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November 26, 2019

Via Electronic Filing

Ms. Tanowa Troupe
Administration/Docketing
Public Utilities Commission of Ohio
180 East Broad Street, 11th Floor
Columbus, OH 43215-3793

**Re: Republic Wind, LLC,
OPSB Case No. 17-2295-EL-BGN**

Dear Ms. Troupe:

Attached hereto is the Rebuttal Testimony of Benjamin M. Doyle, which includes Revised Rebuttal Attachment BMD-1. Rebuttal Testimony of Benjamin M. Doyle, which included the Revised Rebuttal Attachment BMD-1, was marked as and admitted as Applicant Exhibit 41 during the November 25, 2019 hearing in this case.

Please do not hesitate to contact me if you have any questions.

Sincerely,

Devin D. Parram

Attachment

Cc: Parties of Record (w/Attachment)

**BEFORE
THE OHIO POWER SITING BOARD**

In the Matter of the Application of)
REPUBLIC WIND, LLC for a Certificate of)
Environmental Compatibility and Public Need) Case No. 17-2295-EL-BGN
for a Wind-Powered Electric Generating)
Facility in Republic and Sandusky Counties,)
Ohio.)

REBUTTAL TESTIMONY OF

**Benjamin M. Doyle
Capitol Airspace Group**

on the behalf of

Republic Wind, LLC

November 21, 2019

Q-1. Please state your name, current title, and business address.

A-1. My name is Benjamin M. Doyle. I am the President of Capitol Airspace Group (“Capitol Airspace”), located at 5400 Shawnee Road, Suite 304, Alexandria, VA 22312.

Q-2. On whose behalf are you offering testimony?

A-2. I am testifying on behalf of the Applicant in the case, Republic Wind, LLC (“Applicant” or “Republic Wind”).

Q-3. Did you present direct testimony in this proceeding?

A-3. Yes.

Q-4. What is the purpose of your rebuttal testimony?

A-4. The purpose of my testimony is to rebut the direct testimony John Stains of the Ohio Department of Transportation Office of Aviation (“ODOT”). Specifically, I am addressing Mr. Stains’ claims regarding the potential impact of the Republic Wind project on the non-directional beacon approach to Runway 24 at the Seneca County Airport (the “NDB Approach”). In his testimony, Mr. Stains testified that he was informed by Brad Newman, manager of the Seneca County Airport, that the NDB Approach is “frequently” used by the airport. In my testimony, I will explain that the full NDB Approach to Runway 24 at the Seneca County Airport is rarely used. My conclusion is based upon the Federal Aviation Association’s (FAA) findings, traffic data obtained from the FAA, and the results of an Air Traffic Flow Analysis conducted by my company. The results of this Air Traffic Flow Analysis supports the FAA’s findings contained in the determinations of no hazard issued for the Republic Wind’s case. Collectively, these findings represent the best available method for determining the number and type of instrument operations at Seneca County Airport and are contrary to ODOT’s claims that the NDB Approach to the airport is “frequently” used.

Q-5. What exhibits are you sponsoring?

A-5. I am sponsoring an Air Traffic Flow Analysis that was prepared by Capitol Airspace Group dated June 29, 2018. This document is attached to my testimony as Rebuttal Attachment BMD-1 and was prepared under my direction. I am also sponsoring the published NDB

RWY 24 (Rebuttal Attachment BMD-2) and RNAV (GPS) RWY 24 (Rebuttal Attachment BMD-3) instrument approach procedure charts for Seneca County Airport (16G).

Q-6. Please generally describe how Rebuttal Attachment BMD-1 was prepared?

A-6. Capitol Airspace conducted an air traffic flow analysis to evaluate instrument flight rule (“IFR”) approaches to Seneca County Airport (identified by the FAA by its three letter airport identifier “16G”). The purpose of this study was to quantify the number of IFR arrivals that flew the NDB Approach to Runway 24. In order to determine the number of flights that have historically flown this instrument approach procedure, Capitol Airspace evaluated FAA National Offload Program (“NOP”) radar returns within 25 nautical miles of Seneca County Airport that occurred between January 1, 2016 and December 31, 2016.

Q-7. In your opinion, how reliable is the FAA’s NOP data?

A-7. It is the most accurate data available to the public for determining the number of NDB approaches at Seneca County Airport.

Q-8. What is the NOP?

A-8. The NOP is an FAA repository that contains historical national airspace data. The NOP tracks and stores IFR flight track data from FAA air surveillance systems.

Q-9. Why did you analyze January 1, 2016 through December 31, 2016 in preparing Rebuttal Attachment BMD-1?

A-9. Capitol Airspace started working on this project in 2015. We submitted our request for data in 2017 and received data from the FAA for the 2016 calendar year. We completed our traffic flow study in 2018 utilizing the 2016 data set. The 2016 traffic data was determined to be sufficiently representative of current traffic at Seneca County Airport. A review of traffic trends for the airport indicates that traffic has decreased since 2016. Therefore, we view the findings of our traffic flow study to be conservative.

1 **Q-10. In his testimony, ODOT witness Stains testified that he was informed by Mr. Newman**
2 **that the NDB Approach was used “frequently” at Seneca County Airport. (Stains**
3 **Direct at 13:13-19) Do you agree that the NDB Approach is being flown frequently?**

4 **A-10.** No. Rebuttal Attachment BMD-1 demonstrates that the full NDB Approach is rarely flown
5 at Seneca County Airport. The NOP data for Seneca County Airport contained 54,052,316
6 radar returns representing a total of 346,699 unique flights. 345,988 of these flights were
7 transiting through the airspace and never approached Seneca County Airport. The
8 remaining 711 flights transited through the Runway 24 approach corridor and were further
9 analyzed for altitude and direction trends. Of the 711 flights that transited through the
10 approach corridor, only four flights flew the full NDB Approach to Runway 24. The
11 remainder flew the RNAV (GPS) Approach to Runway 24, received vectors to final from
12 air traffic control in landing their aircraft on Runway 24 or flew visually.

13 **Q-11. Please explain what the terms “radar returns” and “unique flights” mean.**

14 **A-11.** The FAA’s NOP data provides date and time stamped location information for each radar
15 return received. The term ‘radar return’ describes a single update provided to the air traffic
16 controller for each target (aircraft) the radar sees. Depending on the type of radar, these
17 returns occur approximately every 5 or 12 seconds. The NOP data set can include multiple
18 radar returns for the same aircraft at the same location. This occurs because the data set
19 may include data from multiple radars with overlapping coverage of the area. In order to
20 get an accurate count of operations, it is necessary to combine these multiple, collocated
21 returns into a single ‘unique’ return. These single returns are then grouped into tracks
22 depicting the actual flight track of the aircraft.

23 **Q-12. Rebuttal Attachment BMD-1 indicates that 711 flights transited through the Runway**
24 **24 approach corridor at Seneca County Airport between January 1, 2016 and**
25 **December 31. Do the 711 flights represent all operations that occurred at the airport**
26 **between January 1, 2016 and December 31, 2016?**

27 **A-12.** No. It represents the number of aircraft that transited through the approach course to
28 Runway 24 at Seneca County Airport during that time period.

1 **Q-13. Are the results of the Air Traffic Flow Analysis consistent with the FAA's**
2 **determination of no hazard ("DNH") for the project?**

3 **A-13.** Yes. The DNH indicates that the Performance Data Analysis and Reporting System
4 ("PDARS") IFR flight trajectory demonstrates that few, if any, full NDB published
5 approaches are flown at Seneca County Airport. The yellow lines in the attached Air
6 Traffic Flow Analysis (Rebuttal Attachment BMD-1) depict the four flight tracks in which
7 aircraft flew the full NDB Approach, as published, to Runway 24. Further, the DNH
8 indicates that nearly all of the IFR approaches are "straight-in" based upon information
9 from PDARS. Similarly, the Air Traffic Flow Analysis (Rebuttal Attachment BMD-1)
10 determined that all other flight tracks were flown straight-in. Attached to my testimony are
11 the published NDB RWY 24 (Rebuttal Attachment BMD-2) and RNAV (GPS) RWY 24
12 (Rebuttal Attachment BMD-3) instrument approach procedures for Seneca County Airport
13 (16G). Rebuttal Attachment BMD-2 depicts the "loop" shaped procedure turn related to
14 the NDB Approach, while Rebuttal Attachment BMD-3 depicts has RNAV GPS "straight-
15 in" approach.

16 **Q-14. Can you explain the significance of the "straight-in" approach?**

17 **A-14.** Yes. Only aircraft using the NDB navigation system are required to make a procedure turn
18 within 10 nautical miles of the airport. This procedure turn can be seen in radar tracks as a
19 "loop". Because the procedure turn must be completed within 10 nautical miles of the
20 airport, these "loops", and their location, become uniquely identifiable as aircraft flying the
21 full NDB Approach. Unless the NDB is being flown straight-in with the assistance of radar
22 vectors from air traffic control, these loops will always be seen in the flight track data if the
23 NDB Approach is flown. As I stated above, these flights are depicted in yellow on
24 Rebuttal Attachment BMD-1. Aircrafts that did not use the NDB navigation system to land
25 on Runway 24 had trajectories that followed published routing for aircraft using GPS or
26 with the assistance of radar vectors from air traffic control and lacked the tell-tale loop
27 associated with using the NDB navigation system. These flight trajectories are referred to
28 as "straight-in" approaches, as reflected in Rebuttal Attachment BMD-1 as the RNAV
29 (GPS) Approach.

1 **Q-15. How many of the proposed turbines in the Republic Wind project may impact**
2 **aircrafts utilizing the NDB Approach at the Seneca County Airport?**

3 **A-15.** Only turbine T1 could have some impact on the ability of pilots to utilize the NDB
4 Approach at the Seneca County Airport. In John Stains testimony, he indicates that 18
5 turbines impact NDB Approach at Seneca County Airport and need to be modified to
6 eliminate the obstruction. (Stains Testimony, pg. 11, lns. 14-16) In actuality, only one
7 these turbines (turbine T1) will potentially have an impact on a pilot's ability to land using
8 the NDB Approach at Seneca County Airport. Only T1 will require the final approach
9 minimum descent altitude be increased by 40 feet. The remaining turbines would have no
10 affects on a pilot's ability to land while using the NDB Approach but would trigger the
11 FAA to increase the procedure turn altitude by 100 feet. Increasing this altitude will not
12 affect the efficiency of the procedure nor would it limit pilots from landing in any way.
13 This 100 foot increase the procedure turn altitude only effects pilots flying the full
14 procedure turn (of which there were only four in 2016). Because of the very limited
15 number of NDB Approaches at Seneca County Airport, the FAA was correct in
16 determining that the impacts of T1 would not constitute a significant adverse effect to
17 navigable airspace.

18 **Q-16. Does the fact that the NDB Approach is rarely used at Seneca County Airport further**
19 **support the FAA's conclusion that Republic Wind's proposed turbines will not**
20 **constitute a hazard to navigable airspace?**

21 **A-16.** Yes. In considering whether the obstruction caused by turbines may constitute a hazard,
22 the FAA first seeks to ensure that, if the turbines are constructed as proposed, flight
23 operations still could be conducted in accordance with the FAA's safety standards. To
24 comply with those standards, the FAA could opt to alter procedure designs and/or increase
25 minimum altitudes. Once safety concerns are resolved, the FAA still must determine what
26 impact its alterations would have on the efficiency of aircraft operations in the area. To
27 determine how many aircraft operations would be affected by the change, the FAA
28 determines if the number of aircraft operations impacted would exceed an established
29 threshold. Only if the number of aircraft operations impacted exceeds this threshold, will
30 the FAA conclude that the obstruction will have a "substantial aeronautical impact" to air

1 navigation, and determine that a structure is a “hazard” to air navigation. See 14 CFR
2 77.31(c).

3 A structure would have a substantial adverse effect if a significant volume of aeronautical
4 operations would be affected by the structure. Information from PDARS and Toledo
5 Terminal Radar Approach Control indicated that a significant volume of aeronautical
6 operations would not be affected. The FAA relied upon this information to reach its
7 conclusion. The FAA’s analysis is further supported by Rebuttal Attachment BMD-1.

8 **Q-17. Does this conclude your testimony?**

9 **A-17.** Yes.

CERTIFICATE OF SERVICE

I hereby certify that the foregoing was served upon the following parties of record via regular or electronic mail this 21st day of November, 2019.



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Air Traffic Flow Analysis

Seneca County Airport (16G) NDB Approach to Runway 24

June 29, 2018

Overview

Capitol Airspace conducted an air traffic flow analysis to evaluate IFR approaches to Seneca County Airport (16G) in Tiffin, Ohio. The purpose for this study was to quantify the number of IFR arrivals that likely flew the NDB Approach to Runway 24.

In order to determine the number of flights that have historically flown this instrument approach procedure, Capitol Airspace analyzed one year's worth of historical radar track data obtained from the FAA.

Methodology

Capitol Airspace evaluated FAA National Offload Program (NOP) radar returns within 25 nautical miles of Seneca County Airport from January 1, 2016 through December 31, 2016. The NOP data contained 54,052,316 radar returns representing a total of 346,699 unique flights. 345,988 of these flights were transiting through the airspace and never approached Seneca County Airport. The remaining 711 flights transited through the Runway 24 approach corridor and were further analyzed for altitude and direction trends.

Results

Of the 711 flights that transited through the approach corridor, only three flights likely flew the NDB Approach to Runway 24 ([Figure 1](#)). The remaining 708 flights did not fly the NDB Approach to Runway 24 and were either:

- flying the RNAV (GPS) Approach to Runway 24 (94 tracks)
- flying the VOR Approach to Runway 6 (1 track)
- enroute to another airport (412 flights)
- operating in a manner consistent with visual flight rules (VFR) operations (201 tracks)

Please direct any questions regarding these findings to either [Rick Coles](#) or [Candace Childress](#) at (703) 256-2485.

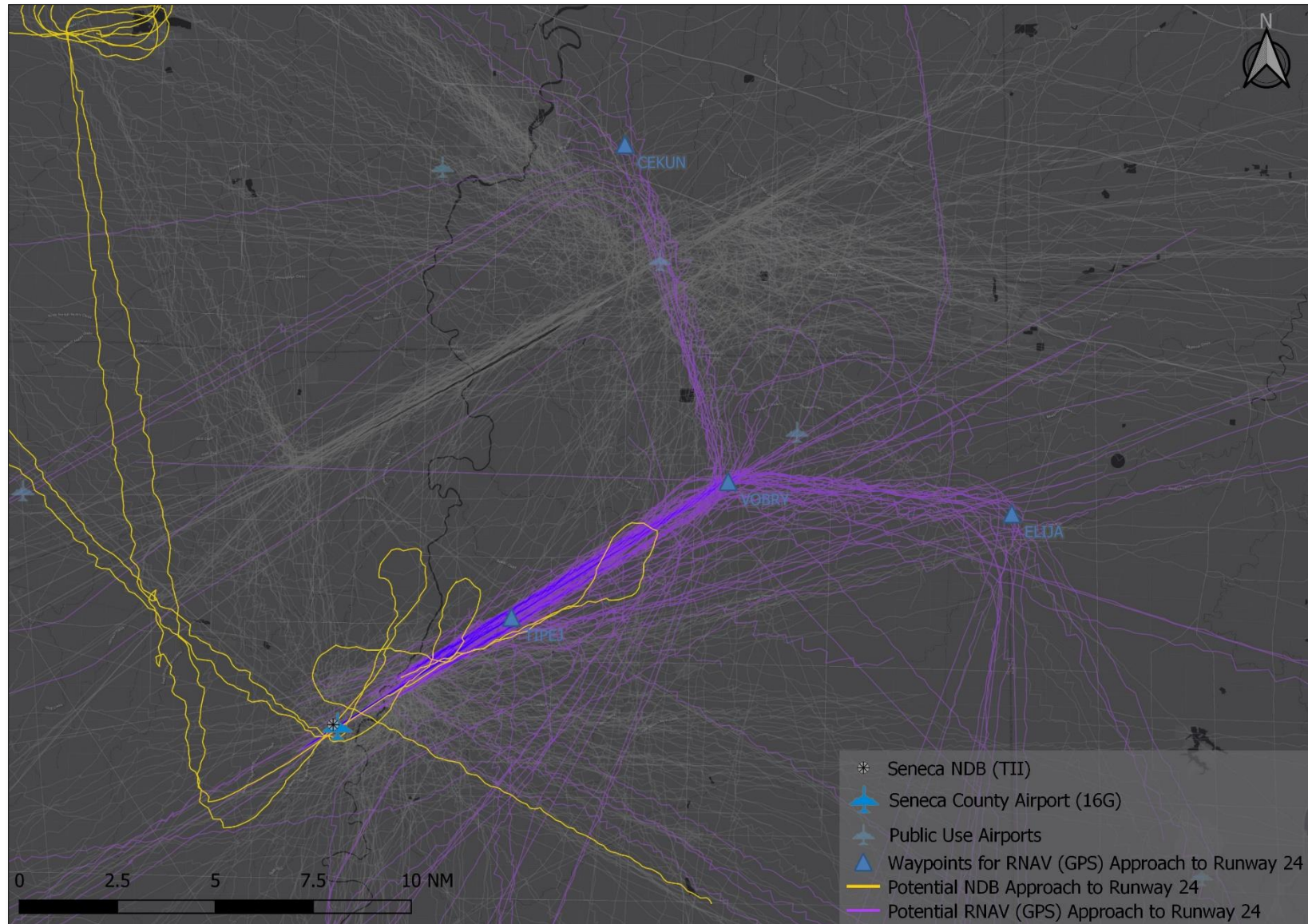


Figure 1: Historical flights in proximity to Seneca County Airport (16G)

REBUTTAL ATTACHMENT BMD-2

TIFFIN, OHIO

AL-5645 (FAA)

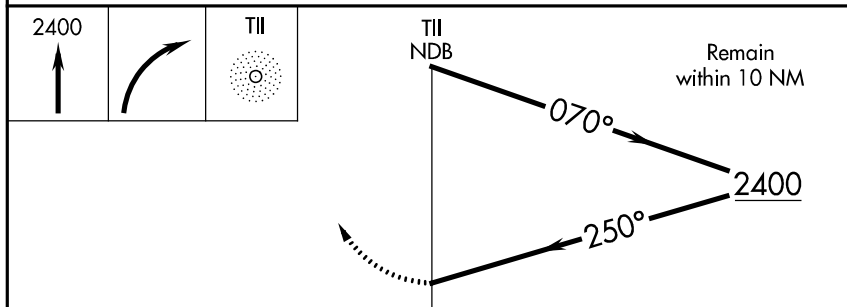
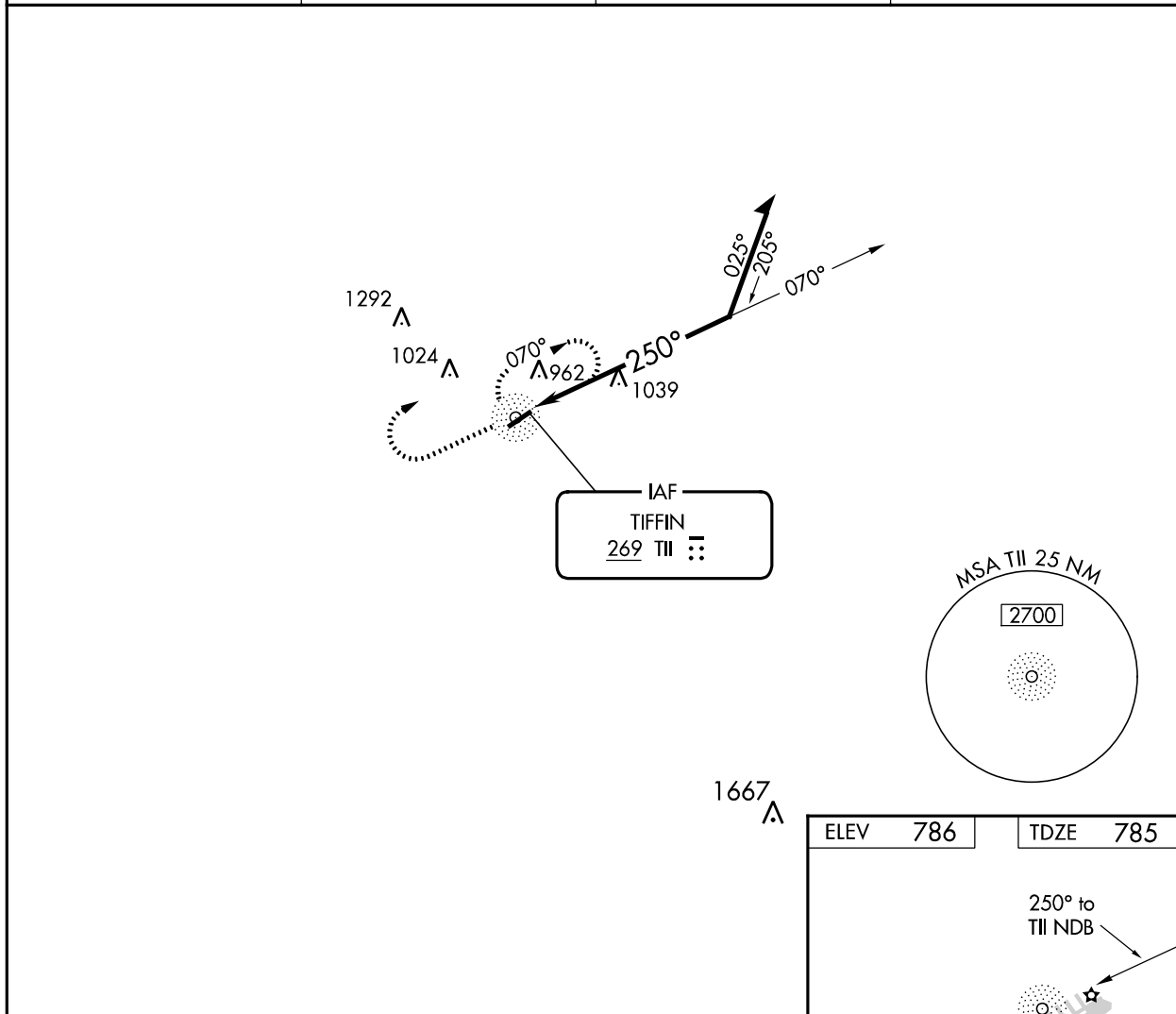
19283

NDB TII 269	APP CRS 250°	Rwy Idg 4000
		TDZE 785
		Apt Elev 786

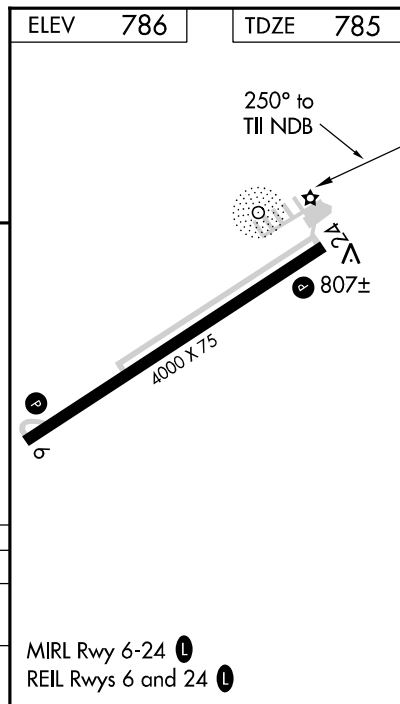
NDB RWY 24
SENECA COUNTY (16G)

<p>▼ Rwy 24 helicopter visibility reduction below 1 SM NA. When local altimeter setting not received, use Findlay altimeter setting and increase all MDA 60 feet and increase S-24 Cat C visibility $\frac{1}{8}$ SM. Straight-in Rwy 24 NA at night, Circling Rwy 24 NA at night.</p> <p>▲ NA</p>	<p>MISSED APPROACH: Climb to 2400 then right turn direct TII NDB and hold.</p>
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AWOS-3 127.175	FDY ASOS 132.85	TOLEDO APP CON 120.8 317.55	UNICOM 123.0 (CTAF) ①
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CATEGORY	A	B	C	D
S-24	1460-1 675 (700-1)		1460-1 $\frac{7}{8}$ 675 (700-1 $\frac{7}{8}$)	1460-2 675 (700-2)
CIRCLING	1460-1 674 (700-1)		1460-2 674 (700-2)	1460-2 $\frac{1}{4}$ 674 (700-2 $\frac{1}{4}$)



TIFFIN, OHIO

Amdt 7D 19JUL18

41°06'N-83°13'W

SENECA COUNTY (16G)
NDB RWY 24

EC-2, 07 NOV 2019 to 05 DEC 2019

EC-2, 07 NOV 2019 to 05 DEC 2019

REBUTTAL ATTACHMENT BMD-3

TIFFIN, OHIO

AL-5645 (FAA)

19283

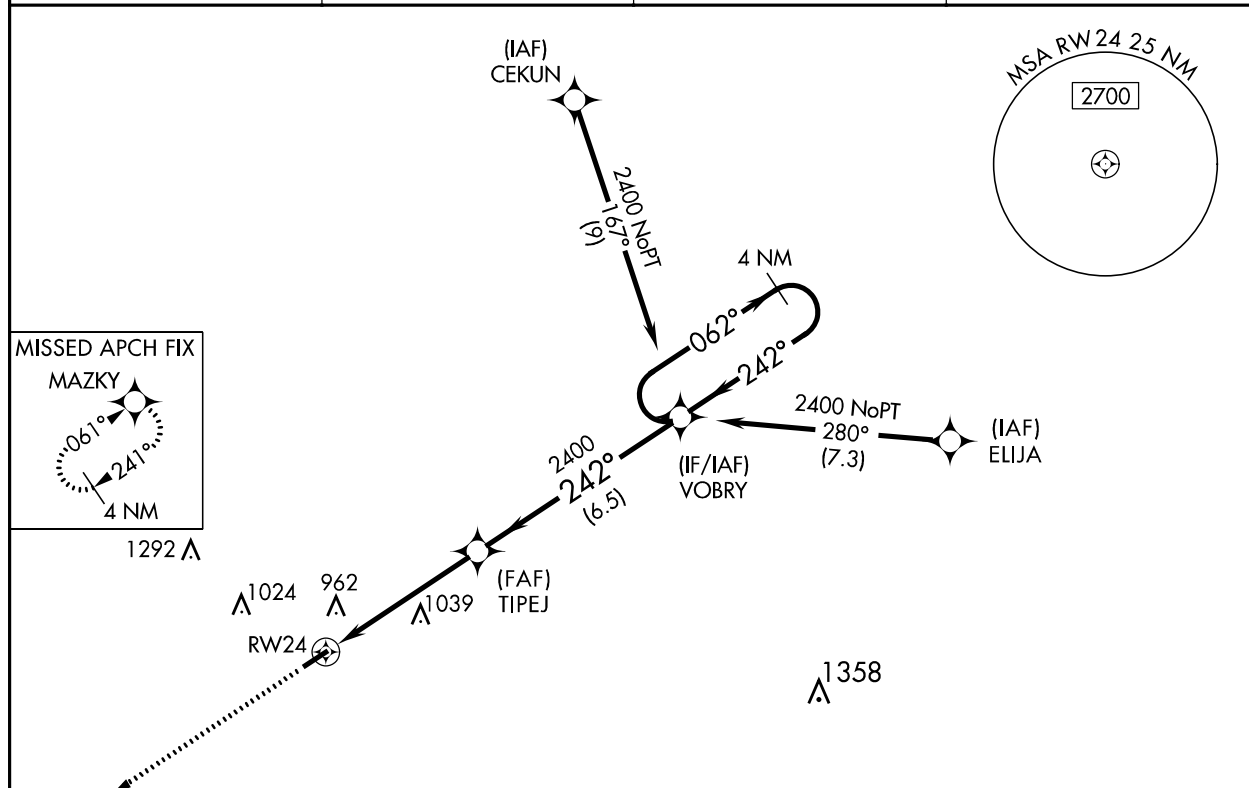
WAAS CH 90528 W24A	APP CRS 242°	Rwy Idg TDZE Apt Elev	4000 785 786
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RNAV (GPS) RWY 24

SENECA COUNTY(16G)

RNP APCH.	<p>▼ Circling to Rwy 24 NA at night. Baro-VNAV NA when using Findlay altimeter setting. Rwy 24 helicopter visibility reduction below $\frac{3}{4}$ SM NA. For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -16C or above 54°C. When local altimeter setting not received, use Findlay altimeter setting and increase all DA/MDA 60 feet, and increase LPV, LNAV/VNAV all Cats and Circling Cat C visibility $\frac{1}{8}$ SM, increase LNAV Cat C visibility $\frac{1}{4}$ mile.</p>	MISSED APPROACH: Climb to 2400 direct MAZKY and hold.
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AWOS-3 127.175	FDY ASOS 132.85	TOLEDO APP CON 120.8 317.55	UNICOM 123.0 (CTAF) 0
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ELEV	786	TDZE	785
<p>242° to RW24</p> <p>4000 X 75</p> <p>807±</p> <p>MIRL Rwy 6-24 0</p> <p>REIL Rws 6 and 24 0</p>			
2400	MAZKY	TIPEJ	VOBRY
2400	2400	2400	2400
4.9 NM	6.5 NM	4 NM	Holding Pattern
CATEGORY	A	B	C
LPV DA	1058-1	273 (300-1)	NA
LNAV/VNAV DA	1063-1	278 (300-1)	NA
LNAV MDA	1280-1	495 (500-1)	1280-1 $\frac{3}{8}$ 495 (500-1 $\frac{3}{8}$)
CIRCLING	1280-1	494 (500-1)	1280-1 $\frac{1}{2}$ 494 (500-1 $\frac{1}{2}$)

TIFFIN, OHIO

Amdr 1C 19JUL18

41°06'N-83°13'W

SENECA COUNTY(16G)

RNAV (GPS) RWY 24

EC-2, 07 NOV 2019 to 05 DEC 2019

This foregoing document was electronically filed with the Public Utilities

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11/26/2019 12:19:14 PM

in

Case No(s). 17-2295-EL-BGN

Summary: Correspondence of Republic Wind, LLC Filing Rebuttal Testimony of Benjamin Doyle with Revised Rebuttal Attachment BMD-1 electronically filed by Teresa Orahod on behalf of Devin D. Parram