. to Daniel P. Murray, Manager, Safety Division, Federal Aviation Administration at 2 (Jan. 22, 2021) ("FWS Jan. 22, 2021 Letter").

<sup>20</sup> *Id.*

environmental harm is occurring that was not previously considered.<sup>21</sup> With the new activities being proposed, it is even more evident that an EIS is required.

In sum, the FAA is proposing to authorize a new, expanded version of the SpaceX program at Boca Chica, which includes activities that have proven to result in significant harm to the environment, including to endangered species. Courts have specifically held that under NEPA and its implementing regulations, courts “cannot accept [an EA] as a substitute for an EIS — despite the time, effort, and analysis that went into their production — because an EA and an EIS serve very different purposes.”<sup>22</sup> “To treat an EA as if it were an EIS would confuse these different roles, to the point where neither the agency nor those outside it could be certain that the government fully recognized and took proper account of environmental effects in making a decision with a likely significant impact on the environment.”<sup>23</sup> Under the circumstances here, an EA cannot suffice. Indeed, an EA aims simply to identify (and assess the “significance” of) potential impacts on the environment to see whether an EIS is needed, but it is not intended to provide the full analysis – the “hard look” – that NEPA requires for major federal actions with significant environmental effects.<sup>24</sup> Where, as here, there clearly are significant effects, officials must make their decision “in light of an EIS.”<sup>25</sup> Therefore, the FAA’s failure to produce an EIS is arbitrary, capricious, and in clear violation of NEPA.

#### **B. The FAA failed to take the requisite “hard look” at the environmental impacts of the project**

Even if an environmental assessment would suffice for this project, which it clearly cannot, the FAA has failed to provide a sufficient analysis of the impacts of the proposed action in the DPEA and has therefore failed to take the hard look required under NEPA to fully consider the environmental impacts of the proposed SpaceX activities.<sup>26</sup>

As discussed above, the SpaceX facility is surrounded by publicly owned conservation, park, and recreation lands including Boca Chica State Park, Brazos Island State Park, the Lower Rio Grande Valley National Wildlife Refuge, the South Bay Coastal Preserve, and the Las Palomas Wildlife Management Area (Boca Chica Unit). These lands are of incredible conservation value for a range of federally and state listed species and other protected species such as migratory

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<sup>21</sup> See 40 C.F.R. § 1501.29 (providing that a supplemental EIS is required when there are “significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts”).

<sup>22</sup> *Sierra Club v. Marsh*, 769 F.2d 868, 875 (1st Cir. 1985) (Breyer, J.).

<sup>23</sup> *Id.*; See also *Massachusetts v. Watt*, 716 F.2d 946, 951 (1st Cir. 1983).

<sup>24</sup> *Id.*

<sup>25</sup> *Sierra Club v. Marsh*, 769 F.2d 868, 875 (1st Cir. 1985) (noting that “the purpose of an EA is simply to help the agencies decide if an EIS is needed”).

<sup>26</sup> See *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989).

birds. The DPEA, however, does not provide a full analysis of the environmental impacts to these areas and the wildlife that rely on them. Rather, it provides only cursory statements about the potential for environmental harm – including passing reference to potentially catastrophic harm from rocket explosions that may cause extensive wildfires – but fails to provide any real analysis of the actual impacts to the people, habitats and wildlife that will be adversely affected.

For example, as discussed in the attached documents obtained through FOIA,<sup>27</sup> there have been several explosions of rockets at the SpaceX facility, and the DPEA acknowledges that FAA anticipates further “anomalies” from the SpaceX Starship/Super Heavy Launch Vehicle Program at Boca Chica. In fact, the DPEA states that SpaceX is proposing to conduct approximately 10 tank tests of its rockets per month and estimates a 10 percent rate of anomalies during tank testing, which “would result in an explosion and the spread of debris. The distance for which debris could spread is considered the blast danger area,” which includes the adjacent wildlife refuge and park lands.<sup>28</sup> However, the DPEA totally glosses over what the actual environmental impacts of these explosions could be. It merely mentions offhandedly that there may be monthly explosions but provides no in-depth analysis of how debris from such explosions would affect nearby wildlife and habitats, other than conclusory statements regarding the potential for some unknown amount of harm. The DPEA fails to address the direct harm to wildlife and habitats from the debris, as well as debris recovery efforts, which FWS has stated – as set forth above – are causing undue adverse impacts to wildlife, including listed species.<sup>29</sup> However, “general statements about possible effects and some risk do not constitute a hard look absent a justification regarding why more definitive information could not be provided.”<sup>30</sup>

The DPEA also fails to address the potential for devastating wildfires and hazardous material contamination from these anomalies.<sup>31</sup> It only briefly notes that “[c]hanges to terrestrial habitat structure might occur from fire in small areas adjacent to the launch mount and landing pad. Vegetative land cover in these areas is classified as barren or grasslands, both of which would recover quickly post-fire.”<sup>32</sup> However, SpaceX’s activities have resulted in several fires in areas immediately adjacent to the launch site, such as two fires in the LRGV which burned 140 acres of refuge habitat. Moreover, SpaceX’s operations are located within piping plover critical habitat, yet the DPEA fails to address how piping plovers would be impacted as a result of these fires. Rather, the FAA merely discusses how SpaceX would respond to a fire, but this does not

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<sup>27</sup> The Center incorporates these documents by reference and asks that they be included in the administrative record for this matter.

<sup>28</sup> DPEA at 16.

<sup>29</sup> Photos of impacts to piping plover critical habitat from removing rocket explosion debris are attached hereto.

<sup>30</sup> *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1213 (9th Cir. 1998).

<sup>31</sup> A discussion of the potential harm from these incidents can be found in the letter to FAA from Charles Ardizzone, FWS Field Supervisor, dated March 2, 2020 (attached hereto).

<sup>32</sup> DPEA at 112.

provide a “hard look” at the potential for catastrophic damage to surrounding habitat from an anomaly. This is clearly not enough to satisfy NEPA.<sup>33</sup>

In addition, the FAA failed to address the impacts of SpaceX’s activities on the ozone layer. It is well established that the ozone layer plays an important role in protecting the earth (and its inhabitants) from the sun’s harmful rays. The EPA has stated that “the ozone layer in the stratosphere absorbs a portion of the radiation from the sun, preventing it from reaching the planet’s surface. Most importantly, it absorbs the portion of UV light called UVB. UVB has been linked to many harmful effects, including skin cancers, cataracts, and harm to some crops and marine life.”<sup>34</sup> In the DPEA, the FAA claims that it need not consider the impacts of SpaceX activities on the ozone layer, since “the proposed launch activities do not generate ozone depleting substances;”<sup>35</sup> however, the FAA provides no support for this contention. In fact, studies have shown that rocket engine emissions *do* adversely affect the ozone layer. Rocket engine exhaust contains gases and particles that can have important impacts on climate and ozone because rocket engines emit various amounts of submicrometer-sized particles of soot (or black carbon, BC) and alumina (aluminum oxide) directly into the stratosphere.<sup>36</sup> The FAA’s failure to consider the impacts of rocket emissions on the ozone layer is a glaring violation of NEPA.

Finally, the FAA violated NEPA because the DPEA does not provide an analysis of all reasonable alternatives to the proposed action. The alternatives analysis is the heart of the NEPA process,<sup>37</sup> and the FAA’s own NEPA implementing regulations explicitly state that “The FAA decision-making process must consider and disclose the potential impacts of a proposed action and its alternatives on the quality of the human environment.”<sup>38</sup> Yet the only alternative provided for analysis was the proposed action. FAA failed to analyze other options, including a less-intensive use of the Boca Chica site (i.e., fewer launches per year), or the use of other sites for the proposed launches, such as the Kennedy Space Center. The failure to consider a full range of alternatives renders the FAA’s NEPA analysis arbitrary and capricious.

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<sup>33</sup> See *Ocean Advocates v. U.S. Army Corps of Eng’rs*, 402 F.3d 846, 864-66 (9th Cir. 2005) (holding the agency failed to take a “hard look” where its assessment included only conclusory assertions and did not discuss contrary evidence); *Alaska Wilderness League v. Kempthorne*, 548 F.3d 815, 831 (9th Cir. 2008) (“This is the type of ‘conclusory assertion’ that is disfavored by this court because the agency has not provided any scientific data that justifies this position.”).

<sup>34</sup> EPA, Basic Ozone Layer Science. Available at <https://www.epa.gov/ozone-layer-protection/basic-ozone-layer-science>.

<sup>35</sup> DPEA at 43.

<sup>36</sup> M.N. Ross and D.W. Toohey, The Coming Surge of Rocket Emissions. EOS, Sep. 24, 2019) available at <https://eos.org/features/the-coming-surge-of-rocket-emissions> (attached hereto).

<sup>37</sup> See 40 C.F.R. § 1502.14.

<sup>38</sup> FAA Order 1050.1E at 1-8.



### C. The FAA failed to consider SpaceX's contribution to the climate crisis

NEPA necessitates a consideration of climate impacts because it requires that federal agencies consider the reasonably foreseeable direct and indirect impacts of their actions, even if the extent of these impacts is not known.<sup>39</sup> Climate impacts are an indirect result of the proposed SpaceX activities, and therefore must be considered in the NEPA analysis.<sup>40</sup> However, the FAA has failed to analyze the impacts of SpaceX's emissions on the environment. Indeed, the FAA failed to even include all of the emissions associated with the project in its cursory discussion of climate – such as the methane emissions from the fracking of natural gas to supply the fuel for the rockets and power plant – and therefore its analysis is woefully incomplete.

It is notable that Elon Musk, the CEO of SpaceX, has acknowledged that climate change is the “biggest threat facing humanity.”<sup>41</sup> Yet, his company is using an incredible amount of energy and greenhouse gasses to fuel the activities at Boca Chica. Regardless of that inherent contradiction, the FAA certainly has a duty to fully analyze the contribution of the proposed activities to the current climate crisis. However, the FAA provides no analysis in the DPEA as to the impacts the proposed SpaceX activities would have on our climate and how such changes will impact people and the environment, instead claiming that the emissions will not be significant, based only on comparing SpaceX to the total GHG emissions of the US.<sup>42</sup> However, the emissions from SpaceX are certainly not discountable, and the FAA's approach ignores that every contribution of GHGs to the atmosphere causes cumulative harm. Ignoring the incremental

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<sup>39</sup> See 42 U.S.C. § 4332(2)(C), 40 C.F.R. § 1508.8.

<sup>40</sup> See *Center for Biological Diversity v. Bernhardt*, 982 F.3d 723, 736 (9th Cir. 2020) (holding GHG emissions are a ‘reasonably foreseeable’ indirect effect). Federal agencies evaluating climate impacts of their proposals have frequently claimed that science has not developed the tools to analyze climate impacts of individual proposals. This is not accurate. The social cost of carbon and social cost of methane are two reliable tools that are available and should be utilized by BLM in the PEIS process. Under NEPA's implementing regulations, where “information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known,” NEPA regulations direct agencies to evaluate a project's impacts “based upon theoretical approaches or research methods generally accepted in the scientific community.” 40 C.F.R. § 1502.21. The social cost of carbon and social cost of methane are based on generally accepted research methods and years of peer-reviewed scientific and economic studies. As the D.C. Circuit recently explained in invalidating the Federal Energy Regulatory Commission's review of a fossil fuel infrastructure project, 40 C.F.R. § 1502.21 requires federal agencies to evaluate the social cost of carbon as one potentially available, scientifically accepted tool for analyzing climate impacts. *Vecinos para el Bienestar de la Comunidad Costera v. Fed. Energy Regul. Comm'n*, 6 F.4th 1321, 1329 (D.C. Cir. 2021).

<sup>41</sup> <https://www.npr.org/2021/02/08/965372754/elon-musk-funds-100-million-xprize-for-pursuit-of-new-carbon-removal-ideas>

<sup>42</sup> DPEA at 47.

contribution of a project like SpaceX will only lead to death by a thousand small cuts, which the FAA has failed to properly consider.<sup>43</sup>

As SpaceX itself notes, the Super Heavy Rocket is the World's most powerful rocket. It holds up to 3,700 metric tons of propellant, while the Starship holds up to 1,500 metric tons. The Raptor engines on these rockets use liquid methane, a potent greenhouse gas that may also need to be vented into the atmosphere by SpaceX. According to the FAA, burst testing would include the "deliberate release" of LN2 and/or LOX to the environment, and such tank tests would occur 10 times per month, releasing a significant amount of greenhouse gasses into the atmosphere.<sup>44</sup> Similarly, the FAA states that during pre-flight operations it is possible that the rocket would not be able to connect to reconnect to the ground systems, requiring the release of up to 814 tons of methane propellant into the atmosphere. While SpaceX claims this would be a rare, unplanned event, the FAA must still assess the impacts of such events on the environment, yet the agency is silent as to the climate impacts of these releases. Same with releases following suborbital launches that would occur 20 times per year, where approximately 10 metric tons of propellants would be vented to the atmosphere after each launch, with the potential for significantly more if there is an "anomaly."

And the "proposed action" includes not only the launching of methane-fueled rockets, but the construction and operation of a desalination plant, a new LNG-fueled power plant to generate power for activities at all SpaceX facilities,<sup>45</sup> and a natural gas pretreatment facility, all of which are energy and greenhouse-gas intensive. Yet, the DPEA is silent as to the implications of the action on climate change. The FAA failed to even address where the methane fuel/LNG is coming from, how it will be shipped, and the upstream impacts associated with fracking or other methods required to obtain the fuel needed for SpaceX rockets and infrastructure. And the FAA ignored emissions from anomalies, which could result in significant methane releases.

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<sup>43</sup> See *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1216-17 (9th Cir. 2008) (holding that, under NEPA, agencies must "discuss the *actual* environmental effects resulting from . . . emissions").

<sup>44</sup> DPEA at 15-16.

<sup>45</sup> The power plant is itself a major action with significant environmental consequences that requires review in an EIS. According to the FAA:

The power plant would be approximately 5.4 acres in size. Power for the power plant would be generated using a large natural gas turbine and a steam turbine running in a combined cycle, and a small natural gas turbine and a steam turbine running in a combined cycle. The power plant would be comprised of multiple structures, including air intake, compressors, expanders, reflux tanks, surge tank, cold box, and cooling tower. Some of these structures would be less than 30 feet tall; however, some structures would be up to 150 feet tall.

BA at 23.

This is a critical error because methane emissions are particularly alarming. Immediate, deep reductions in methane emissions are critical for lowering the rate of global warming in the near-term, preventing the crossing of irreversible planetary tipping points, and avoiding harms to species and ecosystems from methane's intensive near-term heating effects and ground-level ozone production.<sup>46</sup> Methane is a super-pollutant 87 times more powerful than CO<sub>2</sub> at warming the atmosphere over a 20-year period,<sup>47</sup> and is second only to CO<sub>2</sub> in driving climate change during the industrial era.<sup>48</sup> Methane also leads to the formation of ground-level ozone, a dangerous air pollutant that harms ecosystems and species by suppressing plant growth and reducing plant productivity and carbon uptake.<sup>49</sup>

Because methane is so climate-damaging but also comparatively short-lived with an atmospheric lifetime of roughly a decade, cutting methane has a relatively immediate effect in slowing the rate of temperature rise in the near-term. Critically, deep cuts in methane emissions of ~45% by 2030 would avoid 0.3°C of warming by 2040 and are considered necessary to achieve the Paris Agreement's 1.5°C climate limit and prevent the worst damages from the climate crisis.<sup>50</sup> Deep cuts in methane emissions that reduce near-term temperature rise are also critical for avoiding the crossing of planetary tipping points—abrupt and irreversible changes in Earth systems to states wholly outside human experience, resulting in severe physical, ecological and socioeconomic harms.<sup>51</sup> The FAA's failure to fully consider the implications of SpaceX's activities, particularly when those activities will result in significant LNG and methane emissions, is a clear violation of NEPA.

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<sup>46</sup> United Nations Environment Programme and Climate and Clean Air Coalition, *Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions*, Nairobi: United Nations Environment Programme (2021) [hereinafter *Global Methane Assessment*], <https://www.unep.org/resources/report/global-methane-assessment-benefits-and-costs-mitigating-methane-emissions>, at 11.

<sup>47</sup> Myhre, G. et al., *Anthropogenic and Natural Radiative Forcing*. In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F. et al. (eds.)] (2013), *available at* <https://www.ipcc.ch/report/ar5/wg1/> at Table 8.7.

<sup>48</sup> *Global Methane Assessment* at 11.

<sup>49</sup> *Id.* at 11, 69.

<sup>50</sup> *Id.* at 11.

<sup>51</sup> Hoegh-Guldberg, O. et al., *Impacts of 1.5°C Global Warming on Natural and Human Systems*, In: *Global Warming of 1.5°C, An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [Masson-Delmotte, V. et al. (eds.)] (2018), <https://www.ipcc.ch/sr15/chapter/chapter-3/>, at 262.

In sum, the FAA's failure to consider the human health and environmental impacts of SpaceX's emissions in the context of the current climate crisis renders the FAA's NEPA analysis arbitrary and capricious.

**D. The FAA failed to adequately address the impacts of storm damage on aboveground storage tanks.**

The FAA states that launch propellant and commodities (including gaseous and liquid methane) will be stored in aboveground tanks at the Boca Chica site. This includes thousands of metric tons of propellants, which by definition are explosive, but also have been shown to be carcinogenic and toxic. The Boca Chica site has the potential to be hit by hurricanes coming off the Gulf of Mexico, which have been increasing in recent year. Furthermore, FEMA's flood risk map (attached hereto) clearly shows that all SpaceX facilities at Boca Chica are at risk of flooding. However, the FAA has failed to consider the potential impacts of storm damage, including from a worst-case scenario tank rupture, and the harm that would result in the habitat areas surrounding the SpaceX site. The FAA has therefore failed to take a "hard look" at the environmental impacts of storing dangerous and toxic chemicals in above-ground tanks at the Boca Chica site.

**II. The Proposed Mitigation is Insufficient**

As set forth herein and in the attached documents – including several letters and emails to FAA from FWS and EPA detailing the agencies' concerns, which are attached and incorporated by reference – there is no doubt that the SpaceX activities at Boca Chica have resulted, and will continue to result, in environmental harm, including to ESA-listed wildlife. FWS has averred that SpaceX already has exceeded the traffic, construction, personnel levels, lighting, noise, and vibration impacts that were contemplated for the prior use of the Boca Chica site, resulting in a violation of the Incidental Take Statement.<sup>52</sup> FWS further stated that rocket launch failures have impacted migratory birds, with "documented evidence that the debris and its removal has impacted and scarred various habitats in the area, including tidal flats which are foraging habitat for the threatened piping plover and red knot."<sup>53</sup> FWS made it very clear that more must be done to mitigate such impacts.<sup>54</sup>

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<sup>52</sup> FWS Jan. 22, 2021 Letter.

<sup>53</sup> *Id.*

<sup>54</sup> *Id.* See also email from Bryan Winton Re: DRAFT REPORT SN11 Anomaly - Rocket engine explosion @ 0.5-1 mile above the launch site (Mar. 30, 2021) (attached hereto) (describing the impacts of an anomaly); email between Bryan Winton and Mary Orms Re: Information for Informal Scoping FWS Response Letter to FAA per proposal to Draft a new EA (Jan. 21, 2021) (attached hereto) (listing anomalies).

Likewise, EPA has found that SpaceX's activities at Boca Chica have caused "substantial and unacceptable adverse impacts to aquatic resources of national importance (ARNI)," due to the impacts to mudflats, estuarine and non-tidal wetlands, which "support benthic invertebrate communities which make them essential foraging habitats for wintering and migrating shorebirds, including the threatened piping plover and red knot."<sup>55</sup> The EPA further noted that the affected wetland complex "was designated by the Western Hemisphere Shorebird Network as a Site of International Importance," and is "critical to the survival of many species of shorebirds and waterfowl."<sup>56</sup> The EPA expressed concern over the "direct, secondary, and cumulative impacts associated with destruction of the rare and valuable aquatic habitats within the project area," and questioned "whether adequate compensatory mitigation will be provided for project impacts."<sup>57</sup>

These impacts have not been adequately mitigated. Indeed, the Texas Parks and Wildlife Commission has stated that SpaceX has failed to even comply with several of the basic avoidance and minimization measures set forth in the 2014 EIS and ROD for the Boca Chica Launch Site, including limiting construction to 8 a.m. – 5 p.m. to mitigate noise impacts, avoiding lateral light spread and uplighting, and limiting vehicles to 25 mph.<sup>58</sup>

SpaceX is now proposing an even more intensive use of the Boca Chica site, with larger rockets that would cause even more damage if/when they experience launch failures, and that would increase the noise and light pollution already impacting the neighboring habitats, including critical habitat in wildlife refuge lands. And SpaceX intends to build additional infrastructure including a desalination plant, power plant, and LNG processing facility, increasing not only the direct impacts to the area, but also contributing to the climate crisis.

As one of the wealthiest individuals in the world and one of the most well-funded commercial operations in this country, Mr. Musk (the wealthiest person in the world, worth ≈ \$250 Billion) and SpaceX (which has raised more than \$6 billion in equity to date<sup>59</sup>) have the capacity – and indeed the duty – to ensure that the impacts of their operations are mitigated to the fullest extent possible. Indeed, as discussed further below, 23 U.S.C. § 138 precludes the Secretary of Transportation from approving a program or project unless the action includes all possible planning to minimize harm to an affected refuge. Likewise, the ESA requires the application of reasonable and prudent measures necessary or appropriate to minimize impacts to listed

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<sup>55</sup> Letter from Maria L. Martinez, EPA, to Joe McMahan, U.S. Army Corps (April 7, 2021) (hereinafter, EPA April 7, 2021 Letter) (attached hereto).

<sup>56</sup> *Id.*

<sup>57</sup> *Id.*

<sup>58</sup> Texas Parks & Wildlife Commission, NEPA Scoping Comments at 3 (January 27, 2021) (attached hereto).

<sup>59</sup> <https://spacenews.com/spacex-adds-to-latest-funding-round/>

species.<sup>60</sup> And the Clean Water Act Section 404(b)(1) Guidelines, which are also applicable to SpaceX's activities at Boca Chica, require SpaceX to incorporate all appropriate and practicable measures to avoid impacts to wetlands, streams, and other aquatic resources and to minimize unavoidable impacts. As the EPA has stated, "given that the proposed project site is located in an environmentally sensitive area with high quality habitats, emphasis should be placed on the importance of avoiding and minimizing impacts to these distinctly sensitive aquatic resources."<sup>61</sup>

However, the mitigation measures outlined in the DPEA and BA are simply inadequate to compensate for the significant impacts that SpaceX is having on the Boca Chica area. As discussed above, this area provides some of the most important habitat for migratory birds in the U.S. The Lower Rio Grande Valley Refuge is one of the most biologically diverse regions in North America, and species from the Central and Mississippi flyway converge on this area, making it an essential stopover for migratory birds. Not only does the Boca Chica tract provide habitat for migratory birds, such as ESA-listed piping plovers, but it is one of the few places where the Kemp's Ridley sea turtle, the most critically endangered sea turtle in the world, nests.

Yet SpaceX is proposing to take very few measures to protect the species that rely on the surrounding habitat, and it remains unclear whether SpaceX will even adhere to those measures.<sup>62</sup> For example, the BA acknowledges that light from the facility would negatively affect nesting sea turtles because it could cause adult females to false crawl or hatchlings to become disoriented and reduce nesting success and hatchling survival. Yet it does not suggest ways to mitigate the effects of that lighting, such as season/time lighting restrictions during the crucial hatching season. Rather, it claims that there may be times when white lights would need to be used continually for several days. Laughably, the BA includes as an "operational measure" to "minimize lighting effects on wildlife" such routine things as "turning the lights off when not needed,"<sup>63</sup> which is meaningless given that SpaceX appears to need such lighting nearly all the time.

At the very least, SpaceX should have to follow the same mitigation as the Kennedy Space Center (KSC) / Cape Canaveral Spaceport, which is likewise situated in an area that provides habitat for sensitive bird and turtle species that are adversely affected by noise and light

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<sup>60</sup> 50 C.F.R. § 402.14.

<sup>61</sup> EPA April 7, 2021 Letter.

<sup>62</sup> FWS has stated that SpaceX has not adhered to the measures in the 2013 Biological Opinion, but rather "continue[s] to do whatever they want with no concern for the impacts to the natural world their activity causes." Email from Bryan Winton to Chris Perez Re: Boca Chica monitoring (Sep. 16, 2020) (attached hereto).

<sup>63</sup> BA at 27.

pollution.<sup>64</sup> According to the Cape Canaveral Spaceport Development Manual,<sup>65</sup> the KSC Exterior Lighting Requirements include positioning of lights so that the light source and any reflective surface are not visible from beach areas, and that all lights be shielded and/or recessed. It also specifically requires that areas seaward of the frontal dunes (where turtle nests would be located) are not illuminated. Moreover, the KSC manual states that all facilities that are in close proximity to the beach and/or cause significant sky glow must prohibit the use of exterior lights between 9 p.m. and dawn from May 1 through October 31 to protect turtles, and that certain types of lights (such as metal halide and mercury vapor lights with wavelengths between 320-560 nm) should not be used for external lighting. KSC requires a plan showing the proposed location of all exterior lights, with each type of fixture to be used, along with a proposed operation schedule. The applicant may seek a variance from these requirements, including the May 1 – October 31 prohibition on exterior lights, if there is a compelling need, but that requires a process wherein FWS has the opportunity to consider the impacts of any variance on listed species, and provides that the applicant must mitigate any negative effects that may result from the variance.

It remains unclear why the FAA has not required the same mitigation measures for the Boca Chica site, which is no less ecologically important than Cape Canaveral. As discussed further below, the FAA does not even have the specific information required to analyze light impacts because no lighting plan has been provided; however, the BA does state that SpaceX would require “bright spotlighting for periods of time (sometimes days) when illuminating the launch vehicle on the launch pad,” and that “white lighting” would be needed 24 hours a day, 7 days a week throughout the year for ground support operations.<sup>66</sup> The BA even states that these spotlights would be metal halide, precisely the type of lighting that has been deemed too detrimental to wildlife for use at the KSC. The BA does include, as an operational measure, that low pressure sodium lights could be used, “to the extent practicable,” during sea turtle nesting season, but it qualifies this with by saying that brighter, white lights would be necessary “for ground support operations performed 24/7 throughout the year,” making this a meaningless mitigation measure.

While SpaceX certainly can do more to protect imperiled birds and sea turtles from light pollution by, at minimum, following the protocols for the KSC, it can and must go farther than

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<sup>64</sup> See, e.g., NASA, Environmental Assessment for Exploration Park North at the John F. Kennedy Space Center, Kennedy Space Center, Florida (August 2021). Attached hereto and available at [https://netpublic.grc.nasa.gov/main/ExpParkNorth\\_FINAL%20EA%2007-27-21.pdf](https://netpublic.grc.nasa.gov/main/ExpParkNorth_FINAL%20EA%2007-27-21.pdf).

<sup>65</sup> Space Florida, Cape Canaveral Spaceport Development Manual (Feb. 2, 2016) (“KSC Development Manual”). Available at [https://www.spaceflorida.gov/wp-content/uploads/2018/12/ccs\\_development\\_manual\\_2-2-16\\_revision-1-1-withsigjk.pdf](https://www.spaceflorida.gov/wp-content/uploads/2018/12/ccs_development_manual_2-2-16_revision-1-1-withsigjk.pdf). (Attached hereto).

<sup>66</sup> BA at 9.

that. The best way to protect the listed species in the area is to give them a fighting chance by protecting as much of their habitat as possible. That is particularly the case where ecologically sensitive habitats are being impacted, making compensatory, out-of-kind mitigation less useful. As the EPA noted, “there are concerns if non-contiguous and out-of-kind mitigation through preservation is proposed,” and that restoration and enhancement is preferred over creation of new habitat, due to the higher likelihood of success.<sup>67</sup> SpaceX, however, has failed to take any action to increase the habitat available for listed species by protecting and/or enhancing additional lands in the vicinity of the areas that are adversely affected by its activities.

Additional mitigation is also warranted to address the impacts of increased vehicle traffic, which exposes jaguarundis and ocelots to the increased potential for vehicle collisions (according to the BA there will be an extra 505 vehicles per day through potential travel corridors for the Gulf Coast jaguarundi and the ocelot), and is clearly not being controlled by SpaceX.<sup>68</sup> The project will harm Gulf Coast jaguarundis and ocelots by causing them to avoid areas and seek other north-south travel corridors through the lomas, expending additional energy and increasing the potential for vehicular mortality. Protecting additional north-south travel corridors is essential to offset the impacts of the proposed increase in vehicle traffic, yet SpaceX does not appear to have taken any steps to provide for additional protections.

In sum, SpaceX is in a position to mitigate its impacts by expanding and enhancing the surrounding conservation lands and available habitat in the vicinity of Boca Chica, providing additional protection to areas that sensitive species like plovers, ocelot and jaguarundi can move into when they are harassed by the Noise and Light from SpaceX, and to avoid the increased vehicle traffic that the FAA acknowledges may harm these species. SpaceX should work with FWS to determine where land could be purchased to extend the protections of the NWRs and reduce the impacts to the listed species in the region by protecting the habitat functions and values these species rely on. It is simply absurd that a company with the resources of SpaceX and Mr. Musk would not do more to ensure that the conservation values of the surrounding wildlife habitat are protected.

### **III. The FAA’s Biological Assessment is inadequate**

ESA Section 7 is a vital safeguard that requires each federal agency to “insure”—at the “earliest possible time”—that “any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification” of designated critical habitat.<sup>69</sup> To effectuate

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<sup>67</sup> EPA April 7, 2021 Letter.

<sup>68</sup> See email from Ernesto Reyes (FWS) to Steve Davis (SpaceX) (Feb. 12, 2016) (attached hereto).

<sup>69</sup> 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14.



that duty, Section 7 and the ESA's implementing regulations provide a detailed process that agencies must follow before approving actions that "may affect" listed species.

First, the action agency must prepare a biological assessment to evaluate whether the proposed action is likely to adversely affect listed species or critical habitat in the "action area."<sup>70</sup> The biological assessment should include the results of on-site inspections, the views of recognized experts, a review of literature and other available information, an analysis of the effects of the proposed action on listed species and habitat including cumulative effects, and an analysis of alternatives to the proposed action.<sup>71</sup> If the agency concludes in the biological assessment that the action is "not likely to adversely affect" listed species, it must seek a concurrence from FWS to complete the consultation process.<sup>72</sup> Conversely, if the action is "likely to adversely affect" listed species, the agency must enter into "formal consultation" with FWS, a more extensive and protective process to consider the action's impacts.<sup>73</sup>

For either a request for concurrence or the initiation of formal consultation, the action agency must provide sufficient information in the biological assessment for FWS to make an informed determination as to the potential impacts to listed species from the proposed action. The regulations therefore require the action agency to provide a description of the proposed action along with any measures intended to avoid or mitigate impacts, which must provide "sufficient detail to assess the effects of the action on listed species and critical habitat."<sup>74</sup> That description must provide not only basic background information—such as the purpose, duration, timing, and location of the action—but also details regarding the "specific components of the action and how they will be carried out," as well as "maps, drawings, blueprints or similar schematics" detailing the specific components, along with any other information pertinent to the action's effects on listed species and critical habitat.<sup>75</sup> The regulations make clear that the action agency *must* provide a "map or description of all areas to be affected," as well as all information that the agency has in its possession, "including available information such as the presence, abundance, density, or periodic occurrence of listed species and the condition and location of the species' habitat, including any critical habitat."<sup>76</sup> Furthermore, the action agency must provide a "description of the effects of the action and an analysis of any cumulative effects."<sup>77</sup> That

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<sup>70</sup> 50 C.F.R. § 402.02; *see also id.* § 402.12.

<sup>71</sup> 50 C.F.R. § 402.12(f).

<sup>72</sup> 50 C.F.R. § 402.13(c).

<sup>73</sup> 50 C.F.R. §§ 402.12(k), 402.14(a).

<sup>74</sup> 50 C.F.R. § 402.14(c)(1).

<sup>75</sup> *Id.*

<sup>76</sup> *Id.*

<sup>77</sup> *Id.*

analysis must be based on the “best scientific and commercial data available” in order to properly evaluate impacts to listed species.<sup>78</sup>

As set forth below, the FAA has failed to provide sufficient detailed information in its biological assessment and has not relied on the best available scientific information to determine whether listed species will be jeopardized or critical habitat will be adversely modified by the proposed action, in clear violation of the ESA.<sup>79</sup>

The Center remains very concerned about the impacts to imperiled wildlife from the proposed SpaceX activities, which pose significant risk to Eastern black rails, northern aplomado falcons, piping plovers, red knots, Gulf Coast jaguarundi, ocelots, West Indian manatees, and several sea turtles, including greens, hawksbill, Kemp’s Ridley’s, leatherbacks and loggerheads. Indeed, SpaceX’s activities are completely incompatible with and directly threaten the integrity of the adjacent refuge and park lands that listed species rely on, due to a wide range of direct and indirect adverse impacts to nationally significant shorebird and waterbird habitats. The Starship/Super Heavy program now being considered includes a massive amount of construction activity which would result in a significant increase in the already existing adverse environmental impacts from SpaceX activities. The increased use of the Boca Chica site for rocket launches will cause significant harm to important habitat that listed species rely on, including designated critical habitat, which the FAA has failed to adequately analyze.

While the Center understands that the reinitiated ESA Section 7 consultation process remains ongoing and FWS will eventually provide a biological opinion for the project, the Center provides the following comments regarding the FAA’s analysis, which fails to fully analyze the impacts to listed species at Boca Chica using the best available science, including from noise and light pollution, traffic, rocket explosions, wildfires, and water withdrawals.

In addition, the issues discussed below also constitute a violation of NEPA, since the FAA relied entirely on its BA to satisfy its duty to address impacts to listed species under NEPA in its DPEA. For the reasons set forth below, the FAA has not only violated the ESA, but has failed to take the requisite hard look at the impacts to listed species from SpaceX activities at the Boca Chica site.<sup>80</sup>

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<sup>78</sup> 16 U.S.C. § 1536(a)(2); 40 C.F.R. § 402.14(d).

<sup>79</sup> See *Resources Ltd. v. Robertson*, 35 F.3d 1300, 1305 (9th Cir., 1994) (invalidating a consultation where the action agency failed to provide the FWS with all of the data and information required by 50 C.F.R. § 402.14(d) – the best available science mandate).

<sup>80</sup> The EA itself, not a biological assessment, is where the agency’s “defense of its position must be found.” *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1211 (9th Cir. 1998).

**A. The FAA did not, and could not, adequately analyze the impacts from noise and light pollution**

The BA acknowledges that the operation of the SpaceX facility will harm listed species through noise and light pollution, including from the firing of booster rockets and intense lighting to support ground operations. As the BA acknowledges, noise and light associated with SpaceX operations can harm or harass listed species, including piping plovers in their critical habitat, sensitive ocelot and jaguarundi in some of their last remaining habitat, and Kemp's Ridley sea turtles, the most critically endangered sea turtle in the world. For example, the Boca Chica Tract of the Lower Rio Grande NWR is one of the few places where the Kemp's Ridley sea turtles comes ashore to nest. As the FAA notes, "[l]ighting could cause adult females to false crawl or hatchlings that were not relocated to become disoriented and reduce nesting success / hatchling survival."<sup>81</sup> Meanwhile, noise from rocket launches and construction activities would adversely affect ocelot and jaguarundi, since their "response to noise could potentially cause the species to expend energy, increase their risk of vehicular collision, or cause individuals to abandon their movements through the area and decrease opportunities to improve genetic diversity within the Texas populations."<sup>82</sup> As discussed above, these impacts have not been adequately addressed with sufficient mitigation.

Moreover, the FAA has not adequately analyzed the impacts of noise and light pollution on listed species, and in fact it could not do so because the FAA acknowledges that "[d]etailed information about some of the launch-related infrastructure (e.g., exact location and design) is not currently available. Therefore, the BA makes assumptions about these unknowns using best available information and professional expertise."<sup>83</sup> However, as discussed above the Services' regulations specifically require a request for concurrence or formal consultation to include a "description of the proposed action" with "sufficient detail to assess the effects of the action on listed species and critical habitat," including not only the "specific components of the action," but "maps, drawings, blueprints, or similar schematics," so that the Service has the information it needs to make a well-reasoned jeopardy determination.<sup>84</sup> Consistent with this requirement, the only other major U.S. spaceport – the Cape Canaveral Kennedy Space Center (KSC) – has a development manual that specifically requires, at minimum, a plan drawing showing "all exterior lighting fixtures and other lights that may be visible at night," which "must include details of each type of fixture to be used, such as lamp type, wattage, installation height, and proposed operation schedule"<sup>85</sup>

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<sup>81</sup> BA at 69. *See also* NASA, Dark Skies Program <https://www.nasa.gov/content/kennedy-space-center-keeps-dark-skies-for-sea-turtle-nesting>.

<sup>82</sup> *Id.* at 67.

<sup>83</sup> *Id.* at 3.

<sup>84</sup> 50 C.F.R. § 402.14(c)(1).

<sup>85</sup> KSC Development Manual, KSC Exterior Lighting Requirement at 3 (Section 5.1) (attached hereto). *See also* Kennedy NASA Procedural Requirements, Kennedy Space Center

Here, however, none of that information has been provided, and so the BA is incomplete. In fact, the BA states that “the number of pole lights would be finalized during the site design process,”<sup>86</sup> confirming that the information needed to analyze the impacts of the lighting has not yet been made available to the FAA or FWS.<sup>87</sup>

Since the actual location of launch-related infrastructure remains unknown, the impacts from noise and light cannot have been fully addressed by the FAA, as these are very site-specific concerns with localized impacts that may defer based on placement of such infrastructure on the site. Moreover, since the SpaceX parcel is so small and is directly adjacent to essential habitat areas – including national wildlife refuges that provide critical habitat for listed species – the placement of infrastructure is of vital import when considering the potential for harm. Without the specific information the regulations require, the BA is incomplete, and the Service cannot make a fully informed jeopardy determination.

Furthermore, the analysis that the FAA does provide regarding noise impacts is woefully inadequate. For example, the BA concludes that noise from operations may temporarily disturb or displace piping plovers, but it does not appear to give appropriate consideration to the full impacts that noise disturbances may have on the species. Indeed, it notes that noise from nearby beachgoers has already existed in the area, implying that noise generated by beachgoers is comparable to the noise generated by construction activities and rocket launches. This ignores the louder, though more infrequent, noise impacts that would result from launches, sonic booms during landings, and noises related to engine testing.

It is undeniable that noise from the rockets is likely to displace sensitive species, and in fact the FAA states in the BA that red knots and piping plovers could be killed if they are within the heat plume created by engine ignition during testing and launches, but suggests that they would probably leave the area due to noise disturbances before that would happen, indicating that such noise *will* displace plovers from their critical habitat. In fact, a recent study submitted to FWS by the Coastal Bend Bays & Estuaries Program (attached hereto) indicates that the piping plover population at Boca Chica has experienced a significant decline, and indeed a rapid and substantial loss of the population, due to SpaceX, and that the area is functioning as a population sink due to the plover’s historic reliance on the area coupled with the increased harm from SpaceX activities. Yet the FAA provides no real analysis as to how that may affect the continued existence of the species and the use of the critical habitat.

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Environmental Requirement (Mar. 6, 2017) (attached hereto) (requiring a lighting management plan to protect marine turtles) (attached hereto).

<sup>86</sup> BA at 9.

<sup>87</sup> In a letter dated March 2, 2020 (attached hereto), FWS confirmed that “lighting, parking, construction times, and anticipated traffic are not clear and not comparable to the original consultation documents.”

There are also significant gaps in the FAA’s analysis regarding the impacts of overpressure from SpaceX activities on listed species. For example, the BA notes that “overpressures less than 1 psf are not expected to adversely affect animals,” suggesting that pressures over that amount *would* result in adverse effects.<sup>88</sup> The BA goes on to state that overpressures greater than 1 psf would “extend about 13 miles from the launch pad” for Super Heavy booster landings.<sup>89</sup> This would result in overpressures above 1 psf on refuge lands and critical habitat areas. While the FAA admits that the noise would adversely affect listed species, and therefore formal consultation is required, it did not provide any analysis of the actual impacts of this noise pollution on plovers, ocelot, or jaguarundi, which may be forced away from some of their last remaining habitat by such noise.

The Center is hopeful that the FWS will provide a more thorough and complete analysis of noise and light impacts in its biological opinion; however, the FAA’s BA fails to provide the requisite information and analysis and is therefore inadequate.

#### **B. FAA failed to adequately address the impacts to listed species from “anomalies”**

The FAA acknowledges that a “Starship/Super Heavy test operation or launch could fail (referred to as an anomaly or mishap). An anomaly on the launch pad represents the greatest risk to the environment. If this occurs, a number of possible outcomes could result, the most likely being a fire on the launch pad. An explosion on the launch pad would spread debris.”<sup>90</sup> It further concedes that “in the event of an anomaly, an explosion could injure or kill wildlife species adjacent to the launch pad or within areas impacted by debris. In addition, fires could potentially start from an explosion that could result in a loss of habitat.”<sup>91</sup> However, it discounts the impacts of such anomalies, stating only that SpaceX would adhere to its Fire Mitigation and Response Plan to prevent and respond to any fires. This provides no reassurance – particularly given the history of rocket explosions and wildfires discussed herein and in the attached documents.

Moreover, when setting forth the impacts to listed species from an anomaly — such as debris and fires that can kill or adversely modify habitat of piping plovers, ocelots and jaguarundi — the FAA provides no actual analysis of the impacts to listed species from debris and recovery or fires from launch anomalies (other than admitting they could affect the species), even though FWS has found that:

SpaceX rocket debris falling onto the Refuge has damaged the sensitive wind tidal flats. And, the vehicles or machinery used to retrieve rocket debris have created ruts and

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<sup>88</sup> BA at 29.

<sup>89</sup> *Id.*

<sup>90</sup> *Id.* at 16.

<sup>91</sup> *Id.* at 61.

caused other damage that interrupts water sheet flow across these flats. Two SpaceX incidents on July 25, 2019 and again in August 2019 resulted in wildfires of 130-acres and 10-acres respectively burned through coastal prairie and dune habitats on refuge managed land. Anomalies resulting in explosions on November 20, 2019, February 28, 2020, and December 9, 2020 resulted in debris scattered onto refuge managed lands. Retrieval methods damaged the sensitive alkaline flat and refuge cable fencing installed to protect the area from disturbance.<sup>92</sup>

The FAA only spends a few pages discussing the possibility of rocket explosions and the adverse environmental impact of such explosions, but it provides no actual analysis of the impacts of these anomalies, and it fails to provide measures to prevent harm from fires, such as limiting or reducing rocket testing between March 15 and August 15, as FWS has suggested.<sup>93</sup> For example, while the FAA acknowledges that an anomaly could affect ocelot and jaguarundi, “particularly if a wildfire is started and burns many acres of suitable cat habitat,” and that the “loss of habitat could affect species movement and potentially affect migration corridors,”<sup>94</sup> it provides no analysis of how this would affect the survival and recovery of the species, such as the impact to the regional population, genetic diversity, and the species’ resiliency to climate change. Instead, the FAA appears to discount the potential for catastrophic wildfires by arguing that the loss of habitat is temporary because the vegetation will grow back,<sup>95</sup> ignoring that even short-term impacts could be catastrophic for these species, and further ignoring that the lost habitat may never regenerate due to climate change.

The Center is likewise concerned about the FAA’s inadequate consideration of the impacts of anomalies and debris collection on the threatened piping plover’s critical habitat. The FAA, while it notes that a launch failure may occur, dismisses the possibility of a crash as “unlikely,” regardless of the fact that SpaceX has had several launch failures. It is noteworthy that 8 of the last 10 launches have resulted in the destruction of the rocket. Of particular concern, massive uncontrolled explosions have taken place during the last four rocket launches.

The wide area covered by debris from failed launches raises significant concerns about adverse environmental impacts. The explosion of SN 11 on March 30, 2021, which occurred at altitude and not on the launch pad, merits particular attention, as large amounts of debris uncontrollably fell outside of SpaceX property on to public conservation lands, including high value, ecologically sensitive habitats that are used by the Piping Plover, Wilson’s Plover, and Snowy Plover. There was also at least one explosion in 2021 that scattered debris on the Refuge.<sup>96</sup>

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<sup>92</sup> FWS Jan. 22, 2021 Letter.

<sup>93</sup> FWS Mar. 2, 2020 Letter (attached hereto).

<sup>94</sup> BA at 67.

<sup>95</sup> *Id.*

<sup>96</sup> See Email from Bryan Winton, Refuge Manager, Lower Rio Grande Valley National Wildlife Refuge, U.S. Fish & Wildlife Serv. (Mar. 30, 2021, 21:22 CST) (Attached hereto); *see also*

Operations to retrieve the debris have further damaged the refuge. According to FWS, “debris that has fallen onto the Refuge has damaged sensitive wind tidal flats. The vehicles or machinery used to retrieve debris have created rutting and damage that interrupts tidal water sheet flow across these flats.”<sup>97</sup> In the past, SpaceX has used high-capacity tow trucks and a construction dump truck to drag the debris through parts of the refuge. FWS personnel have noted that botched retrieval efforts have further damaged the refuge.<sup>98</sup> Because Service personnel are barred from the refuge following explosions, they have been unable to assess the full extent to which refuge wildlife are harmed. Last month, the Service asserted that “none of the damage to the sensitive tidal flats from debris pickup and motorized equipment and human access has been adequately addressed.”<sup>99</sup> Yet the FAA failed to assess the impacts to piping plovers or other listed species from explosions and debris cleanup in the BA.

In addition, while FAA maintains that in the event of an anomaly SpaceX would coordinate with FWS,<sup>100</sup> that is insufficient to meet the FAA’s duty to fully consider the impacts of the SpaceX project before it moves forward. Furthermore, the FAA has not indicated that it would undertake emergency ESA consultation in the event of an anomaly. The Services have established a specific consultation process in the case of “emergencies.” In an emergency, such as “situations involving acts of God, disasters, casualties, national defense or security emergencies, etc.,”<sup>101</sup> initial consultation may be conducted informally through alternative procedures that are consistent with Section 7 of the ESA (*i.e.* by calling or emailing the Services to discuss the emergency action and any prudent mitigation), *id.*, and then “[f]ormal consultation shall be initiated as soon as practicable after the emergency is under control.”<sup>102</sup> The Handbook explains that in the initial stages of emergency consultation, the Services “offer recommendations to minimize the effects of the emergency response action on listed species or their critical habitat,” and then a full, formal consultation is to take place after the emergency is under control. The emergency formal consultation “is treated like any other formal consultation.”<sup>103</sup> However, post-emergency consultations require the agency to provide additional information, including “an evaluation of the response to and the impacts of the emergency on affected species and their habitats, including documentation of how the Services’ recommendations were implemented,

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Email from Stacey Zee, FAA (Mar. 3, 2021) (debris found and collected from LRGV, which was within the “ground hazard area”).

<sup>97</sup> FWS Jan. 22, 2021 Letter.

<sup>98</sup> *See e.g.* Email from Bryan Winton (Jan 21, 2021) (“April 21,22 -2019 - Space X employee(s) get stuck with 2 vehicles and a forklift in tidal flats. Causes significant damage to tidal flats”).

<sup>99</sup> FWS Aug. 2021 Letter at 3.

<sup>100</sup> BA at 17.

<sup>101</sup> 50 C.F.R. § 402.05(a).

<sup>102</sup> *Id.* § 402.05(b). The Services have expounded on the emergency consultation process in their ENDANGERED SPECIES CONSULTATION HANDBOOK 8-1 to 8-5 (1998) (“Handbook”)

<sup>103</sup> *Id.*

and the results of implementation in minimizing take.”<sup>104</sup> The FAA does not appear to have undertaken emergency consultation on prior anomalies, but should make clear that it will comply with this process in the event of a future anomaly.<sup>105</sup>

Regardless, it is readily apparent that the FAA has failed to adequately address the impacts to listed species from anomalies, and therefore the BA is inadequate, arbitrary and capricious, in violation of the ESA.

### **C. The FAA failed to analyze the impacts to listed species from SpaceX’s contribution to climate change**

As discussed above in the context of NEPA, the FAA has failed to consider SpaceX’s contribution to the climate crisis. The ESA, however, also requires that the FAA consider the impacts to listed species from SpaceX’s contribution to global climate change. “The plain intent of Congress in enacting [the ESA] was to halt and reverse the trend toward species extinction, *whatever the cost*.”<sup>106</sup> Because SpaceX’s activities will have an appreciable, cumulative impact on climate-threatened species, the FAA must include climate impacts as part of its consultation. Its failure to do so is a clear violation of the ESA.

Indeed, it is clear that the anticipated greenhouse gas pollution from SpaceX will harm listed species far beyond the immediate area of the proposed activity in a manner that is attributable to the agency action, which must therefore be addressed in the BA; yet, this issue was glossed over by the FAA, which claims that the GHG emissions from SpaceX are not significant (only when compared to total national GHG emissions), without sufficient support to ignore the project’s contribution to the climate crisis.

Regardless, the science is overwhelmingly clear that climate change represents a stark threat to the future of biodiversity within the United States and around the world. The Fourth National Climate Assessment warns that “climate change threatens many benefits that the natural environment provides to society,” and that “extinctions and transformative impacts on some ecosystems” will occur “without significant reductions in global greenhouse gas emissions.”<sup>107</sup> The best available science shows that anthropogenic climate change is causing widespread harm to life across the planet, disrupting species’ distribution, timing of breeding and migration,

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<sup>104</sup> *Id.*

<sup>105</sup> See email from Sonny Perez dated Dec. 17, 2020 (discussing the need to undertake emergency consultation on rocket anomalies) (attached hereto).

<sup>106</sup> *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 184 (1978); *see also* 16 U.S.C. § 1532(3).

<sup>107</sup> U.S. Global Change Research Program, Climate Science Special Report - Fourth National Climate Assessment, Vol. I at 51 (available at [https://science2017.globalchange.gov/downloads/CSSR2017\\_FullReport.pdf](https://science2017.globalchange.gov/downloads/CSSR2017_FullReport.pdf)).



physiology, vital rates, and genetics—in addition to increasing species extinction risk.<sup>108</sup> Climate change-related local extinctions are widespread and have occurred in hundreds of species, including almost half of the 976 species surveyed.<sup>109</sup> Nearly half of terrestrial non-flying threatened mammals and nearly one-quarter of threatened birds are estimated to have been negatively impacted by climate change in at least part of their range.<sup>110</sup> Furthermore, across the globe, populations of terrestrial birds and mammals that are experiencing greater rates of climate warming are more likely to be declining at a faster rate.<sup>111</sup>

Furthermore, there are no defensible legal rationales for ignoring climate-threatened species that are harmed by the emissions that will result from this proposed action, such as piping plovers. Studies have found that “for small beach dependent populations such as Piping Plovers, even the most subtle changes could have profound affects on survivorship.”<sup>112</sup> It is therefore abundantly clear that activities that contribute GHG emissions, such as SpaceX, have real impacts that cross the “may affect” threshold, even if some of those impacts are still of an undetermined character at this point. The purpose of the consultation process, by design, is to allow the expert wildlife agencies to assess these impacts using the best available science, so that they can evaluate the harm that may be caused.

Species extinction risk will accelerate with continued greenhouse gas pollution, such as from SpaceX. One million animal and plant species are now threatened with extinction, with climate change as a primary driver.<sup>113</sup> At 2°C compared with 1.5°C of temperature rise, species’ extinction risk will increase dramatically, leading to a doubling of the number of vertebrate and plant species losing more than half their range, and a tripling for invertebrate species.<sup>114</sup>

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<sup>108</sup> Warren, Rachel et al., Increasing impacts of climate change upon ecosystems with increasing global mean temperature rise, 106 *Climatic Change* 141 (2011).

<sup>109</sup> Wiens, John J., Climate-related local extinctions are already widespread among plant and animal species, 14 *PLoS Biology* e2001104 (2016).

<sup>110</sup> Pacifici, Michela et al., Species’ traits influenced their response to recent climate change, 7 *Nature Climate Change* 205 (2017). The study concluded that “populations of large numbers of threatened species are likely to be already affected by climate change, and ... conservation managers, planners and policy makers must take this into account in efforts to safeguard the future of biodiversity.”

<sup>111</sup> Spooner, Fiona E.B. et al., Rapid warming is associated with population decline among terrestrial birds and mammals globally, 24 *Global Change Biology* 4521 (2018).

<sup>112</sup> Ruth Boettcher, Tom Penn, Robert R. Cross, Karen T. Terwilliger, and Ruth A. Beck “An Overview of the Status and Distribution of Piping Plovers in Virginia,” *Waterbirds* 30(sp1), 138-151, (1 December 2007).

<sup>113</sup> Brondizio, E.S. et al. (eds.), IPBES, Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, IPBES secretariat, Bonn, Germany (2019), *available at* <https://ipbes.net/global-assessment>.

<sup>114</sup> IPCC Climate Change 2021, Summary for Policymakers.

Numerous studies have projected catastrophic species losses during this century if climate change continues unabated: 15 to 37% of the world's plants and animals committed to extinction by 2050 under a mid-level emissions scenario<sup>115</sup>; the potential extinction of 10 to 14% of species by 2100<sup>116</sup>; global extinction of 5% of species with 2°C of warming and 16% of species with business-as-usual warming<sup>117</sup>; the loss of more than half of the present climatic range for 58% of plants and 35% of animals by the 2080s under the current emissions pathway, in a sample of 48,786 species<sup>118</sup>; and the loss of a third or more of animals and plant species in the next 50 years.<sup>119</sup> As summarized by the Third National Climate Assessment, “landscapes and seascapes are changing rapidly, and species, including many iconic species, may disappear from regions where they have been prevalent or become extinct, altering some regions so much that their mix of plant and animal life will become almost unrecognizable.”<sup>120</sup>

The FAA's total failure to consider impacts to listed species from SpaceX's emissions in the context of the climate crisis renders the FAA's ESA analysis arbitrary and capricious.

#### **D. FAA failed to address the impacts of water withdrawals on listed species**

According to the BA, it is possible that SpaceX would require an enormous amount of water for its operation, particularly if it uses deluge water on the plume during launches to control temperature.<sup>121</sup> The BA notes that “all water (including deluge and potable water) would be either delivered by truck or withdrawn from existing or new wells located adjacent to the launch pad.”<sup>122</sup> The BA further states that the desalination plant would treat water “from two new source wells” that would extract groundwater at a rate of 40 gallons per minute.<sup>123</sup>

However, BA is silent as to the impacts of such water withdrawals on listed species and critical habitat. Water withdrawals (onsite or offsite) may alter the adjacent habitat, including by reducing water availability or increasing salinity in certain areas. It is notable that EPA has found that SpaceX's activities at Boca Chica have caused “substantial and unacceptable adverse

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<sup>115</sup> Thomas, Chris. D. et al., Extinction risk from climate change, 427 Nature 145 (2004).

<sup>116</sup> Maclean, Ilya M. D. & Robert J. Wilson, Recent ecological responses to climate change support predictions of high extinction risk, 108 PNAS 12337 (2011).

<sup>117</sup> Urban, Mark C., Accelerating extinction risk from climate change, 348 Science 571 (2015).

<sup>118</sup> Warren, Rachel et al., Quantifying the benefit of early climate change mitigation in avoiding biodiversity loss, 3 Nature Climate Change 678 (2013).

<sup>119</sup> Román-Palacios, Cristian & John J. Wiens, Recent responses to climate change reveal the drivers of species extinction and survival, 117 PNAS 4211 (2020).

<sup>120</sup> Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., 2014: Climate Change Impacts in the United States: The Third National Climate Assessment. U.S. Global Change Research Program, 841 pp. doi:10.7930/J0Z31WJ2.

<sup>121</sup> BA at 12.

<sup>122</sup> *Id.*

<sup>123</sup> *Id.* at 23.

impacts to aquatic resources of national important (ARNI),” due to the impacts to mudflats, estuarine and non-tidal wetlands, which “support benthic invertebrate communities which make them essential foraging habitats for wintering and migrating shorebirds, including the threatened piping plover and red knot.”<sup>124</sup> Water withdrawals may further harm the adjacent wetland communities, harming these listed species. The FAA’s failure to consider the impacts of water withdrawals on listed species is a glaring violation of the ESA (as well as NEPA).

#### **IV. The FAA has ignored interrelated actions and indirect effects, unlawfully segmenting its analysis**

The FAA has failed to include interrelated and/or interdependent actions in its DPEA and BA and is unlawfully segmenting its analysis. Under both NEPA and the ESA, an agency must consider the full action, including any interdependent or interrelated actions.<sup>125</sup> Here, the FAA has stated in the DPEA and BA that SpaceX is still in the testing stages of the launch vehicle, including ongoing Starship prototype tests that have been approved under a separate license, and that SpaceX will also need to conduct similar tests of Super Heavy prototypes, which has not yet been approved under a separate license.<sup>126</sup> The testing of the Starship and Super Heavy rockets is clearly intertwined with the proposed action. Indeed, the BA specifies that these tests are the foundation for the development and operational phases of the project, since it can only move forward after the testing phase has been completed.<sup>127</sup> Therefore, the testing phase of the Starship and Super Heavy rockets *must* be included with the analysis of the development and operational phases in order to comply with NEPA and the ESA. Since the prior NEPA and ESA analyses were for the falcon rockets, the FAA cannot rely on those documents to fulfill their duty under these bedrock environmental laws.

Several other related actions that must be considered in these NEPA and ESA analyses were ignored by the FAA. For example, while the BA acknowledges that Starship and Super Heavy rockets would be delivered by barge to the Port of Brownsville, there is no discussion of the

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<sup>124</sup> EPA April 7, 2021 Letter.

<sup>125</sup> See 40 C.F.R. § 1508.25 (providing that under NEPA, “connected actions” should be discussed in the same EIS). Connected actions must be considered in a single EIS even under the NEPA regulations promulgated by the Trump Administration. See 85 Fed. Reg. 43304, 43322 (stating that 40 C.F.R. §§ 1501.9(e) and 1502.4(a) providing that agencies must evaluate, in a single EIS, proposals or parts of proposals that are related closely enough to be, in effect, a single course of action). See also 50 C.F.R. § 402.02 (the “effects of the action” include all consequences to listed species caused by the proposed action, including the consequences of other activities that are caused by the proposed action); See *ESA Handbook* at 4-27 (directing agencies to apply a “but for” test to determine whether actions are interdependent or interrelated); see also *Ctr. for Biological Diversity v. BLM*, 698 F. 3d 1101, 1113 (9th Cir. 2012) (same).

<sup>126</sup> See BA at 8.

<sup>127</sup> *Id.*

impacts of that barge, including potential collisions with listed turtles and marine mammals. Similarly, the FAA does not include any analysis of the LNG and methane fuels that would be needed for the proposed launches, including impacts from fracking and transporting the fuel to Boca Chica. It is our understanding that this project will require the installation of a pipeline through the LRGV to transport LNG to the site, which was not discussed in the DPEA or BA. The FAA also seems to have ignored work by Mountain Valley Electric Cooperative to realign and upgrade a powerline from East Brownsville to the Boca Chica Beach area, intended to serve SpaceX.<sup>128</sup>

All of these connected, interrelated and/or interdependent components of the SpaceX project must be analyzed within the DPEA and BA. The failure to do so is a blatant violation of the ESA and NEPA.

## **V. FAA has failed to show compliance with Section 4(f) of the Transportation Act**

Because the operation of the Boca Chica facility for SpaceX rocket launches will result in intense noise and light pollution in adjacent National Wildlife Refuge lands – in particular, the Boca Chica Tract of the Lower Rio Grande Valley NWF – the action will result in a “constructive use” of refuge lands, subjecting FAA to Section 4(f) of the Department of Transportation Act.<sup>129</sup> The Section 4(f) regulations specifically “require rigorous exploration and objective evaluation of alternative actions that would avoid all use of Section 4(f) properties...that would avoid some or all adverse effects.”<sup>130</sup> Furthermore, 23 U.S.C. § 138 precludes the FAA from approving a program or project unless there is no feasible and prudent alternative to the using that land and the action includes all possible planning to minimize harm to the refuge.

Here, the FAA has not shown that these requirements have been met. It makes no effort to show that there is no prudent alternative to the Boca Chica site or alternative ways to utilize the site to reduce the impacts to the adjacent refuge lands. Regardless, even if expansion of that site were the only available alternative, the FAA must still consider the impacts to the refuge lands from SpaceX activities in the context of the Refuge’s purpose. The LRGV NWR, and the national Refuge System in general, maintains the biological integrity, diversity and environmental health

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<sup>128</sup> <https://www.fws.gov/nwrs/threecolumn.aspx?id=6442470706>. *See also* email from Bryan Winton dated Feb. 4, 2021 (confirming that the Mountain Valley Electric Coop line is intended to serve SpaceX, and that the proposed line may adversely affect land administered by FWS) (attached hereto).

<sup>129</sup> Based on the Section 4(f) definitions, a “constructive use” occurs when there is “a temporary occupancy of land that is adverse in terms of the statute’s preservation purpose” or when “a project’s proximity impacts are so severe that the protected activities, features, or attributes of a property are substantially impaired.”

<sup>130</sup> OEPC Section 4(f) Handbook, 23 C.F.R. § 774.

of natural resources for the benefit of present and future generations of Americans.<sup>131</sup> The LRGV was established in 1979, as a long-term program of acquiring lands to protect and restore the unique biodiversity of the Lower Rio Grande Valley of Texas. The stated purposes and legislative authorities for this Refuge are “for the development, advancement, management, conservation, and protection of fish and wildlife resources....”<sup>132</sup> Using these lands as a sacrificial debris field when blowing up gigantic rockets would seem incompatible with the area’s intended use for conservation.

According to FWS, SpaceX’s use of the Boca Chica site has already resulted in “adverse” and even “severe” impacts to public use, management, wildlife, and habitat on refuge lands, with FWS going so far as to state that “Due to operations by SpaceX, the FWS’s ability to maintain the biological integrity, diversity and environmental health of Refuge resources, as well as our ability to ensure the viability of the six wildlife-dependent recreational uses, has been significantly diminished at the Boca Chica tract.”<sup>133</sup> These impacts certainly rise to the level of a substantial impairment and thus constitute a “constructive use,” as defined under Section 4(f); Yet, FAA has failed to address the Section 4(f) factors in its DPEA.

FAA must therefore undertake a new or supplemental analysis to provide the required “rigorous exploration” of alternatives to avoid the impacts to refuge lands and must ensure that SpaceX is undertaking all possible mitigatory actions to minimize harm to the adjacent wildlife refuge lands. As set forth above, it is readily apparent that FAA has failed to ensure that SpaceX considered all alternatives and will implement all reasonable mitigation at the Boca Chica site – including, for example, lighting and noise restrictions to protect birds and turtles as well as purchasing conservation lands to offset impacts from SpaceX activities – and therefore as proposed the action does not meet the requirements of Section 4(f).

## **VI. The Project Will Violate the National Wildlife Refuge System Improvement Act of 1997**

The National Wildlife Refuge System is managed pursuant to the National Wildlife Refuge System Administration Act of 1966, Pub. L. No. 89-669, 80 Stat. 926 (1966), as amended by the National Wildlife Refuge System Improvement Act of 1997, Pub L. No. 105-57, 111 Stat. 1252 (1997) (“Refuge Act”). The primary Mission of the National Wildlife Refuge System is to administer lands and waters for the conservation of fish, wildlife, and plant resources and their habitats for the benefit of present and future generations of Americans.<sup>134</sup> To achieve the mission of the System, the Refuge Act sets forth one of the strongest legislative mandates for ecosystem protection on public lands and waters, directing the Service to “ensure that the biological

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<sup>131</sup> National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. 668dd-668ee.

<sup>132</sup> 16 U.S.C. § 742f (a)(4).

<sup>133</sup> FWS Jan. 22, 2021 Letter.

<sup>134</sup> 16 U.S.C. § 668dd(a)(2).

integrity, diversity, and environmental health of the System are maintained for the benefit of present and future generations of Americans.”<sup>135</sup>

To accomplish that mission, the law creates a presumption against public use,<sup>136</sup> and under subsection (d) of the Refuge Act the Service may only permit the use of refuge lands if it determines that such uses are “compatible with the purposes for which these areas are established.”<sup>137</sup> The Service therefore cannot “permit a new use . . . or expand, renew, or extend an existing use” without first determining whether that use is compatible.<sup>138</sup> For a use to be “compatible” it must be “a wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the [Service], will not materially interfere with or detract from the fulfillment of the mission of the System or the purposes of the refuge.”<sup>139</sup>

SpaceX is proposing to use the adjacent refuge lands as a sacrificial debris field and is preventing FWS and the public from accessing important refuge areas, which is clearly an incompatible use. FWS has, in fact, explicitly stated that its “ability to maintain the biological integrity, diversity and environmental health of Refuge resources” has been significantly diminished at the Boca Chica tract,” because SpaceX operations prevent and constrain public access year-round, “hampering biological and monitoring studies including sea turtle patrols, sea turtle cold-stunning responses, [and] hampering refuge management and law enforcement patrol....”<sup>140</sup> Once again, according to FWS these limitations have caused “both ‘*adverse*’ and ‘*severe*’ impacts to Refuge public use, management, wildlife, and habitat.”<sup>141</sup> And while the Refuge Improvement Act prioritizes wildlife-dependent recreational uses of refuges (if they are deemed compatible) over other types of uses, such as economic uses,<sup>142</sup> clearly SpaceX (a commercial operation) is interfering with priority recreational uses by forcing closures of the refuge during rocket launches.

FAA, however, has failed entirely to show that the SpaceX activities it is considering are consistent with these legal requirements, and it does not appear possible for it to do so. The Refuge Act requires the Service to administer the System to “ensure that the biological integrity, diversity, and environmental health of the System are maintained for the benefit of present and future generations of Americans.”<sup>143</sup> However, the Service has explicitly stated: “Due to operations by SpaceX, the FWS’s ability to maintain the biological integrity, diversity and

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<sup>135</sup> *Id.* § 668dd(a)(4)(B).

<sup>136</sup> 50 C.F.R. § 25.21(a).

<sup>137</sup> 16 U.S.C. § 668dd(d)(1)(B).

<sup>138</sup> *Id.* § 668dd(d)(3)(A)(i).

<sup>139</sup> *Id.* § 668ee(1).

<sup>140</sup> FWS Jan. 22, 2021 Letter.

<sup>141</sup> *Id.*

<sup>142</sup> 16 U.S.C. 668dd(a)(3)(C).

<sup>143</sup> 16 U.S.C. § 668dd(a)(4)(B).

environmental health of Refuge resources... has been significantly diminished at the Boca Chica tract.”<sup>144</sup> The proposed action is therefore inconsistent with the requirements of the Refuge Act. If the FAA were to authorize the action under these circumstances this is yet another reason why the agency’s decision would be arbitrary and capricious and contrary to law.

## **VII. The Project must obtain a permit for take under the Migratory Bird Treaty Act**

In 1918, Congress enacted the Migratory Bird Treaty Act (MBTA) to implement a treaty for the protection of migratory birds between Great Britain (on behalf of Canada) and the United States. The objective of the treaty was to create a “uniform system of protection” to “insur[e] the preservation of such migratory birds,” because “a lack of adequate protection” for many migratory birds traveling through the United States left them vulnerable to extinction.<sup>145</sup> The MBTA has helped restore countless populations of birds once on the path to extinction, such as sandhill cranes, snowy egrets, and wood ducks. In fact, the Supreme Court has described the purpose of the MBTA as a “national interest of very nearly the first magnitude.”<sup>146</sup>

As a “conservation statute[] designed to prevent the destruction of certain species of birds,”<sup>147</sup> the MBTA protects more than 1,000 species of birds found in the United States.<sup>148</sup> Under this law:

[u]nless and except as permitted by regulations . . . it shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, [or] kill . . . any migratory bird [or] any part, nest, or egg of any such bird . . . included in the terms of the conventions . . . .<sup>149</sup>

Although the Trump Administration adopted an interpretation of the MBTA that eliminated liability for “incidental” take and killing of migratory birds—at variance with decades of prior practice and policy—that interpretation was emphatically rejected by a federal court.<sup>150</sup> Accordingly, the Interior Department and FWS have recently completed a rulemaking that formally revokes the Trump Administration interpretation and reinstates the prior understanding of the statute, pursuant to which the foreseeable incidental take of migratory birds cannot proceed without formal authorization from the FWS.<sup>151</sup>

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<sup>144</sup> FWS Jan. 2021 Letter at 2-3.

<sup>145</sup> Convention for the Protection of Migratory Birds, 39 Stat. 1702 (Aug. 16, 1916).

<sup>146</sup> *Missouri v. Holland*, 252 U.S. 416, 435 (1920).

<sup>147</sup> *Andrus v. Allard*, 444 U.S. 51, 52 (1979).

<sup>148</sup> See 50 C.F.R. § 10.13.

<sup>149</sup> 16 U.S.C. § 703(a).

<sup>150</sup> See *Natural Res. Def. Council v. U.S. Dep’t of the Interior*, 478 F. Supp. 3d 469 (S.D.N.Y. 2020).

<sup>151</sup> See 86 Fed. Reg. 54643 (Oct. 4, 2021).

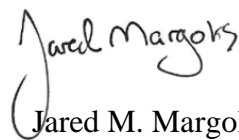
Here, there is little doubt that the proposed activities may foreseeably kill or take migratory birds. Indeed, the FWS in a Jan. 22, 2021, letter explained that “[o]n three separate occasions in 2020, rocket launch failures resulted in explosions and the spread of debris on and off Refuge lands” and that “[v]ideos of these events show evidence of different species of birds being impacted by the blast.” Although the FWS could not ascertain what species of migratory birds and/or birds listed as threatened or endangered under the ESA were harmed or harassed,” the Service found that “[t]here is documented evidence that the debris and its removal has impacted and scarred various habitats in the area, including tidal flats which are foraging habitat for the threatened piping plover and red knot.”

There is, therefore, a strong likelihood that the extensive activities in migratory bird habitat that are contemplated here—especially if undertaken during the breeding season—will result in the mortality and taking of migratory birds. For this reason, it would be unlawful for FAA to authorize the activities to proceed in the absence of authorization from the FWS pursuant to the MBTA.

#### **VIII. Conclusion**

For the foregoing reasons, the FAA has failed to comply with NEPA, the ESA, the Transportation Act, the Refuge Act, and the Migratory Bird Treaty Act. SpaceX’s activities at the Boca Chica site continue to have undue adverse impacts on surrounding habitat and the wildlife that relies on those areas, including federally protected species, and those impacts have not been adequately analyzed by FAA or mitigated by SpaceX. Please contact me if you have any questions regarding these comments.

Sincerely,



Jared M. Margolis  
Senior Attorney  
Center for Biological Diversity

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]



---

**From:** Jared Margolis <[REDACTED]>  
**Sent:** Monday, November 1, 2021 9:47 AM  
**To:** SpaceXBocaChica  
**Subject:** RE: Center for Biological Diversity Comments on SpaceX Draft PEA and BA  
**Attachments:** [EXTERNAL] Memo re\_ inability to continue resea....pdf; [EXTERNAL] RE\_ Boca Chica monitoring.pdf; [EXTERNAL] RE\_ SpaceX Boca Chica site - noon - ....pdf; 2019 3-25-2019 1217 pm Mail - Orms, Mary - Outlook Closures.pdf; 2019 11-29-2019 932 am Fwd\_ [EXTERNAL] SpaceX removal of debris North of Hwy 4.pdf

Ms. Zee –

I just tracked the package with the Center's comment letter and USB key containing the attachments to the letter, and it will arrive this Wednesday (it was shipped last Thursday, and I am not sure why there has been a delay) so I am sending the attachments to you via email as well to ensure they are included in the record in this matter. This will likely take several emails, so I apologize in advance for cluttering the in box.

First set attached -

Jared M. Margolis  
Senior Attorney | Endangered Species Program  
Center for Biological Diversity  
[REDACTED]

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---

**From:** Jared Margolis  
**Sent:** Monday, November 1, 2021 9:38 AM  
**To:** [REDACTED]  
**Subject:** Center for Biological Diversity Comments on SpaceX Draft PEA and BA

Good morning,

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Sincerely,

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Senior Attorney | Endangered Species Program  
Center for Biological Diversity

A large black rectangular redaction box covering several lines of text.

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**From:** Jared Margolis <[REDACTED]>  
**Sent:** Monday, November 1, 2021 9:49 AM  
**To:** SpaceXBocaChica  
**Subject:** RE: Center for Biological Diversity Comments on SpaceX Draft PEA and BA  
**Attachments:** 2020 6-4-2020 1242 pm 20200507\_SpaceX\_Presentation\_FINAL\_reducedsize\_novideo\_slide.pdf; 20160212 speeding trucks 2-12-2016 1255 pm DOI EM FWS and SpaceX- Fwd\_ Speeding Trucks.pdf; 20190205 Bryan concerned with impacts EM - Orms, Mary - Outlook request site visit.pdf; 20190324 out of compliance with BO [EXTERNAL] RE\_ SpaceX closure scheduled for Mar....pdf; 20190404 FWS comments on WR DOI EM - SpaceX Comments.pdf

Second set -

Jared M. Margolis  
Senior Attorney | Endangered Species Program  
Center for Biological Diversity  
[REDACTED]

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**Sent:** Monday, November 1, 2021 9:49 AM  
**To:** SpaceXBocaChica  
**Subject:** RE: Center for Biological Diversity Comments on SpaceX Draft PEA and BA  
**Attachments:** 20190405 FWS wants to reinstate [EXTERNAL] RE\_ SpaceX(1).pdf; 20190405 take of piping plover habitat DOI EM - SpaceX.pdf; 20190421 SpaceX stuck vehicle location.jpg; 20190423\_101838.jpg; 20190728 Refuge fire [EXTERNAL] RE\_ Space X - Refuge fire.pdf

Third set -

Jared M. Margolis  
Senior Attorney | Endangered Species Program  
Center for Biological Diversity  
[REDACTED]

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**From:** Jared Margolis <[REDACTED]>  
**Sent:** Monday, November 1, 2021 9:50 AM  
**To:** SpaceXBocaChica  
**Subject:** RE: Center for Biological Diversity Comments on SpaceX Draft PEA and BA  
**Attachments:** 20190731 more on fire and lack of EIS for it - [EXTERNAL] SpaceX - Refuge fire meeting.pdf; 20191121 blew up a rocket impacts to refuge EM - Orms, Mary - Outlook.pdf; 20191129 debris removal impacts.pdf; 20200302 Debris Locations \_ Details (1).pdf; 20200302 Debris Locations \_ Details.pdf

Fourth set -

Jared M. Margolis  
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Center for Biological Diversity  
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**From:** Jared Margolis <[REDACTED]>  
**Sent:** Monday, November 1, 2021 9:51 AM  
**To:** SpaceXBocaChica  
**Subject:** RE: Center for Biological Diversity Comments on SpaceX Draft PEA and BA  
**Attachments:** 20200302 FWS new Final WR Comment Ltr (1).pdf; 20200302 FWS new Final WR Comment Ltr.pdf; 20200304 explosion incident report.pdf; 20200310 Bryan Refuge and SpaceX Debris removal.pdf; 20200604 another explosion.pdf; Attachment A - August 2021 Service Letter.pdf; Attachment C - Debris Removal in 2021.pdf

Fifth set -

Jared M. Margolis  
Senior Attorney | Endangered Species Program  
Center for Biological Diversity  
[REDACTED]

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**Sent:** Monday, November 1, 2021 9:52 AM  
**To:** SpaceXBocaChica  
**Subject:** RE: Center for Biological Diversity Comments on SpaceX Draft PEA and BA  
**Attachments:** Attachment D - Debris Removal with Photos.pdf; Attachment H - No Path Toward FONSI.pdf; Attachment J - Section 9 Letter to SpaceX.pdf; CBBEP\_P IPL\_BocaChica\_report\_2021\_10\_22 (002).pdf; DRAFT Request for Comment\_Programmatic EA\_Spac.doc

Sixth set -

Jared M. Margolis  
Senior Attorney | Endangered Species Program  
Center for Biological Diversity  
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**To:** SpaceXBocaChica  
**Subject:** RE: Center for Biological Diversity Comments on SpaceX Draft PEA and BA  
**Attachments:** ccs\_development\_manual\_2-2-16\_revision-1-1-withsigjk.pdf

Seventh set -

Jared M. Margolis  
Senior Attorney | Endangered Species Program  
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**To:** [REDACTED]  
**Subject:** Center for Biological Diversity Comments on SpaceX Draft PEA and BA

Good morning,

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Sincerely,

Jared M. Margolis  
Senior Attorney | Endangered Species Program  
Center for Biological Diversity  
[REDACTED]

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forwarding without express permission is strictly prohibited. If you are not the intended recipient, please contact the sender and delete all copies.

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**From:** Jared Margolis <[REDACTED]>  
**Sent:** Monday, November 1, 2021 9:54 AM  
**To:** SpaceXBocaChica  
**Subject:** RE: Center for Biological Diversity Comments on SpaceX Draft PEA and BA  
**Attachments:** DWH-ARZ000415.pdf; EPA comments to USACE on Space X 404 permit - A.....pdf; FAA Scoping FWS1.pdf; FAA Scoping FWS2.pdf; FAA Scoping FWS3.pdf

Eighth set -

Jared M. Margolis  
Senior Attorney | Endangered Species Program  
Center for Biological Diversity  
[REDACTED]

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**To:** SpaceXBocaChica  
**Subject:** RE: Center for Biological Diversity Comments on SpaceX Draft PEA and BA  
**Attachments:** ExpParkNorth\_FINAL EA 07-27-21 (1).pdf

Ninth Set -

Jared M. Margolis  
Senior Attorney | Endangered Species Program  
Center for Biological Diversity  
[REDACTED]

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**To:** SpaceXBocaChica  
**Subject:** RE: Center for Biological Diversity Comments on SpaceX Draft PEA and BA  
**Attachments:** FEMA flood risk.pdf; Fw\_ [EXTERNAL] Authorization Update for SpaceX'....pdf; Fw\_ [EXTERNAL] Location.pdf; Fw\_ [EXTERNAL] SpaceX Starship\_Super Heavy at B....pdf; KNPR\_8500.1 \_\_Rev\_D\_FINAL.pdf

Tenth set -

Jared M. Margolis  
Senior Attorney | Endangered Species Program  
Center for Biological Diversity  
[REDACTED]

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**Sent:** Monday, November 1, 2021 9:56 AM  
**To:** SpaceXBocaChica  
**Subject:** RE: Center for Biological Diversity Comments on SpaceX Draft PEA and BA  
**Attachments:** pictures of new impact for take analyzes.pdf; Re\_ [EXTERNAL] Location(1).pdf; Re\_ [EXTERNAL] RE\_ SN11 Anomaly March 30, 2021(1).pdf; Re\_ [EXTERNAL] RE\_ SN11 Anomaly March 30, 2021(2).pdf; Re\_ After Action Review Follow up.pdf; Re\_ Boca Chica monitoring.pdf; Re\_ DRAFT REPORT SN11 Anomaly - Rocket engine e....pdf; Re\_ Information for Informal Scoping FWS Respon....pdf; RefugeresponcetoFAA4F.doc

Eleventh set -

Jared M. Margolis  
Senior Attorney | Endangered Species Program  
Center for Biological Diversity  
[REDACTED]

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**From:** Jared Margolis <[REDACTED]>  
**Sent:** Monday, November 1, 2021 9:57 AM  
**To:** SpaceXBocaChica  
**Subject:** RE: Center for Biological Diversity Comments on SpaceX Draft PEA and BA  
**Attachments:** Space X Final WR Comment Letter 3-2-2019.pdf; SpaceX Boca Chica WR Closure Hours Final FWS C.pdf; SpaceX stuck vehicle location 4-21-2019.jpg; SWG-2012-00381 - SpaceX Mod - EPA 3(a) Comment Letter (4-7-21).pdf; The Coming Surge of Rocket Emissions - Eos.pdf; USACESpaceXexpansion\_final.pdf; WL45802 Draft EA SpaceX Starship SuperHeavy Bo.pdf

Twelfth and final set -

Jared M. Margolis  
Senior Attorney | Endangered Species Program  
Center for Biological Diversity  
[REDACTED]

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## Comments on Written Re-Evaluation of the 2014 Final EIS for SpaceX Texas Launch Site

Orms, Mary <[REDACTED]>

Mon 3/2/2020 2:35 PM

To: Zee, Stacey (FAA) <[REDACTED]>

Cc: Reyes, Ernesto <[REDACTED]> Winton, Bryan <[REDACTED]> Kendal Keyes

<[REDACTED]>

 1 attachments (1 MB)

Final WR Comment Letter 3-2-2019.pdf;

Stacey,

A. ched are our final comments on the WR. Thank for allowing us the extra me t o comment.

Mary



**United States Department of the Interior**  
**FISH AND WILDLIFE SERVICE**



In Reply Refer To:  
FWS/R2/ES/02ETCC00-2012-F-0186

March 02, 2020

Ms. Stacey M. Zee  
Office of Commercial Space Transportation  
Federal Aviation Administration  
800 Independence Ave., SW  
Washington, DC 20591

Dear Ms. Zee:

This letter responds to the November 29, 2019, request for U.S. Fish and Wildlife Service (Service) review of the Written Re-evaluation (WR) for Space Exploration Technologies' (SpaceX) Texas Launch Site. The WR evaluates whether supplemental environmental analyses are needed to support the Federal Aviation Administration (FAA) Office of Commercial Space Transportation's decision to issue launch licenses and/or experimental permits to SpaceX for experimental test flights of a reusable suborbital launch vehicle from the Texas Launch Site in Cameron County, Texas.

SpaceX's experimental test program will develop new rockets called the Starship and Super Heavy. The Starship will be tested and perform a suborbital space flight. The original Vertical Launch Area (VLA) and Control Center Area infrastructure will also be modified. SpaceX maintains that the modifications remain entirely within the property boundary analyzed previously. SpaceX anticipates the three-phased test program would last 2-3 years. Phase 1 construction in the VLA included the initial build of a propellant farm and associated ground equipment; development of an initial command control system; establishment of security and safety systems; establishment of water storage for fire suppression (three aboveground tanks); and construction of a small space vehicle pad for static fire tests and small hops. Additionally, Phase I included the construction of a pad with concrete access roads and facilities to store and transfer propellant. Liquid nitrogen propellant is stored in two vertical tanks approximately 30 feet tall. The command and control center area involves the use of the launch control centers, falcon support building, ground tracking, antenna dishes, and solar panel farm and/or generators. A building 200 feet by 100 feet and approximately 16 feet tall and two windbreaks and a tent taller than 30 feet, would be used to manufacture, fabricate, and assemble the Starship and spacecraft vehicle components. The tent is to be closed so light is not visible from outside. Road

base was installed for parking next to the tent. Phase 1 is complete. Phase 2 construction includes the necessary systems and equipment for higher hop tests. We are uncertain if Phase 2 construction is complete. The "hops" in Phase 1 and 2 are launches and would require a license, permit or waiver issued from FAA. Phase 1 and 2 operations would include mission rehearsals and static engine firing tests and would use up to 7,000 gallons of deluge water for fire suppression during tests. SpaceX does not anticipate the water discharging offsite, nor increasing lighting. Power is from a solar farm with non-reflective panels that are approximately five feet tall. Phase 1 and 2 tests would inform Phase 3. Space X is unable to provide the FAA adequate data and information regarding Phase 3 to enable the FAA to analyze the potential environmental impacts. Therefore, the scope of the WR is limited to Phases 1 and 2.

FAA's WR concluded that the contents of the 2014 Environmental Impact Statement (EIS) remained current, substantially valid and that the issuance of a launch license or experimental permit to conduct tests from the Texas Launch Site did not require a new Environmental Assessment (EA) or EIS. The FAA made this decision based on the following: 1) there were no substantial changes in the action that were relevant to environmental concerns, 2) data and analysis in the previous EA or EIS were still valid, 3) there were no significant new circumstances or information relevant to environmental concerns affecting the proposed action or its impacts; and 4) pertinent conditions and requirements of the prior approval have been, or will be, met in the current action.

A majority of the construction described in the WR has been completed and operations are ongoing. We believe they warrant full evaluation of different effects than we analyzed previously to National Wildlife Refuge Property or listed species. The Service provided written comments on the WR on April 4, 2019. FAA responded to the comments, which are enclosed. We believe our 2019 comments are still valid and have not been adequately addressed. The Service has been in discussions with FAA and SpaceX over various project changes on site that do not conform to the original project description, potential violations, and incidents resulting in damages on refuge lands and excessive closure notices that affect public and scientific access to the beach. The Service recommends a new National Environmental Policy Act (NEPA) document (EIS or EA) and Biological Assessment (BA) be prepared and consultation reinitiated. During a February 19, 2019, conference call FAA committed to reinitiating section 7 consultation and writing a new NEPA document. Below are issues and recommendations to address in new analyses and documents.

#### **Issues and Recommendations:**

##### **Construction**

Much of the construction proposed in the WR has already occurred or ongoing. Buildings are described but the details of lighting, parking, construction times, and anticipated traffic are not clear and not comparable to the original consultation documents. Nighttime construction was limited in the BO to two weeks during construction of pilings and nighttime launch activities. There has been reported and documented construction at night that exceed those limits. A schedule of nighttime construction should be included in the new EIS, EA or BA. We recommend pre-construction and post construction surveys to verify that no impacts have occurred to Refuge property or listed species or their habitats. Trash associated with SpaceX

construction and operation has been identified on adjacent Refuge lands. Employee cars are parked on both sides of Highway 4, along ditches and right-of-ways. We recommend the BA assess those impacts and adhere to the conservation measures in the original BO or identify new methods to alleviate impacts that may be occurring.

### **Road Closures**

The EIS and BO identified a maximum of 180 hours of road closures annually. The Service negotiated the 180 hours seeking to minimize disruption to the public accessing the beach, fishing, birding, visiting the refuge, state park, and battlefield site. Additionally the Service seeks to maintain predictable and regular scientific survey access.

In 2019, Space X reported 158 hours of road closures. The Service calculated overall disruption to public access in excess of 1,000 hours in 2019. We recommend all agencies need to agree on the method of record keeping, announcements, and cancellations and these details included or appended to the revised NEPA documents. This process needs to be put into effect as soon as possible to calculate 2020 hours of road closures.

The Service recommends that road closure announcements be provided to affected landowners 1-2 weeks prior via email notification with the time range. These will count toward the 180 hours allowed in the BO. Backup dates, as required by the Governor's Office for the State of Texas, will not count toward cumulative hours if cancelled within a minimum of 24-hour notice to affected agencies and the public. We recommend the Cameron County Judge be briefed by FAA or the Service on the established method of announcing and tracking closures.

### **Checkpoints**

The Soft Checkpoint location for future road closures cannot be changed due to border security needs. It is west of the Border Patrol's Fort Brown Highway 4 Checkpoint. The Service believes the Hard Checkpoint location could be adjusted to provide access to Massey Way Gun Range users, even during road closures, as this was identified as a private landowner economic hardship.

### **Hazardous Incidents and Contaminants**

On February 28, 2020, a test rocket exploded during a nighttime firing and voicemail was left for the Refuge Manager. Debris reportedly landed northwest of the launch site. Refuge staff will be assessing explosion impacts to nesting birds and impacts from ATV use and then make recommendations on the least impactful way to clear the debris field. On July 25, 2019, a burn occurred after a rocket test. It occurred at approximately 11:30 pm and burned about 10 to 15 acres of Boca Chica State Park, a property owned by TPWD but managed by the Service. The Refuge was not notified until the next day and by that time, the fire was smoldering and flared up and had burned approximately 130 to 135 acres more. Fire engines had gone off road and had gotten stuck causing damage to refuge lands. On August 2019, 6.2 acres were burned and debris was scattered on Refuge lands. Firefighters were not allowed to enter the area for three hours because of the type of fuel that was used. On April 22, 2019, SpaceX employees went off-road and got a golf cart stuck in the tidal flats on Refuge land. They attempted to remove the golf cart

and in doing so got an additional truck and forklift stuck in the same area. The Refuge was not immediately contacted. Damage accrued to sensitive mudflats which provide shorebird habitat.

These types of incidents were not anticipated to this extent in the original BO because the likelihood of it occurring on launching known vehicles, which we analyzed, was less than during experimentation on new space crafts. Therefore, the Refuge proposes to establish a damage assessment protocol to address any future spills, rocket fuel releases, launches/tests, fires, explosions and debris cleanup. Natural resource damages thus far were negligible, but in the event of a larger impact, a damage assessment protocol will be identified to FAA and SpaceX. The protocol should be will be similar to that used to address oil and gas development impacts on refuges in Texas and Louisiana.

The incidents that have occurred have not been during a migratory bird season. Therefore, large flocks of migratory birds or listed species were not in the area. If a fire occurs during the migratory season, impacts may be greater. SpaceX should strive to avoid or reduce the number of testing/launches between March 15 and August 15 to avoid disturbance to nesting sea turtles and shorebirds that utilize refuge areas immediately adjacent to the launch site.

The Service and TPWD should be allowed access to surrounding public lands to survey the scene and document/record any observed environmental impacts (i.e., fire, explosion, sound impacts, dead birds, other wildlife, etc.). SpaceX should also explore options to compensate the Refuge and TPWD for damages caused by the two fires and two explosions. One possible option is to contract the completion of the Cable Fence Project. The cables benefit SpaceX, the public, and conservation of the area. In addition, plant, soil and water monitoring can be added to track effects of the different fuel types and explosions.

#### **Hiring of Law Enforcement and Biologist**

SpaceX has agreed to hire one Refuge law enforcement staff through a reimbursable agreement. Further negotiations regarding the 22% Administrative Fee should be resolved. Although monitoring sites established in the general area may be of great learning experience for undergraduate studies at the University of Texas at Brownsville, the pre-construction and operational monitoring must follow peer-reviewed protocols. Protocols and monitoring should be developed and monitoring conducted by experts within the field, as findings of the baseline monitoring will lead to adaptive management decisions by the Service, SpaceX, and FAA.

During the original consultation, SpaceX agreed to hire two biologists. These biologist would be Refuge-hired employees, located at the Refuge, and would monitor and collect data outlined in the BO for the life of the project. The University of Texas at Brownsville was asked to do preconstruction baseline studies until the biologists could be hired. The hiring of the biologist has not occurred, because FAA states it was an agreement between the Refuge and SpaceX, not FAA. Additional biological monitoring needs are necessary to collect vegetation data associated with larger rocket engines and different fuel type associated with tests, launches and releases of any kind. We recommend FAA reconsider funding the biologists as SpaceX proposed.



**Traffic and Speed**

Additional Wildlife Crossing Signs and Reduced Speed limit signs are needed based on the significant increase in daily traffic volume now occurring on Highway 4. Roadkill appears to have increased and includes bobcats, tortoises, javelina, and white-tailed deer, along with a variety of other species (feral pigs, birds, etc.) There have been over 150-200 vehicles at the StarGate Building and SpaceX Launch Control Center area. The original EIS assessed only 30 to 130 personnel that would be at the site in the future. More construction is occurring on the site. Impacts from vehicles have included parking along the road shoulder (some on the refuge), trash and litter, and road-killed wildlife due to high volume vehicle traffic and vehicle speeds. We recommend further discussion on conservation measures that could avoid or minimize the risk of a potential take of an ocelot or jaguarundi, and possibly receiving take authorization for the species.

**Suggested Conservation Activities**


SpaceX approached the Service for a list of possible conservation activities they could implement for listed species. The Service would also like to collaborate with SpaceX to provide multi-purpose information for the public. An increase in public visitation is occurring because of the attraction to SpaceX. The Service seeks to take advantage of these new visitors to educate them about natural resources, the Palmito Ranch Battle, and to offer information about SpaceX activity. Another suggestion is funding or assistance in implementing recovery actions such as additional nest platforms for the northern aplomado falcon and ocelot crossing signage. The Service is interested in exploring other options with SpaceX if they would like to voluntarily assist with such efforts.

The issues and recommendations above are ones that we have discussed frequently. We recommend FAA thoroughly review the BO and compare it to the actions now proposed or being implemented, address changes in development and operation of the site, assess impacts to species and Refuge lands, note Plans that need updating, and review the Conservation Measures, Reasonable and Prudent Measures and Terms and Conditions that SpaceX agreed to implement.

Thank you for reinitiating consultation and we look forward to working with you on the new EA, EIS and/or BA. If you have any questions please contact Mary Orms at [REDACTED] or by email at [REDACTED]

Sincerely,



 Charles Ardizzone  
Field Supervisor

Enclosure

cc: Bryan Winton, Santa Ana Refuge  
Kendall Keyes, Texas Parks and Wildlife  
Ernesto Reyes, Alamo ESFO



## United States Department of the Interior



In Reply Refer To:  
02ETCC00-20 12-F -0186

April 3, 2019

Stacey Zee  
Federal Aviation Administration  
800 Independence Avenue SW  
Washington, DC 20591

Dear Ms. Zee:

The U.S. Fish and Wildlife Service (Service) thanks you for the opportunity to provide comments on the written re-evaluation (WR) of the 2014 Final Environmental Impact Statement for the Space Exploration Technologies Corporation (SpaceX) Texas Launch Site. The 2014 action was the issuance of launch licenses and/or experimental permits to authorize SpaceX to launch Falcon 9 and Falcon Heavy orbital vertical launch vehicles and a variety of reusable suborbital launch vehicles. The Service issued a Biological Opinion (BO) on December 18, 2013, to the FAA for the SpaceX license. The Federal Aviation Administration (FAA) Office of Commercial Space Transportation WR evaluates whether the development the Big Falcon Rocket (BFR) and the experimental test program of the Big Falcon Ship (BFS) requires a supplemental environmental analysis to issue launch licenses and/or experimental permits to SpaceX. The license would be to conduct experimental test flights of reusable suborbital launch vehicles from SpaceX's private launch site located at Boca Chica, Cameron County, Texas.

**FAA Response:** Please refer to the updated WR we sent you on March 18, 2019. SpaceX renamed BFS to "Starship" and BFR to "Super Heavy." Super Heavy will eventually be the first stage of the launch vehicle and Starship will be the second stage of the launch vehicle. SpaceX's current test program at Boca Chica involves testing a Starship prototype.

The test program would last 2-3 years and have three phases. The following table details each phase. The total number of events shown in the table are for the entire test program.

**Table 1. Phases of the Experimental Test Program**

Test	Total # of Events <sup>a</sup>	Description
Wet Dress	5-10	Verify ground systems and spacecraft by fueling the Ship.
Static Fire	5	Verify engine ignition and performance by conducting a brief (few seconds) ignition of the Ship's engines.

Small Hops	3	Verify engine ignition and thrust to lift the Ship a few centimeters off the ground.
Small Hops	3	Engine ignition and thrust to lift the Ship over 30 cm and up to 150 m.
Medium Hops	3	Engine ignition and thrust to lift the Ship over 30 cm and up to 3 km.
Suborbital Space Flight	3	Launch up to 100 km, flip the Ship at high altitude, and conduct a reentry and landing.

The proposed experimental test program involves modifications to the vertical launch area (VLA) and Control Center Area. The construction will be done in two phases within the property boundary and the same project area analyzed in the 2014 EIS. Phase 1 construction in the VLA is ongoing and includes the initial build of the propellant farms and associated ground equipment. Phase 2 construction includes the necessary systems and equipment for higher BFS hop tests.

The FAA did not issue a launch license and/or experimental permit, but opted to waive the need for SpaceX to obtain a launch license and/or permit to conduct the currently proposed actions. The waiver, a federal action, is limited to: 1) loading and unloading fuel test; 2) spin test; and 3) minihops. The total number of events, in Phases 1 and 2 that can occur within that waiver, over the 2-3 years timeframe is listed in Table 1. Phase 3 would require another WR and analysis.

**FAA Response:** Please note that the table you included above is missing a column identifying the phase (refer to the WR sent to you on March 18, 2019). Phase 1 includes wet dress rehearsals, static fires, and small hops. Phase 2 includes small and medium hops.

The FAA issued a waiver to SpaceX for tethered Starship hop tests. Since starting the Starship tests in March 2019, SpaceX has conducted five wet dress rehearsals, two static fires, and one small hop.

The FAA WR concluded that the issuance of launch licenses and/or experimental permits to SpaceX to conduct BFS tests conformed to the prior environmental documentation, that the data contained in the 2014 EIS remain substantially valid, there were no significant environmental changes, and that all pertinent conditions and requirements of the prior approval have been met or will be met in the current action. Therefore, a supplemental EIS or new environmental document was not necessary.

#### **General Comments:**

The 2014 EIS for the Falcon 9 launches described three types of launch licenses and experimental permits to operate reusable orbital and suborbital launch vehicles:

- Launch-Specific License - "authorizes a licensee to conduct one or more launches, having the same launch parameters, of one type of launch vehicle from one launch site" (14 CFR §415.3[a]). A licensee's authorization to launch terminates upon completion of all launches authorized by the license or the expiration date stated in the license, whichever occurs first.
- Launch Operator License - "authorizes a licensee to conduct launches from one launch site, within a range of launch parameters, of launch vehicles from the same family of vehicles transporting specified classes of payloads" (14 CFR §415.3 [b ]). A launch operator license remains in effect for five years from the date of issuance.



- Experimental Permit - "authorizes launch and reentry of a reusable suborbital rocket" (14 CFR§437.7). An experimental permit lasts for one year from the date issued.

The EIS did not analyze the potential for a waiver to be issued to SpaceX for their Falcon 9 launches, nor is it mentioned in the WR for the Phase 1 and Phase 2 scheduled events. It appears the federal action changed from providing a license or experimental permit for SpaceX to launch Falcon 9 rockets into orbit and/or other various suborbital rockets providing a waiver for BFS tests. The Service requests an explanation of the use of a waiver instead of a license or experimental permit.

**FAA Response:** SpaceX applied for a waiver to a license and, after reviewing the application, the FAA granted the waiver under 14 CFR Part 404.5. The waiver states that SpaceX must comply with all applicable local, state, and federal laws, as well as any applicable agreements or requirements. During Starship tests in March and April 2019, SpaceX closed a section of Highway 4 and Boca Chica Beach to ensure public safety.

In accordance with Paragraph 9-2.c of FAA Order 1050.1F, the preparation of a new or supplemental EIS is not necessary when the following can be documented:

1. The proposed action conforms to plans or projects for which a prior EA and FONSI have been issued or a prior EIS has been filed and there are no substantial changes in the action that are relevant to environmental concerns;
2. Data and analyses contained in the previous EA and FONSI or EIS are still substantially valid and there are no significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts; and
3. Pertinent conditions and requirements of the prior approval have been, or will be, met in the current action.

The FAA contends that the mission has changed, but the proposed action of issuing a license and/or experimental permit has not changed. Additionally FAA states that: all construction and activities will be within the same footprint; pertinent requirements will be met in the current action; there have been no substantial changes to the EIS; and no significant new circumstances or information relative to environmental concerns therefore, the FAA states a new supplemental EIS is not needed.

The Service agrees the mission has changed and construction and activities will occur within the boundaries already analyzed under the 2014 EIS and 2013 BO. However, changes in how construction and closures are being conducted are not being followed as outlined in the BO and may be impacting listed species beyond what was originally analyzed. The Service has contacted FAA and SpaceX, via emails, regarding noncompliance; but resolution has not occurred. Therefore, the Service requests, closures and testing events cease until noncompliance issues are resolved.

**FAA Response:** SpaceX apologizes for not complying with the BO's process for notification in advance of a closure. SpaceX has completed the first round of tests in Phase 1 and is not planning a closure within the next 2 weeks. SpaceX and the FAA are committed to complying with the BO's approximate 2-week notice of a closure.

The BO is a legally binding document between FAA/SpaceX and the Service. FAA/SpaceX have stated they will follow the BO. Many project aspects have changed and therefore, the BO should be amended to reflect the current proposed action and activities to occur under that waiver. Various measures under

the May 13, 2014, amendment have not been completed and should be addressed in the next amendment (enclosed) and annual report.

**FAA Response:** The FAA emailed a letter to the Service on November 5, 2018 to provide an update on Consultation Number 02ETCC00-2012-F-0186. The letter provided a brief consultation history and an overview of SpaceX's planned Starship test program, including a description of the Starship, updates to construction, and an effects analysis. SpaceX also provided the Service (via email on December 4, 2018) with Google Earth KMZ files showing the planned infrastructure footprint and previously mapped vegetation (including piping plover habitat). In the November 2018 letter, the FAA concluded that the proposed changes to SpaceX's Texas Launch Site would not 1) cause effects to ESA-listed species or critical habitat in a manner or to an extent not considered in the BO or 2) result in an increase in the amount of take of ESA-listed species and critical habitat provided in the Service's incidental take statement. The FAA welcomed feedback from the Service but never received any. The Service has had several months to revise the BO accordingly and/or conduct further consultation with the FAA based on the information we provided.

The FAA is aware of the file the Service refers to as the "BO Amendment." However, the FAA was never involved in the development of the amendment. It is the FAA's understanding that this file was a negotiation between SpaceX (Steve Davis) and the Refuge and was never executed. Thus, as it pertains to ESA compliance, the FAA is using the BO executed on December 18, 2013.

The FAA is aware of another document—titled "Reimbursable Funding and Donation Agreement between U.S. Fish and Wildlife Service, South Texas Refuge Complex and Space Exploration Technologies Corp. to Accommodate Commercial Spacecraft Launches from the SpaceX Texas Launch Site"—which was executed by Steve Davis on September 11, 2015 and the Service (Aaron M. Archibeque) on August 11, 2015. Please note that Matt Thompson of SpaceX provided Mary Orms a follow-up copy of the Reimbursable agreement on April 4, 2019. The FAA has no involvement in this agreement.

#### **Specific Comments:**

**Page 4, WR, Table 1, Phase 1, Wet Dress, 5-10 events, verify ground systems and spacecraft by fueling the BFS.**

**Comment:** There have been 13 days of closures or proposed closures between March 20 and April 1, 2019. If the total number of events in Table 1 are for the entire test program (2-3 years) and do not represent a number of monthly or annual operations it would appear that if a test was done each of the 13 days then the 5-10 events on the table, planned over 2-3 years has been exceeded. The EIS and BO analyzed a closure of up to 15 hours. Closures impact federal refuge and state park attendance, and interfere with daily sea turtle patrols, being conducted by Sea Turtle, Inc. in an effort to locate nesting sea turtles and secure eggs for hatching. Many of the turtles are daytime nesters. It also interferes with monitoring of birds and plants making it difficult to analyze the pre and post effects of the closures and wet dress activities.

Small hops vs medium hops include low-altitude and higher-altitude test that range from 500 meters (1,650 feet) meters to 5,000 meters (16,500 feet) for an overall time length of 1.5 to 6 minutes each and



usually run approximately 3 times a week. For clarification, will 3 small hop events occurring 3 times a week, increase the number of events and the length of time a closure will occur?

**FAA Response:** Although the number of closures has exceed the number of tests identified in the table above, SpaceX did not conduct a test during each of closures. The table includes an estimated 5-10 wet dress rehearsals, 5 static fires, and 3 small hops for Phase 1 operations. SpaceX will not exceed these estimated numbers. Of the closures that occurred, each was limited to a maximum of 8 hours.

No, SpaceX estimates a total of 3 small hops will be performed during Phase 1 of the test program, as shown in the table.

**Page 5, WR, Phase 1 Construction 2"d paragraph "This is the same area that was stabilized for construction via the surcharging project conducted in 2016"**

**Comment:** Does the surcharging project refer to the pilings discussed in the EIS and BO that were to be completed in 2 weeks? That was a one time nighttime construction with associated noise and lighting that was only to occur during the two weeks of concrete pouring.

**FAA Response:** No, the surcharging project started in 2016 and was completed the same year. The surcharging project was needed to stabilize the substrate at the VLA. SpaceX has not used any pilings to date at the launch site.

**Page 7, WR, 1st paragraph "The BFS test program would involve use of launch control centers, Falcon support building, emergency services building, ground tracking antenna dishes and solar farm."**

**Comment:** The antenna dishes have been installed and can be used to communicate between the Control Center and the VLA. Are these dishes currently licensed and functioning or does the Federal Communications Commission require a license?

**FAA Response:** Yes, the antennas are functioning and are operated in accordance with SpaceX's license from the Federal Communications Commission.

**Page 8, WR, 1st paragraph "The tent would be installed in the location of the proposed support buildings mentioned in the 2014 EIS. The tent would be used to house welding and fabrication activities needed for structures at the VLA....Work activities inside the tent would occur at night and therefore require lighting"**

**Comment:** The EIS and the BO state there would not be any night construction except for the 2-week period when pilings were to be installed. Night construction should cease and there should not be any lighting visible over the dunes during sea turtle season (March 15 to October 1st). Inspections should be occurring to ensure lights, security and parking follow the guidelines set in the Conservation Measures of the BO.

**FAA Response:** SpaceX is avoiding nighttime activity as much as possible. Some nighttime activity has occurred in order to meet project requirements. The tent lighting is being minimized to the greatest extent possible. The tent is located approximately two miles from the beach and is not visible from the beach. SpaceX has been conducting periodic inspections of the facilities to

ensure that all required turtle related lighting mitigations are in place. These include the mobile fixtures, filters, orientation, and shielding, and also the use of appropriate permanent light fixtures. According to SpaceX, no lights are discernable from the beach.

Page 9, Table 3. Phase 2 Commodities

Quantity	Description
302 cubic feet	Ship purges/pneumatics
2 tanks: 302 cubic feet 450 cubic feet	Ship pneumatics
Two tanks: 16,000 gallons 60,000 gallons	Propellant densification/Gaseous Nitrogen Recharge/Densification
1550 cubic feet	Ship Oxygen Tank Press
1040 cubic feet	Ship Methane Tank Press

**Comment:** The type of fuel has changed from the original EIS and the BO should be amended to reflect that change.

**FAA Response:** The FAA provided this information in the ESA letter sent to the Service on November 5, 2018.

Page 10, WR, Affected Environment, Paragraph 2 "SpaceX installed a solar farm on Parcel 2."

**Comment:** Texas Parks and Wildlife commented that solar arrays can have a "lake effect," and cause birds and their insect prey to mistake a reflective solar facility for a water body. SpaceX committed to installing non-reflective solar panels and it is important they were installed to limit migratory and/or listed bird species from being potentially impacted.

**FAA Response:** SpaceX installed non-reflective panels.

Page 11, WR, Re-evaluation of Environmental Consequences "The FAA does not believe the tent would cause effects to species listed under the Endangered Species Act (ESA) in a manner not considered in the Biological Opinion and not increase the amount of take"

**Comment:** A tent or building is now onsite at the VLA and appears to be a storage area for equipment and materials; however it is open on both ends and emanates light from inside and out in addition to other construction lighting at night. Lighting was not to occur onsite except during one or two nighttime launches, which SpaceX states will no longer occur. It is sea turtle nesting season and nighttime construction could cause additional impacts to sea turtles that were not considered in the EIS or BO.

**FAA Response:** Please note that the temporary tent structure is located at the control center area (approximately two miles from the beach), not the VLA. The tent structure is now closed on all sides. SpaceX enclosed the tent prior to the start of sea turtle nesting season.

Page 12, WR, Biological Resources (including Fish, Wildlife, and Plants) The FAA and SpaceX are committed to implementing the conservation measures and terms and conditions outlined in the BO to minimize potential effects to ESA-listed species and critical habitat. Any license or permit issued by



the FAA to SpaceX for operations at the Texas Launch Site will include a term and condition for environmental compliance."

**Comment:** FAA and SpaceX have been informed that they are out of compliance with the BO. The FAA and SpaceX have not coordinated with various agencies as outlined in the BO, 14 Days prior to closures. Instead, they continue to have continuous day after day closures, potentially exceeding their 2-3 year total number of events. Nighttime construction is also potentially illuminating the beach during sea turtle season and increasing the risk of "take" not anticipated or covered in the BO.

**FAA Response:** Please refer to our responses above on this topic.

Page 18, WR, Visual Effects (including Light Emissions) "The 2014 EIS determined construction activities would impact the visual environment of residents of Boca Chica Village and travelers on State Highway 4, but the impacts would be intermittent, temporary, and minimized through SpaceX's Lighting Management Plan.... The amount of nighttime lighting at the VLA would be less. Aside from the methane flare, SpaceX is not planning to have nighttime lighting at the VLA."

**Comment:** Since the new program began, Boca Chica residents have reported that the lighting is continuous throughout the night. A picture on SPACENEWS30 Texas on December 24, 2018, by Jeff Foust shows the BFS being built, at night, with bright equipment lights lighting up the night sky.

**FAA Response:** SpaceX has and is avoiding nighttime activity as much as possible. SpaceX does not believe take of a listed species has occurred during the nighttime activity to-date. No take has been reported to the FAA. As stated above, SpaceX has been conducting periodic inspections of the facilities to ensure that all required turtle related lighting mitigations are in place. These include the mobile fixtures, filters, orientation, and shielding, and also the use of appropriate permanent light fixtures. According to SpaceX, no lights are discernable from the beach.

The following comments address the BO:

Page 2, "Construction Activities, Construction of the launch and control center facilities is expected to be complete within 24 months. Most construction will occur during the hours of 8 a.m. to 5 p.m., Monday through Friday. Night construction will occur for approximately 2 weeks during concrete pouring and approximately 2 weeks for pile driving."

**Comment:** Construction is occurring during the night, which is not in compliance of the BO. This poses a greater risk on listed species.

**FAA Response:** Please refer to our responses above on this topic.

Page 2, Launch Area, "The proposed vertical launch area will occupy 20 of the 56.5 acres owned or leased by SpaceX."

**Comment:** The BO should be amended to include the current number of acres occupied.

**FAA Response:** The infrastructure at the VLA occupies approximately eight acres.

Page 2, "Pilings will be driven to construct the larger facilities that support heavy loads. Staging areas will occur within proposed project boundaries and no additional areas will be needed. Facilities within the launch area will include the integration and processing hangar (hangar), launch pad, launch stand with flame duct, water tower, deluge water retention basin, propellant storage and handling areas, workshop and office area, parts storage warehouse, roads, parking areas, fencing, security gates, and utilities (Figure 5 and 6)."

Comment: The BO should be amended to reflect current facilities to be constructed and operated.

**FAA Response:** The FAA provided this information in the ESA letter sent to the Service on November 5, 2018.

Page 2 and 3, "There are four primary areas: liquid oxygen (LOX), rocket propellant-1 (RP-1), helium, and nitrogen. Each area will include storage tanks or vessels, containment area, fluid pumps, gas vaporizers, and other components necessary to control fuel flow to the launch vehicle."

Comment: An amended BO needs to analyze the change in fuel type and storage location.

**FAA Response:** The FAA provided this information in the ESA letter sent to the Service on November 5, 2018.

Page 3, Access Roads and Infrastructure, "Roads and utilities will provide access, power, data, and water to the facilities within the vertical launch area. Approximately 2.45 acres will be parking and road area. Parking for the launch area and the control area will accommodate up to 250 personnel. Roads will be constructed of concrete or asphalt. The perimeter access road would be dirt/gravel. The area will also include exterior lighting, security fences, and gates."

Comment: The BO should be amended to reflect total parking and road area, number of personnel expected, and where lighting will occur if different from what has been described above.

**FAA Response:** Please refer to our November 2018 letter for an updated description of the infrastructure at the VLA. The infrastructure at the VLA occupies approximately eight acres. SpaceX still anticipates many parking locations at the control center area.

Page 3, Access Roads and Infrastructure, "Primary power for the vertical launch area would be provided by commercial power from the control center area, located approximately 2 miles west, to the vertical launch area."

Comment: We understood the area would be powered by the solar array. What changed?

**FAA Response:** SpaceX plans to transition to solar power only in the future, hence the installation of the solar array. Auxiliary power currently is needed during critical operations.

Page 3, Access Roads and Infrastructure, "Potable water will either be delivered by truck to a holding tank at the vertical launch area or pumped from a well on the property. The septic system would consist of a mobile above ground processing unit and holding tank."

Comment: Please update information for the BO amendment as to how potable water and the septic



system are handled.

**FAA Response:** SpaceX says this BO text remains accurate.

Page 3, Facility Security, "Two 6-foot tall perimeter chain-link fences will be erected around the vertical launch area and will enclose approximately 20 acres. The two fences will be approximately 10 feet apart with a 7-foot wide dirt access road inside the inner fence for security patrols. The outside perimeter fence will include a sensor system to detect unauthorized access. The control center will maintain 24 hour monitoring of all security systems."

**Comment:** We understand there will be a security fence, with lights, but will there still be a double fence where security guards will drive around the perimeter? Please update the section.

**FAA Response:** SpaceX's current plans do not include a double fence; however, another fence is possible in the future. Please also note that the launch site is located in an area that the U.S. Department of Homeland Security (DHS) has identified for border fencing. SpaceX is working with DHS representatives in South Texas to ensure the border fencing does not eliminate SpaceX's use of its launch site. To date, DHS representatives have indicated that they may be able to accept SpaceX's approach to fencing the area and connect SpaceX's fencing to the fence that DHS builds. To facilitate a mutually acceptable outcome, SpaceX has delayed progress with its fencing and is analyzing fencing options that will accommodate DHS concerns.

Page 3, Facility Security, "Lighting will be positioned to illuminate the perimeter and a zone leading up to the controlled areas in hours of darkness. All building exterior lights will be lit from dusk to dawn."

**Comment:** Will there building exterior lights from dusk to dawn?

**FAA Response:** Yes, it is certainly possible. Please refer to the Facility Design and Lighting Management Plan that we distributed to you for review on November 20, 2018, and March 18, 2019.

Page 4, Control Center Area.

**Comment:** Please update changed portions of this section for the BO amendment.

**FAA Response:** The FAA provided this information in the ESA letter sent to the Service on November 5, 2018.

Page 4, Control Center Area, "The Dragon capsule, a satellite, typically uses hydrazine, a different fuel than the launch vehicle."

**Comment:** Please let us know if reference to the Dragon capsule should be removed, as it will not be part of the project any longer.

**FAA Response:** SpaceX is not planning to launch Dragon from the launch site. Therefore, you can remove it from the BO.

Page 5, Project Operations, Falcon 9 and Falcon Heavy launches will have commercial payloads,

satellites, experimental payloads, or a capsule, such as the SpaceX Dragon capsule. SpaceX may also launch smaller suborbital launch vehicles with all launch trajectories to the east and over the Gulf of Mexico. SpaceX proposes up to 12 launch operations per year through 2025, within a few days or weeks of payload arrival at the launch site. Launch operations could include Falcon 9 launches, a maximum of two Falcon Heavy launches, and associated pre-flight activities such as mission rehearsals and static fire engine tests."

**Comment:** Please update to reflect that there are no launches planned under this waiver, phase 1 and 2, and there are no longer 12 planned launches. Additionally, please update Launch vehicles, Payloads, and Propellant, Gas, Fuel, Oil, and Solvent Storage Areas sections.

**FAA Response:** Please refer to our November 2018 ESA letter for a description of planned construction and launch operations at the VLA. SpaceX no longer plans to conduct Falcon launches at the launch site.

Page 6, Pre-Launch Activities, "Wet dress rehearsals will require restricted access in the immediate vicinity of the vertical launch area and control center area. In addition SpaceX may conduct static fires. Static fires are identical to wet dress rehearsals except engines ignite for approximately 2 seconds then shut down. Static testing may last up to three hours.

Approximately 2 weeks in advance of a launch operation with restricted public access (i.e., actual launch, wet dress rehearsal, or static fire engine test), FAA/SpaceX will coordinate with the Cameron County Commissioner's Court, Secretariat of Communications and Transportation- Mexico, U.S. Coast Guard (USCG), Houston Air Route Traffic Control Center (ARTCC), Texas Parks and Wildlife Department (TPWD), National Park Service (NPS), the Service's Lower Rio Grande Valley NWR and Ecological Services Office, National Marine Fisheries Service, and Customs and Border Patrol regarding launch activities and ensure public safety. This will allow for the issuance of a Notice to Mariners (NOTMARs) and Notice to Airmen (NOTAMs). Approximately 3-6 days prior to a launch operation with restricted public access, the public would be notified of the upcoming launch operation and security closure through local media and through the use of NOTMARs and NOTAMs. The notices will include the proposed date, the expected closure time and a backup closure date and time."

**Comment:** This coordination has not occurred for any of the closures that were scheduled by SpaceX and Cameron County and does not comply with the BO. The Service and other agencies need sufficient time to prepare for the closures and coordinate ongoing activities and/or monitoring with SpaceX. We request that no further closures be scheduled until this coordination is complete. We have received a list of contacts from SpaceX that is missing many of the agencies listed above. Please update and correct the list. In addition, please add Ernesto Reyes, U.S. Fish and Wildlife Service ES, Texas Parks and Wildlife Game Wardens, and Cameron County Parks and remove Ted Hollingsworth since he is retired. We will forward the notices to our Law Enforcement.

**FAA Response:** Please refer to our responses above regarding closure notification. We are creating a closure notification list for review by the Service. Additionally, SpaceX is working with each stakeholder to ensure they have the correct contact(s). The list will be periodically updated as needed.

Page 7, Security Plan Implementation, "Launch operation day activities will include securing the safety zone at least 6 hours prior to a launch operation. Personnel will restrict access to unauthorized



persons at the soft checkpoint on SH4, just west of the U.S. Customs and Border Protection checkpoint (approximately 14-16 miles west of the SH 4 terminus at Boca Chica Beach), and the hard checkpoint just west of the control center, approximately 1.5 miles from the coast near Massey Road. Boca Chica beach will be temporarily closed from the Brownsville Ship Channel south to the U.S./Mexico border on the Gulf side for up to 15 hours."

**Comment:** Closures were intended to be for launches of Falcon 9s. There were some scheduled dry and wet dress dates; however, there seems to be a disconnect on how many and how often these closures are being handled now. Additionally, the checkpoint was moved during the March 20-21 closure. This checkpoint location was agreed upon by all entities to reduce the potential impact on refuge lands. The checkpoint location should not be moved without consulting the Service and Refuge staff.

**FAA Response:** SpaceX required multiple closures for this initial round of testing because SpaceX was unable to execute a test during each closure. Thus, SpaceX requested additional closures until they were able to complete the tests.

Despite the agreed upon traffic control plan, Texas Department of Transportation (TxDOT) directed Cameron County on where to place the checkpoint. SpaceX contacted Cameron County Engineering and requested that the checkpoint be moved. Cameron County coordinated with TxDOT in order to move the checkpoint to the correct location.

Page 7, Security Plan Implementation, "FAA/SpaceX will develop a plan in coordination with Padre Island National Seashore (PAIS), Sea Turtle Coordinator or Sea Turtle Inc. (STI) to notify and allow sea turtle patrollers to survey the beach for sea turtle and sea turtle nests once the beach is closed to the public and prior to the beach security patrols and also prior to the beach being reopened to the public after a launch."

**Comment:** Sea turtle season is March 15 to October 1. This is the time sea turtles come up on the beach and lay their eggs and return to the water. Nest are located and the eggs are removed for secure hatching. Sea turtles nest during the day and a few at night, therefore, it is important that the patrols get out on the beach before and after closures to look for signs of nesting. FAA and SpaceX should be coordinating with PAIS or STI to allow for patrols as described above to occur. PAIS and STI patrol the beaches during peak season, April to June. If activities and closures are to occur in March, July, August or September FAA/SpaceX is responsible contracting with an experienced and certified sea turtle patroller to conduct surveys. Recent closures have delayed STI training of interns. STI now has a tentative date of April 8<sup>th</sup> for training and beginning daily patrols.

**FAA Response:** Per the "Active Construction Species Monitoring Plan" (August 19, 2016), SpaceX is coordinating directly with STI and will ensure patrols are conducted.

Page 8, Personnel levels, On average, beginning in 2016, it is expected 30 full-time SpaceX employees/contractors will be present at the launch area and control center. They will work a single shift, between the hours of 8:00a.m. to 5:00p.m... Average personnel levels are expected to rise from 30 to 130 and the maximum levels during a launch from 130 to 250 employees onsite between 2016 and 2025.

**Comment:** Is this still accurate? Please provide updates for the BO amendment.

**FAA Response:** According to SpaceX, average personnel levels range from 30–100. Maximum levels during launch operations is expected around 150 personnel.

**Page 8, Conservation Measures.**

**Comment:** All plans should be reviewed and updated to fit the current activity and submitted to the Service for review. FAA has submitted annual reports, and addressed some of the measures in those reports. However, FAA and SpaceX should review the conservation measures and revise to reflect the most current activities authorized under this waiver.

**FAA Response:** SpaceX has updated and is in the process of updating the various plans mentioned in the BO, including the Facility Design and Lighting Management Plan, Emergency Action Plan, Hazardous Materials Emergency Response Plan, Hurricane Preparation Plan, and Stormwater Pollution Prevention Plan. Those plans requiring review by the Service will be submitted to the Service. For example, we submitted an updated Facility Design and Lighting Management Plan—that includes the updated Starship project—to you for review in November 2018 and March 2019. We will be submitting updates to other plans in the near future.

**Comments addressing the May 13, 2014, amendment to the BO.**

**Comment:** The BO was issued to FAA December 18, 2013, and amended in 2014 to cover SpaceX proposed changes. SpaceX submitted mitigation proposals that they were willing to commit to implementing. The agreed upon changes that have not been implemented by FAA/SpaceX are highlighted in yellow. The Service was agreeable to the land acquisition but did not want to set a number of acres to be acquired because of the difficulty SpaceX may have finding sufficient land.

The most important change was SpaceX's commitment to fund three positions. The newly hired biologist were to assume all monitoring bird and vegetation plans developed and currently being undertaken by the University of Texas Rio Grande Valley at Brownsville. The positions have never been funded by SpaceX.

Under the Reasonable and Prudent Measures FAA/SpaceX agreed on additional measures to avoid impacts to listed species and refuge lands. The measures were to be addressed in six separate plans to be prepared later. The Plans were submitted and approved, but need additional review and updating to address the current testing program. Annual reports have been submitted by FAA, as required in the BO, but not all measures have been addressed.

Under the Terms and Conditions, the Lower Rio Grande Valley Refuge and SpaceX reviewed the updated measures in more detail and signed below each measure to commit to the changes. The BO amendment is enclosed for reference. We highlight the proposals not completed.

**FAA Response:** Please refer to our response above regarding the "BO Amendment."

This concludes the Services comments on the WR and the BO. If you have any questions please contact Mary Orms at (361) 225-7315 or by email [mary\\_orms@fws.gov](mailto:mary_orms@fws.gov).

Sincerely,

Charles Ardizzone  
Field Supervisor

cc:

Bryan Winton, LRGV NWR

Rob Jess, LRGV NWR

Sonny Perez, LRGV NWR

Ernesto Reyes, USFWS

Kendall Keyes, TPWD

Mark Spier, NPS

Alejandro Rodriguez, USFWS, LE

enclosures

## Comments on Written Re-Evaluation of the 2014 Final EIS for SpaceX Texas Launch Site

Orms, Mary <[REDACTED]>

Mon 3/2/2020 2:35 PM

To: Zee, Stacey (FAA) <[REDACTED]>

Cc: Reyes, Ernesto <[REDACTED]> Winton, Bryan <[REDACTED]> Kendal Keyes

<[REDACTED]>

 1 attachments (1 MB)

Final WR Comment Letter 3-2-2019.pdf;

Stacey,

Attached are our final comments on the WR. Thank for allowing us the extra time to comment.

Mary





**United States Department of the Interior**  
**FISH AND WILDLIFE SERVICE**



In Reply Refer To:  
FWS/R2/ES/02ETCC00-2012-F-0186

March 02, 2020

Ms. Stacey M. Zee  
Office of Commercial Space Transportation  
Federal Aviation Administration  
800 Independence Ave., SW  
Washington, DC 20591

Dear Ms. Zee:

This letter responds to the November 29, 2019, request for U.S. Fish and Wildlife Service (Service) review of the Written Re-evaluation (WR) for Space Exploration Technologies' (SpaceX) Texas Launch Site. The WR evaluates whether supplemental environmental analyses are needed to support the Federal Aviation Administration (FAA) Office of Commercial Space Transportation's decision to issue launch licenses and/or experimental permits to SpaceX for experimental test flights of a reusable suborbital launch vehicle from the Texas Launch Site in Cameron County, Texas.

SpaceX's experimental test program will develop new rockets called the Starship and Super Heavy. The Starship will be tested and perform a suborbital space flight. The original Vertical Launch Area (VLA) and Control Center Area infrastructure will also be modified. SpaceX maintains that the modifications remain entirely within the property boundary analyzed previously. SpaceX anticipates the three-phased test program would last 2-3 years. Phase 1 construction in the VLA included the initial build of a propellant farm and associated ground equipment; development of an initial command control system; establishment of security and safety systems; establishment of water storage for fire suppression (three aboveground tanks); and construction of a small space vehicle pad for static fire tests and small hops. Additionally, Phase I included the construction of a pad with concrete access roads and facilities to store and transfer propellant. Liquid nitrogen propellant is stored in two vertical tanks approximately 30 feet tall. The command and control center area involves the use of the launch control centers, falcon support building, ground tracking, antenna dishes, and solar panel farm and/or generators. A building 200 feet by 100 feet and approximately 16 feet tall and two windbreaks and a tent taller than 30 feet, would be used to manufacture, fabricate, and assemble the Starship and spacecraft vehicle components. The tent is to be closed so light is not visible from outside. Road

base was installed for parking next to the tent. Phase 1 is complete. Phase 2 construction includes the necessary systems and equipment for higher hop tests. We are uncertain if Phase 2 construction is complete. The "hops" in Phase 1 and 2 are launches and would require a license, permit or waiver issued from FAA. Phase 1 and 2 operations would include mission rehearsals and static engine firing tests and would use up to 7,000 gallons of deluge water for fire suppression during tests. SpaceX does not anticipate the water discharging offsite, nor increasing lighting. Power is from a solar farm with non-reflective panels that are approximately five feet tall. Phase 1 and 2 tests would inform Phase 3. Space X is unable to provide the FAA adequate data and information regarding Phase 3 to enable the FAA to analyze the potential environmental impacts. Therefore, the scope of the WR is limited to Phases 1 and 2.

FAA's WR concluded that the contents of the 2014 Environmental Impact Statement (EIS) remained current, substantially valid and that the issuance of a launch license or experimental permit to conduct tests from the Texas Launch Site did not require a new Environmental Assessment (EA) or EIS. The FAA made this decision based on the following: 1) there were no substantial changes in the action that were relevant to environmental concerns, 2) data and analysis in the previous EA or EIS were still valid, 3) there were no significant new circumstances or information relevant to environmental concerns affecting the proposed action or its impacts; and 4) pertinent conditions and requirements of the prior approval have been, or will be, met in the current action.

A majority of the construction described in the WR has been completed and operations are ongoing. We believe they warrant full evaluation of different effects than we analyzed previously to National Wildlife Refuge Property or listed species. The Service provided written comments on the WR on April 4, 2019. FAA responded to the comments, which are enclosed. We believe our 2019 comments are still valid and have not been adequately addressed. The Service has been in discussions with FAA and SpaceX over various project changes on site that do not conform to the original project description, potential violations, and incidents resulting in damages on refuge lands and excessive closure notices that affect public and scientific access to the beach. The Service recommends a new National Environmental Policy Act (NEPA) document (EIS or EA) and Biological Assessment (BA) be prepared and consultation reinitiated. During a February 19, 2019, conference call FAA committed to reinitiating section 7 consultation and writing a new NEPA document. Below are issues and recommendations to address in new analyses and documents.

#### **Issues and Recommendations:**

##### **Construction**

Much of the construction proposed in the WR has already occurred or ongoing. Buildings are described but the details of lighting, parking, construction times, and anticipated traffic are not clear and not comparable to the original consultation documents. Nighttime construction was limited in the BO to two weeks during construction of pilings and nighttime launch activities. There has been reported and documented construction at night that exceed those limits. A schedule of nighttime construction should be included in the new EIS, EA or BA. We recommend pre-construction and post construction surveys to verify that no impacts have occurred to Refuge property or listed species or their habitats. Trash associated with SpaceX

construction and operation has been identified on adjacent Refuge lands. Employee cars are parked on both sides of Highway 4, along ditches and right-of-ways. We recommend the BA assess those impacts and adhere to the conservation measures in the original BO or identify new methods to alleviate impacts that may be occurring.

### **Road Closures**

The EIS and BO identified a maximum of 180 hours of road closures annually. The Service negotiated the 180 hours seeking to minimize disruption to the public accessing the beach, fishing, birding, visiting the refuge, state park, and battlefield site. Additionally the Service seeks to maintain predictable and regular scientific survey access.

In 2019, Space X reported 158 hours of road closures. The Service calculated overall disruption to public access in excess of 1,000 hours in 2019. We recommend all agencies need to agree on the method of record keeping, announcements, and cancellations and these details included or appended to the revised NEPA documents. This process needs to be put into effect as soon as possible to calculate 2020 hours of road closures.

The Service recommends that road closure announcements be provided to affected landowners 1-2 weeks prior via email notification with the time range. These will count toward the 180 hours allowed in the BO. Backup dates, as required by the Governor's Office for the State of Texas, will not count toward cumulative hours if cancelled within a minimum of 24-hour notice to affected agencies and the public. We recommend the Cameron County Judge be briefed by FAA or the Service on the established method of announcing and tracking closures.

### **Checkpoints**

The Soft Checkpoint location for future road closures cannot be changed due to border security needs. It is west of the Border Patrol's Fort Brown Highway 4 Checkpoint. The Service believes the Hard Checkpoint location could be adjusted to provide access to Massey Way Gun Range users, even during road closures, as this was identified as a private landowner economic hardship.

### **Hazardous Incidents and Contaminants**

On February 28, 2020, a test rocket exploded during a nighttime firing and voicemail was left for the Refuge Manager. Debris reportedly landed northwest of the launch site. Refuge staff will be assessing explosion impacts to nesting birds and impacts from ATV use and then make recommendations on the least impactful way to clear the debris field. On July 25, 2019, a burn occurred after a rocket test. It occurred at approximately 11:30 pm and burned about 10 to 15 acres of Boca Chica State Park, a property owned by TPWD but managed by the Service. The Refuge was not notified until the next day and by that time, the fire was smoldering and flared up and had burned approximately 130 to 135 acres more. Fire engines had gone off road and had gotten stuck causing damage to refuge lands. On August 2019, 6.2 acres were burned and debris was scattered on Refuge lands. Firefighters were not allowed to enter the area for three hours because of the type of fuel that was used. On April 22, 2019, SpaceX employees went off-road and got a golf cart stuck in the tidal flats on Refuge land. They attempted to remove the golf cart

and in doing so got an additional truck and forklift stuck in the same area. The Refuge was not immediately contacted. Damage accrued to sensitive mudflats which provide shorebird habitat.

These types of incidents were not anticipated to this extent in the original BO because the likelihood of it occurring on launching known vehicles, which we analyzed, was less than during experimentation on new space crafts. Therefore, the Refuge proposes to establish a damage assessment protocol to address any future spills, rocket fuel releases, launches/tests, fires, explosions and debris cleanup. Natural resource damages thus far were negligible, but in the event of a larger impact, a damage assessment protocol will be identified to FAA and SpaceX. The protocol should be will be similar to that used to address oil and gas development impacts on refuges in Texas and Louisiana.

The incidents that have occurred have not been during a migratory bird season. Therefore, large flocks of migratory birds or listed species were not in the area. If a fire occurs during the migratory season, impacts may be greater. SpaceX should strive to avoid or reduce the number of testing/launches between March 15 and August 15 to avoid disturbance to nesting sea turtles and shorebirds that utilize refuge areas immediately adjacent to the launch site.

The Service and TPWD should be allowed access to surrounding public lands to survey the scene and document/record any observed environmental impacts (i.e., fire, explosion, sound impacts, dead birds, other wildlife, etc.). SpaceX should also explore options to compensate the Refuge and TPWD for damages caused by the two fires and two explosions. One possible option is to contract the completion of the Cable Fence Project. The cables benefit SpaceX, the public, and conservation of the area. In addition, plant, soil and water monitoring can be added to track effects of the different fuel types and explosions.

#### **Hiring of Law Enforcement and Biologist**

SpaceX has agreed to hire one Refuge law enforcement staff through a reimbursable agreement. Further negotiations regarding the 22% Administrative Fee should be resolved. Although monitoring sites established in the general area may be of great learning experience for undergraduate studies at the University of Texas at Brownsville, the pre-construction and operational monitoring must follow peer-reviewed protocols. Protocols and monitoring should be developed and monitoring conducted by experts within the field, as findings of the baseline monitoring will lead to adaptive management decisions by the Service, SpaceX, and FAA.

During the original consultation, SpaceX agreed to hire two biologists. These biologist would be Refuge-hired employees, located at the Refuge, and would monitor and collect data outlined in the BO for the life of the project. The University of Texas at Brownsville was asked to do preconstruction baseline studies until the biologists could be hired. The hiring of the biologist has not occurred, because FAA states it was an agreement between the Refuge and SpaceX, not FAA. Additional biological monitoring needs are necessary to collect vegetation data associated with larger rocket engines and different fuel type associated with tests, launches and releases of any kind. We recommend FAA reconsider funding the biologists as SpaceX proposed.



**Traffic and Speed**

Additional Wildlife Crossing Signs and Reduced Speed limit signs are needed based on the significant increase in daily traffic volume now occurring on Highway 4. Roadkill appears to have increased and includes bobcats, tortoises, javelina, and white-tailed deer, along with a variety of other species (feral pigs, birds, etc.) There have been over 150-200 vehicles at the StarGate Building and SpaceX Launch Control Center area. The original EIS assessed only 30 to 130 personnel that would be at the site in the future. More construction is occurring on the site. Impacts from vehicles have included parking along the road shoulder (some on the refuge), trash and litter, and road-killed wildlife due to high volume vehicle traffic and vehicle speeds. We recommend further discussion on conservation measures that could avoid or minimize the risk of a potential take of an ocelot or jaguarundi, and possibly receiving take authorization for the species.

**Suggested Conservation Activities**


SpaceX approached the Service for a list of possible conservation activities they could implement for listed species. The Service would also like to collaborate with SpaceX to provide multi-purpose information for the public. An increase in public visitation is occurring because of the attraction to SpaceX. The Service seeks to take advantage of these new visitors to educate them about natural resources, the Palmito Ranch Battle, and to offer information about SpaceX activity. Another suggestion is funding or assistance in implementing recovery actions such as additional nest platforms for the northern aplomado falcon and ocelot crossing signage. The Service is interested in exploring other options with SpaceX if they would like to voluntarily assist with such efforts.

The issues and recommendations above are ones that we have discussed frequently. We recommend FAA thoroughly review the BO and compare it to the actions now proposed or being implemented, address changes in development and operation of the site, assess impacts to species and Refuge lands, note Plans that need updating, and review the Conservation Measures, Reasonable and Prudent Measures and Terms and Conditions that SpaceX agreed to implement.

Thank you for reinitiating consultation and we look forward to working with you on the new EA, EIS and/or BA. If you have any questions please contact Mary Orms at [REDACTED] or by email at [REDACTED]

Sincerely,



 Charles Ardizzone  
Field Supervisor

Enclosure

cc: Bryan Winton, Santa Ana Refuge  
Kendall Keyes, Texas Parks and Wildlife  
Ernesto Reyes, Alamo ESFO



## United States Department of the Interior



In Reply Refer To:  
02ETCC00-20 12-F -0186

April 3, 2019

Stacey Zee  
Federal Aviation Administration  
800 Independence Avenue SW  
Washington, DC 20591

Dear Ms. Zee:

The U.S. Fish and Wildlife Service (Service) thanks you for the opportunity to provide comments on the written re-evaluation (WR) of the 2014 Final Environmental Impact Statement for the Space Exploration Technologies Corporation (SpaceX) Texas Launch Site. The 2014 action was the issuance of launch licenses and/or experimental permits to authorize SpaceX to launch Falcon 9 and Falcon Heavy orbital vertical launch vehicles and a variety of reusable suborbital launch vehicles. The Service issued a Biological Opinion (BO) on December 18, 2013, to the FAA for the SpaceX license. The Federal Aviation Administration (FAA) Office of Commercial Space Transportation WR evaluates whether the development the Big Falcon Rocket (BFR) and the experimental test program of the Big Falcon Ship (BFS) requires a supplemental environmental analysis to issue launch licenses and/or experimental permits to SpaceX. The license would be to conduct experimental test flights of reusable suborbital launch vehicles from SpaceX's private launch site located at Boca Chica, Cameron County, Texas.

**FAA Response:** Please refer to the updated WR we sent you on March 18, 2019. SpaceX renamed BFS to "Starship" and BFR to "Super Heavy." Super Heavy will eventually be the first stage of the launch vehicle and Starship will be the second stage of the launch vehicle. SpaceX's current test program at Boca Chica involves testing a Starship prototype.

The test program would last 2-3 years and have three phases. The following table details each phase. The total number of events shown in the table are for the entire test program.

**Table 1. Phases of the Experimental Test Program**

Test	Total # of Events <sup>a</sup>	Description
Wet Dress	5-10	Verify ground systems and spacecraft by fueling the Ship.
Static Fire	5	Verify engine ignition and performance by conducting a brief (few seconds) ignition of the Ship's engines.

Small Hops	3	Verify engine ignition and thrust to lift the Ship a few centimeters off the ground.
Small Hops	3	Engine ignition and thrust to lift the Ship over 30 cm and up to 150 m.
Medium Hops	3	Engine ignition and thrust to lift the Ship over 30 cm and up to 3 km.
Suborbital Space Flight	3	Launch up to 100 km, flip the Ship at high altitude, and conduct a reentry and landing.

The proposed experimental test program involves modifications to the vertical launch area (VLA) and Control Center Area. The construction will be done in two phases within the property boundary and the same project area analyzed in the 2014 EIS. Phase 1 construction in the VLA is ongoing and includes the initial build of the propellant farms and associated ground equipment. Phase 2 construction includes the necessary systems and equipment for higher BFS hop tests.

The FAA did not issue a launch license and/or experimental permit, but opted to waive the need for SpaceX to obtain a launch license and/or permit to conduct the currently proposed actions. The waiver, a federal action, is limited to: 1) loading and unloading fuel test; 2) spin test; and 3) minihops. The total number of events, in Phases 1 and 2 that can occur within that waiver, over the 2-3 years timeframe is listed in Table 1. Phase 3 would require another WR and analysis.

**FAA Response:** Please note that the table you included above is missing a column identifying the phase (refer to the WR sent to you on March 18, 2019). Phase 1 includes wet dress rehearsals, static fires, and small hops. Phase 2 includes small and medium hops.

The FAA issued a waiver to SpaceX for tethered Starship hop tests. Since starting the Starship tests in March 2019, SpaceX has conducted five wet dress rehearsals, two static fires, and one small hop.

The FAA WR concluded that the issuance of launch licenses and/or experimental permits to SpaceX to conduct BFS tests conformed to the prior environmental documentation, that the data contained in the 2014 EIS remain substantially valid, there were no significant environmental changes, and that all pertinent conditions and requirements of the prior approval have been met or will be met in the current action. Therefore, a supplemental EIS or new environmental document was not necessary.

#### **General Comments:**

The 2014 EIS for the Falcon 9 launches described three types of launch licenses and experimental permits to operate reusable orbital and suborbital launch vehicles:

- Launch-Specific License - "authorizes a licensee to conduct one or more launches, having the same launch parameters, of one type of launch vehicle from one launch site" (14 CFR §415.3[a]). A licensee's authorization to launch terminates upon completion of all launches authorized by the license or the expiration date stated in the license, whichever occurs first.
- Launch Operator License - "authorizes a licensee to conduct launches from one launch site, within a range of launch parameters, of launch vehicles from the same family of vehicles transporting specified classes of payloads" (14 CFR §415.3 [b ]). A launch operator license remains in effect for five years from the date of issuance.



- Experimental Permit - "authorizes launch and reentry of a reusable suborbital rocket" (14 CFR§437.7). An experimental permit lasts for one year from the date issued.

The EIS did not analyze the potential for a waiver to be issued to SpaceX for their Falcon 9 launches, nor is it mentioned in the WR for the Phase 1 and Phase 2 scheduled events. It appears the federal action changed from providing a license or experimental permit for SpaceX to launch Falcon 9 rockets into orbit and/or other various suborbital rockets providing a waiver for BFS tests. The Service requests an explanation of the use of a waiver instead of a license or experimental permit.

**FAA Response:** SpaceX applied for a waiver to a license and, after reviewing the application, the FAA granted the waiver under 14 CFR Part 404.5. The waiver states that SpaceX must comply with all applicable local, state, and federal laws, as well as any applicable agreements or requirements. During Starship tests in March and April 2019, SpaceX closed a section of Highway 4 and Boca Chica Beach to ensure public safety.

In accordance with Paragraph 9-2.c of FAA Order 1050.1F, the preparation of a new or supplemental EIS is not necessary when the following can be documented:

1. The proposed action conforms to plans or projects for which a prior EA and FONSI have been issued or a prior EIS has been filed and there are no substantial changes in the action that are relevant to environmental concerns;
2. Data and analyses contained in the previous EA and FONSI or EIS are still substantially valid and there are no significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts; and
3. Pertinent conditions and requirements of the prior approval have been, or will be, met in the current action.

The FAA contends that the mission has changed, but the proposed action of issuing a license and/or experimental permit has not changed. Additionally FAA states that: all construction and activities will be within the same footprint; pertinent requirements will be met in the current action; there have been no substantial changes to the EIS; and no significant new circumstances or information relative to environmental concerns therefore, the FAA states a new supplemental EIS is not needed.

The Service agrees the mission has changed and construction and activities will occur within the boundaries already analyzed under the 2014 EIS and 2013 BO. However, changes in how construction and closures are being conducted are not being followed as outlined in the BO and may be impacting listed species beyond what was originally analyzed. The Service has contacted FAA and SpaceX, via emails, regarding noncompliance; but resolution has not occurred. Therefore, the Service requests, closures and testing events cease until noncompliance issues are resolved.

**FAA Response:** SpaceX apologizes for not complying with the BO's process for notification in advance of a closure. SpaceX has completed the first round of tests in Phase 1 and is not planning a closure within the next 2 weeks. SpaceX and the FAA are committed to complying with the BO's approximate 2-week notice of a closure.

The BO is a legally binding document between FAA/SpaceX and the Service. FAA/SpaceX have stated they will follow the BO. Many project aspects have changed and therefore, the BO should be amended to reflect the current proposed action and activities to occur under that waiver. Various measures under

the May 13, 2014, amendment have not been completed and should be addressed in the next amendment (enclosed) and annual report.

**FAA Response:** The FAA emailed a letter to the Service on November 5, 2018 to provide an update on Consultation Number 02ETCC00-2012-F-0186. The letter provided a brief consultation history and an overview of SpaceX's planned Starship test program, including a description of the Starship, updates to construction, and an effects analysis. SpaceX also provided the Service (via email on December 4, 2018) with Google Earth KMZ files showing the planned infrastructure footprint and previously mapped vegetation (including piping plover habitat). In the November 2018 letter, the FAA concluded that the proposed changes to SpaceX's Texas Launch Site would not 1) cause effects to ESA-listed species or critical habitat in a manner or to an extent not considered in the BO or 2) result in an increase in the amount of take of ESA-listed species and critical habitat provided in the Service's incidental take statement. The FAA welcomed feedback from the Service but never received any. The Service has had several months to revise the BO accordingly and/or conduct further consultation with the FAA based on the information we provided.

The FAA is aware of the file the Service refers to as the "BO Amendment." However, the FAA was never involved in the development of the amendment. It is the FAA's understanding that this file was a negotiation between SpaceX (Steve Davis) and the Refuge and was never executed. Thus, as it pertains to ESA compliance, the FAA is using the BO executed on December 18, 2013.

The FAA is aware of another document—titled "Reimbursable Funding and Donation Agreement between U.S. Fish and Wildlife Service, South Texas Refuge Complex and Space Exploration Technologies Corp. to Accommodate Commercial Spacecraft Launches from the SpaceX Texas Launch Site"—which was executed by Steve Davis on September 11, 2015 and the Service (Aaron M. Archibeque) on August 11, 2015. Please note that Matt Thompson of SpaceX provided Mary Orms a follow-up copy of the Reimbursable agreement on April 4, 2019. The FAA has no involvement in this agreement.

#### **Specific Comments:**

**Page 4, WR, Table 1, Phase 1, Wet Dress, 5-10 events, verify ground systems and spacecraft by fueling the BFS.**

**Comment:** There have been 13 days of closures or proposed closures between March 20 and April 1, 2019. If the total number of events in Table 1 are for the entire test program (2-3 years) and do not represent a number of monthly or annual operations it would appear that if a test was done each of the 13 days then the 5-10 events on the table, planned over 2-3 years has been exceeded. The EIS and BO analyzed a closure of up to 15 hours. Closures impact federal refuge and state park attendance, and interfere with daily sea turtle patrols, being conducted by Sea Turtle, Inc. in an effort to locate nesting sea turtles and secure eggs for hatching. Many of the turtles are daytime nesters. It also interferes with monitoring of birds and plants making it difficult to analyze the pre and post effects of the closures and wet dress activities.

Small hops vs medium hops include low-altitude and higher-altitude test that range from 500 meters (1,650 feet) meters to 5,000 meters (16,500 feet) for an overall time length of 1.5 to 6 minutes each and



usually run approximately 3 times a week. For clarification, will 3 small hop events occurring 3 times a week, increase the number of events and the length of time a closure will occur?

**FAA Response:** Although the number of closures has exceed the number of tests identified in the table above, SpaceX did not conduct a test during each of closures. The table includes an estimated 5-10 wet dress rehearsals, 5 static fires, and 3 small hops for Phase 1 operations. SpaceX will not exceed these estimated numbers. Of the closures that occurred, each was limited to a maximum of 8 hours.

No, SpaceX estimates a total of 3 small hops will be performed during Phase 1 of the test program, as shown in the table.

**Page 5, WR, Phase 1 Construction 2"d paragraph "This is the same area that was stabilized for construction via the surcharging project conducted in 2016"**

**Comment:** Does the surcharging project refer to the pilings discussed in the EIS and BO that were to be completed in 2 weeks? That was a one time nighttime construction with associated noise and lighting that was only to occur during the two weeks of concrete pouring.

**FAA Response:** No, the surcharging project started in 2016 and was completed the same year. The surcharging project was needed to stabilize the substrate at the VLA. SpaceX has not used any pilings to date at the launch site.

**Page 7, WR, 1st paragraph "The BFS test program would involve use of launch control centers, Falcon support building, emergency services building, ground tracking antenna dishes and solar farm."**

**Comment:** The antenna dishes have been installed and can be used to communicate between the Control Center and the VLA. Are these dishes currently licensed and functioning or does the Federal Communications Commission require a license?

**FAA Response:** Yes, the antennas are functioning and are operated in accordance with SpaceX's license from the Federal Communications Commission.

**Page 8, WR, 1st paragraph "The tent would be installed in the location of the proposed support buildings mentioned in the 2014 EIS. The tent would be used to house welding and fabrication activities needed for structures at the VLA....Work activities inside the tent would occur at night and therefore require lighting"**

**Comment:** The EIS and the BO state there would not be any night construction except for the 2-week period when pilings were to be installed. Night construction should cease and there should not be any lighting visible over the dunes during sea turtle season (March 15 to October 1st). Inspections should be occurring to ensure lights, security and parking follow the guidelines set in the Conservation Measures of the BO.

**FAA Response:** SpaceX is avoiding nighttime activity as much as possible. Some nighttime activity has occurred in order to meet project requirements. The tent lighting is being minimized to the greatest extent possible. The tent is located approximately two miles from the beach and is not visible from the beach. SpaceX has been conducting periodic inspections of the facilities to

ensure that all required turtle related lighting mitigations are in place. These include the mobile fixtures, filters, orientation, and shielding, and also the use of appropriate permanent light fixtures. According to SpaceX, no lights are discernable from the beach.

Page 9, Table 3. Phase 2 Commodities

Quantity	Description
302 cubic feet	Ship purges/pneumatics
2 tanks: 302 cubic feet 450 cubic feet	Ship pneumatics
Two tanks: 16,000 gallons 60,000 gallons	Propellant densification/Gaseous Nitrogen Recharge/Densification
1550 cubic feet	Ship Oxygen Tank Press
1040 cubic feet	Ship Methane Tank Press

**Comment:** The type of fuel has changed from the original EIS and the BO should be amended to reflect that change.

**FAA Response:** The FAA provided this information in the ESA letter sent to the Service on November 5, 2018.

Page 10, WR, Affected Environment, Paragraph 2 "SpaceX installed a solar farm on Parcel 2."

**Comment:** Texas Parks and Wildlife commented that solar arrays can have a "lake effect," and cause birds and their insect prey to mistake a reflective solar facility for a water body. SpaceX committed to installing non-reflective solar panels and it is important they were installed to limit migratory and/or listed bird species from being potentially impacted.

**FAA Response:** SpaceX installed non-reflective panels.

Page 11, WR, Re-evaluation of Environmental Consequences "The FAA does not believe the tent would cause effects to species listed under the Endangered Species Act (ESA) in a manner not considered in the Biological Opinion and not increase the amount of take"

**Comment:** A tent or building is now onsite at the VLA and appears to be a storage area for equipment and materials; however it is open on both ends and emanates light from inside and out in addition to other construction lighting at night. Lighting was not to occur onsite except during one or two nighttime launches, which SpaceX states will no longer occur. It is sea turtle nesting season and nighttime construction could cause additional impacts to sea turtles that were not considered in the EIS or BO.

**FAA Response:** Please note that the temporary tent structure is located at the control center area (approximately two miles from the beach), not the VLA. The tent structure is now closed on all sides. SpaceX enclosed the tent prior to the start of sea turtle nesting season.

Page 12, WR, Biological Resources (including Fish, Wildlife, and Plants) The FAA and SpaceX are committed to implementing the conservation measures and terms and conditions outlined in the BO to minimize potential effects to ESA-listed species and critical habitat. Any license or permit issued by



the FAA to SpaceX for operations at the Texas Launch Site will include a term and condition for environmental compliance."

**Comment:** FAA and SpaceX have been informed that they are out of compliance with the BO. The FAA and SpaceX have not coordinated with various agencies as outlined in the BO, 14 Days prior to closures. Instead, they continue to have continuous day after day closures, potentially exceeding their 2-3 year total number of events. Nighttime construction is also potentially illuminating the beach during sea turtle season and increasing the risk of "take" not anticipated or covered in the BO.

**FAA Response:** Please refer to our responses above on this topic.

Page 18, WR, Visual Effects (including Light Emissions) "The 2014 EIS determined construction activities would impact the visual environment of residents of Boca Chica Village and travelers on State Highway 4, but the impacts would be intermittent, temporary, and minimized through SpaceX's Lighting Management Plan.... The amount of nighttime lighting at the VLA would be less. Aside from the methane flare, SpaceX is not planning to have nighttime lighting at the VLA."

**Comment:** Since the new program began, Boca Chica residents have reported that the lighting is continuous throughout the night. A picture on SPACENEWS30 Texas on December 24, 2018, by Jeff Foust shows the BFS being built, at night, with bright equipment lights lighting up the night sky.

**FAA Response:** SpaceX has and is avoiding nighttime activity as much as possible. SpaceX does not believe take of a listed species has occurred during the nighttime activity to-date. No take has been reported to the FAA. As stated above, SpaceX has been conducting periodic inspections of the facilities to ensure that all required turtle related lighting mitigations are in place. These include the mobile fixtures, filters, orientation, and shielding, and also the use of appropriate permanent light fixtures. According to SpaceX, no lights are discernable from the beach.

The following comments address the BO:

Page 2, "Construction Activities, Construction of the launch and control center facilities is expected to be complete within 24 months. Most construction will occur during the hours of 8 a.m. to 5 p.m., Monday through Friday. Night construction will occur for approximately 2 weeks during concrete pouring and approximately 2 weeks for pile driving."

**Comment:** Construction is occurring during the night, which is not in compliance of the BO. This poses a greater risk on listed species.

**FAA Response:** Please refer to our responses above on this topic.

Page 2, Launch Area, "The proposed vertical launch area will occupy 20 of the 56.5 acres owned or leased by SpaceX."

**Comment:** The BO should be amended to include the current number of acres occupied.

**FAA Response:** The infrastructure at the VLA occupies approximately eight acres.



Page 2, "Pilings will be driven to construct the larger facilities that support heavy loads. Staging areas will occur within proposed project boundaries and no additional areas will be needed. Facilities within the launch area will include the integration and processing hangar (hangar), launch pad, launch stand with flame duct, water tower, deluge water retention basin, propellant storage and handling areas, workshop and office area, parts storage warehouse, roads, parking areas, fencing, security gates, and utilities (Figure 5 and 6)."

Comment: The BO should be amended to reflect current facilities to be constructed and operated.

**FAA Response:** The FAA provided this information in the ESA letter sent to the Service on November 5, 2018.

Page 2 and 3, "There are four primary areas: liquid oxygen (LOX), rocket propellant-1 (RP-1), helium, and nitrogen. Each area will include storage tanks or vessels, containment area, fluid pumps, gas vaporizers, and other components necessary to control fuel flow to the launch vehicle."

Comment: An amended BO needs to analyze the change in fuel type and storage location.

**FAA Response:** The FAA provided this information in the ESA letter sent to the Service on November 5, 2018.

Page 3, Access Roads and Infrastructure, "Roads and utilities will provide access, power, data, and water to the facilities within the vertical launch area. Approximately 2.45 acres will be parking and road area. Parking for the launch area and the control area will accommodate up to 250 personnel. Roads will be constructed of concrete or asphalt. The perimeter access road would be dirt/gravel. The area will also include exterior lighting, security fences, and gates."

Comment: The BO should be amended to reflect total parking and road area, number of personnel expected, and where lighting will occur if different from what has been described above.

**FAA Response:** Please refer to our November 2018 letter for an updated description of the infrastructure at the VLA. The infrastructure at the VLA occupies approximately eight acres. SpaceX still anticipates many parking locations at the control center area.

Page 3, Access Roads and Infrastructure, "Primary power for the vertical launch area would be provided by commercial power from the control center area, located approximately 2 miles west, to the vertical launch area."

Comment: We understood the area would be powered by the solar array. What changed?

**FAA Response:** SpaceX plans to transition to solar power only in the future, hence the installation of the solar array. Auxiliary power currently is needed during critical operations.

Page 3, Access Roads and Infrastructure, "Potable water will either be delivered by truck to a holding tank at the vertical launch area or pumped from a well on the property. The septic system would consist of a mobile above ground processing unit and holding tank."

Comment: Please update information for the BO amendment as to how potable water and the septic

system are handled.

**FAA Response:** SpaceX says this BO text remains accurate.

Page 3, Facility Security, "Two 6-foot tall perimeter chain-link fences will be erected around the vertical launch area and will enclose approximately 20 acres. The two fences will be approximately 10 feet apart with a 7-foot wide dirt access road inside the inner fence for security patrols. The outside perimeter fence will include a sensor system to detect unauthorized access. The control center will maintain 24 hour monitoring of all security systems."

**Comment:** We understand there will be a security fence, with lights, but will there still be a double fence where security guards will drive around the perimeter? Please update the section.

**FAA Response:** SpaceX's current plans do not include a double fence; however, another fence is possible in the future. Please also note that the launch site is located in an area that the U.S. Department of Homeland Security (DHS) has identified for border fencing. SpaceX is working with DHS representatives in South Texas to ensure the border fencing does not eliminate SpaceX's use of its launch site. To date, DHS representatives have indicated that they may be able to accept SpaceX's approach to fencing the area and connect SpaceX's fencing to the fence that DHS builds. To facilitate a mutually acceptable outcome, SpaceX has delayed progress with its fencing and is analyzing fencing options that will accommodate DHS concerns.

Page 3, Facility Security, "Lighting will be positioned to illuminate the perimeter and a zone leading up to the controlled areas in hours of darkness. All building exterior lights will be lit from dusk to dawn."

**Comment:** Will there building exterior lights from dusk to dawn?

**FAA Response:** Yes, it is certainly possible. Please refer to the Facility Design and Lighting Management Plan that we distributed to you for review on November 20, 2018, and March 18, 2019.

Page 4, Control Center Area.

**Comment:** Please update changed portions of this section for the BO amendment.

**FAA Response:** The FAA provided this information in the ESA letter sent to the Service on November 5, 2018.

Page 4, Control Center Area, "The Dragon capsule, a satellite, typically uses hydrazine, a different fuel than the launch vehicle."

**Comment:** Please let us know if reference to the Dragon capsule should be removed, as it will not be part of the project any longer.

**FAA Response:** SpaceX is not planning to launch Dragon from the launch site. Therefore, you can remove it from the BO.

Page 5, Project Operations, Falcon 9 and Falcon Heavy launches will have commercial payloads,



satellites, experimental payloads, or a capsule, such as the SpaceX Dragon capsule. SpaceX may also launch smaller suborbital launch vehicles with all launch trajectories to the east and over the Gulf of Mexico. SpaceX proposes up to 12 launch operations per year through 2025, within a few days or weeks of payload arrival at the launch site. Launch operations could include Falcon 9 launches, a maximum of two Falcon Heavy launches, and associated pre-flight activities such as mission rehearsals and static fire engine tests."

**Comment:** Please update to reflect that there are no launches planned under this waiver, phase 1 and 2, and there are no longer 12 planned launches. Additionally, please update Launch vehicles, Payloads, and Propellant, Gas, Fuel, Oil, and Solvent Storage Areas sections.

**FAA Response:** Please refer to our November 2018 ESA letter for a description of planned construction and launch operations at the VLA. SpaceX no longer plans to conduct Falcon launches at the launch site.

Page 6, Pre-Launch Activities, "Wet dress rehearsals will require restricted access in the immediate vicinity of the vertical launch area and control center area. In addition SpaceX may conduct static fires. Static fires are identical to wet dress rehearsals except engines ignite for approximately 2 seconds then shut down. Static testing may last up to three hours.

Approximately 2 weeks in advance of a launch operation with restricted public access (i.e., actual launch, wet dress rehearsal, or static fire engine test), FAA/SpaceX will coordinate with the Cameron County Commissioner's Court, Secretariat of Communications and Transportation- Mexico, U.S. Coast Guard (USCG), Houston Air Route Traffic Control Center (ARTCC), Texas Parks and Wildlife Department (TPWD), National Park Service (NPS), the Service's Lower Rio Grande Valley NWR and Ecological Services Office, National Marine Fisheries Service, and Customs and Border Patrol regarding launch activities and ensure public safety. This will allow for the issuance of a Notice to Mariners (NOTMARs) and Notice to Airmen (NOTAMs). Approximately 3-6 days prior to a launch operation with restricted public access, the public would be notified of the upcoming launch operation and security closure through local media and through the use of NOTMARs and NOTAMs. The notices will include the proposed date, the expected closure time and a backup closure date and time."

**Comment:** This coordination has not occurred for any of the closures that were scheduled by SpaceX and Cameron County and does not comply with the BO. The Service and other agencies need sufficient time to prepare for the closures and coordinate ongoing activities and/or monitoring with SpaceX. We request that no further closures be scheduled until this coordination is complete. We have received a list of contacts from SpaceX that is missing many of the agencies listed above. Please update and correct the list. In addition, please add Ernesto Reyes, U.S. Fish and Wildlife Service ES, Texas Parks and Wildlife Game Wardens, and Cameron County Parks and remove Ted Hollingsworth since he is retired. We will forward the notices to our Law Enforcement.

**FAA Response:** Please refer to our responses above regarding closure notification. We are creating a closure notification list for review by the Service. Additionally, SpaceX is working with each stakeholder to ensure they have the correct contact(s). The list will be periodically updated as needed.

Page 7, Security Plan Implementation, "Launch operation day activities will include securing the safety zone at least 6 hours prior to a launch operation. Personnel will restrict access to unauthorized

persons at the soft checkpoint on SH4, just west of the U.S. Customs and Border Protection checkpoint (approximately 14-16 miles west of the SH 4 terminus at Boca Chica Beach), and the hard checkpoint just west of the control center, approximately 1.5 miles from the coast near Massey Road. Boca Chica beach will be temporarily closed from the Brownsville Ship Channel south to the U.S./Mexico border on the Gulf side for up to 15 hours."

**Comment:** Closures were intended to be for launches of Falcon 9s. There were some scheduled dry and wet dress dates; however, there seems to be a disconnect on how many and how often these closures are being handled now. Additionally, the checkpoint was moved during the March 20-21 closure. This checkpoint location was agreed upon by all entities to reduce the potential impact on refuge lands. The checkpoint location should not be moved without consulting the Service and Refuge staff.

**FAA Response:** SpaceX required multiple closures for this initial round of testing because SpaceX was unable to execute a test during each closure. Thus, SpaceX requested additional closures until they were able to complete the tests.

Despite the agreed upon traffic control plan, Texas Department of Transportation (TxDOT) directed Cameron County on where to place the checkpoint. SpaceX contacted Cameron County Engineering and requested that the checkpoint be moved. Cameron County coordinated with TxDOT in order to move the checkpoint to the correct location.

Page 7, Security Plan Implementation, "FAA/SpaceX will develop a plan in coordination with Padre Island National Seashore (PAIS), Sea Turtle Coordinator or Sea Turtle Inc. (STI) to notify and allow sea turtle patrollers to survey the beach for sea turtle and sea turtle nests once the beach is closed to the public and prior to the beach security patrols and also prior to the beach being reopened to the public after a launch."

**Comment:** Sea turtle season is March 15 to October 1. This is the time sea turtles come up on the beach and lay their eggs and return to the water. Nest are located and the eggs are removed for secure hatching. Sea turtles nest during the day and a few at night, therefore, it is important that the patrols get out on the beach before and after closures to look for signs of nesting. FAA and SpaceX should be coordinating with PAIS or STI to allow for patrols as described above to occur. PAIS and STI patrol the beaches during peak season, April to June. If activities and closures are to occur in March, July, August or September FAA/SpaceX is responsible contracting with an experienced and certified sea turtle patroller to conduct surveys. Recent closures have delayed STI training of interns. STI now has a tentative date of April 8<sup>th</sup> for training and beginning daily patrols.

**FAA Response:** Per the "Active Construction Species Monitoring Plan" (August 19, 2016), SpaceX is coordinating directly with STI and will ensure patrols are conducted.

Page 8, Personnel levels, On average, beginning in 2016, it is expected 30 full-time SpaceX employees/contractors will be present at the launch area and control center. They will work a single shift, between the hours of 8:00a.m. to 5:00p.m... Average personnel levels are expected to rise from 30 to 130 and the maximum levels during a launch from 130 to 250 employees onsite between 2016 and 2025.

**Comment:** Is this still accurate? Please provide updates for the BO amendment.



**FAA Response:** According to SpaceX, average personnel levels range from 30–100. Maximum levels during launch operations is expected around 150 personnel.

**Page 8, Conservation Measures.**

**Comment:** All plans should be reviewed and updated to fit the current activity and submitted to the Service for review. FAA has submitted annual reports, and addressed some of the measures in those reports. However, FAA and SpaceX should review the conservation measures and revise to reflect the most current activities authorized under this waiver.

**FAA Response:** SpaceX has updated and is in the process of updating the various plans mentioned in the BO, including the Facility Design and Lighting Management Plan, Emergency Action Plan, Hazardous Materials Emergency Response Plan, Hurricane Preparation Plan, and Stormwater Pollution Prevention Plan. Those plans requiring review by the Service will be submitted to the Service. For example, we submitted an updated Facility Design and Lighting Management Plan—that includes the updated Starship project—to you for review in November 2018 and March 2019. We will be submitting updates to other plans in the near future.

**Comments addressing the May 13, 2014, amendment to the BO.**

**Comment:** The BO was issued to FAA December 18, 2013, and amended in 2014 to cover SpaceX proposed changes. SpaceX submitted mitigation proposals that they were willing to commit to implementing. The agreed upon changes that have not been implemented by FAA/SpaceX are highlighted in yellow. The Service was agreeable to the land acquisition but did not want to set a number of acres to be acquired because of the difficulty SpaceX may have finding sufficient land.

The most important change was SpaceX's commitment to fund three positions. The newly hired biologist were to assume all monitoring bird and vegetation plans developed and currently being undertaken by the University of Texas Rio Grande Valley at Brownsville. The positions have never been funded by SpaceX.

Under the Reasonable and Prudent Measures FAA/SpaceX agreed on additional measures to avoid impacts to listed species and refuge lands. The measures were to be addressed in six separate plans to be prepared later. The Plans were submitted and approved, but need additional review and updating to address the current testing program. Annual reports have been submitted by FAA, as required in the BO, but not all measures have been addressed.

Under the Terms and Conditions, the Lower Rio Grande Valley Refuge and SpaceX reviewed the updated measures in more detail and signed below each measure to commit to the changes. The BO amendment is enclosed for reference. We highlight the proposals not completed.

**FAA Response:** Please refer to our response above regarding the "BO Amendment."

This concludes the Services comments on the WR and the BO. If you have any questions please contact Mary Orms at (361) 225-7315 or by email [mary\\_orms@fws.gov](mailto:mary_orms@fws.gov).

Sincerely,

Charles Ardizzone  
Field Supervisor

cc:

Bryan Winton, LRGV NWR

Rob Jess, LRGV NWR

Sonny Perez, LRGV NWR

Ernesto Reyes, USFWS

Kendall Keyes, TPWD

Mark Spier, NPS

Alejandro Rodriguez, USFWS, LE

enclosures

**[EXTERNAL] RE: SpaceX - Summary of Feb. 28, 2020 Starship SN1 Incident**

Zee, Stacey (FAA) <[REDACTED]>

Wed 3/4/2020 11:35 AM

To: Orms, Mary <[REDACTED]>

Cc: Winton, Bryan <[REDACTED]> Kendal Keyes <[REDACTED]> Reyes, Ernesto

<[REDACTED]>

Thank you all!

---

**From:** Orms, Mary <[REDACTED]>

**Sent:** Wednesday, March 04, 2020 12:31 PM

**To:** Zee, Stacey (FAA) <[REDACTED]>

**Cc:** Winton, Bryan <[REDACTED]> Kendal Keyes <[REDACTED]> Reyes, Ernesto

<[REDACTED]>

**Subject:** SpaceX - Summary of Feb. 28, 2020 Starship SN1 Incident

Please see the attached summary of the SN1 incident that occurred on Friday Feb 28, 2020.



**United States Department of the Interior**  
**FISH AND WILDLIFE SERVICE**



In Reply Refer To:  
FWS/R2/ES/02ETCC00-2012-F-0186

March 4, 2020

Ms. Stacey M. Zee  
Office of Commercial Space Transportation  
Federal Aviation Administration  
800 Independence Ave., SW  
Washington, DC 20591

Dear Ms. Zee:

In our March 2, 2020, letter the U.S. Fish and Wildlife Service (Service) transmitted comments on the Federal Aviation Administration's (FAA) Written Re-evaluation (WR) for Space Exploration Technologies' (SpaceX) Texas Launch Site. In our comment letter, we stated that on February 28, 2020, a test rocket exploded. On March 3, 2020, we received an email from Bryan Winton, Refuge Manager confirming that a fuel tank had actually caused the explosion. We apologize for the mistake. Below is our understanding of the incident.

**Description of Explosion**

The explosion occurred on Friday February 28, 2020, at 10 p.m. during a test firing of SpaceX's Starship SN1. Refuge Manager Bryan Winton received a voicemail from Davis Libbey with SpaceX at 10:04 pm that same night. Bryan missed the original call, but on February 29, 2020, at 8 a.m. he took a call from Randy Rees, SpaceX, informing him they had a tank explosion during their test the night before. Randy requested permission to walk in to Refuge property to identify debris. He asked to use ATVs as well. He stated the largest piece they could see was again northwest of the launch site, same as when the top flew off the rocket at the previous test. Randy stated some smaller pieces of the explosion were in the wetlands south of their launch site. Refuge staff were to begin assessing any shorebird nesting impacts from the explosion and ATV's and make recommendations for a least-damaging method to remove the debris.



On February 29, 2020, after receiving the Service's permission, Randy Rees performed debris surveys. He emailed the SN1 debris locations that were located outside of SpaceX physical fence line to the Service and FAA. He included notes and maps of the northern and southern debris areas. They utilized 4-wheel ATVs where appropriate and entered on foot at other locations. He stated the individual pieces were each photographed and geo-tagged prior to being recovered. No recovery by any mechanical means was authorized or executed. Maps with notes are enclosed. Pictures he sent in his email and additional pictures we have received are also enclosed.

On March 2, 2020, Bryan Winton and other Refuge biologists, and Stephanie Bilodeau, scientist and bird expert for the Coastal Bend Bays & Estuaries Program (CBBEP), met with Randy Rees onsite at 10:30 a.m. to view three pieces of debris that had landed on Boca Chica State Park and discuss options for removal. Stephanie Bilodeau, searched for nesting birds in close proximity to the debris that needed to be removed. She reported Wilson's plovers were not nesting yet near the launch site. Snowy plovers were nesting nearby.

Collectively, all parties agreed that removal of the largest pieces by helicopter would be the least damaging alternative. The helicopter should limit flying time over the Refuge/State Park, fly directly to the debris, lift it, and then remove it to Highway 4. This will minimize time in the air and disturbance to nesting snowy plovers. The two smaller pieces will be drug out carefully as to not do additional damage to mangroves near Highway 4. The substrate is very soft in this area; therefore, the use of a vehicle to move the debris was not an option. Randy Rees will report back once the removal action is set to occur, and when it is completed.

#### **Closure Notices**

It has also come to our attention that the closure notices were inconsistent. A closure was not scheduled for Friday February 28, 2020, nor was the test. A summary of the closure notices the Service received follows.

On February 21, 2020, Alma Walzer Santos sent a notice out on behalf of SpaceX that they were planning to conduct systems testing on Thursday, February 27, 2020, at the company's site located near Boca Chica Beach, Cameron County, Texas. The window for testing was to be from 7 p.m. to 11 p.m. the same day. Backup dates were February 28, and 29, 2020. February 28<sup>th</sup> the closure was to be from 7 p.m. to 11 p.m. and the 29<sup>th</sup> from 12 p.m. to 4 p.m. that day. Judge Trevino signed the order on February 21, 2020.

On February 27 2020, Ms. Santos emailed that SpaceX had revoked the closure date of February 27, 2020, and was planning to conduct systems testing on Saturday, February 29, 2020 from 2 a.m. to 6 a.m. Approved backup dates were Sunday, March 1<sup>st</sup> from 2 a.m. to 6 a.m. and Monday, March 2nd from 12 midnight to 4 a.m. if needed.

On Thursday, February 27, 2020, Judge Trevino ordered a Beach Closure and temporary closure of Highway 4. The purpose for the closure would be to protect the Public Health and Safety during space flight activities on February 29, 2020. The closure would be between 2 a.m. and 6

a.m. of February 29. The alternative dates were March 1, 2020 2 a.m. and 6 a.m. and March 2, 2020 12 a.m. to 4 a.m. This was the first notice Bryan Winton had received in 2020.

On February 28, 2020, Ms. Santos sent out another notice that SpaceX had revoked the closure date of February 29, 2020 at the company's site located near Boca Chica Beach, Cameron County, Texas. The backup dates of March 1-2, 2020, were also revoked. Both Highway 4 and Boca Chica Beach were opened.

As you can see, the Closure Notices are numerous and confusing. The notices listed 5 consecutive days access to the beach and road would be closed. There is no way for the Refuge to be able to tell ahead of time which day any SpaceX activity will actually occur. The public just assumes those days are not available for access. It is a remote location. The public will avoid potential days of closure. The Refuge and researchers are unable to schedule their activities. This exemplifies persistent difficulties in tracking the 180-hour limit as outlined in the biological opinion (BO). SpaceX calculates the actual date, and the Service calculates potentially 5 days of impact. No notice should be issued without proper prior notification to the agencies and landowners as outlined in the BO and another single date is identified.

#### **Closure-Date of Incident**

Shelby Bassette, who oversees University of Texas at Rio Grande Valley, (UTRGV) Coastal Studies Laboratory on the island reported she was on Boca Chica Beach doing a dolphin necropsy until 8 p.m. the night of February 28<sup>th</sup>. She stated there was no road closure when she left, approximately two hours before the explosion. Two separate videos captured that night and her report leaves it open to question what closure procedures were in place that night. One video shows Elon Musk speaking and having a question and answer session, with a large group, at the launch site just prior to the test. <https://youtu.be/sFY1qDvMfxw> The second video shows a car passing by just minutes before the explosion. It could have been a SpaceX security vehicle or potentially some member of the public. It is unclear, as to which it was in the video. <https://youtu.be/sYeVnGL7fgw>

The Service is extremely concerned for risks to public and scientific use and urges FAA to have a secure, trackable closure plan put in place.

#### **Nighttime Activities**

The Service reiterates that SpaceX agreed to only one nighttime launch in the BO. Many days of construction and testing have occurred at night. It is possible SpaceX believes there is less public disruption at this time. To minimize impacts to wildlife including listed species (sea turtles, ocelots, jaguarundis) in our BO we asked launch activities avoid dusk to dawn when these species are more active. Nighttime activities also hinder efforts to extinguish fires, evacuate people, remove trespassers, and delays debris removals. A new or amended BO is needed.

The Service is committed to working with FAA and SpaceX to resolve these and other issues through reinitiation of consultation. The Refuge will be awaiting for further information

Ms. Zee

4

regarding the cleanup. If you have any further questions please contact Mary Orms at (361) 225-7315 or by email at [mary\\_orms@fws.gov](mailto:mary_orms@fws.gov).

Sincerely,

  
for Charles Ardizzone  
Field Supervisor

Enclosures

cc: Bryan Winton, Refuge Manager  
Kendall Keyes, TPWD  
Ernesto Reyes, Texas Coastal ESFO

### Southern Debris

Each of the pins on the image below indicates a small hand carried piece of debris that was logged and recovered. There were no pieces of debris to the South of the Launch Pad, that we were unable to recover back to our debris processing area, on foot. SpaceX personnel took the opportunity, while out in this area, to also collect general litter that was found during the search for SpaceX debris.





### Northern Debris

Three (3) pieces of debris that are located in the refuge North of Hwy 4, are indicated in the map below. These pieces all remain as found and have not been moved.

The **red** line from the Forward Dome indicates 407' from the edge of the highway.

The **blue** line from the North Sheet 1 indicates 137' from the edge of the highway.



## Detail Pictures

North Sheet 1



North Sheet 2

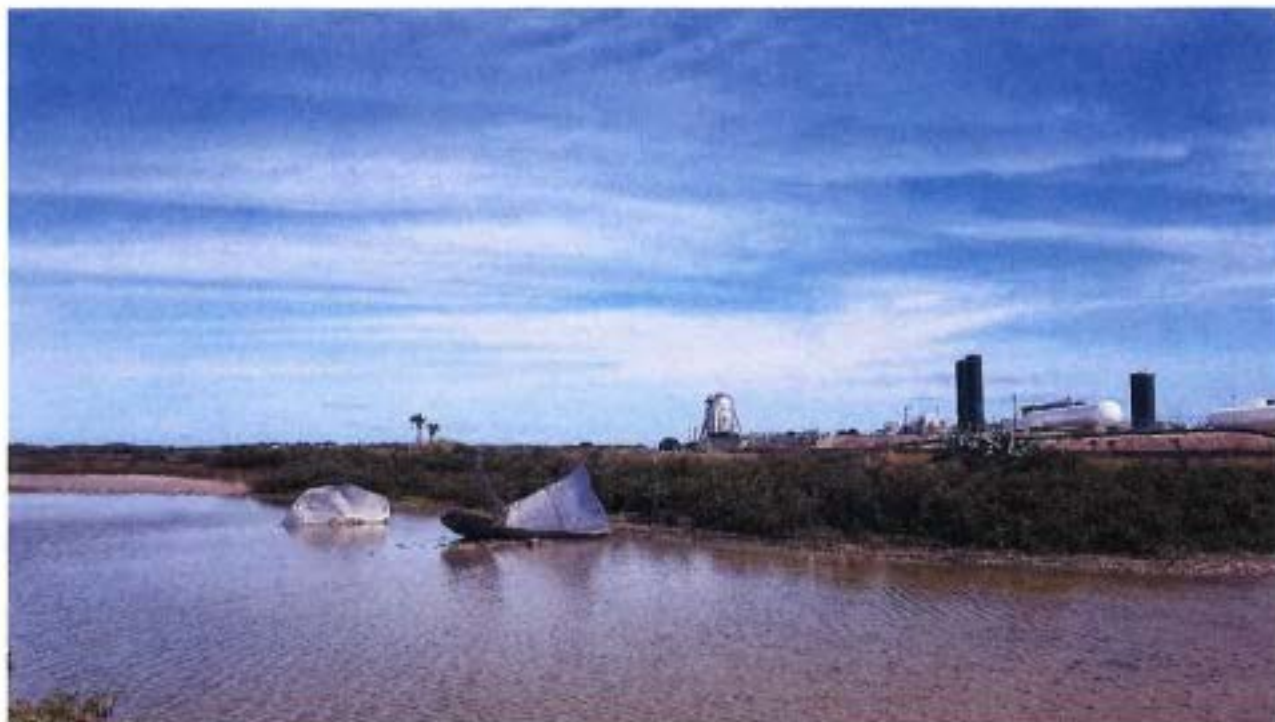




Forward Dome















***Eddie Treviño, Jr.***  
*County Judge*

**PUBLIC NOTICE OF CAMERON COUNTY ORDER TO  
TEMPORARILY CLOSE STATE HIGHWAY 4  
AND BOCA CHICA BEACH**

Under the authority granted to Cameron County pursuant to Texas Natural Resources Code Section 61.132 which permits the Texas General Land Office ("GLO") and the County to enter into a memorandum of agreement under the terms of which Boca Chica Beach may be closed temporarily for space launches and in conformity with the Memorandum of Agreement, contract number 2013C08253/GLO contract number 13-447-000-7916 between the County and the GLO that delineates the circumstances under which the County is authorized to close the beach and beach access points for the limited purpose of protecting Public Health and Safety during spaceflight activities and the Texas Department of Transportation authorized a SpaceX Roadway Closure Traffic Control Plan to perform road closures on State Highway 4;

COMES NOW, Cameron County Judge Eddie Treviño, Jr., on behalf of Cameron County and the Cameron County Commissioners Court as authorized by Court Order 201903002 and hereby issues this ORDER AND GIVES PUBLIC NOTICE of this Order to Temporarily Close State Highway 4 and Boca Chica Beach for the purpose of protecting Public Health and Safety during space flight activities on February 27, 2020, in the time period between 7:00 p.m. Central Standard Time and 11:00 p.m. of the same day, and in the alternative on February 28, 2020, from 7:00 p.m. Central Standard Time and 8:00 p.m. of that day, and/or February 29, 2020, from 12:00 p.m. Central Standard Time and 4:00 p.m. of that day. Should SpaceX not complete its planned space flight activities on February 27, 2020, then SpaceX may use the alternate dates to complete its test launch activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "Eddie Treviño, Jr.", is written over a horizontal line. The signature is stylized with a long, sweeping horizontal stroke extending to the right.

Eddie Treviño, Jr.  
Cameron County Judge

Date:

February 21, 2020



***Eddie Treviño, Jr.***  
*County Judge*

**PUBLIC NOTICE OF CAMERON COUNTY ORDER TO  
TEMPORARILY CLOSE STATE HIGHWAY 4  
AND BOCA CHICA BEACH**

Under the authority granted to Cameron County pursuant to Texas Natural Resources Code Section 61.132 which permits the Texas General Land Office ("GLO") and the County to enter into a memorandum of agreement under the terms of which Boca Chica Beach may be closed temporarily for space launches and in conformity with the Memorandum of Agreement, contract number 2013C08253/GLO contract number 13-447-000-7916 between the County and the GLO that delineates the circumstances under which the County is authorized to close the beach and beach access points for the limited purpose of protecting Public Health and Safety during spaceflight activities and the Texas Department of Transportation authorized a SpaceX Roadway Closure Traffic Control Plan to perform road closures on State Highway 4;

COMES NOW, Cameron County Judge Eddie Treviño, Jr., on behalf of Cameron County and the Cameron County Commissioners Court as authorized by Court Order 201903002 and hereby issues this ORDER AND GIVES PUBLIC NOTICE of this Order to Temporarily Close State Highway 4 and Boca Chica Beach for the purpose of protecting Public Health and Safety during space flight activities on February 29, 2020, in the time period between 2:00 a.m. Central Standard Time and 6:00 a.m. of the same day, and in the alternative on March 1, 2020, from 2:00 a.m. Central Standard Time and 6:00 a.m. of that day, and/or March 2, 2020, from 12:00 a.m. Central Standard Time and 4:00 a.m. of that day. Should SpaceX not complete its planned space flight activities on February 29, 2020, then SpaceX may use the alternate dates to complete its test launch activities.

Sincerely,

  
Eddie Treviño, Jr.  
Cameron County Judge

Date:

February 27, 2020

**RE: Field Site Visit - Thursday, March 12**

Alma Walzer Santos &lt;[REDACTED]&gt;

Tue 3/10/2020 10:18 AM

**To:** Winton, Bryan <[REDACTED]> Randy Rees <[REDACTED]> Davis Libbey <[REDACTED]>**Cc:** Orms, Mary <[REDACTED]> Gardiner, Dawn <[REDACTED]> Reyes, Ernesto <[REDACTED]> delaGarza, Laura <[REDACTED]> Extranet Contact - Stacey.Zee <[REDACTED]>

Good morning, Bryan,

I'm sorry I'm unavailable to meet on Thursday.

I will be out of the office starting tomorrow, and return March 19.

I don't want to cause further delay for you but would like to meet with you when I return, if possible.

Thanks,

Alma

---

**From:** Winton, Bryan <[REDACTED]>**Sent:** Monday, March 9, 2020 2:16 PM**To:** Randy Rees <[REDACTED]> Davis Libbey <[REDACTED]> Alma Walzer Santos <[REDACTED]>**Cc:** Extranet Contact - Mary\_Orms <[REDACTED]> Extranet Contact - Dawn\_Gardiner <[REDACTED]>

&lt;[REDACTED]&gt; Extranet Contact - ernesto\_reyes &lt;[REDACTED]&gt; delaGarza, Laura &lt;[REDACTED]&gt;

&lt;[REDACTED]&gt; Extranet Contact - Stacey.Zee &lt;[REDACTED]&gt;

**Subject:** Field Site Visit - Thursday, March 12

Randy et al.

Would it be possible to meet you at Boca Chica this Thursday sometime to take a look at the debris removal from the refuge/Boca Chica State Park, from the February 28, 2020 10pm explosion?

I would like to assess the level of impact to the vegetation and alkaline flats resulting from dragging the debris to the road.

When we met on-site (Monday, March 2, 2020 at 10:30am), we viewed the 3 pieces of metal debris, and recommended that the 2 smaller pieces (closest to the road), be dragged out carefully over the vegetation, and that the largest piece be cut into pieces and removed by helicopter, as was originally recommended by you, Randy.

On Friday, March 6, 2020 at about 4:15pm I received a call from you stating the helicopter option was not going to be feasible due to high winds, uncertainty of debris weight, and because additional refuge lands would be needed for the helicopter to take off/land from, and because bird nesting has already begun, this would likely cause an unacceptable level of disturbance. So, during this call, I gave you permission to proceed with using a winch truck or cable to drag the pieces of debris from within the refuge. I viewed this "cheaper" "faster" option as beneficial to both Space-X and the refuge because of the unneeded action the debris was causing. The rationale was to expedite the removal, before bird nesting occurred in the vicinity of the debris.

Now that there have been 2 explosions, with debris both times in pretty much the same area, I want to meet with you and discuss remedies for the damage to vegetation and ruts created in the alkaline flats. I would also like to see the refuge cable fence damaged during the removal process repaired.

Lastly, I have received several reports of trash scattered about the refuge lands surrounding the Space X Launch Control Center where the recently hired 250-employees are now reporting. The trash is being blown into the refuge due to high winds, and negligence. Trash dumpsters and bins need lids, or stored in areas where blowing winds don't lift trash and blow it into the refuge. Also, there is over 200 vehicles parked on the side of the road next to the refuge wetland. This area is a safety issue for visitors to the beach. While the impacts are mostly to vegetation along the shoulder of the road, there is again a lot of trash being blown from truck beds, truck cabs, etc.

I noticed that when departing the beach, there is an Adopt-A-Highway sign that is in need of a sponsor. I am requesting that until a sponsor is determined, that Space-X and its employees take on the responsibility of removing trash and debris that is located between the launch site and control center, and even a few miles east of the control center, as it appears the owners of the dumpsters are also not covering the load adequately, as evident from the quantity of trash, type of trash, and distance of trash from the road. The refuge has never experienced this level of trash visible from the road ever.... not even after Memorial Day or July 4th weekends at Boca Chica. It is readily apparent that the trash is related to Space-X and the motorist driving to-from the site daily.

The refuge is being negatively impacted because of failure to properly store and remove trash, packaging material, boxes, etc when put in the dumpster and when transported to the landfill. Please institute measures to contain your trash and prevent it from blowing onto the refuge. Also, please educate your hired staff so they don't contribute further to the problem.

Please let me know if you can meet with me on Thursday, so we can discuss these matters in more detail.

Sincerely,  
bryan



[EXTERNAL] RE: Space X Methane dump last week

Zee, Stacey (FAA) <[REDACTED]>

Thu 6/4/2020 2:50 PM

To: Orms, Mary <[REDACTED]>

Cc: Winton, Bryan <[REDACTED]> Gardiner, Dawn <[REDACTED]>

Thanks for the info Mary. Katy is going to outline the schedule going forward tomorrow. They are dra. ing the next EA and Biological Assessment and we plan to submit files soon.

Chapters 1 and 2 of the EA are a attached to tomorrow's mee ng invite and other files will follow this summer.

Look forward to talking to you all tomorrow.

---

**From:** Orms, Mary <[REDACTED]>

**Sent:** Friday, May 29, 2020 7:33 PM

**To:** Zee, Stacey (FAA) <[REDACTED]>

**Cc:** Winton, Bryan <[REDACTED]> Gardiner, Dawn <[REDACTED]>

**Subject:** Re: Space X Methane dump last week

Stacey,

Today, May 29, 2020 SpaceX's SN4 exploded. I do not have a full report, but I can probably guess that debris was spread onto the refuge again. We really need to get the reinitaon s tarted and address these issues. May have to see it in Google Chrome. Somemes Explor er does not show the video. If you choose to look at other videos there are some where you may be able to get a sense of the noise that is generated 24/7, night illuminaon and tr affic issues on SH4.

[hp s://www.youtube.com/watch?v=7RPyDPpmDAk](https://www.youtube.com/watch?v=7RPyDPpmDAk)



### Starship SN4 explodes shortly after a static fire test

Starship SN4 exploded on the launch pad shortly after completing a static fire test in Boca Chica, Texas. The cause of the anomaly is not currently known. Due to a large safety radius, nobody was hurt during the incident. Updates: <https://forum.nasaspaceflight.com/index.php?topic=48895.1380> Articles: <https://www.nasaspaceflight.com/?>

[www.youtube.com](https://www.youtube.com)

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**From:** Winton, Bryan <[REDACTED]>

**Sent:** Friday, May 29, 2020 3:51 PM

**To:** Orms, Mary <[REDACTED]> Gardiner, Dawn <[REDACTED]>

**Subject:** Space X Methane dump last week

And vehicle failure today



- LIVE STATUS
- ✓ Road Closed 10:24
  - ✓ Pad Clear 10:37
  - ✓ Farm Venting 13:00
  - ✓ Side Venting 13:31
  - ✓ Engine Chill 13:31
  - ✓ Siren 13:34
  - ✓ Big Flare 13:47
  - ✓ Static Fire 13:48
  - Vehicles/Pad

Overcast clouds

Temp 80°F (26°C)

Wind 7.8 mph

Humidity 78%

Visibility 10+ km

Sunrise 06:37

Sunset 20:15



- LIVE STATUS
- ✓ Road Closed 10:23
  - ✓ Pad Clear 10:23
  - ✓ WDR 13:57
  - ✓ Farm Venting 14:12
  - ✓ Side Venting 14:40
  - ✓ Engine Chill 14:43
  - ✓ Siren 14:43
  - ✓ Big Flare 14:53

LabPadre

LIVE FROM THE ORMS, MARY

Nerdle Vision

num altitude of 2km. Permit start date is May 20. ||

Thank you for watch

2:56:27 PM

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# United States Department of the Interior

FISH AND WILDLIFE SERVICE

South Texas Refuge Complex  
Lower Rio Grande Valley National Wildlife Refuge



August 23, 2021

Mr. James R. Repchek  
Federal Aviation Administration (FAA)  
800 Independence Ave., SW  
Washington, D.C. 20591

Dear Mr. Repchek:

This responds to your letter dated July 15, 2021, requesting U.S. Fish and Wildlife Service (FWS) input on FAA's initiation of a Section 4(f) consultation of eligible properties that include the Boca Chica Tract of the Lower Rio Grande Valley National Wildlife Refuge (Refuge) for the SpaceX Starship/Super Heavy Launch project at Boca Chica, Texas. FWS input to FAA also extends to the Palmito Ranch Battlefield National Historic Landmark (NHL) as a significant portion of the NHL is within the Refuge. Section 4(f) of the Department of Transportation Act of 1966 protects publicly owned parks, recreation areas, and wildlife and waterfowl refuges of national, state, or local significance and historic sites of national state, or local significance from "use" by transportation-related projects. The FAA is seeking input on several Section 4(f) issues including: 1) if a proposed utility installation would result in a temporary occupancy but have a "de minimus" impact under FWS fee-owned land; 2) if an increase to 500 hours would constitute a "constructive use" as defined under Section 4(f); 3) if the noise from the proposed action would constitute a constructive use; 4) if anomaly-related activities constitute a constructive use; 5) if an additional 300 closure hours would result in permanent or residual effects to a temporary occupancy; and 6) if the need for closures in the event of an anomaly constitute a constructive use.

The Refuge, and the National Wildlife Refuge System in general, maintains the biological integrity, diversity and environmental health of its natural resources for the benefit of present and future generations of Americans (National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. 668dd-668ee). The Refuge was established in 1979, as a long-term program of acquiring lands to protect and restore the unique biodiversity of the Lower Rio Grande Valley of Texas. The Refuge ensures the conservation of unique South Texas fish, wildlife and plant populations and their habitat, which is necessary for the scientific study of wildlife, conservation biology and ecosystem management. In addition to its primary task of conserving wildlife, the Refuge also provides six wildlife-dependent recreational uses, which include: hunting, fishing, wildlife observation, photography, environmental education, and interpretation. Prior to SpaceX-associated closures that impede access to the Refuge, an estimated 110,000 visitors accessed the Refuge annually. Sixty three percent of visitors to the Boca Chica tract were going to surf fish or beachcomb. The majority of visitors are from Brownsville, which has one of the

country's highest poverty rates with 26 percent of the population below the federal poverty line and 23 percent of families earning less than \$25,000.

Section 4(f) provides that a "*constructive use*" occurs when there is "*a temporary occupancy of land that is adverse in terms of the statute's preservation purpose*" or when "*a project's proximity impacts are so severe that the protected activities, features, or attributes of a property are substantially impaired.*" The level, nature, and extent to which an area is constructively used is subject to the expertise and determination of the agency responsible for management and administration of the 4(f) lands impacted by the constructive use, in this case, the FWS.

At the outset, the FWS advises the FAA that ongoing activities (i.e., the SpaceX Starship/Super Heavy Project) previously permitted already result in a constructive use, as defined under Section 4(f). SpaceX activities already exceed the 300 road closure hours of FAA-permitted operations. Closures of the beach affect a population with limited income and few options to recreate. Boca Chica is the only beach that is free to the nearby and largely Hispanic communities. Current activities, such as large explosions and falling debris from SpaceX flight test activities, the appearance of significantly increased highway traffic 24 hours per day all week, and extensive construction, have not been adequately analyzed nor addressed. The effect of both existing and anticipated noise levels on wildlife, such as nesting sea turtles or birds, resulting from these tests has not been adequately analyzed and there has been no demonstration that the noise levels pose no harmful effect. In addition, debris that has fallen onto the Refuge has damaged sensitive wind tidal flats. The vehicles or machinery used to retrieve debris have created rutting and damage that interrupts tidal water sheet flow across these flats. These hazardous activities have prompted concerns including re-evaluating FAA's current EIS, as well as the potential need to reinstate consultation with the FWS on the Biological Opinion analyzing SpaceX operations pursuant to 50 C.F.R., part 402.16.

Over the past six years, closures of the road to Boca Chica Beach have become increasingly frequent and may occur for one or more days due to delays or problems occurring during testing. The FAA/SpaceX closure reporting computation remains in question, as the extended closures occurring for hazardous explosion- and debris-related events or delays are deterrents for public access to the Boca Chica tract and its beaches for the duration of all published closure timeframes. In 2019, the FWS conservatively quantified more than 1,000 closure hours and noted a significant disparity in accounting between SpaceX's reported total of 158 hours and the conservative total being tracked by FWS staff. Frequent closures caused by SpaceX activities are already substantially impairing both the Refuge's ability to adequately manage the Refuge and the public's enjoyment of the Boca Chica Beach area for wildlife-dependent recreation.

There are both "*adverse*" and "*severe*" impacts to Refuge public use, management, wildlife, and habitat from SpaceX activities. Increasing the number of "official" closure hours will only exacerbate the levels of impairment of Refuge properties. The protected activities of the Refuge that are being substantially impaired include fishing, wildlife observation, photography, environmental education, and interpretation. When closures occur, all of these wildlife-dependent recreational uses are substantially impaired because they are not available to the public. Additional features and attributes of the Refuge that have already been substantially impaired include the sensitive tidal flats, salt prairies, wildlife, and sensitive bird nesting and wintering sites. Based on bird monitoring reports, Snowy and Wilson's plovers have not been documented nesting in close proximity to the SpaceX launching site as they had in years prior to

the project. Finally, none of the damage to the sensitive tidal flats from debris pickup and motorized equipment and human access has been adequately addressed. These features and attributes will likely continue to be substantially impaired because explosions, debris, traffic, building construction, and invasive plant species will continue to threaten the health and diversity of the Refuge's habitats and wildlife.

Section 4(f) regulations "*require rigorous exploration and objective evaluation of alternative actions that would avoid all use of Section 4(f) properties...that would avoid some or all adverse effects*" (OEPC Section 4(f) Handbook, after 23 CFR § 774). 23 U.S.C. § 138 precludes the Secretary of Transportation from approving a program or project unless "*such program includes all possible planning to minimize harm*" to wildlife refuges.

Therefore, to assist in the FAA's consultation and to include all possible planning to minimize harm to wildlife refuges, the FWS recommends the following measures be evaluated as alternative actions that may help to avoid or deter constructive use:

- SpaceX be limited to use of the Boca Chica Site for launches only as originally proposed and not as a testing facility, in order to reduce closure hours and decrease the number of anomaly incidents.
- Explosions result in emergency consultation process with FWS.
- SpaceX contract environmental cleanup using only specialized personnel and equipment designed to protect and restore the sensitive habitat types found in the area.
- Space X not be allowed to prohibit FWS staff, TPWD staff, NPS staff, or other agency representatives and their researchers to enter to collect biological and cultural resource data even during closures, and ensure SpaceX contract or fund collection of data on impacts to sensitive habitat types and wildlife species impacted by anomalies.
- Restoration of impacted habitats, if possible, should be required. If restoration is not possible impacted habitats should be protected through land exchanges or land purchases.
- SpaceX provide an environmental cleanup fund that agencies can utilize to pay for environmental damage caused by SpaceX activities.
- SpaceX use land exchange as a mitigative option to compensate for habitat loss.
- SpaceX engage in land exchanges, land purchases or recreation use improvements (enhancements) for recreational use loss, for example, providing improved facilities for the public (interpretive signage, fishing access, maintained trails, educational programs, etc., as improvements).
- SpaceX coordinate directly with FWS regarding protective and restorative measures for habitat, cultural resources, and public use opportunities regarding FWS owned or managed land.
- SpaceX integrate traffic control measures to minimize traffic to their site
  - For example, SpaceX establish a "park and ride" in town and shuttle staff/crews as opposed to individual 24/7 high traffic volumes on State Highway 4.
- SpaceX assist the TXDOT to install several protected wildlife crossings to prevent refuge fragmentation and address listed species and general wildlife concerns along State Highway 4.
- SpaceX be required to utilize predictive scheduling with a minimum of two-week advance notice for road closures.
- SpaceX comply with a specific road closure window.



- For example, set days and hours during the week, excluding weekends and holidays.
- SpaceX closure authorization should be limited to a single day rather than a proposed date with two coinciding backup days.
- Any and all SpaceX future plans for expansion of facilities and operations be fully disclosed and adequately analyzed in the FAA's upcoming NEPA documentation.
- Noise levels be measured at various points such as on the beachfront and at points inland to determine potential effects to further inform appropriate measures for protection of natural resources and Historic Properties like NHL.
- SpaceX and/or any utility contractors coordinate with the Refuge to address the placement of utilities within FWS fee-owned lands beneath portions of State Highway 4.

We appreciate your consideration of the above issues and FWS recommendations and look forward to discussing these or other concerns as pertains to the SpaceX Boca Chica site. You may contact me via email at [REDACTED]

Sincerely,

**Manuel  
Perez III**  Digitally signed by  
Manuel Perez III  
Date: 2021.08.23  
14:29:25 -05'00'

Manuel "Sonny" Perez III  
South Texas Refuge Complex Manager

cc:

Stacey Zee, Federal Aviation Administration, Washington, DC.  
Bryan R. Winton, Refuge Manager, Lower Rio Grande Valley NWR  
Kelly McDowell, Refuge Supervisor, OK/TX Refuges  
Dawn Gardiner, Assistant Field Supervisor, Texas Coastal ES Field Office

**From:** [Gardiner, Dawn](#)  
**To:** [Winton, Bryan](#); [Orms, Mary](#)  
**Subject:** Re: DRAFT REPORT SN11 Anomaly - Rocket engine explosion @ 0.5-1 mile above the launch site - 3-30-21  
**Date:** Wednesday, March 31, 2021 7:52:27 AM

---

Mary- in the current BA, we need them to describe their response to anomalies. Clean up and retrieval will be occurring in piping plover habitat, maybe red knot habitat and black rail habitat and aplomado. Maybe pipl critical habitat.

---

**From:** Winton, Bryan <[REDACTED]>  
**Sent:** Tuesday, March 30, 2021 9:25 PM  
**To:** Gardiner, Dawn <[REDACTED]> Orms, Mary <[REDACTED]>  
**Subject:** Fw: DRAFT REPORT SN11 Anomaly - Rocket engine explosion @ 0.5-1 mile above the launch site - 3-30-21

FYI

The debris field is likely 2-3 miles. Majority is on north side of HW 4. Its the worst "anomaly" we've experienced thus far. There is the Full Moon now so tides are high, site is being inundated, and retrieval will be significantly delayed and or more costly (helicopter).

I'll forward a copy of the Final Report.

bryan

---

**From:** Winton, Bryan  
**Sent:** Tuesday, March 30, 2021 9:22 PM  
**To:** [REDACTED] <[REDACTED]> [REDACTED] <[REDACTED]>  
<[REDACTED]> Garza, Rolando L <[REDACTED]> Stephanie Bilodeau  
<[REDACTED]> Edler, Scot <[REDACTED]> Longoria, Gerardo  
<[REDACTED]> David Kroskie <[REDACTED]>  
**Cc:** Reagan Faught <[REDACTED]> Perez, Sonny <[REDACTED]>  
Fernandez, Oralia Z <[REDACTED]>  
**Subject:** DRAFT REPORT SN11 Anomaly - Rocket engine explosion @ 0.5-1 mile above the launch site - 3-30-21

This is a DRAFT report. I am requesting the TEAM review this summary, and provide feedback by 12pm Wednesday, so that a Complete Recommendation can be reviewed/recommended by TPWD.



Thank you to the staff from TPWD, NPS, CBBEP and FWS for responding to the 7:50am Space X Anomaly/explosion today at Boca Chica.

All staff arrived on-site at or near 1pm today, and stayed until ~6:15pm.

TPWD Biological staff (Liana Garcia and Andres Garcia) were granted the lead on-site to advise me, the POC for the incident, how they recommended Space-X proceed with removal of debris. Leo Alaniz was the Space-X POC.

NPS Cultural Resources Staff (Rolando Garza) and TPWD Cultural Resources Staff (David Kroskie) surveyed the debris field but were not able to access the piling (Historical Features) or the majority of the other cultural resources within the State Park. Coastal Bend Bays and Estuary Biological staff, Stephanie Bilodeau, surveyed the area for nesting birds, evidence of nest initiation, and any evidence of impact from the debris field or Space-X staff which were authorized by myself and the Team to walk the entire debris field in search of the 2nd Flight Termination Device, which is a FAA required safety item.

No GLO representatives were present.

The debris field consists of the entire rocket. Significantly more debris on the Boca Chica State Park, Lower Rio Grande Valley NWR, and, this time, the General Land Office properties, than occurred during the previous 2 Hopper and 3 SN anomalies.

Conditions: Due to Full Moon, and subsequent high tides, the debris field had been or is subject to inundation. From what was reported by Space-X, 90% of the debris is north of the launch site/north of HW4, due to height of rocket upon explosion, and prevailing south winds.

During the afternoon much of the debris was clearly visible partly lodged in or atop the wet/soft alkaline flats.

Staff were on stand-by until 4:45pm when the 2nd Flight Termination Device was located and removed. Upon removal, staff were cleared for access to the alkaline flats to determine substrate firmness and extent of debris field. Staff reported the debris field was much more extensive than when observing from HW4. Lots more large and smaller pieces of debris than previously. Due to height of explosion, much of the materials of larger size are lodged into the alkaline flat. Approximately 20 pieces of debris are of such size that they will require equipment for removal or use of helicopter for removal. The majority of the debris (~50%) appeared to be smaller size pieces that can be removed by hand, by walking on the flats, stockpiling the materials in a particular area onto the edge of 1 of 3 vegetated lomas, where ORV or other small equipment can be used at a later time to load and remove the debris--minimizing widespread ORV/ATV tracking about the flats in the soft substrate. This was a mutual Team recommendation. The Team determined that the least-damaging approach would be to allow foot access only at this time. POC Leo Alaniz was advised that Space-X could continue GPS location for all materials so that upon my arrival on Wednesday, 9am, Space-X may begin debris capable of being collected on foot for stockpiling. Alaniz stated Space-X would focus on debris removal on HW 4, for which there was substantial materials, including 1 of the 3 raptor engines.

TPWD and the Team did not collectively agree on an approach for future debris retrieval. TPWD recommended mats for accessing the larger items that are 0.3-0.5 miles from HW 4. Some items are well into the South Bay, so during high tide those items can be retrieved by boat ideally.

The question for Leadership at this time is can we delay the retrieval due to habitat conditions, and if so, for how long. Best case scenario, the flats will likely not be capable of drying until 3-5 days after Full Moon, and an anticipated northern expected to reach the Valley by Thursday evening. The northern will likely push tidal waters far into the flats up against HW 4. Notwithstanding a significant rain event accompanying the northern, the flats could potentially be in a state they can begin drying by this Friday.

As for removal of the 20+ larger debris items. Either Space-X will need to wait until the flats are dry/firm so equipment can access those items (still high level of expected damage/ruts), and seek assistance via Helicopter so that foot access to debris can be conducted along with slings and hand-carried equipment, and then helicopter removal and drop in a designated area off the State Park/Refuge. The Team did not unanimously agree on the preferred method of retrieval for large debris items, although some participating staff had not responded to any previous Hopper or SN incidents.

US Fish & Wildlife Service will continue to serve as lead for the incident. However, TPWD Leadership, along with FWS Sonny Perez should fine-tune what approach is recommended, so that I can implement the strategy identified.

Bryan Winton  
Refuge Manager  
Lower Rio Grande Valley National Wildlife Refuge  






REVISION	DATE
Version 0	August 21, 2015
Version 1.0	December 14, 2015
Version 1.1	February 2, 2016



# Cape Canaveral Spaceport Development Manual

February 2, 2016  
Latest Version (1.1)

## DOCUMENT ORGANIZATIONAL TABLE

VOLUME	TITLE	STATUS
<b>VOLUME 1 CAPE CANAVERAL SPACEPORT</b>		
CHAPTER 1	OVERVIEW	VERSION 1.1
<b>VOLUME 2 KENNEDY SPACE CENTER</b>		
CHAPTER 1	GENERAL REQUIREMENTS	VERSION 1.1
CHAPTER 2	SHUTTLE LANDING FACILITY	VERSION 1.0
CHAPTER 3	EXPLORATION PARK	VERSION 1.1
CHAPTER 4	LAUNCH COMPLEXES	FUTURE
CHAPTER 5	PROCESSING & OTHER FACILITIES	FUTURE
<b>VOLUME 3 CAPE CANAVERAL AIR FORCE STATION</b>		
CHAPTER 1	GENERAL REQUIREMENTS	FUTURE
CHAPTER 2	SPACE LAUNCH COMPLEXES	FUTURE
CHAPTER 3	PROCESSING & OTHER FACILITIES	FUTURE
<b>VOLUME 4 DESIGN CRITERIA (FUTURE)</b>		
CHAPTER 1	CITY OF TITUSVILLE	FUTURE
CHAPTER 2	TECHNICAL SPECIFICATIONS	FUTURE
<b>VOLUME 5 SPACE FLORIDA PROJECTS</b>		
CHAPTER 1	GENERAL REQUIREMENTS	VERSION 1.0

## Forward

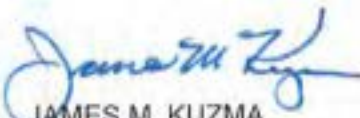
The Cape Canaveral Spaceport Development Manual is a living document prepared and updated as needed by Space Florida. Its purpose is to assist users in understanding the processes, procedures, standards, and design criteria applicable to projects which are designed and constructed on sites under Space Florida's control located upon federal property within the boundary of the Cape Canaveral Spaceport (CCS).

The CCS is defined within Space Florida's authorizing statute as a geographical area that includes the entirety of NASA's John F. Kennedy Space Center (KSC) and the U.S. Air Force's Cape Canaveral Air Force Station (CCAFS). While both installations remain federal land, Space Florida is granted development rights, and the right to permit others to develop sites and projects, under the terms of numerous property agreements with NASA and the USAF. These property agreements define the land that has been made available for Space Florida's use, and define the processes which Space Florida will use to guide, review, and approve development projects.

It is Space Florida's intent to streamline the design and construction of commercial and other non-governmental projects on sites under its control within the CCS. Space Florida operates as an Independent Special District, with statutory authorities similar to those of a municipality with regard to land planning and adoption of design and construction standards, reviews, and approvals applicable to CCS sites and projects under its control. There is no other county or municipal development code jurisdiction or approval processes.

Except for defined Florida Building Codes and Life Safety Codes as governed by Space Florida's federal property use agreements, it is intended the development and design standards identified in this document establish general criteria to be used in directing future building placement and design, as well as site design at the CCS complex. It is Space Florida's preference to not prescribe specific design solutions, but rather suggest directions for those who will design and manage the facilities. While each new project will present its own set of unique circumstances, development and design standards should allow projects to exhibit a desired degree of consistency in form and character required by Space Florida and land owners, while simultaneously allowing flexibility to meet customer needs.

If you have any questions/comments regarding these documents you can contact Space Florida at 321-730-5301, or at their Corporate Office, located at 505 Odyssey Way, Suite 300, Exploration Park, Florida 32953.



JAMES M. KUZMA  
Chief Operating Officer  
Space Florida





# **Cape Canaveral Spaceport Development Manual**

## **VOLUME 1**

# **CAPE CANAVERAL SPACEPORT**

## **CHAPTER 1 OVERVIEW**

## Table of Contents

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VERSION 1.1

# CHAPTER 1 - OVERVIEW

## 1.1 Introduction

The intent of this Cape Canaveral Spaceport Development Manual is to provide Space Florida's Tenants and contractors with an understanding of the criteria for the development of infrastructure and facility projects within Cape Canaveral Spaceport (CCS), Florida. The CCS consists of facilities and properties within Kennedy Space Center (KSC) which is primarily governed by the National Aeronautics and Space Administration (NASA) and Cape Canaveral Air Force Station (CCAFS) which is primarily governed by the United States Air Force (USAF). Agreements are in place between SPFL, NASA, and USAF that transfer the responsibility for certain facilities and land areas to SPFL. These Agreements include design/construction standards and approval processes required by NASA and USAF that must be followed by SPFL and its Tenants. This Development Manual includes the standards and processes required by these agreements by specific description or reference. Regardless of the standards or processes within this document, Space Florida will have authority and responsibility, as the point of contact for the Tenant, and will issue all approvals to the Tenant. Any reviews or approvals required under the agreements with NASA or USAF will be coordinated by SPFL. Development Standards and Design Criteria described in this document shall:

- ✓ Establish general criteria to be used in directing future facilities placement and design, and site design.
- ✓ Outline the specific development and design requirements mandated by the NASA and Space Florida Agreements, which Space Florida's potential customers are required to comply with.
- ✓ Outline the specific development and design requirements mandated by the USAF-CCAFS and Space Florida Agreements, which Space Florida's potential customers are required to comply with.
- ✓ Provide the framework for coherent development such that each new project and phase of development is consistent with the Cape Canaveral Spaceport's (CCS) overarching plan and vision.
- ✓ Avoid prescribing specific design solutions, but rather provide standards to those who will design and manage the facilities and infrastructure.

It is understood that each new project presents its own unique set of requirements and challenges. Therefore, these Development Standards are intended to allow projects to develop and exhibit a desired degree of consistency in form and character, while simultaneously allowing flexibility for positive innovation.

Note: The abbreviations used in this document are defined in Appendix 1A.

## 1.2 Development Manual Organization

The Development Manual for CCS consists of a series of volumes and chapters enabling the distribution of applicable development processes, procedures, standards, and criteria to CCS Tenants and contractors engaged in site development and/or facility design/construction. Site and building development requirements, together with applicable processes and standards, are generally site or CCS area specific. To simplify the user's understanding of what applies to their specific project, Space Florida will furnish only those volumes and chapters applicable to the area of the planned development project. CCS Development Manual Volumes and Chapters

and a brief description are as follows:

**Volume 1: Cape Canaveral Spaceport** – General overview and introductory information related to Space Florida administered development projects at CCS.

**Volume 2: Kennedy Space Center** – Processes and standards applicable for Space Florida-administered development within the KSC portion of the CCS.

- ✓ Chapter 1: General Requirements – Common processes and standards for all Space Florida administered development within KSC.
- ✓ Chapter 2: Shuttle Landing Facility – Additional processes and standards specific to the Shuttle Landing Facility (SLF).
- ✓ Chapter 3: Exploration Park – Additional processes and standards specific to Exploration Park.
- ✓ Chapter 4: Processing and Other Facilities – Additional processes and standards specific to processing and other facilities.
- ✓ Chapter 5: Launch Complexes – Additional processes and standards specific to launch complexes.

**Volume 3: Cape Canaveral Air Force Station** – Processes and standards applicable for Space Florida administered development within the CCAFS portion of the CCS.

- ✓ Chapter 1: General Requirements – Common processes and standards for all Space Florida administered development within CCAFS.
- ✓ Chapter 2: Processing and Other Facilities – Additional processes and standards specific to processing and other facilities.
- ✓ Chapter 3: Launch Complexes – Additional processes and standards specific to Launch Complexes.

**Volume 4: Design Criteria** – Specific technical requirements associated with infrastructure improvements as defined by Space Florida partnering agencies and the Construction Specification Institute's (CSI) Standard Construction Specifications.

- ✓ Chapter 1: Space Florida adopted Design Criteria and Development Standards (adapted from City of Titusville)
- ✓ Chapter 2: Technical Specifications

**Volume 5: Space Florida Projects** – Specific requirements for Space Florida procured projects.

- ✓ Chapter 1: General Requirements – Standards and processes applicable for development of Space Florida procured projects.

### 1.3 Scope and Purpose

This Development Manual establishes specific design/construction standards and criteria for infrastructure, buildings, and other facilities, which are owned, operated, funded or maintained by Space Florida within the spaceport territory boundary of CCS. It also serves to provide design/construction standards and criteria for all other facilities constructed within the boundaries of property which has been out-granted to Space Florida's use and development pursuant to land lease, easement, or other agreement. This includes launch and integration complexes at CCS

under the management of Space Florida.

It is not Space Florida's intent to limit or dismiss the experience, knowledge or talent of the designer or contractor. Therefore, Space Florida encourages developers, engineers, contractors and customers to recommend alternative solutions where deviations are beneficial. However, adherence to these standards and criteria will result in project development that conforms to the goals and objectives of Space Florida and complies with its various property agreements with partner agencies.

The facilities located on CCS for which Space Florida maintains responsibility as asset owner or development administrator are located on property owned by the U.S. Government under the jurisdiction of NASA or the USAF. As such, the property owners maintain certain access rights to all facilities and may have a limited role in project coordination and the approval process; however, Space Florida remains the approval authority, primary coordinator, and point of contact for all development projects implemented under its authorities and responsibilities within the CCS.

## **1.4 Space Florida Organization**

Space Florida is an Independent Special District of the State of Florida, created by Chapter 331, Part II, Florida Statutes (FS), for the purpose of fostering the growth and development of a sustainable and world-leading space industry in Florida. Space Florida uniquely serves as the single point of contact for all space-related functions of the State to strengthen Florida's position as a global leader in aerospace research, investment, exploration and commerce. Space Florida has a variety of agreements for the use and management of land, facilities and campuses within the CCS, either with NASA or USAF. These agreements provide Space Florida with the right to use and develop defined areas of the CCS, and also specify Space Florida's responsibilities in managing design and construction activities carried out by Space Florida itself or others (e.g. Tenants) under its administration.

The CCS spaceport territory is defined in Chapter 331, Part II, FS with a geographic territory that includes all of KSC and CCAFS. The CCS also consists of infrastructure and physical assets which are designed, constructed, and operated under the authority of Space Florida. Space Florida prepares and periodically updates a Cape Canaveral Spaceport Complex Master Plan to define goals and strategies for the modernization and expansion of CCS in support of both commercial space activities and U.S. Government space missions. For additional information about the CCS Complex Master Plan and Space Florida, refer to <http://www.spaceflorida.gov/>.

Space Florida is specifically chartered and directed to develop partnerships to renew and upgrade infrastructure at KSC and CCAFS, improving access for commercial launch activities and pursuing the development of commercial spaceport capabilities. It is empowered to acquire and develop property, infrastructure, and facilities to carry out these and other duties. As an Independent Special District, Space Florida has powers and authorities similar to those of a municipality with regard to its administration of development activities, and is empowered to enter into cooperative agreements with local government entities as it finds appropriate to carry out its responsibilities. Tables 1 and 2 show key Space Florida Personnel and CCS Facilities/Assets leased or owned by Space Florida. Figure 1 shows a map of the CCS and Vicinity with major areas and complexes identified.

**Table 1: Space Florida Key Personnel**

<b>Name</b>	<b>Title</b>
Frank DiBello	President and Chief Executive Officer
Jim Kuzma	Sr. Vice President and Chief Operations Officer
Mark Bontrager	Vice President Spaceport Operations
Pat McCarthy	Director of Spaceport Operations
James Moffit	SLF Airfield Manager
Steve Szabo	Spaceport Development Program Manager & Building Official
Pete Eggert	Spaceport Health, Safety and Environmental
Ted Beerman	Spaceport Facilities Operations and Maintenance

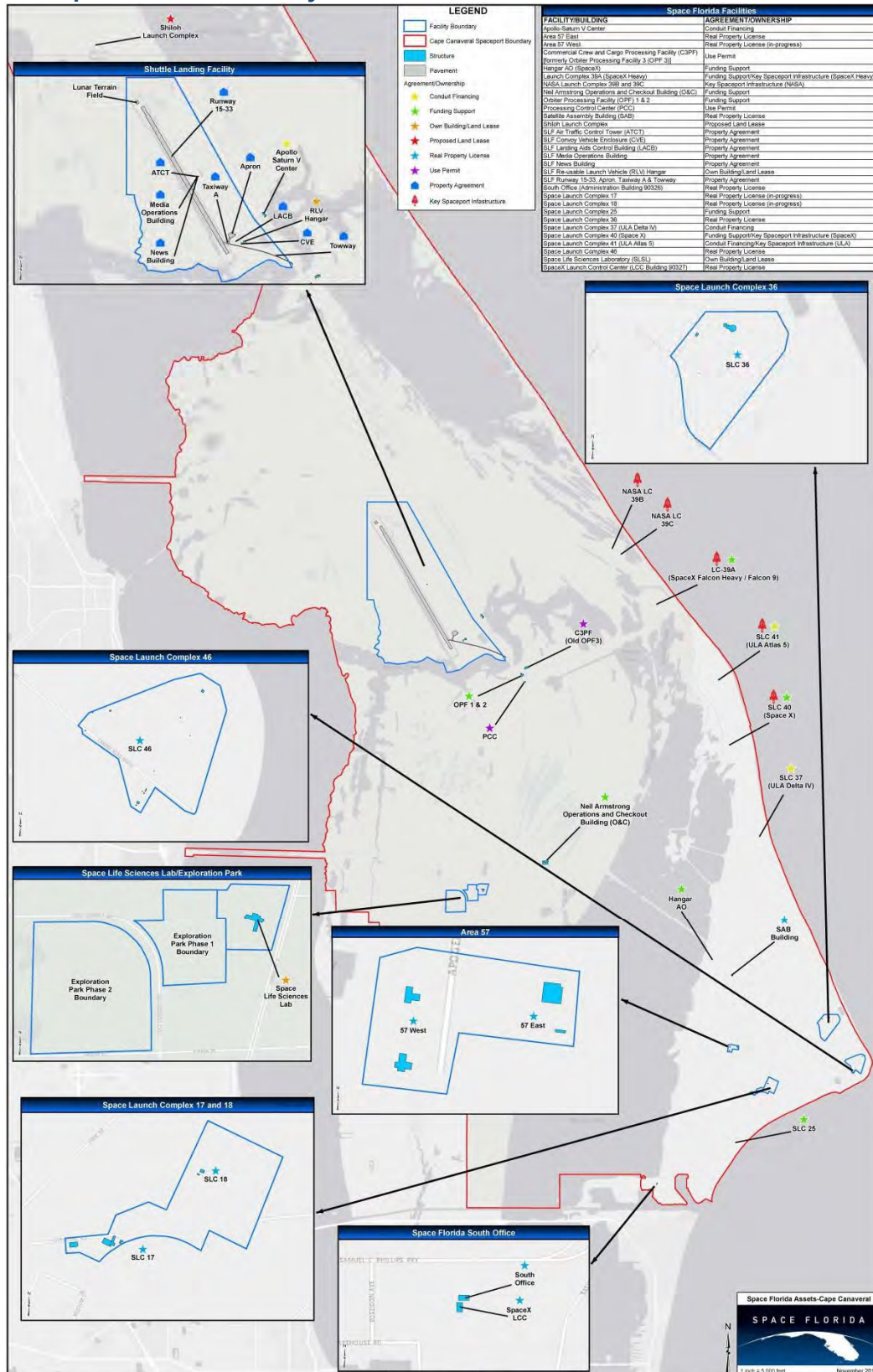
**Table 2: Space Florida's CCS Facilities/Assets**

<b>Facility</b>	<b>Facility Description</b>	<b>KSC/CCAFS</b>
Area 57 East	Vehicle Integration	CCAFS
Area 57 West	Vehicle Integration	CCAFS
Processing Control Center (PCC)	Launch Team Training; Launch Processing System Maintenance	KSC
Satellite Assembly Building (SAB)	Vehicle Processing	KSC
Shiloh Launch Complex	Vertical Launch/Vertical Landing	KSC
SLF Air Traffic Control Tower (ATCT)	Air Traffic Control	KSC
SLF Convoy Vehicle Enclosure (CVE)	Hangar; Storage	KSC
SLF Landing Aids Control Building (LACB)	SLF Control Center; Office Space; SLF Terminal	KSC
SLF Media Operations Building	Office Space; Operations; Observations	KSC
SLF News Building	Storage; Office Space	KSC
SLF Re-usable Launch Vehicle (RLV) Hangar	Vehicle Processing; Office Space; Operations and Maintenance Facility	KSC
SLF Runway 15-33, Apron, Taxiway A & Towway (concrete pavement)	Horizontal Launch and Landing Facility	KSC
Space Launch Complex 17 (partial)	Vertical Launch	CCAFS
Space Launch Complex 18	Vertical Launch	CCAFS
Space Launch Complex 36	Vertical Launch	CCAFS
Space Launch Complex 46	Vertical Launch	CCAFS
SpaceX Launch Control Center (LCC)*	Office Space and Launch Controls	CCAFS
South Campus Office (Administration Building 90326)*	Office Space	CCAFS
Exploration Park Space Life Sciences Laboratory (SLSL)*	Research and Development; Office Space; Space Florida Headquarters	KSC
Exploration Park Phases 1 and 2*	Office and Vehicle Integration	KSC

\* These facilities are located outside the secured boundary limits of KSC and CCAFS which can be accessed by the general public.



Figure 1: Map of CCS and Vicinity





## **1.5 Authority of Space Florida**

No building or other improvements will be erected, constructed, placed, removed, occupied or permitted to exist on any land parcel under Space Florida's management responsibility until:

- ✓ The proposed use of such building or improvement has been approved by Space Florida in writing;
- ✓ Schematic designs and plans, in compliance with this Development Manual, have been submitted to and approved in writing by Space Florida; and
- ✓ Final plans and specifications in the form and content provided in this Development Manual, have been submitted to and approved in writing by Space

It will not be necessary to submit and have approved by Space Florida designs and plans relating solely to a non-structural, interior alteration to any Building.

Space Florida may appoint professional consultants, authorized agents and representatives at their discretion to assist in performing duties on their behalf, including, but not limited to, any necessary inspection of a parcel or improvement.

## **1.6 Request for Variances and/or Interpretation Statement**

It is recognized that variances to the referenced standards and/or other design criteria in this document may be necessary to meet the unique needs of clients and their projects. A request for variance shall be submitted along with any substantiating documentation to Space Florida's Chief Operations Officer (COO). Any request to Space Florida for variance from requirements enforced by NASA, USAF, Florida Department of Transportation (FDOT), St. Johns River Water Management District (SJRWMD), Federal Aviation Administration (FAA) and other applicable regulatory agencies will require documented concurrence from that agency.

## **1.7 Procedures for Changes to this Manual**

Proposed changes to this manual should be submitted to Space Florida. Requests for changes, additions, or deletions shall include a justification for the proposed change with a complete description of the change proposed and shall be accompanied by sufficient technical analyses to support the change or addition. This Development Manual will be updated and modified on a routine basis by Space Florida.

## **1.8 Space Florida Insurance and Bond Requirements**

The following paragraphs outline the general insurance requirements for Space Florida Tenants at CCS. The specific insurance requirements will be as documented in the lease agreement between Space Florida and the Tenant. Unless otherwise specified, all insurance limits shall be determined by Space Florida based on the specific Tenant project and usage. The limits, so determined, shall be escalated every fifth year as reasonably determined by Space Florida using appropriate indices to generally ensure that the amounts are increased to keep up with currency inflation.



### 1.8.1. General Requirements

- a. All insurance and all renewals shall be issued by companies with a rating of at least "A-" "VIII" (or its equivalent successor) or better in the current edition of Best's Insurance Reports and be licensed to do and is doing business in Florida.
- b. Each policy shall be endorsed to provide that the policy shall not be cancelled or materially altered without thirty (30) days prior written notice to Space Florida and shall remain in effect notwithstanding any such cancellation or alteration until such notice shall have been given to Space Florida and such period of thirty (30) days shall have expired.

### 1.8.2. General Contractor Insurance Requirements

A current insurance certificate(s) is required for every developer or contractor performing work on the premises of CCS. The minimum coverage required is as follows:

- a. Commercial general liability insurance, including contractual liability, broad form property damage liability, fire legal liability, products and completed operations, and medical payments;
- b. Business auto liability insurance;
- c. Workers' compensation insurance for all of its employees in statutory limits as required by Florida law; and
- d. **Employer's liability insurance which affords not less than five hundred thousand dollars (\$500,000) for each employee.**

### 1.8.3. Tenant or Operator Insurance Requirements

For all Tenants or operators, a current insurance certificate is required to cover the loss of or damage to U.S. Government (USG) property as a result of any activities conducted by the Tenant.

The Tenant or Operator shall maintain insurance to protect against loss or damage to improvements, whether the improvements are Space Florida, Tenant, or operator improvements, as a result of any activities conducted by the Tenant or operator.

Insurance coverage in general shall meet statutory minimums as applicable. Prior to activities at CCS, Tenant or operator shall provide proof of adequate insurance for damage to USG property and Space Florida improvements. Based on the Tenant or operator planned activities, the insurance requirements necessary or appropriate will be determined based on the risks to USG property and Space Florida improvements.

If applicable, the Tenant or operator shall provide separate insurance coverage for actual space launch activities as required by their launch operator license issued by the FAA.

#### **1.8.4. Performance and Payment Bonds**

Prior to beginning of construction, the construction contractor shall provide to Space Florida, in a form acceptable to Space Florida, two bonds for each contract; specifically, a performance bond and a payment bond, each with good and sufficient surety or sureties acceptable to Space Florida. For projects within the KSC boundary, Space Florida and NASA shall be named on such bonds as co-payees.

The penal amount for each performance bond shall be one hundred (100) percent of the contract value at the time of the award. Performance bonds shall be submitted in the form and following the procedures in Federal Acquisition Regulation (FAR) 52.228-15 and FAR Part 28.

Payment bonds shall be one hundred (100) percent of the contract value at the time of the award. Payment bonds shall be submitted in the form and following the procedures in FAR 52.228-15 and FAR Part 28.

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## APPENDIX 1A – ABBREVIATIONS

The following table of abbreviations applies to the entire Cape CCS Development Manual. Some abbreviations may not apply to certain facilities within the CCS.

Acronym	Description
ACC	Accessibility Compliance Checklist
AHJ	Authority Having Jurisdiction
AIA	American Institute of Architects
ASAF	Airspace Study Application Form
ASME	American Society of Mechanical Engineers
AST	Aboveground Storage Tank
ATCT	Air Traffic Control Tower
BO	Biological Opinion
BOT	Build-Operate-Transfer
CCAFS	Cape Canaveral Air Force Station
CCR	Covenants Conditions and Restrictions
CCS	Cape Canaveral Spaceport
CCTV	Closed Circuit TV
CD	Compact Disc
CFPS	Construction and Fire Prevention Standards
CFR	Code of Federal Regulations
CM	Construction Manager
CO/U	Certificate of Occupancy/Use
CPP	Commissioning Policy and Procedures
CPTED	Crime Prevention Through Environmental Design
CSA	Commercial Space Activities
CSC	Certificate of Substantial Completion
CSI	Construction Specification Institute
CVE	Convoy Vehicle Enclosure
DB	Design-Build
DBB	Design-Bid-Build
DBOM	Design-Build-Operate-Maintain
DCP	Development Concept Plan
DDESB	Department Of Defense Explosives Safety Board
DOT	Department of Transportation
DSH	Design Standards Handbook
DSM	Development Standards Manual
EAB	Environmental Assurance Branch
EBS	Environmental Baseline Survey
ECC	Environmental Compliance Checklist
ECOC	Environmental Close-Out Checklist
EIFS	Exterior Insulation And Finish Systems
ERP	Environmental Resource Permit
ESP	Explosive Site Plan
EUL	Enhanced Use Lease
The Park	Exploration Park
FS	Florida Statutes

<b>Acronym</b>	<b>Description</b>
<b>FAA</b>	<b>Federal Aviation Administration</b>
<b>FAA/AST</b>	<b>Federal Aviation Administration Office of Commercial Space Transportation</b>
<b>FAC</b>	<b>Florida Administrative Code</b>
<b>FAR</b>	<b>Federal Acquisition Regulation</b>
<b>FBC</b>	<b>Florida Building Code</b>
<b>FCAA</b>	<b>Federal Clean Air Act</b>
<b>FCCNA</b>	<b>Florida Consultant's Competitive Negotiations Act</b>
<b>FDEP</b>	<b>Florida Department of Environmental Protection</b>
<b>FDOT</b>	<b>Florida Department of Transportation</b>
<b>FGBC</b>	<b>Florida Green Building Coalition</b>
<b>FGCBS</b>	<b>Florida Green Commercial Building Standard</b>
<b>FM</b>	<b>Facility Manager</b>
<b>FNPS</b>	<b>Florida Native Plant Society</b>
<b>FOD</b>	<b>Foreign Object Damage</b>
<b>FWS</b>	<b>US Fish And Wildlife Service</b>
<b>GBIGG</b>	<b>Green Building Initiative's Green Globes</b>
<b>GPS</b>	<b>Global Positioning System</b>
<b>HSE</b>	<b>Health, Safety and Environmental</b>
<b>HSPD</b>	<b>Homeland Security Presidential Directive</b>
<b>HVAC</b>	<b>Heating, Ventilation, Air Conditioning</b>
<b>IGCC</b>	<b>International Green Construction Code</b>
<b>IPD</b>	<b>Integrated Project Delivery</b>
<b>ISC</b>	<b>Institutional Services Contract</b>
<b>KCA</b>	<b>Kennedy Center Agreement</b>
<b>KNPR</b>	<b>Kennedy NASA Procedural Requirements</b>
<b>KSC</b>	<b>Kennedy Space Center</b>
<b>LACB</b>	<b>Landing Aids Control Building</b>
<b>LCC</b>	<b>Launch Control Center</b>
<b>LEED</b>	<b>Leadership In Energy and Environmental Design</b>
<b>LMPs</b>	<b>Light Management Plans</b>
<b>LPS</b>	<b>Low-Pressure Sodium</b>
<b>MINWR</b>	<b>Merritt Island National Wildlife Refuge</b>
<b>MOU</b>	<b>Memorandum of Understanding</b>
<b>MSDS</b>	<b>Material Safety Data Sheet</b>
<b>NAS</b>	<b>National Air Space</b>
<b>NASA</b>	<b>National Aeronautics and Space Administration</b>
<b>NAVAIDS</b>	<b>Navigational Aids</b>
<b>NBS</b>	<b>National Bureau of Standards</b>
<b>NCS</b>	<b>National Canaveral Seashore</b>
<b>NEPA</b>	<b>National Environmental Policy Act</b>
<b>NFPA</b>	<b>National Fire Protection Administration</b>
<b>NGVD</b>	<b>National Geodetic Vertical Datum (1929 or 1983 as applicable)</b>
<b>NHPA</b>	<b>National Historic Preservation Act</b>
<b>NOI</b>	<b>Notice of Intent</b>
<b>NPDES</b>	<b>National Pollutant Discharge Elimination System</b>
<b>NPR</b>	<b>NASA Procedural Requirements</b>
<b>NRHP</b>	<b>National Registry of Historic Places</b>

Acronym	Description
O&MM	Operations & Maintenance Manuals
OM	Operations Manual
OSHA	Occupational Safety and Health Administration
P3	Public Private Partnership
PA	Programmatic Agreement
PCC	Processing Control Center
PDF	Portable Document Format
PE	Professional Engineer
PIR	Pollution Incident Report
PM	Project Manager
POC	Point of Contact
PSO	Protective Services Office
QD	Quantity-Distance
R&D	Research & Development
REC	Record of Environmental Checklist
RFSPR	Range Flight Safety Program Requirements
RLV	Re-usable Launch Vehicle
RQ	Reportable Quantity
RSAA	Reimbursable Space Act Agreement
S&MA	Safety & Mission Assurance
SAB	Satellite Assembly Building
SHPO	State Historic Preservation Office
SIR	Shell Isolation Rating
SJRWMD	St. Johns River Water Management District
SLC	Space Launch Complex
SLF	Shuttle Landing Facility
SLSL	Space Life Sciences Laboratory
SME	Subject Matter Expert
SOQ	Statement of Qualifications
SPCC	Spill Prevention, Control, and Countermeasures
SPFLP	Space Florida Projects
SWPPP	Stormwater Pollution Prevention Plan
TP	Tenant Projects
UAS	Unmanned Aerial Systems
USAF	U.S. Air Force
USDC	U.S. Department of Commerce
USEPA	U.S. Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGBC	United States Green Building Council
UST	Underground Storage Tank



# **Cape Canaveral Spaceport Development Manual**

## **VOLUME 2**

## **KENNEDY SPACE CENTER**

### **CHAPTER 1 GENERAL REQUIREMENTS**



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## SECTION 1 – INTRODUCTION

### 1.1 Introduction

The intent of this Chapter is to highlight the common requirements associated with the processes and design/construction standards for development of CCS infrastructure and facility projects on land under the responsibility of Space Florida within the boundaries of Kennedy Space Center (KSC).

This includes required reviews by NASA and compliance with specific NASA standards mandated by the specific Property Agreements between NASA and Space Florida. In all cases, Space Florida will be the final approval authority and will perform required coordination with NASA.

The majority of processes and standards presented in this Chapter are common to all development within CCS with modification depending if development is within the KSC or CCAFS property boundary. When CCS is referenced in this Chapter, it shall be interpreted as that portion of the CCS within the boundary of KSC only.

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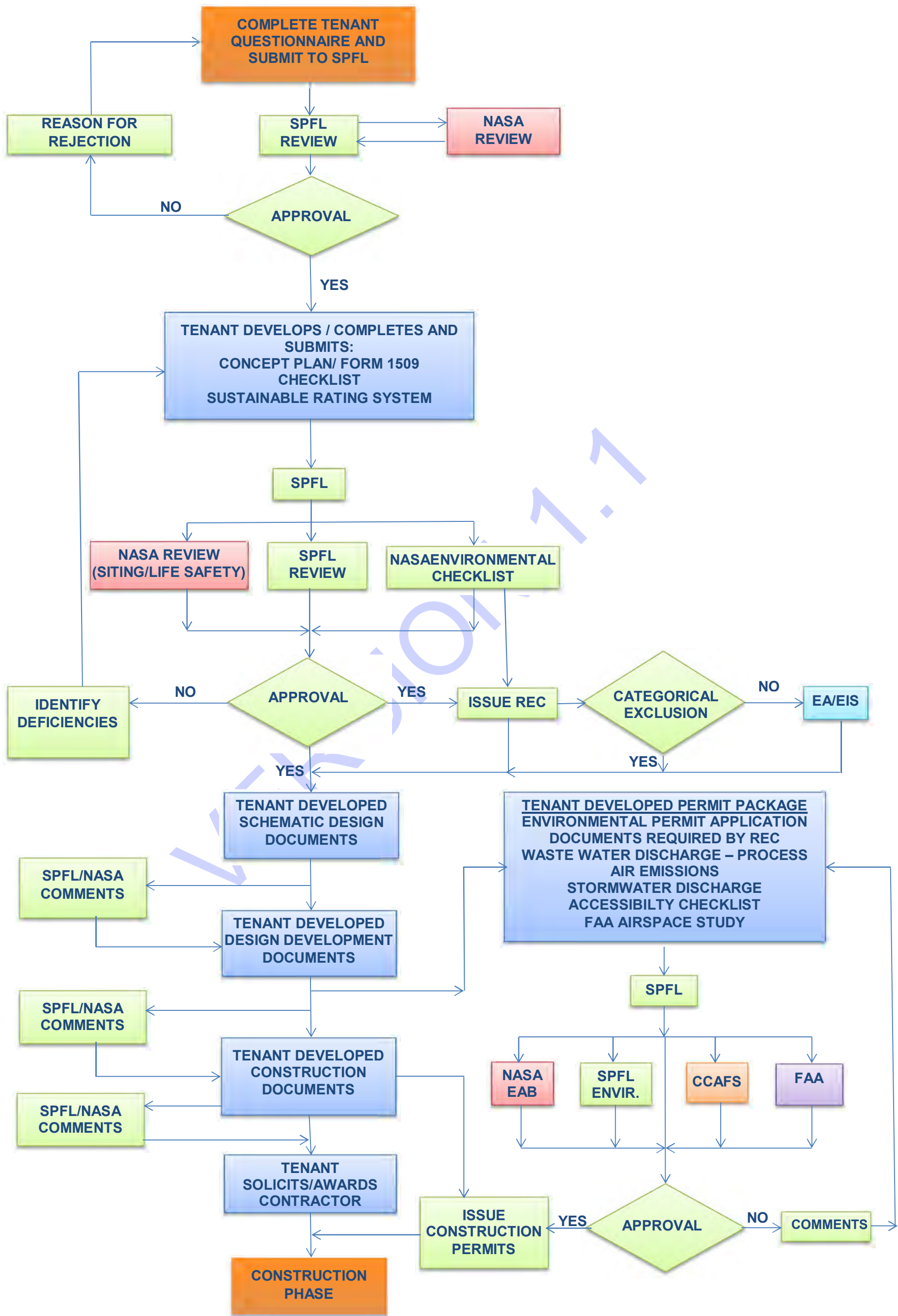
## SECTION 2 – PROJECT REVIEW & CONSTRUCTION PROCESSES

The following flow chart shows the general process for obtaining review and approval for all Tenant projects at Cape Canaveral Spaceport (CCS). Depending on the specific project and its location, exceptions to the process, primarily with respect to outside reviews, may occur. A review of the process shall take place during the initial meetings with the Tenant to address any exceptions or possible additions to the process based on the specific project.

Where NASA is referenced, Space Florida is the point of contact and governing authority. NASA is included by reference to indicate its involvement in reviews and approvals as may be mandated by agreements between Space Florida and NASA. If required, those interactions with NASA will be coordinated by Space Florida.

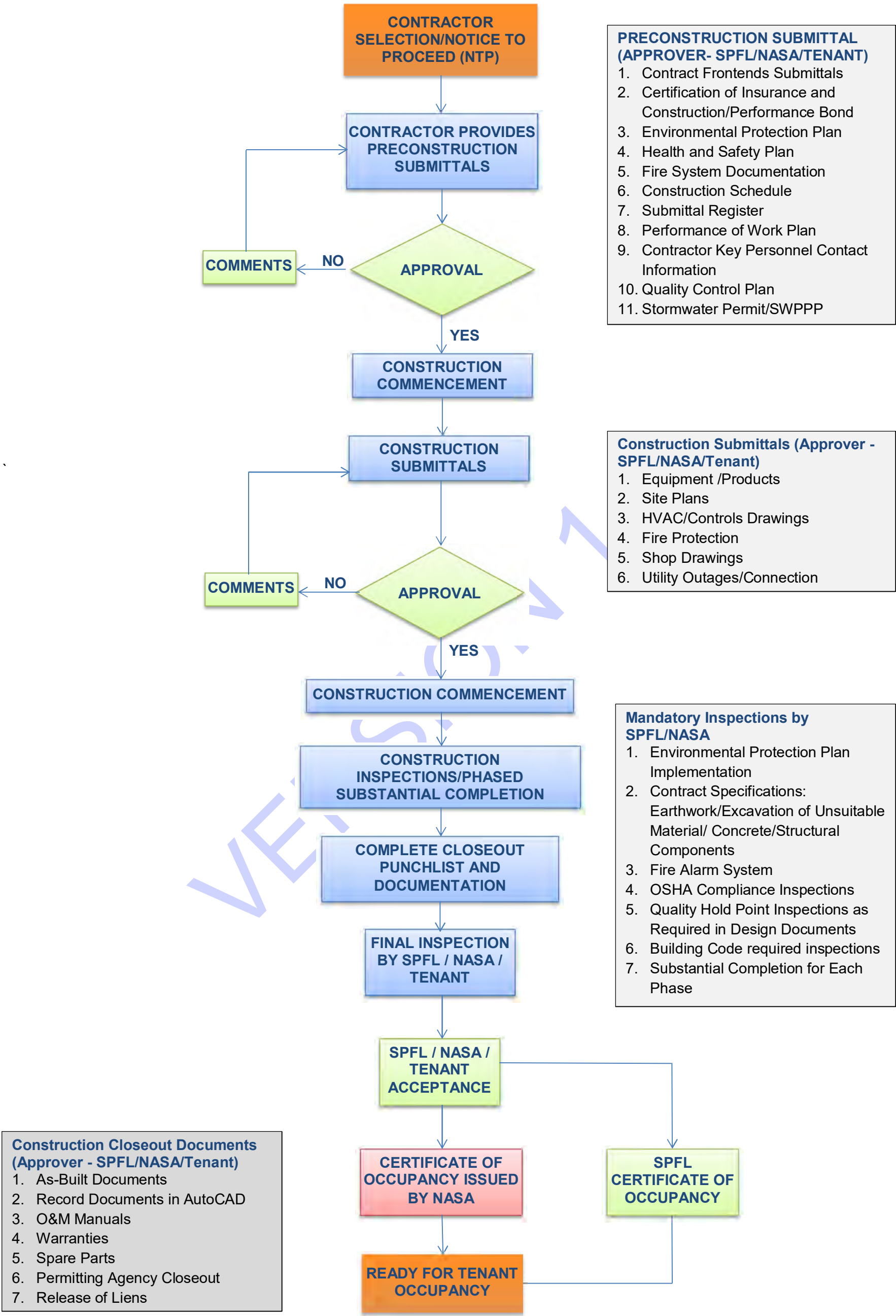
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CAPE CANAVERAL SPACEPORT SITE DEVELOPEMENT PROCESS



Note: Some steps may not be necessary depending on the project and Space Florida's discretion.

CAPE CANAVERAL SPACEPORT CONSTRUCTION PHASE PROCESS



Note: Some of these steps may not be necessary depending on the project and Space Florida’s discretion.

## 2.1 Project Approval, Planning, and Coordination

### 2.1.1 Project Approval

Prior to commencing the design and construction of an improvement project within CCS, Tenant must first submit a New Tenant Questionnaire and obtain Space Florida/NASA-written concurrence to proceed with the planned improvement. In addition, the Tenant must submit a completed Form 1509 Template describing any improvement equal to or greater than \$100,000. Refer to Appendix 1A – Forms for the New Tenant Questionnaire and Form 1509.

### 2.1.2 Project Coordination

## 2.2 Design Review and Approval

Space Florida shall serve as the **Building Official** and is responsible for code compliance on all construction at CCS. Tenant shall submit deliverables at milestones established during the delivery of the project to Space Florida and other regulatory governing agencies. Space Florida shall provide independent design review for compliance with these standards and Florida Building Codes (FBC), as well as independent construction inspection for code compliance. This review and inspection does not relieve the Tenant from the responsibility of performing quality control assurance reviews and inspections on all design and construction work.

Space Florida shall perform independent inspections, as necessary, of Tenant construction projects implemented on the facilities/property for which they are responsible. The independent inspections do not replace or relieve the Tenant's obligation to develop and implement a quality control program for their construction projects.

NASA's limited design review/approval and inspection of construction shall be required only for the determination of life safety code compliance of the site infrastructure and building construction as necessary to support a certification of occupancy. At NASA's sole discretion, NASA contractors may be used to perform design reviews for code compliance and inspect construction to support the issuance of a certificate of occupancy. Design documents shall be provided for review and comment at up to three design review intervals in order for any NASA concerns to be identified in a timely manner.

**Table 1: Summary of Approvals**

<b>APPROVALS AND INSPECTIONS</b>	<b>SPFL</b>	<b>NASA</b>	<b>USAF</b>	<b>FDEP</b>	<b>SJRWMD</b>
<b><u>APPROVALS - DESIGN PHASE</u></b>					
Tenant Questionnaire	✓	✓			
Concept Plan	✓	✓			
Environmental Checklist	✓	✓			
<b><u>PLANS</u></b>					
Form 1509 (Including Sustainable Rating System selection)	✓	✓			
Schematic Design Package (30%)	✓	✓			
Design Development Package ( 60%, 90%)	✓	✓			
Construction Documents	✓	✓			
<b><u>PERMITS</u></b>					
Environmental Permit Application	✓	✓			
Wastewater Discharge Permit	✓	✓	✓	✓	
Stormwater Discharge Permit	✓	✓			✓
Air Emissions Permit	✓			✓	
Potable Water Construction Permit	✓	✓	✓	✓	
Accessibility Checklist	✓				
Construction Building Permit	✓				
Dig Permit (KSC Form 26-312V3 NS)	✓	✓			
<b><u>APPROVALS CONSTRUCTION PHASE</u></b>					
Environmental Protection Plan	✓				
Fire System Documents	✓	✓			
Health and Safety Plan	✓				
Stormwater Pollution Prevention Plan (SWPPP)	✓				
Submittals Required by Contract Documents	✓				
Close-out Documents	✓				
Life Safety Plan		✓			
<b><u>MANDATORY INSPECTIONS</u></b>					
Environmental Protection Plan Implementation	✓				
Cast-in-place Concrete Formwork and Reinforcement Placement	✓				
Excavation of Unsuitable Material	✓				
Fire Protection System (Fire Alarm and Suppression)	✓	✓			



## **2.3 Environmental Compliance and Reporting**

Tenant shall be responsible for preparation of all environmental documentation, including Environmental Assessments (EA) or Environmental Impact statements (EIS) required by regulatory agencies to support its development and/or operations and for obtaining all necessary approvals of the same. Preparation of documents shall be coordinated with Space Florida Health, Safety, and Environmental Manager and follow regulatory processes.

Tenant shall obtain all required environmental permits, licenses, registrations, and approvals for their site activities. Tenant shall prepare all permit applications and pay all permit application fees directly to the regulatory agency. If required by the permit application, the NASA Environmental Assurance Branch (EAB) shall sign permit applications as the landowner or utility system owner. Tenant shall submit courtesy copies of all submitted permit applications to Space Florida within fourteen (14) calendar days after submission to the regulatory agency. Tenant shall submit courtesy copies of all permits, licenses, registrations, and approvals to Space Florida within fourteen (14) calendar days after receipt from the regulatory agency. Tenant shall ensure that all operations, activities, equipment, and facilities are in full compliance with all permit conditions.

### **2.3.1 Air Permit**

NASA holds a facility-wide Federal Clean Air Act (FCAA) Title V Air Operation Permit issued by the Florida Department of Environmental Protection (FDEP) that governs air emissions from dozens of regulated emission sources and hundreds of insignificant emission sources across NASA. NASA intends for SPFL and its Tenants to be independent regarding air emissions permitting and compliance. Tenant shall contact Space Florida prior to:

- a) The operation, reactivation, or modification of an existing emission source/activity,
- b) The construction of any new air emission source, or
- c) The initiation of an activity producing air emissions.

### **2.3.2 Stormwater Permits**

The Surface Water and Stormwater Management System within CCS are under the jurisdiction of the St. Johns River Water Management District (SJRWMD). Each Tenant shall provide the necessary means to assure complete drainage within and immediately adjacent to its leased parcel and provide adequate storm water control facilities to accomplish such objective in accordance with the requirements of the SJRWMD.

### **2.3.3 Water and Wastewater Permits**

The water and wastewater permits within CCS are under the jurisdiction of NASA and FDEP. Wastewater permits also need to be approved by the USAF for discharge to their wastewater treatment plant. Each Tenant shall provide the necessary means to assure proposed water and wastewater systems meet the requirements stated within the applicable permit.

## 2.4 Regulation of Construction Overview

### 2.4.1 Construction and Fire Protection Standards

Space Florida regulates construction within the boundaries of properties under its responsibility and includes the adoption of the FBC. In addition, the following NASA standards apply to all facilities within the boundaries of properties for which Space Florida is responsible.

- ❖ NASA-STD-8719.11, Safety Standard for Fire Protection, as it relates to fire sprinkler and fire alarm systems, associated occupancy and hazard classifications. This standard also serves as a simple NASA specific reference to those FBC and National Fire Protection Administration (NFPA) requirements that are applicable at KSC, or to cover situations where there are no applicable codes.
- ❖ KSC-STD-E-0012, Facility Grounding and Lightning Protection, latest edition if facility presents an explosive hazard to NASA facilities or personnel, or can impact NASA mission related operations.

### 2.4.2 Construction Permit Required

A Construction Permit must be obtained from the Space Florida Building Official in order to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to erect, install, enlarge, alter, repair, remove, convert or replace any electrical, gas, mechanical or plumbing system or to perform any other construction work on property for which Space Florida is responsible.

### 2.4.3 Submittals

The Applicant shall submit to the Space Florida Building Official the following items.

- a. Complete and dated plans and specifications (including traffic control plans if applicable) of sufficient clarity to indicate the location, nature and extent of the work proposed and with sufficient detail to indicate that the proposed work conforms to the provisions of the Florida Building Code (FBC), the Development Manual (DM), and other applicable codes, laws, statutes, orders, and regulations. The Tenant shall submit plans, in Portable Document Format (PDF) with one hard copy, for review at the following levels of completion; Schematic/Conceptual Design, Design Development, and Construction Documents as defined by American Institute of Architects (AIA) standards. All plans shall be 22 x 34 inch format. Plans and specifications shall be prepared by an architect or engineer or other design professional licensed in the State of Florida to practice as such and shall bear the seal of the design professional responsible for preparation of the plans and specifications. Submit PDF and eight (8) hard copy sets of construction documents. The Space Florida Building Official may accept half-size prints for plan review.
- b. Completion of an Accessibility Compliance Checklist (ACC) (refer to Appendix

1A) is required for all projects. Submit required documents per the ACC with this Application. A construction permit cannot be issued until all required information has been received and approved.

- c. If applicable, the completion of Airspace Study Application Form (ASAF) (refer to Appendix 1A. Approval from the Federal Aviation Administration (FAA) is required for projects resulting in a change in the SLF Layout Plan or for the use of cranes and certain other construction equipment. Permits for construction shall be limited until required FAA approvals are obtained.
- d. Applicant is required to submit an Environmental Compliance Checklist (ECC) (refer to Appendix 1A) to the Spaceport Health, Safety and Environmental Manager (HSE). The purpose of the ECC is to identify the environmental regulations that apply to the proposed construction or to the operation of the completed work, structure, or facility. A Record of Environmental Checklist (REC) shall be issued by SPFL outlining specific requirements to be implemented in the Tenant's development. The Tenant must submit to the Space Florida Building Official all applicable documentation required by the REC. A Construction Permit cannot be issued until all required information has been received and approved.
- e. A check payable to Space Florida for payment of Plan Review and Permit Fees must be paid at the Space Florida Building Official's office prior to issuance of a Construction Permit. Furnish to the Space Florida Building Official a Certification Letter (internal memorandum or e-mail for Space Florida projects) stating the estimated cost of construction, which will be used to calculate the plan review cost and construction permit fee.
- f. Prior to proceeding with the installation of fire protection or fire alarm systems, three (3) full-size sets of shop drawings, hydraulic calculations and related submittal data must be submitted to Space Florida, who shall forward them to NASA. Any state required permits or presence of state required inspectors shall be coordinated by the Tenant. Work related to these systems may not proceed until the related shop drawings have been approved by NASA.
- g. Tenant shall complete and submit the Design Submittal Content Checklist (Appendix 1D) with each major design submittal.

#### **2.4.4 Building Construction Projects**

For building construction projects, provide the following information on the cover sheet of the drawings:

- a) Project Number
- b) Structure ID Number
- c) Tenant contact information name, address and phone number
- d) Design consultant name, address and phone number
- e) The edition of the codes under which the project is designed
- f) Sustainable Rating System

- g) Building Code Use and Occupancy Classification
- h) Building Code Construction Type
- i) Design Occupant Load and Exiting Analysis
- j) Whether an automatic sprinkler system is provided
- k) U-factors of building envelope systems and a statement signed and sealed by the architect of record that the building envelope complies with the Energy Code
- l) Tabulation of building components and systems and a statement signed and sealed by the Engineer of Record that all building components and systems comply with the Energy Code.

#### **2.4.5 Construction Permit Issued**

A Construction Permit, in the form of an approval letter, shall be issued when the following has been determined:

- Plans for the proposed project are in compliance with the Florida Building Code and all other applicable code requirements;
- DM and that of all other regulatory requirements have been met;
- Space Florida Building Official has approved the Construction Application.

#### **2.4.6 Dig Permits**

All excavations, cores, bores, and digging operations associated with construction require a Dig Permit requested using “KSC Form 26-312V3 NS (Rev.08/09)” (refer to Appendix 1A). Before any excavations or digging activities occur the Tenant is required to perform utility sweeps of the impacted area. Tenants shall coordinate all digging activities with ISC Duty Office Support, [REDACTED] and Sunshine 811, each day prior to commencing any digging or excavation work. An approved Dig Permit number shall be required for permission to proceed.

### **2.5 Project Construction and Inspection**

#### **2.5.1. Pre-construction Coordination**

Through the approval letter, the Tenant is given instructions to contact the Space Florida Building Official for the purpose of scheduling a pre-construction conference. The conference should include the Tenant, the Tenant's Contractor and the Contractor's major Subcontractors. The Contractor will be briefed on rules, regulations and procedures to be followed for construction projects at CCS. The Contractor must submit an emergency phone list, any required submittals and a construction schedule. After posting the Construction Permit and placing approved construction documents at the project site, the Contractor may begin construction.

#### **2.5.2. Project Construction Inspection**

An inspection is required by Space Florida Building Official and others as applicable before covering or concealing any electrical, plumbing, utility, mechanical, fire sprinkler,

fire alarm or structural systems. Work may not progress beyond any point for which an inspection is required until the Contractor receives an approved inspection report for the inspected work. Prior to completion of construction, a punch list inspection shall be performed with Space Florida personnel or their representative. All punch list items shall be addressed prior to final completion of construction activities. A Copy of the Inspection Checklist is attached as Appendix 1E.

### **2.5.3. Punch Lists**

Depending on the complexity of the construction project, Space Florida reserves the rights to issue construction phase(s) dependent punch lists. The punch list shall be documented in electronic format editable by others. At substantial completion of the overall construction project, Space Florida shall issue a final substantial completion punch list. Upon a mutually agreed time frame, between substantial completion and final completion, Space Florida and Tenant shall conduct a pre-final completion inspection at which time a final punch list shall be prepared. All punch list items shall be completed prior to final completion of the project.

## **2.6 Contract Closeout and Closeout Documentation**

### **2.6.1 Record Documents**

Record documents (as-constructed) reflecting the final installation after all modifications and changes shall be furnished to the Space Florida Contact at the end of each construction project. Record specifications shall be those used for the actual construction, marked with changes made by addendum, change order, or product substitution. Provide hard copy originals and electronic media of record specifications. Record drawings shall be provided in AutoCAD, ARCGIS and PDF formats. All file transfers shall be written to Digital Versatile Disk (DVD) or other Space Florida approved storage devices. All files shall be uncompressed in the file format specified by Space Florida. The DVD shall be in a DVD jewel case, and both the DVD and the case shall be appropriately labeled. The record drawings shall include the following information:

- a) The final location, alignments and material type of all underground utilities.
- b) The final location of all structures, buildings, roads, parking areas, and other elements of the project.
- c) The final locations of all heating and air conditioning equipment, ductwork, air devices, piping, or other devices necessary to the operation of the Heating, Ventilation, and Air Conditioning (HVAC) systems.
- d) The final locations of all plumbing equipment, pumps, piping, necessary for the operation of the plumbing systems.
- e) The final locations of all the electrical equipment, devices, wiring sequences, wiring methods and connections of component systems as installed. The drawings shall include color codes, panel identification, and any other information necessary to identify and locate the equipment.
- f) All initiating devices such as flow switches/pressure switches for fire protection systems.
- g) Initiating devices, wiring sequence, wiring method, and connections of the

components of the protective signaling system as installed. The drawings shall include color codes and terminal identifications.

- h) The final locations of all the communications equipment, devices, wiring sequences, wiring methods and connections of component systems as installed. The drawings shall include color codes.
- i) The final locations of all the security equipment, wiring sequences, wiring methods and connections of component systems as installed. The drawings shall include color codes.
- j) All abandoned piping and underground utilities or structures.
- k) Location of any identified, but undisturbed asbestos remaining encapsulated.

### **2.6.2 Operations and Maintenance Manuals and Warranties**

For Space Florida projects records transfer shall also include Operations and Maintenance Manuals (O&MM) for all systems and equipment; copies of all approved construction submittals and change orders; all acceptance test records and construction approvals; all manufacturer and contractor warranties; and any other documents required by the contract documents.

### **2.6.3 Contract Closeout and Records Transfer**

Upon completion of any Tenant or Space Florida construction or improvement project, a full set of record drawings and technical specifications showing As-Built conditions shall be provided to Space Florida in electronic format. The electronic files of drawings shall be in both PDF and AutoCAD format.

For Space Florida projects records transfer shall also include O&MM for all systems and equipment; copies of all approved construction submittals and change orders; all acceptance test records and construction approvals; all manufacturer and contractor warranties; and any other documents required by the contract documents.

## **2.7 Certificates of Occupancy/Use**

The Contractor must deliver to the Space Florida Building Official the completed Environmental Close-Out Checklist (ECOC), refer to Appendix 1A, (including Material Safety Data Sheets (MSDS) for all materials used in the construction) at the close of construction. Upon acceptance of the ECOC, other required submittals and acceptance of the work following all required inspections, the Space Florida Building Official shall issue a Certificate of Substantial Completion (CSC). After receipt of the required As-Built, Record Documents and correction or completion of any outstanding items of work as listed in the CSC, the Space Florida Building Official shall issue the Certificate of Occupancy/Use (CO/U).

## **SECTION 3 – DESIGN STANDARDS**

### **3.1 Design Standards Introduction**

Designers are encouraged to consider demonstration projects that engage new technologies in partnership with entities around CCS and Space Florida.

It shall be noted that within the general context of promoting a cohesive physical environment, this Development Manual is nevertheless meant to encourage the creativity of building and site designers. This Development Manual is not prescriptive in its definition of absolute requirements for what constitutes visual interest or most effectively promotes interaction. Rather, it recommends that such issues be addressed with thoughtfulness and care. Instead of providing a rigid set of rules, this manual is intended to allow the designers as much flexibility as possible to achieve the ultimate goals and concepts described herein. Accordingly, a variety of design expressions are both desirable and encouraged. Nevertheless, by adhering to the key principles defined above, CCS shall develop, over time, a strong contextual tie to the environment, a coherent identity and a distinct sense of place.

### **3.2 Design of Streets and Roadways**

FDOT Manual of Minimum Uniform Standards for Design, Construction and Maintenance for Streets and Highways, latest version, shall govern the design of streets, parking lots, and roadways. These standards can be obtained via the FDOT website: <http://www.dot.state.fl.us/>



### 3.3 NASA Standards

The following Kennedy NASA Procedural Requirements (KNPR) and NASA Procedural Requirements (NPR) apply to development and operation of facilities at the CCS. Copies of the standards can be obtained from the following web site:  
<https://tdglobal.ksc.nasa.gov/ReferencedDocuments/>

**Table 2: NASA Procedural Requirements**

SECTION	DESCRIPTION	SLF	EP	PF	LC
KNPR 8715.3-3	KSC Safety Procedural Requirements	X	X	X	X
KNPR 8715.5	Range Flight Safety Program Requirements	X			X
KNPR 1860.1	KSC Radiation Protection Program	X	X	X	X
KNPR 1860.2	KSC Nonionizing Radiation Protection Program	X	X	X	X
NASA Form 1509	Facility Project - Brief Project Document	X	X	X	X
NASA Form 1510	Facility Project Cost Estimate	X	X	X	X
NASA STD 8719.11	Safety Standard for Fire Protection	X	X	X	X
KSC STD E-0012	Facility Grounding and Lightning Protection	X		X	X
KNPR 9715.2	Comprehensive Emergency Management Plan	X	X	X	X
KSC Form 21-608	NASA-KSC Environmental Checklist	X	X	X	X
KCA 4185	Programmatic Agreement for Management of Historic Properties	X	X		X
KSC Form 21-555	NASA-KSC Pollution Incident Report	X		X	X
NASA Form 1046,	Transfer and/or Notification of Acceptance of Accountability of Real Property.	X	X	X	X

SLF: Shuttle Landing Facility; EP: Exploration Park; PF: Processing and Other Facilities; LC: Launch Complexes

### 3.4 Laws and Regulations

The following laws, regulations and statutes shall apply to all projects where applicable.

**Table 3: Laws and Regulations**

Regulation	Reference	Description	SLF	EP	PF	LC
Davis Bacon Act*	40 U.S.C. 3141-3148	Local prevailing wages on public works projects for laborers and mechanics	X	X	X	X
Florida Statute	255.253	Sustainable Building Rating	X	X	X	X
Protection of Historic Properties	36 CFR Part 800	Protection of Historical Properties	X			X
Florida Statute	373	Water Resources	X	X	X	X
29 U.S. Code	Chapter 15	Occupational Safety and Health	X	X	X	X
Hazardous Materials	40 CFR Part 302	Designation of Hazardous Substances	X		X	X
	40 CFR Part 355	Emergency Planning and Notification	X		X	X
	49 CFR Parts 171-180	Hazardous Materials Regulations	X		X	X
	Title 40 Part 112	Oil Pollution Prevention	X		X	X
10 U.S Code	Section 2692	Storage, Treatment and Disposal of Non-Defense Toxic and Hazardous Materials		X		
Florida Administrative Code	FAC Chapter 62-150	Hazardous Substance Release Notification	X		X	X
	FAC Chapter 62-770	Petroleum Contamination Site Cleanup Criteria	X		X	X
Petroleum Storage Tanks	FAC Chapter 62-761	Underground Storage Tank (UST) Systems	X	X	X	X
	FAC Chapter 62-762	Aboveground Storage Tank (AST) Systems	X	X	X	X

- SLF: Shuttle Landing Facility; EP: Exploration Park; PF: Processing and Other Facilities; LC: Launch Complexes
- \*Use Davis Bacon Act wage rates only when applicable.

### 3.5 Codes and Standards

The design and construction of all facilities and improvements shall be in compliance with all applicable local, state, and federal laws and regulations, including Chapter 373, Florida Statutes; and in conformance to the latest edition of the Florida Building Code and other design and construction standards adopted by the State, and in effect prior to the start of design. Some of these requirements may include industry standards from the following organizations.

**Table 4: Organization Acronym's**

ACRONYM	STANDARD DESCRIPTION
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute International
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers (ASME)
ASSE/SAFE	American Society of Safety Engineers
ASTM	American Society of Testing and Materials
AWWA	American Water Works Association
AWS	American Welding Society
ASDA	Americans With Disabilities Act Accessibility Standards
CFR	Code of Federal Regulation
DOD	Department of Defense
EPA	Environmental Protection Agency
FAR	Federal Acquisition Regulations
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FAC	Florida Administrative Code
FBC	Florida Building Code
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
IES	Illuminating Engineering Society of North America
NETA	International Electrical Testing Association
IEC	International Electrotechnical Commission
KNPR	Kennedy NASA Procedural Requirements
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
SJRWMD	St. Johns River Water Management District
UL	Underwriters Laboratories
USAF	United States Air Force
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture

### **3.6 Sustainability**

Space Florida is committed to conserving energy and natural resources by applying sustainable design practices intended to conserve energy, water, and other renewable and non-renewable resources. Tenants shall incorporate the adopted State of Florida Sustainability Standards into design and construction of their facilities. The Tenant has the option of selecting one of the rating systems approved for use in FS Section 255.253.

#### **From FS 255.253:**

“Sustainable building rating or national model green building code” means a rating system established by the United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) rating system, the International Green Construction Code (IGCC), the Green Building Initiative’s Green Globes (GBIGG) rating system, the Florida Green Building Coalition (FGBC) standards, or a nationally recognized, high-performance green building rating system as approved by the department.” The IGCC is not a standard, but is intended to be used as a jurisdictional and municipal building code for new construction and major renovations.

The selected rating system and rating tier shall be listed in the submitted Form 1509 Template (of equivalent form) in Appendix 1A. Refer to Appendices 1B for more information on the acceptable sustainability standards.

Designers are encouraged to consider demonstration projects that engage new technologies. Projects should also be respectful of their location within the Merritt Island Wildlife Refuge (MIWR) and the National Canaveral Seashore (NCS), through restoration of habitat and use of native materials.

### **3.7 Site Development – City of Titusville Support**

Space Florida has an Interlocal Agreement with the City of Titusville to perform building code reviews and inspections for vertical construction governed by the FBC. Space Florida is the Building Official and writes the permits and CO/U. The City of Titusville has no authority over Space Florida Projects, but their code reviews, inspections, and recommendations will be taken into account by Space Florida.

#### **3.7.1 Stormwater**

Any construction activity, with more than 1,000 square feet of new impervious surface, requires a stormwater management report signed and sealed by a Professional Engineer (PE). All projects must have a legal positive outfall or retain the 100-year storm event.

#### **3.7.2 Fire Hydrant Determination**

Use International Organization for Standardization (ISO) method per NFPA.

### **3.7.3 Hydraulic Analysis**

Hydrant flow tests should be requested at the pre-application conference. A hydraulic analysis should be completed for any system requiring a main extension to the potable water system (private or public).

### **3.7.4 Water Demand Calculations**

Calculations shall show all water demand requirements within the structures and methodology used for determination of meter size and service lateral size.

### **3.7.5 Lift Station Calculations**

Calculations shall include estimated sewer flows, peak factor used, velocities, head loss, pump selection information, pump curve, run time in both minimum and maximum cycles, wet well capacity and size, pumps on levels, pumps off levels, lag times and buoyancy calculations.

### **3.7.6 Parking Requirements**

The documentation shall include the number of spaces per square foot required and proposed, handicap spaces required and proposed, bicycle spaces required and proposed, and totals.

### **3.7.7 Spread Calculations**

This is required for any new or extension of roads and shall include the following minimum requirements. A 10-year, 24-hour tail water condition shall be used. The rainfall intensity shall be four inches/hour. A minimum of one travel lane (12 feet wide) will be required to be maintained in the worse condition. The hydraulic grade line shall be six (6) inches below the inlet invert.

### **3.7.8 FDEP – NPDES (NATIONAL POLLUTANTS DISCHARGE ELIMINATION SYSTEM) NOTICE OF INTENT**

All construction sites that disturb one acre or greater of land are required to obtain coverage under the Generic Permit for Stormwater Discharge from Large and Small Construction Activities. DEP 62-621.300(4) (a). Sites one acre or greater must complete a Notice of Intent (NOI) - DEP form 62- 621.300(4) (b) to comply with FDEP National Pollutant Discharge Elimination System (NPDES) Phase II Construction Permit. A copy of the NOI and SWPPP must be submitted to the Space Florida prior to construction. FDEP is the agency responsible for reviewing, processing, and issuing NPDES permits. The NOI and the permit application fee must be submitted to FDEP for issuance of the NPDES Permit.

### **3.7.9 ST. JOHNS RIVER WATER MANAGEMENT DISTRICT PERMITTING**

The St. Johns River Water Management District (SJRWMD) regulates construction of drainage systems, storm water treatment ponds, large uses of water, and other types of projects, in order to protect the State's water resources and the rights of existing water

users. Space Florida will not make any determination of SJRWMD permit requirements. With advanced notification to Space Florida and NASA tenants shall contact the SJRWMD Palm Bay Office for any permit determinations or requirements.

### **3.7.10 Standard Construction Details**

During the design preparation phases of projects which require, Space Florida permitting/approval or for information purposes, Tenants and Tenant's design teams shall review the standard construction details provided on the City of Titusville website: <http://www.titusville.com/Page.asp?NavID=2110>. These details provide standards associated with common and potable water; pervious concrete; erosion control; lift station; reclaimed water; sanitary sewer; and, water resources technical specifications.

## **3.8 Architecture**

### **3.8.1 Building Aesthetics**

Recognizing Tenant buildings need to be designed to meet the operational needs of the specific Tenant, the following standards are provided relative to the aesthetics of the structures.

- a) Single large box-like building masses should be avoided where the operational space requirements allow for changes in building mass and appearance. Changes in building mass should not be cosmetic or decorative in nature.
- b) Durable materials shall be used for building exteriors including architectural precast, natural metals, anodized aluminum, clear glass and natural stone. Differentiation of material to accent the public entrance side of the building is suggested. Front entries shall be enhanced areas of the building facades. Accessible routes and equipment shall be integrated with the entries and building design.
- c) Painted materials should be finished in shades of gray, silver, or light colors. Painted brick, stone and concrete are not permitted. The use of bold or bright colors on painted materials shall be limited and subject to Space Florida approval. Reflective glass and Exterior Insulation and Finish Systems (EIFS) shall not be permitted.
- d) Roof top mechanical equipment should be positioned or screened from view. Ground level mechanical and electrical equipment should be enclosed in a structure integrated into the building design, where possible, or screened. Direct sightlines from public ways to mechanical equipment, tanks, transformers, generators and the like shall not be allowed.
- e) Truck delivery / loading areas shall be located at the sides or rear of the building where possible, with visual screening provided to any delivery/loading area that is visible from the front of the building. Long-term truck parking areas shall be screened visually with fencing or landscaping.
- f) Waste and recycling areas on the site shall be visually screened.

### **3.8.2 Architectural Design**

Architecture and building material selection shall be compatible with the CCS Master Plan context and Florida coastal location.

- a) New construction and rehabilitation shall comply with the FBC with regard to environmental design factors such as wind damage prevention, mold prevention, and insect protection.
- b) Non-combustible construction is recommended.
- c) Site design shall be compatible with the building type, geometry and convenient accessible routes to building entries.
- d) Energy saving features and sustainable design features beyond building code requirements are recommended.
- e) Front entries of buildings shall provide overhead weather protection and window openings shall have sun protection. General shading of areas close to the building is recommended.
- f) Roof drainage shall be compatible with the proposed building envelope, site drainage plan and directing water away from high pedestrian traffic areas.
- g) Noise-producing operations related to building function, internal or external, shall have acoustic noise reduction measures provided.
- h) Building and site security measures shall be discreet in design and placement. Razor-wire and similar security fence measures are prohibited.
- i) Buildings close to flight lines or runway access shall have Foreign Object Damage (FOD) prevention measures.

### 3.8.3 Signage

Tenant shall not use NASA or Space Florida name or logo in any form on any signage. Signage on the exterior of buildings or free standing signage within the lease area is limited to Tenant company name and logo (commercial signage) except for way finding and code required signage.

Way finding and code required exterior signage shall be approved by Space Florida including graphics, fonts, and color. Building shall have appropriate building number or street number indicated on front of the building.

The location, size and construction of commercial signs will be subject to the prior approval of Space Florida. Internally illuminated signs must be approved by Space Florida and the requirements of paragraph 3.8.8 Exterior Lighting. All wall signs must be mounted flat on the surface of the walls and may not project above the roof line of any building nor extend more than twelve inches from the building wall on which it is located. No hand-painted, animated or flashing signs will be permitted. Each lease parcel may have one free standing sign located at the primary entrance to the lease parcel. The sign must be no closer than ten feet to the entrance drive and must be set back no less than 10 feet from the lease boundary line. The design of the entrance sign shall be consistent with these standards and will require specific written approval from Space Florida. Each building will be permitted one additional free standing or fascia type sign at the primary entrance to such building. No part of any free standing sign may exceed an above-grade height of six (6) feet.

No more than four colors (including black and white) will be permitted on any sign. Exceptions may be made by Space Florida for company logos, so long as the Tenant of the Parcel obtains the prior written approval of Space Florida for such variance. No signs using vacuum-formed plastic lettering or day-glow colors will be permitted on any Parcel.



### 3.8.4 Landscaping

Landscaping in the form of turf, shrubs, and plants shall be utilized in all non-paved areas within the Tenant's leased area. Plant and shrub material shall be selected based on soil conditions, low water requirements/summer drought tolerance, ease of maintenance, and compatibility with the native vegetation in the surrounding area. Use of xeriscape is encouraged. For acceptable materials consult the Florida Native Plant Society (FNPS). Maximum grades for landscaping areas shall be 1:3. Landscaping breaks at large vehicle parking areas or linear rows of parking spaces are recommended.

### 3.8.5 Noise

All structures, whose primary function is to house people-oriented activities, shall be designed with a suitable combination of building materials and execution of construction details in accordance with established architectural and acoustical principles to reduce the noise between the outside and inside of the building to the following levels.

The methodology to be used shall be the Shell Isolation Rating (SIR) method set out by the U.S. Department of Commerce (USDC), National Bureau of Standards (NBS) *"Design Guide for Reducing Transportation Noise In and Around Buildings"* - Publication: Building Science Series No. 84.

The design shall take into account all possible paths into the facility to include, but not limited to walls, roofs, windows, doors and ventilation openings.

### 3.8.6 Curb Cuts

The location of all curb cuts and any driveway connection serving any Parcel must be approved by Space Florida.

### 3.8.7 Exterior Lighting

Exterior lighting on a Tenant lease shall be limited to internal lighting of signs, security and safety illuminations of adjacent streets, parking areas, loading areas, service areas, access drives, walkways and building entrances and exterior lighting of overall building surfaces. The location, design, materials and type of any exterior lighting shall be subject to the approval of Space Florida. Such lighting shall not produce any excessive glare or reflection onto any portion of any adjacent street or parcel or into the path of any oncoming or passing vehicle. No flashing, animated or intermittent lighting shall be visible from the exterior of any building. All parking lots, loading areas, service areas, pedestrian walkways and security lights, whether wall-mounted or free-standing, must be concealed source fixtures, where the lenses do not project below the opaque section of the fixture. Lighting fixtures for parking areas shall be selected from Space Florida standards and may only be varied with the prior approval from Space Florida. All lighting on a parcel shall be coordinated as to intensity to provide for an attractive overall lighting plan and must be approved in writing by Space Florida.

Refer to Appendix 1C KSC Exterior Lighting Requirement prepared by NASA for additional details.

### **3.9 Hazardous Material, Fuel, and Propellant Storage**

Storage of hazardous materials, fuel and propellants shall be in accordance with all Federal and State regulations and applicable codes and only if approved by Space Florida.

### **3.10 Utility Connections**

All utility services located on or adjacent to any parcel, including, without limitation, any telephone, gas, water, sewer, cable TV, or electric lines or connections, shall be located underground.

### **3.11 Explosive Siting and Range Safety**

Explosive siting shall be in accordance with Air Force Manual 91-201 and CFR 14 Chapter III Part 420. Range Safety shall be in accordance with CFR 14 Chapter III Parts 415, 417, 420 and 431.

### **3.12 Safety Reporting – Mishaps and Close Calls**

All occupants of CCS shall comply with Kennedy NASA Procedural Requirements (KNPR) 8715.3-3, KSC Safety Procedural Requirements for Space Florida Organization's Operating in Exclusive-Use Facilities, with the tailored version of KNPR 8715.3-3 Chapter 7 replacing Chapter 7 of the KNPR. Refer to Appendix 1A for additional details.

NASA shall provide fire and emergency response services for CCS in accordance with the service levels specified in the Reimbursable Space Act Agreement (RSAA) on the basis of developed square footage of buildings and structures, the building types, and types of occupancy.

### **3.13 Security and Security Badging**

NASA-KSC shall provide security and emergency response services for CCS in accordance with the service levels specified in the RSAA for routine patrols of the vicinity and premises of CCS, and shall coordinate law enforcement activities with the Brevard County Sheriff's Office. Security for entry to, or activities within, individual Tenant facilities shall be the responsibility of the individual Tenants.

### **3.14 Environmental Compliance and Reporting**

Refer to Appendix 1A for environmental compliance requirements and reporting.

## APPENDIX 1A – FORMS

1. Tenant Questionnaire (to be provided in the future)
2. NASA Form 1509 Facility Project - Brief Project Document
3. NASA Form 1510 Facility Project Cost Estimate
4. KSC Form 26-312V3 NS Utility Locate/Excavation Permit Request
5. KSC 21-608V2 NS Environmental Compliance Checklist
6. KSC Form 21-555 NASA KSC Pollution Incident Report (to be provided in the future)
7. Accessibility Checklist (to be provided in the future)
8. Airspace Study Application (to be provided in the future)
9. Environmental Close-out Checklist (to be provided in the future)
10. Space Florida Construction Application (to be provided in the future)

VERSION 1.1

## Commercial Aerospace 1509 Template Information Template for Proposed Facility Modifications Requiring NASA Approval

**Date:**

**Location:** Kennedy Space Center, Florida

**Agreement # KCA-**

**Facility Number / Name:**

**Project Title:**

**Scope / Description:**

Provide full description of any proposed construction, alteration, or repair work. Include full description of any proposed demolition work, including specific facilities, structures, facility systems, or collateral equipment to be removed.

**Justification:**

**Technical Point of Contact:**

**Schedule Dates:**

Design Phase

Construction Phase

**Summary of Estimated Costs:**

Design:

Construction:

Demolition:

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