



Kitty Hawk Wind



AVANGRID

Construction and Operations Plan

Appendix DD - Air Traffic
Flow Analysis

September 30, 2022

Submitted by

Kitty Hawk Wind, LLC
1125 NW Couch Street, Suite 600
Portland, Oregon 97209

Submitted to

Bureau of Ocean Energy Management
45600 Woodland Road
Sterling, Virginia 20166

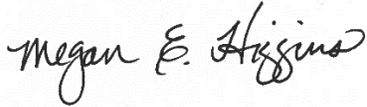
Prepared by

Tetra Tech, Inc.
10 Post Office Square, 11th Floor
Boston, Massachusetts 02109



Appendix DD – Air Traffic Flow Analysis

Document Reference: KTH-GEN-CON-PLN-AGR-000067_037 Rev 03

Prepared by:	Checked by:	Approved by:
 Capitol Airspace Group September 30, 2022	 September 30, 2022	 September 30, 2022

Revision Summary				
Rev	Date	Prepared by	Checked by	Approved by
01	11 Dec 2020	Capitol Airspace Group	Tetra Tech, Inc.	Brian Benito Jr.
02	26 Jul 2021	Capitol Airspace Group	Tetra Tech, Inc.	Brian Benito Jr.
30	30 Sep 2022	Capitol Airspace Group	Tetra Tech, Inc.	Megan Higgins

Description of Revisions			
Rev	Page	Section	Description
01	All	All	Submitted to BOEM
02	All	All	Updates to Project Design Envelope
03	None	None	Updated based on Project name

As of Q3 2022, the Company has updated the Project name from “Kitty Hawk Offshore Wind Project” to “Kitty Hawk North Wind Project”.

The technical content of this report has not been changed since the previous submission.

Kitty Hawk Offshore Wind Project

Kitty Hawk Wind, LLC
Offshore Corolla, NC

Air Traffic Flow Analysis

30 JUNE 2021



Capitol Airspace Group
capitolairspace.com
(703) 256 - 2485



Summary

Capitol Airspace conducted an air traffic flow analysis for the Kitty Hawk Offshore Wind Project (the Project - consisting of the northwestern portion (black outline, [Figure 1](#)) of BOEM Lease Area OCS-A 0508 (purple outline, [Figure 1](#))) located off the coast of Corolla, North Carolina. At the time of this analysis, 70 wind turbine generator (WTG) locations had been identified (black points, [Figure 1](#)). At 1,042 feet (317.5 meters) above mean sea level (AMSL), proposed WTGs in the northwestern section of the study area would require an increase to Norfolk (ORF) Terminal Radar Approach Control (TRACON) minimum vectoring altitudes (MVA). The purpose for this analysis was to determine the number of operations potentially affected by the airspace changes required to accommodate wind development up to 1,042 feet (317.5 meters) AMSL.

The Federal Aviation Administration (FAA) conducts aeronautical studies to ensure that proposed structures do not affect the safety of air navigation and the efficient utilization of navigable airspace by aircraft. Proposed structures undergoing aeronautical study that exceed obstacle clearance surfaces will be identified as having an adverse effect. If the FAA determines that the adverse effect would impact a significant volume of operations, it could be used as the basis for determinations of hazard. For instrument flight rules (IFR) operations the significant volume threshold is one per week; for visual flight rules (VFR) operations the threshold is one per day.

Historical air traffic data (collected from 01 SEP 2018 through 31 AUG 2019) indicates that the required changes to Norfolk (ORF) TRACON MVA sectors should not affect a significant volume of radar vectoring operations. Additionally, the impact on Norfolk (ORF) TRACON MVA would occur greater than 26 nautical miles (48.2 km) outside of Norfolk (ORF) TRACON airspace. As a result, it is possible that Norfolk (ORF) TRACON would be willing to increase the affected MVA in order to accommodate wind development up to 1,042 feet (317.5 meters) AMSL. This mitigation option is subject to FAA review.

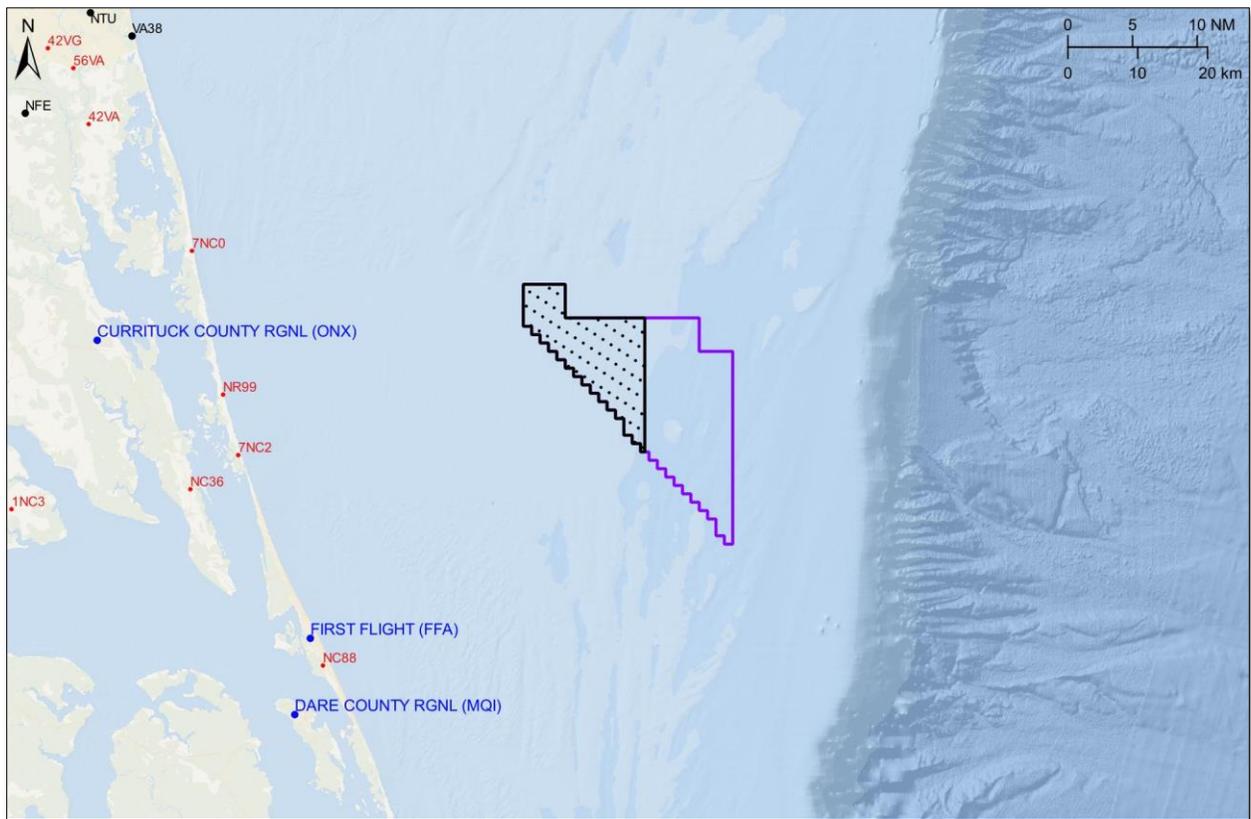


Figure 1: Public-use (blue), private-use (red), and military (black) airports in proximity to the Project



Methodology

At 1,042 feet (317.5 meters) AMSL, proposed WTGs in the northwestern section of the study area (red area, [Figure 2](#)) will exceed MVA sector obstacle clearance surfaces (hatched purple, [Figure 2](#)). As a result, the FAA must modify sector boundaries or establish isolation areas with increased MVAs. These sector modifications result in a three-dimensional volume of affected airspace where radar vectoring would be unavailable. If the FAA determines that this impact would affect as few as one radar vectoring operation per week, it could result in determinations of hazard.

In order to quantify the number of radar vectoring operations potentially affected by MVA sector modifications, Capitol Airspace evaluated FAA National Offload Program (NOP) radar returns covering the period between 01 SEP 2018 and 31 AUG 2019. The FAA NOP data contained 34,435,429 radar returns associated with 434,273 flights receiving air traffic control services.¹ Each flight that had at least one radar return within the affected airspace was analyzed for altitude and direction trends.

Flights that maintained one or more specific headings within the affected airspace operated in a manner consistent with receiving radar vectoring services. These flights also maintained or climbed/descended to maintain an altitude within the affected airspace. The historical presence of these flights within the affected airspace is an indicator that the required MVA sector modifications could affect future air traffic control operations.²

¹ NOP data excludes certain military flights due to the sensitive nature of some operations.

² Oceana (NTU) Radar Air Traffic Control Facility (RATCF) MVA sectors overlie the Project. However, RATCF MVA charts are not publicly available. It is possible that Oceana Approach Control minimum vectoring altitude sector obstacle clearance surfaces are lower than those described in this report. However, the study area is located approximately 20 nautical miles (NM) (37 km) outside of Oceana (NTU) RATCF controlled airspace.



Figure 2: Norfolk (ORF) TRACON FUSION 5 MVA sectors (blue) with Sector B (hatched purple) and Sector K (hatched blue) obstacle evaluation areas



Findings

Norfolk (ORF) TRACON

FUSION 5 (ORF_MVA_FUS5_2020)

Sector B

In order to accommodate wind development up to 1,042 feet (317.5 meters) AMSL, the FAA must increase the existing MVA from 1,700 feet (518.1 meters) AMSL to 2,000 feet (609.6 meters) AMSL. However, flight track data indicates that no flights operated within the affected airspace (dashed blue outline, [Figure 3](#)). This flight total represents an average of *0.00 flights per week* which is below the FAA’s threshold for a significant volume of operations. Additionally, the Project is located approximately 26 nautical miles (48.2 km) outside of Norfolk (ORF) TRACON airspace.

As a result of these findings, it is possible that Norfolk (ORF) TRACON would not object to modifying Sector B in order to accommodate wind development up to 1,042 feet (317.5 meters) AMSL. This mitigation option is subject to FAA approval.

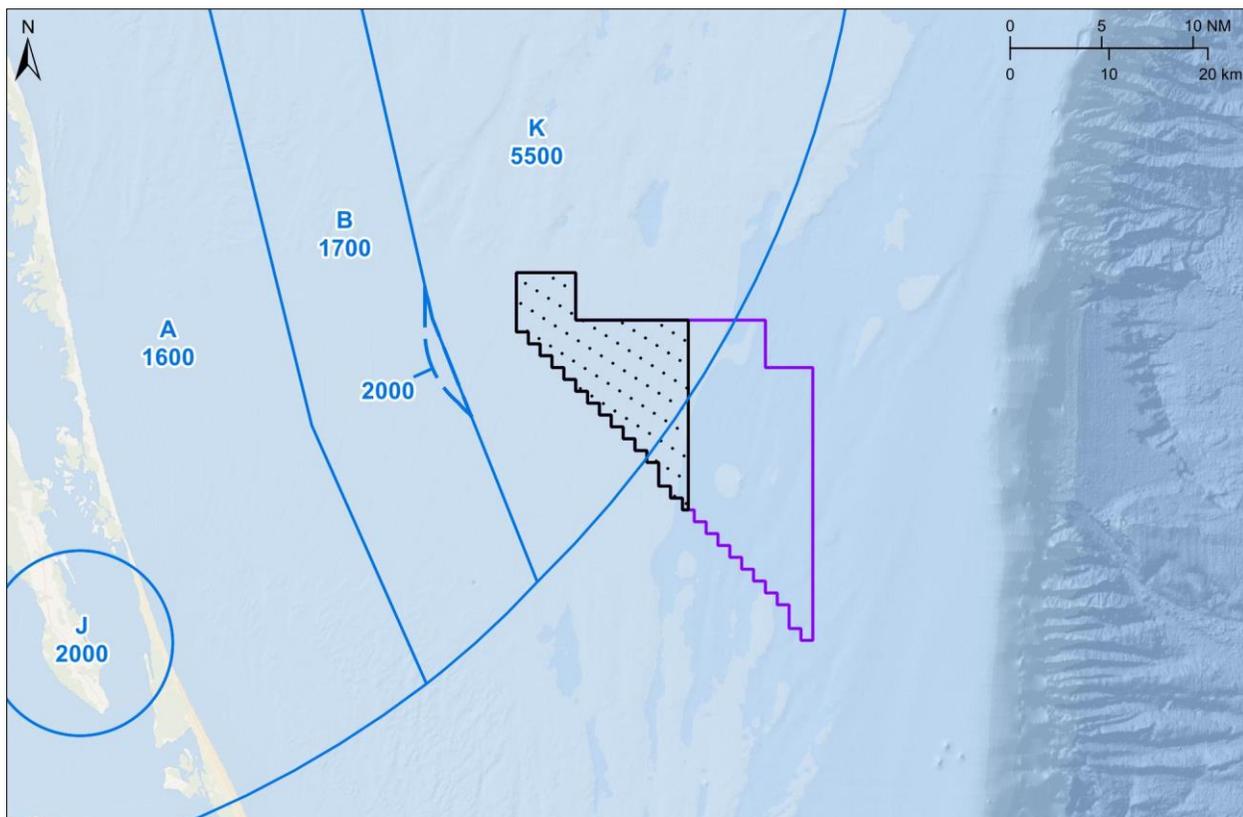


Figure 3: Norfolk (ORF) TRACON FUSION 5 MVA sectors (blue) and affected airspace (dashed blue outline)



Conclusion

Capitol Airspace assessed historical FAA radar track data covering the period of one year (01 SEP 2018 and 31 AUG 2019) to determine the number of operations that could be affected by increasing Norfolk (ORF) TRACON MVAs. In order to accommodate wind development up to 1,042 feet (317.5 meters) AMSL, the MVAs must be increased from 1,700 to 2,000 feet (518.1 to 609.6 meters) AMSL.

Historical radar track data indicates that proposed WTGs should not affect a significant volume of Norfolk (ORF) TRACON radar vectoring operations. Additionally, the Project is located approximately 26 nautical miles (48.2 km) outside of Norfolk (ORF) TRACON airspace. As a result of these findings, it is possible that Norfolk (ORF) TRACON would modify Sector B in order to accommodate wind development up to 1,042 feet (317.6 m) AMSL. This mitigation option is subject to FAA review.

Please contact [Dan Underwood](#) or [Candace Childress](#) at (703) 256-2485 with any questions regarding the findings of this analysis.