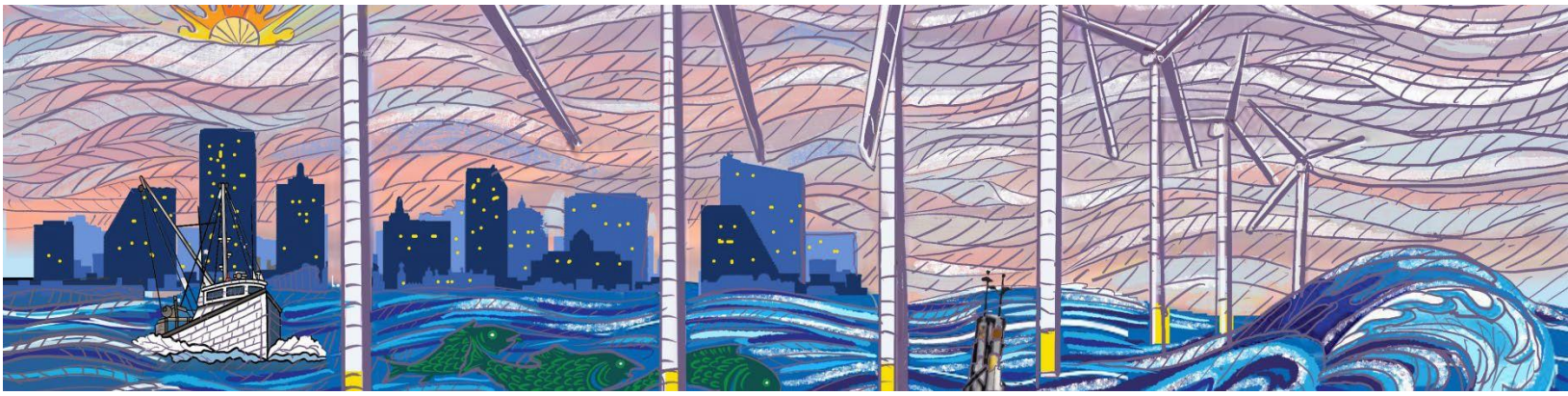

Appendix II-T3

Traffic Flow Analysis Report

Atlantic Shores Offshore Wind

Environmental Design & Research

Offshore Atlantic and Ocean Counties, New Jersey

Air Traffic Flow Analysis

August 17, 2021, Revised December 15, 2021

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Summary

Capitol Airspace conducted an air traffic flow analysis for Atlantic Shores Offshore Wind, LLC (Atlantic Shores) located off the coast of Atlantic and Ocean Counties, New Jersey. At the time of this analysis, 200 individual wind turbine locations had been identified (black points, ***Figure 1***) within the southern portion of Lease Area OCS-A-0499 (shaded gray, ***Figure 1***), referred to as the wind turbine area (WTA, black outline, ***Figure 1***). The WTA includes Project 1 (dashed blue outline, ***Figure 1***), Project 2 (dashed orange outline, ***Figure 1***), and an Overlap Area (dashed purple outline, ***Figure 1***). At 880, 890, or 1,048 feet tall, proposed wind turbines within the WTA could impact Atlantic City (ACY) TRACON minimum vectoring altitudes (MVA). Additionally, at 1,048 feet tall, proposed wind turbines in the northwestern section of the WTA would require an increase to Atlantic City International (ACY) instrument approach procedure minimum holding altitudes (MHA). 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 1,048-feet tall within the WTA.

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.

Historical air traffic data indicates that the required increases to Atlantic City (ACY) TRACON MVAs and Atlantic City International (ACY) holding pattern MHAs should not affect a significant volume of operations. As a result, it is possible that the FAA would be willing to increase these altitudes to accommodate development of wind turbines up to 1,048 feet tall within the WTA. These mitigation options are available and subject to FAA approval.

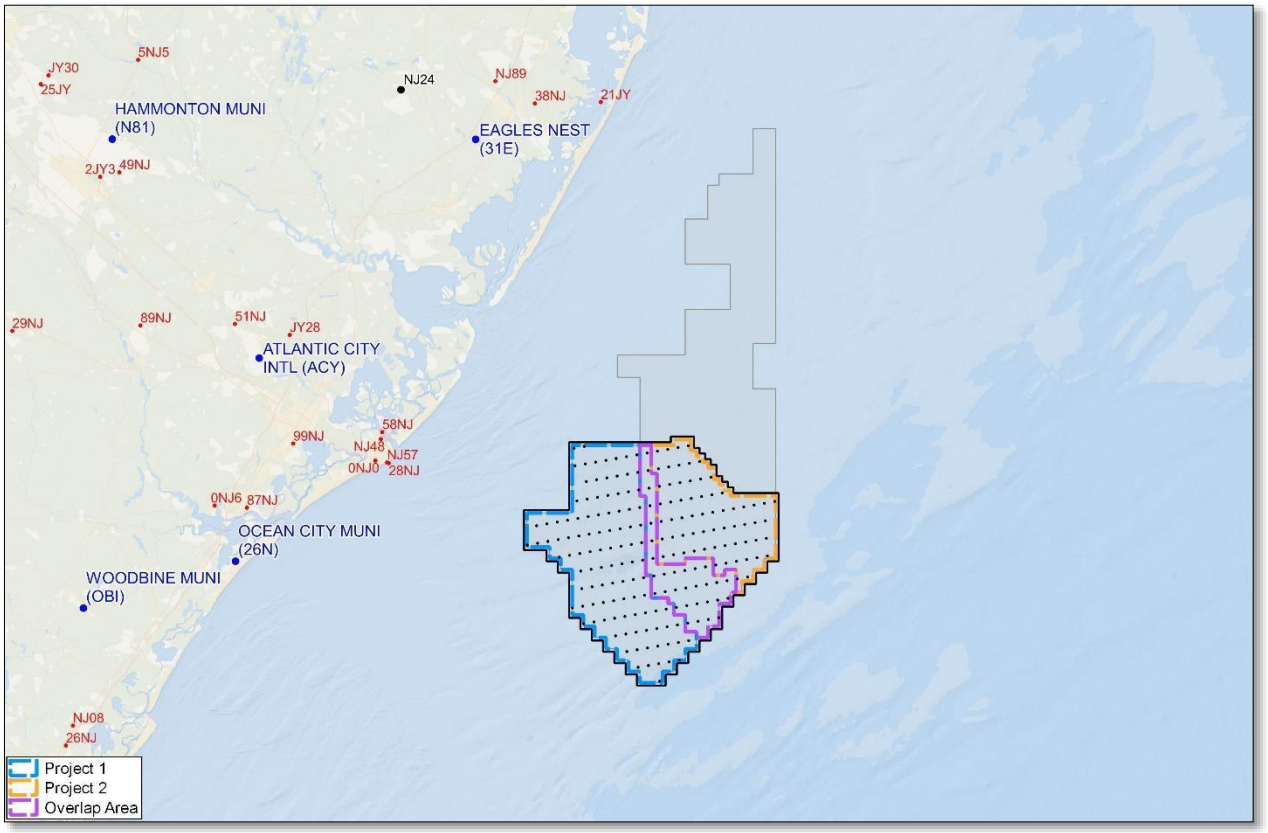

Figure 1: Public-use (blue), military (black), and private-use (red) airports in proximity to the Atlantic Shores offshore wind project

Methodology

Capitol Airspace evaluated FAA National Offload Program (NOP) radar returns in proximity to the Atlantic Shores offshore wind Projects for the period between January 1, 2019 and December 31, 2019. The FAA NOP data contained 936,495,259 radar returns associated with 8,016,455 flights receiving air traffic control services.[1] Radar tracks were created for each flight that had at least one radar return within the affected airspace and at the affected altitudes. In order to understand the nature of flight operations in and around the affected airspace, Capitol Airspace analyzed each track for altitude and direction trends. Historical flights that utilized instrument approach procedures or possibly received radar vectoring services within the affected airspace are an indicator that the required airspace changes could affect future IFR operations.

Instrument Approach Procedures

The FAA publishes instrument approach procedures that provide course guidance to on-board avionics that aid the pilot in locating the runway during periods of reduced visibility and low cloud ceilings. Proposed wind turbines that exceed instrument approach procedure obstacle clearance surfaces would require an increase to their minimum altitudes. Increases to these altitudes, especially critical decision altitudes (DA) and minimum descent altitudes (MDA), can directly impact the efficiency of instrument approach procedures.

At 1,048 feet tall, proposed wind turbines in the northwestern section of the WTA (yellow area, ***Figure 2***), including 25 proposed locations within Project 1, would require an increase to an Atlantic City International (ACY) instrument approach procedure holding pattern MHA from 2,000 to 2,100 feet above mean sea level (AMSL).

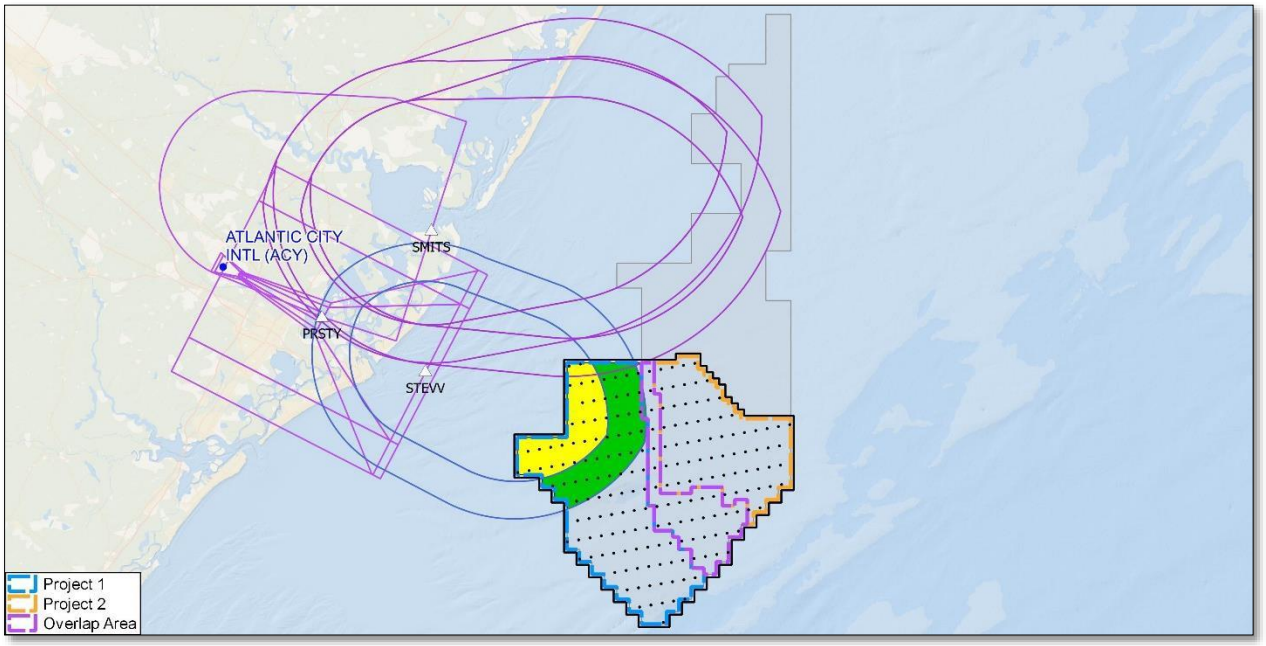

Figure 2: Atlantic City International (ACY) Localizer/DME Approach to Runway 31

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

Minimum Vectoring/IFR Altitudes[2]

The FAA publishes MVA charts that define sectors with the lowest altitudes at which air traffic controllers can issue radar vectors to aircraft. Proposed structures that exceed MVA sector obstacle clearance surfaces (e.g., hatched blue, ***Figure 3***) would require an increase to the altitudes usable by air traffic control for vectoring aircraft. At 880, 890, and 1,048 feet tall, proposed wind turbines in the western section of the WTA (red area, ***Figure 3***), including up to 83 proposed locations within Project 1, 23 proposed locations within Project 2, and eight proposed locations within the Overlap Area, would require an increase to Atlantic City (ACY) TRACON MVAs.

In order to accommodate wind development up to 1,048 feet tall, the FAA must establish isolation areas with an increased MVA. Depending on the chart affected, the isolation area would implement either a three or five nautical mile (NM) buffer around wind turbines in excess of the obstacle clearance surface. If the FAA determines that these impacts would affect as few as one flight per week, it could result in determinations of hazard.

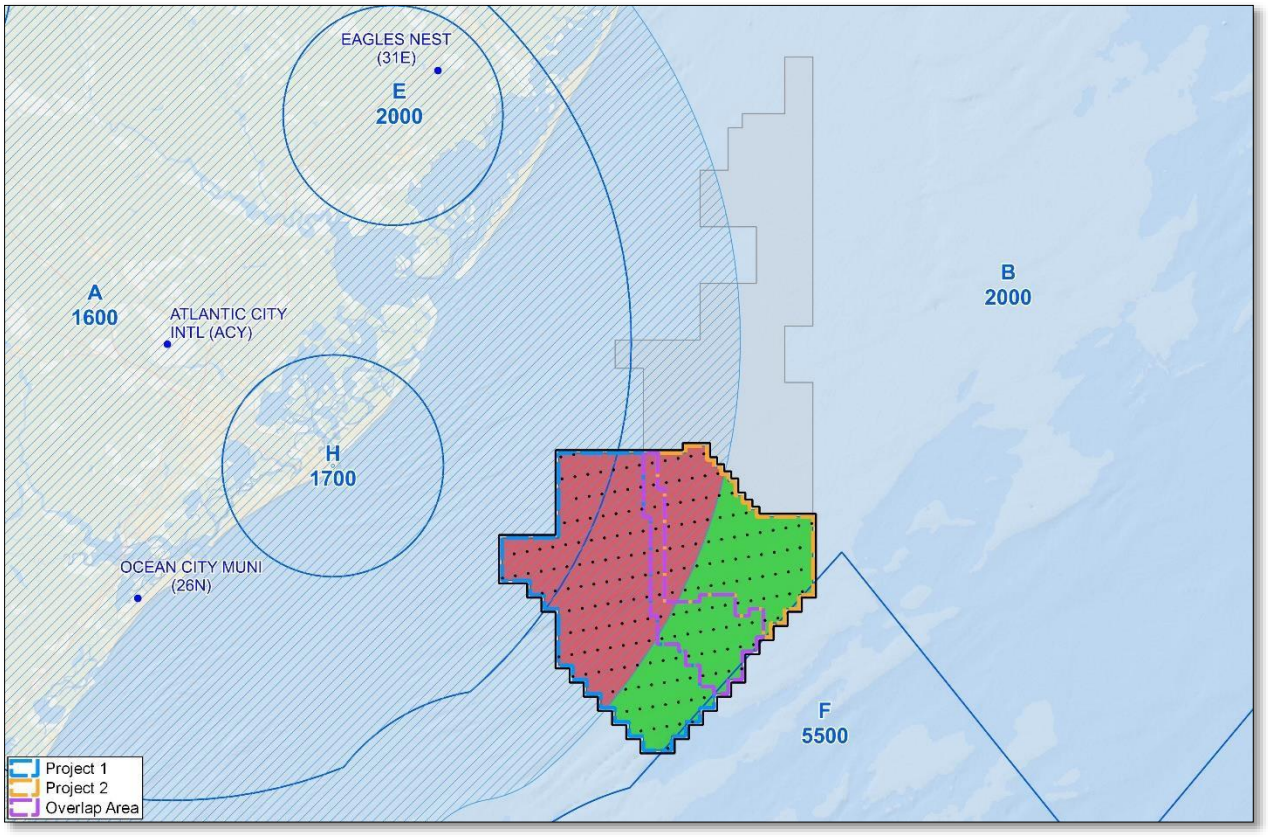

Figure 3: Atlantic City (ACY) TRACON FUSION 5 MVA sectors (blue) with Sector A obstacle evaluation area (hatched blue)

[2] The study area is in proximity to Dover (DOV) Radar Approach Control (RAPCON) and McGuire (WRI) RAPCON airspace. However, Department of Defense (DoD) MVA charts, including those for Navy Radar Air Traffic Control Facilities (RATCF), Army Radar Approach Control Facilities (ARAC), and Air Force RAPCON facilities, are not publicly released and could not be assessed. It is possible that MVA sectors associated with these facilities overlie the study area and result in lower height constraints than those depicted in this report.

Findings

Instrument Approach Procedures

Atlantic City International (ACY) - ILS or Localizer/DME Approach to Runway 31

At 1,048 feet tall, proposed wind turbines in the northwestern section of the WTA (yellow area, ***Figure 4***), including 25 proposed locations within Project 1, would require an increase to the ILS or Localizer/DME Approach to Runway 31 *STEVV* hold-in-lieu of procedure turn MHA from 2,000 to 2,100 feet AMSL. FAA instrument approach procedure design criteria would allow the holding pattern MHA to be increased to 2,100 feet AMSL. Additionally, flight track data indicates that only 14 flights (purple tracks, ***Figure 4***), an average of *0.27 flights per week*, utilized the *STEVV* hold-in-lieu of procedure turn at the affected altitude. As a result, it is possible that the FAA would increase the *STEVV* MHA in order to accommodate wind development up to 1,048 feet tall within the WTA. This mitigation option is subject to FAA approval.

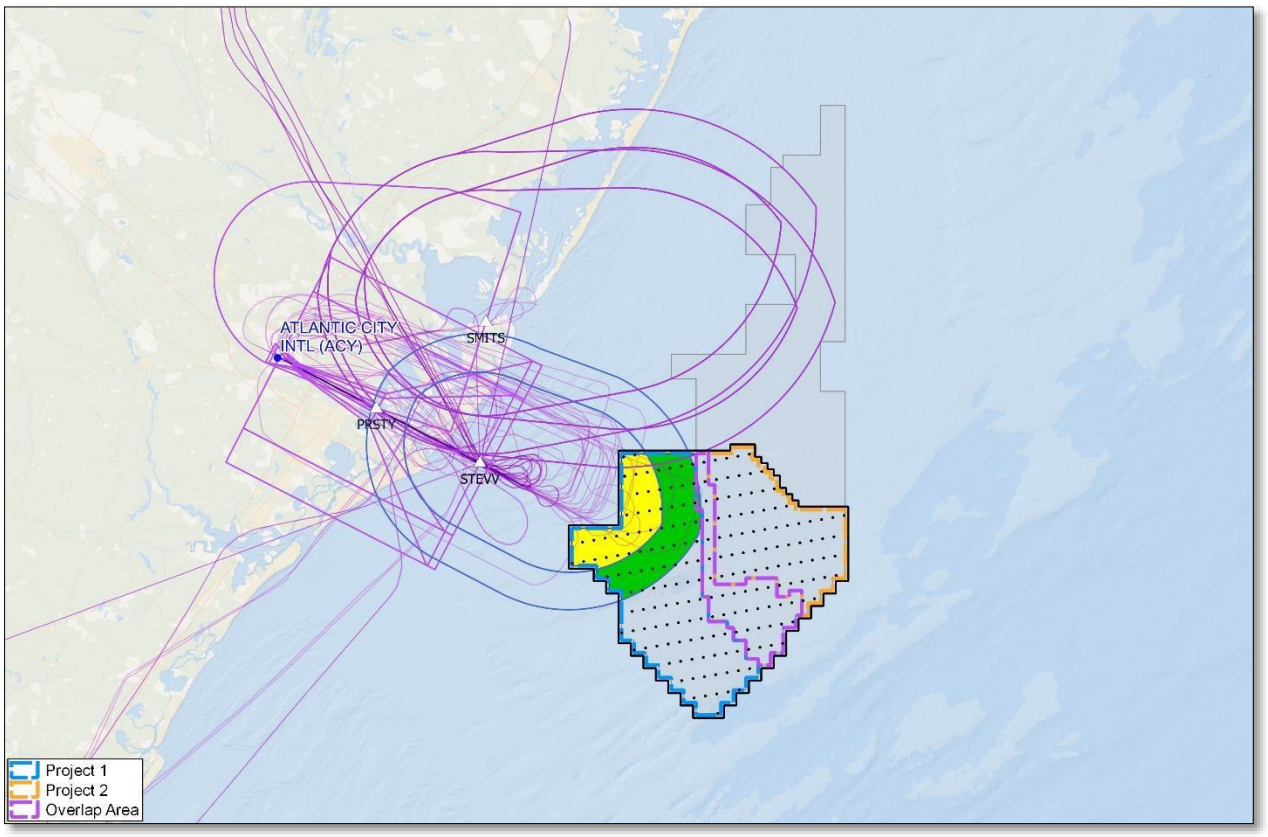

Figure 4: Atlantic City International (ACY) - ILS or Localizer/DME Approach to Runway 31

Atlantic City (ACY) TRACON

ACY_MVA_FUS3_2019 (FUSION 3)

At 880 or 890 feet tall, proposed wind turbines in the western section of the WTA (red area, ***Figure 5***), including up to 66 proposed locations within Project 1, four proposed locations within Project 2, and four proposed locations within the Overlap Area, would require an increased MVA that would affect portions of Sector A. Flight track data indicates that only one flight (yellow track, ***Figure 5***) operated at the affected altitudes within the Sector A isolation area (dashed green outline, ***Figure 5***). However, it is likely that this flight was on its own navigation and not receiving radar vectoring services. This flight total represents an average of *0.00 flights per week*.

Table 1: Atlantic City (ACY) TRACON FUSION 3 MVA impact summary and flight track analysis results based on 880- or 890-foot-tall wind turbines

Sector	MVA		Wind Turbine Area	
	Current	Required	Flights Within Affected Airspace	Flights Potentially Receiving Radar Vectors
A	1600	1900	1	0 (*0.00 flights per week*)

At 1,048 feet tall, proposed wind turbines in the western section of the WTA (red area, ***Figure 6***), including up to 66 proposed locations within Project 1, four proposed locations within Project 2, and four proposed locations within the Overlap Area, would require an increased MVA that would affect portions of Sector A. Flight track data indicates that as many as four unique flights operated at the affected altitudes within the isolation area (dashed green outline, ***Figure 6***). As many as two unique flights (purple tracks, ***Figure 6***) could have been receiving radar vectoring services within the isolation area. This flight total represents an average of *0.04 flights per week*.

Table 2: Atlantic City (ACY) TRACON FUSION 3 MVA impact summary and flight track analysis results based on 1,048-foot-tall wind turbines

Sector	MVA		Wind Turbine Area	
	Current	Required	Flights Within Affected Airspace	Flights Potentially Receiving Radar Vectors
A	1600	2000	4	2 (*0.04 flights per week*)

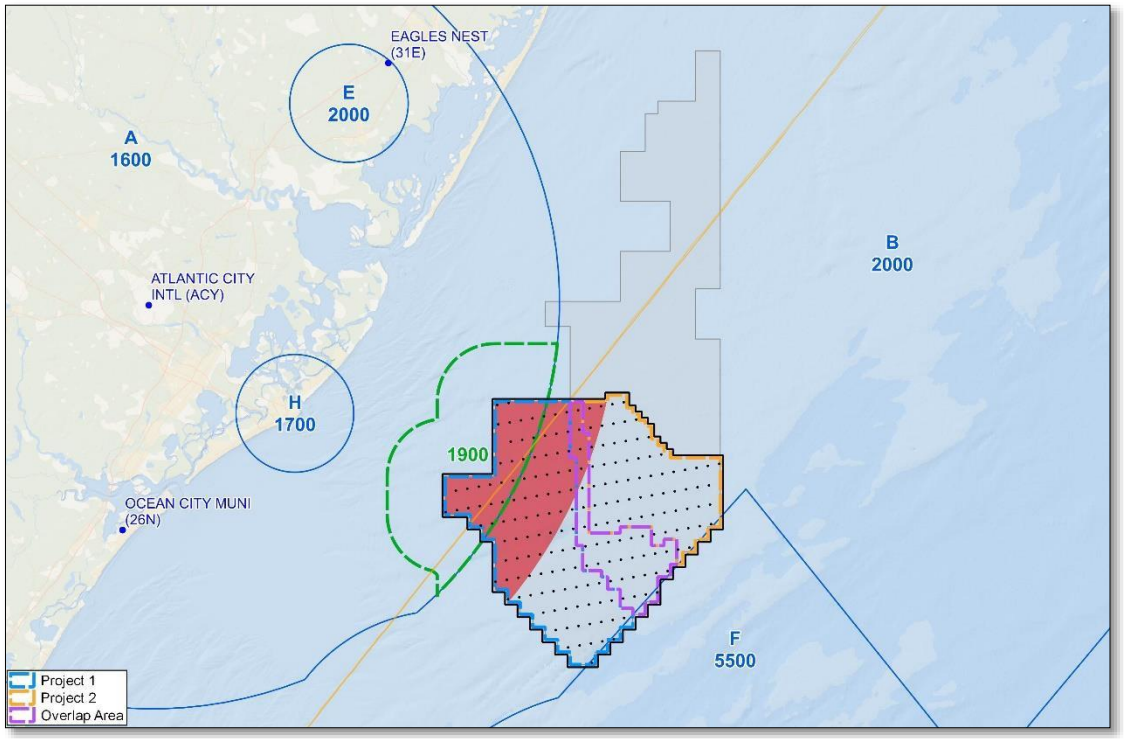

Figure 5: Historical flight track (yellow) that operated within the required 3 NM isolation area (dashed green) based on 880- or 890-foot-tall wind turbines

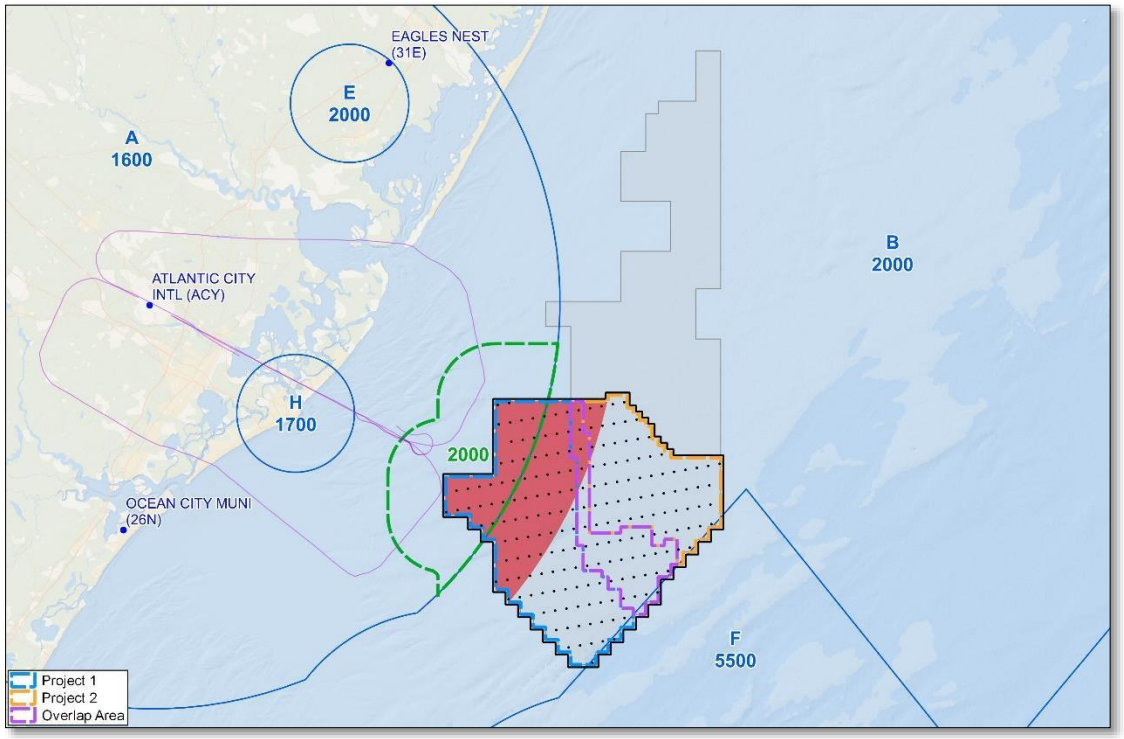

Figure 6: Historical flight tracks (purple) that potentially received radar vectoring services within the required 3 NM isolation area (dashed green) based on 1,048-foot-tall wind turbines

ACY_MVA_FUS5_2019 (FUSION 5)

At 880 or 890 feet tall, proposed wind turbines in the western section of the WTA (red area, ***Figure 7***), including up to 83 proposed locations within Project 1, 23 proposed locations within Project 2, and eight proposed locations within the Overlap Area, would require an increased MVA that would affect portions of Sectors A and H. Due to the proximity of the potential isolation areas it is likely that they would be merged for charting purposes. Flight track data indicates that as many as 10 unique flights operated at the affected altitudes within the merged isolation area (dashed green outline, ***Figure 7***). As many as seven unique flights (purple tracks, ***Figure 7***) could have been receiving radar vectoring services within the isolation area. This flight total represents an average of *0.13 flights per week*.

Table 3: Atlantic City (ACY) TRACON FUSION 5 MVA impact summary and flight track analysis results based on 880- or 890-foot-tall wind turbines

Sector	MVA		Wind Turbine Area	
	Current	Required	Flights Within Affected Airspace	Flights Potentially Receiving Radar Vectors
A	1600	1900	10	7 (*0.13 flights per week*)
H	1700			

At 1,048 feet tall, proposed wind turbines in the western section of the WTA (red area, ***Figure 8***), including up to 83 proposed locations within Project 1, 23 proposed locations within Project 2, and eight proposed locations within the Overlap Area, would require an increased MVA that would affect portions of Sectors A and H. Due to the proximity of the potential isolation areas it is likely that they would be merged for charting purposes. Flight track data indicates that as many as 37 unique flights operated at the affected altitudes within the merged isolation area (dashed green outline, ***Figure 8***). As many as 20 unique flights (purple tracks, ***Figure 8***) could have been receiving radar vectoring services within the isolation area. This flight total represents an average of *0.38 flights per week*.

Table 4: Atlantic City (ACY) TRACON FUSION 5 MVA impact summary and flight track analysis results based on 1,048-foot-tall wind turbines

Sector	MVA		Wind Turbine Area	
	Current	Required	Flights Within Affected Airspace	Flights Potentially Receiving Radar Vectors
A	1600	2000	37	20 (*0.38 flights per week*)
H	1700			

These findings indicate that 880-, 890-, or 1,048-foot-tall wind turbines within the WTA would require an increase to Atlantic City (ACY) TRACON MVAs, but should not affect a significant volume of radar vectoring operations. As a result of these findings, it is possible that Atlantic City (ACY) TRACON would not object to modifying the affected MVA sectors to accommodate wind development up to 1,048 feet tall within the WTA.

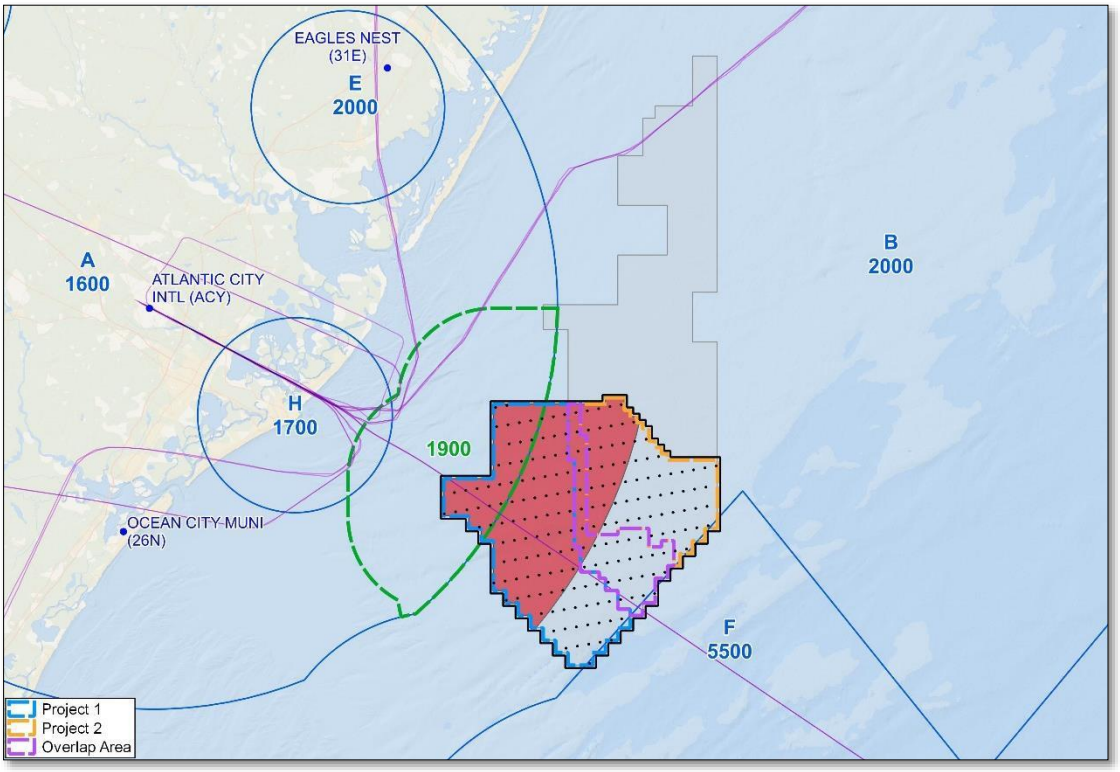

Figure 7: Historical flight tracks (purple) that potentially received radar vectoring services within the required 5 NM isolation area (dashed green) based on 880- or 890-foot-tall wind turbines

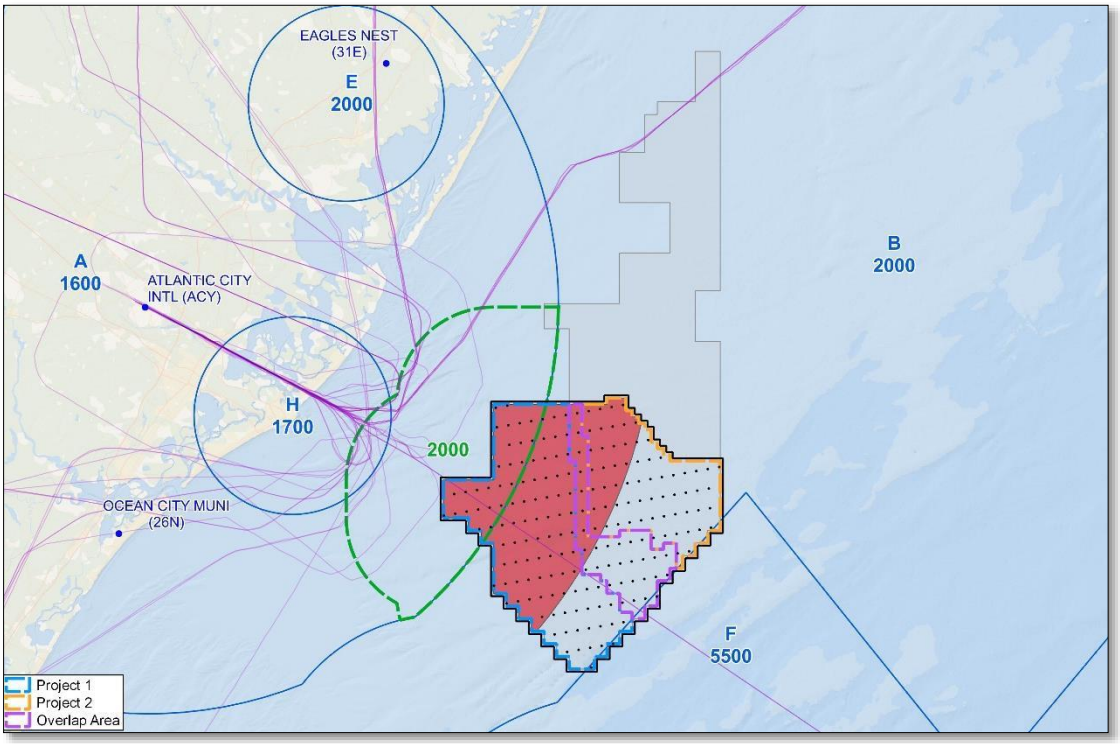

Figure 8: Historical flight tracks (purple) that potentially received radar vectoring services within the required 5 NM isolation area (dashed green) based on 1,048-foot-tall wind turbines

Conclusion

Capitol Airspace assessed FAA NOP data covering the period of one year to determine the likelihood of proposed 880-, 890-, or 1,048-foot-tall wind turbines within the WTA affecting a significant volume of IFR operations:

Atlantic City International (ACY) - Holding Pattern MHA
Impact: At 1,048 feet tall, proposed wind turbines within Project 1 would require an increase to a holding pattern MHA from 2,000 to 2,100 feet AMSL.

Findings: The holding pattern MHA could be increased to 2,100 feet AMSL while still complying with FAA instrument approach procedure design criteria. Additionally, only 14 flights (*0.27 flights per week*) utilized the holding patterns at the affected altitude. This flight total represents an average utilization below the threshold for a significant volume of IFR operations (one per week). As a result, it is possible that Atlantic City (ACY) TRACON may not object to increasing the affected MHA.

Atlantic Shores (ACY) TRACON MVAs
Impact: At 880 or 890 feet tall, proposed wind turbines in the western section of the WTA would require an increase to MVAs from as low as 1,600 to 1,900 feet AMSL. At 1,048 feet tall, proposed wind turbines in the western section of the WTA would require an increase to MVAs from as low as 1,600 to 2,000 feet AMSL.

Findings: No flights (FUSION 3 chart) or seven flights (FUSION 5 chart) could have been receiving radar vectoring services within the potential isolation areas required for wind development up to 890 feet tall. These flight totals represent an average of *0.00 flights per week* (FUSION 3 chart) or *0.13 flights per week* (FUSION 5 chart) which are below the threshold for a significant volume of IFR operations (one per week).

As many as two flights (FUSION 3 chart) or 20 flights (FUSION 5 chart) could have been receiving radar vectoring services within the potential isolation areas required for wind development up to 1,048 feet tall. These flight totals represent an average of *0.04 flights per week* (FUSION 3 chart) or *0.38 flights per week* (FUSION 5 chart) which are below the threshold for a significant volume of IFR operations (one per week).

As a result of these findings, it is possible that the FAA would not object to increasing the affected altitudes in order to accommodate 880-, 890-, or 1,048-foot-tall wind turbines within the WTA. These mitigation options are available and are subject to FAA approval.

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