

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



ERA25LA111

METEOROLOGY

Specialist's Factual Report

October 1, 2025

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A. ACCIDENT

Location: New Lexington, Ohio
Date: February 5, 2025
Time: 1626 eastern standard time (EST)
2126 coordinated universal time (UTC)
Airplane: Cirrus SR22, N406SR

B. METEOROLOGY SPECIALIST

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C. DETAILS OF THE INVESTIGATION

The NTSB's Senior Meteorologist did not travel for this investigation but gathered all data remotely. Data for this investigation were collected from official National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) sources including the Weather Prediction Center (WPC) and the National Center for Environmental Information (NCEI). This Specialist's Factual Report contains the meteorological factors pertinent to the weather surrounding the accident time. All times are eastern standard time (EST) and are based upon the 24-hour clock, where local time is -5 hours from UTC. Directions are referenced to true north and distances are in nautical miles. Heights are above mean sea level (msl) unless otherwise noted. Visibility is in statute miles and fractions of statute miles. NWS station identifiers use the standard International Civil Aviation Organization 4-letter station identifiers versus the International Air Transport Association 3-letter identifiers, which deletes the initial country code designator "K" for U.S. airports.

The accident site was located at approximate latitude 39.689947° N, longitude 82.205084° W, at an altitude of 1,055 feet (ft).

D. FACTUAL INFORMATION

1.0 Synoptic Situation

The synoptic or large-scale migratory weather systems influencing the area were documented using standard NWS charts issued by the National Center for Environmental Prediction and the WPC, located in College Park, Maryland. These are the base products used in describing synoptic weather features and in the creation of forecasts and warnings for the NWS. Reference to these charts can be found in the Federal Aviation Administration (FAA) "Aviation Weather Handbook", FAA-H-8083-28.¹

1.1 Surface Analysis Chart

The NWS Surface Analysis Chart centered over the Ohio River Valley for 1600 EST is provided as figure 1 with the location of the accident site within the black circle. The chart depicted a low-pressure center over eastern Tennessee at 1016-hectopascals (hPa) with a trough² stretching northeastward from the low-pressure center. The trough was oriented northeast-to-southwest from eastern Tennessee into southern New York. Troughs and fronts can act as lifting mechanisms to help produce clouds and precipitation if sufficient moisture is present.

The station model closest to the accident site depicted cloudy skies, an air temperature of 32°F, a dew point temperature of 16°F, and an east wind at 10 knots.

¹ [FAA-H-8083-28A, Aviation Weather Handbook | Federal Aviation Administration](#)

² Trough - An elongated area of relatively low atmospheric pressure or heights, and is associated with a wind shift and rising motion.

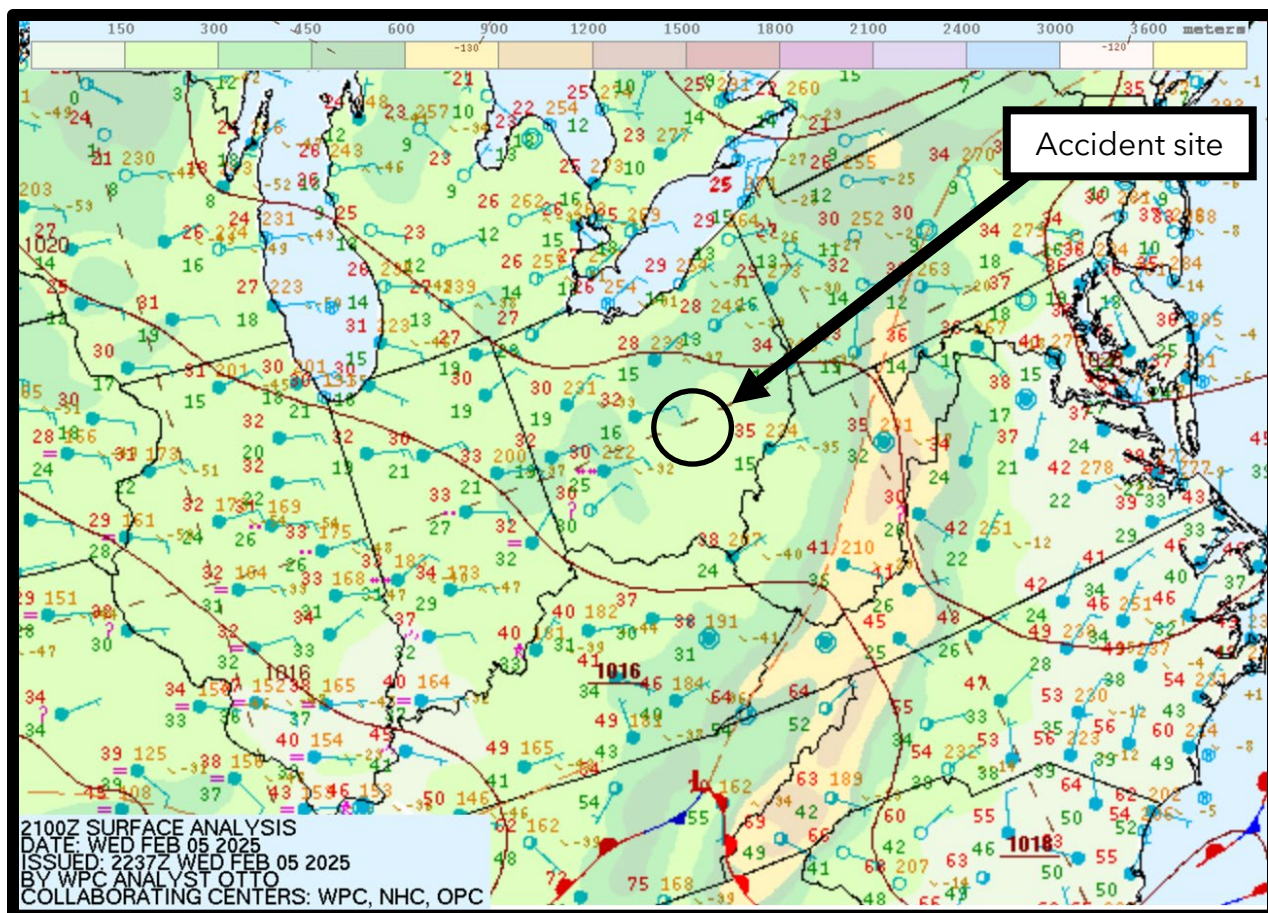


Figure 1. NWS Surface Analysis Chart for 1600 EST.

2.0 Surface Observations

The area surrounding the accident site was documented using official Aviation Routine Weather Reports (METARs) and Aviation Selected Special Reports (SPECIs)³. The following observations were taken from standard code and are provided in plain language. A magnetic variation⁴ of 7.5° west was indicated over the area (figure 2).

³ Latest criteria for SPECIs can be found in the Federal Meteorological Handbook: [Federal Meteorological Handbook Number 1, Surface Weather Observations and Reports \(icams-portal.gov\)](https://www.federalregister.gov/documents/2018/01/16/2018-01-16-federal-meteorological-handbook-number-1-surface-weather-observations-and-reports)

⁴ Magnetic variation - The angle (at a particular location) between magnetic north and true north. Latest measurement taken from <https://skyvector.com/>

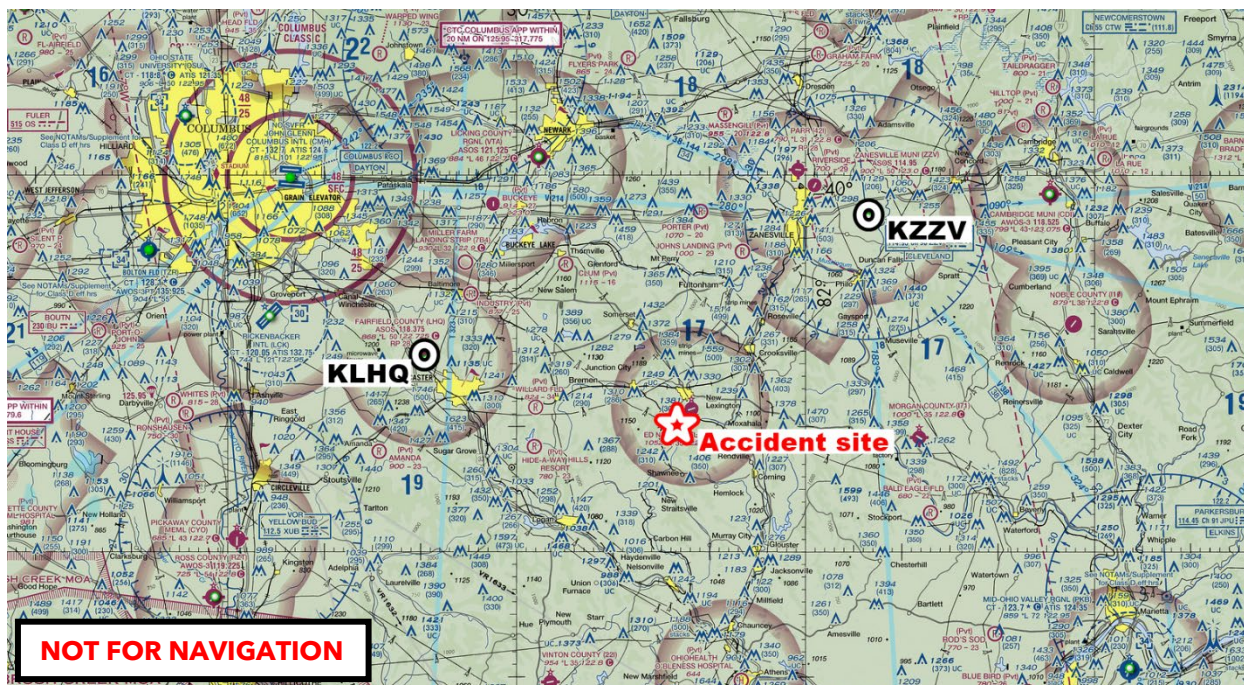


Figure 2. FAA sectional aeronautical chart of the accident area with the locations of the accident site and surface observation sites noted.

Fairfield County Airport (KLHQ) had the closest official weather station to the accident site. KLHQ had an Automated Surface Observing System (ASOS⁵) and its longline⁶ reports were not augmented. The KLHQ ASOS was located around 21 miles west of the accident site (figure 2), at an elevation of 868 ft, and issued the following observations surrounding the accident time:⁷

[1153 EST] METAR KLHQ 051653Z AUTO 08010KT 10SM OVC060
00/M07 A3033 RMK AO2 SLP279 T00001067 \$=

[1253 EST] METAR KLHQ 051753Z AUTO 07009KT 10SM OVC060
00/M08 A3029 RMK AO2 SLP265 T00001078 10006 21022 58026 \$=

⁵ ASOS - Automated Surface Observing System is equipped with meteorological instruments to observe and report wind, visibility, weather phenomena, ceiling, temperature, dewpoint, altimeter, and barometric pressure. ASOS are maintained by the NWS.

⁶ "Longline" refers to the dissemination of weather observations with the intent that they are available in near-real time to national databases and accessible to the general global public from a large number of vendors. This does not include public accessibility to observations from a reporting station's Very High Frequency (VHF; line-of-site) or telephone broadcast, where applicable. Longline dissemination of weather observations is the primary vehicle through which the weather observations are distributed.

⁷ The bold sections of products in this report are intended to highlight the text that directly reference the weather conditions that affected the accident region around the accident time. The local times in this section next to the METARs are provided for quick reference.

[1353 EST] METAR KLHQ 051853Z AUTO 08009KT 10SM OVC055
01/M08 A3024 RMK AO2 SLP247 T00111083 \$=

[1453 EST] METAR KLHQ 051953Z AUTO 07009KT 10SM OVC050
01/M08 A3019 RMK AO2 SLP230 T00111078 \$=

**[1553 EST] METAR KLHQ 052053Z AUTO 09007KT 10SM UP
OVC049 01/M08 A3017 RMK AO2 UPB53 SLP225 P0000 60000
T00111078 56038 \$=**

ACCIDENT TIME 1626 EST

**[1630 EST] SPECI KLHQ 052130Z AUTO 07007KT 4SM FZRA
OVC046 00/M05 A3017 RMK AO2 UPE24RAB10E19FZRAB24
P0002 I1001 T00001050 \$=**

[1645 EST] SPECI KLHQ 052145Z AUTO 08006KT 7SM -FZRA BKN043
OVC055 00/M04 A3018 RMK AO2 UPE24RAB10E19FZRAB24 P0002
I1002 T00001044 \$=

The bold type observations decoded in plain language were as follows:

KLHQ weather at 1553 EST, automated, wind from 090° at 7 knots, visibility 10 miles or greater, unknown precipitation, overcast ceiling at 4,900 ft above ground level (agl), temperature of 1°C, dew point temperature -8°C, and an altimeter setting of 30.17 inches of mercury (inHg). Remarks, automated station with a precipitation discriminator, unknown precipitation began at 1553 EST, sea level pressure 1022.5 hPa, a trace of precipitation since 1453 EST, 6-hourly precipitation of a trace, temperature 1.1°C, dew point temperature -7.8°C, 3-hourly pressure tendency decreased 3.8 hPa, maintenance indicator on.

KLHQ weather at 1630 EST, automated, wind from 070° at 7 knots, visibility 4 miles, moderate freezing rain, overcast ceiling at 4,600 ft agl, temperature of 0°C, dew point temperature -5°C, and an altimeter setting of 30.17 inHg. Remarks, automated station with a precipitation discriminator, unknown precipitation ended at 1624 EST, rain began at 1610 and ended at 1619 EST, freezing rain began at 1624 EST, 0.02 inches of precipitation since 1553 EST, 0.01 inches of ice accumulation since 1553 EST, temperature 0.0°C, dew point temperature -5.0°C, maintenance indicator on.

Zanesville Municipal Airport (KZZV) had the next closest official weather station to the accident site. KZZV had an ASOS and its longline reports were not augmented. The KZZV ASOS was located around 21 miles northeast of the accident site (figure 2), at an elevation of 900 ft, and issued the following observations surrounding the accident time:

[1153 EST] METAR KZZV 051653Z AUTO 07008KT 10SM BKN070
OVC080 M01/M09 A3034 RMK AO2 SLP283 T10061089=

[1253 EST] METAR KZZV 051753Z AUTO 05008KT 10SM OVC080
M01/M09 A3030 RMK AO2 SLP268 T10061094 10000 21022 58024=

[1353 EST] METAR KZZV 051853Z AUTO 08006KT 10SM OVC070
00/M09 A3026 RMK AO2 SLP254 T00001089=

[1453 EST] METAR KZZV 051953Z AUTO 08008KT 10SM OVC060
01/M09 A3022 RMK AO2 PRESFR SLP241 T00061089=

**[1553 EST] METAR KZZV 052053Z AUTO 08007KT 10SM OVC050
01/M09 A3018 RMK AO2 SLP229 T00111094 56038=**

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**[1653 EST] METAR KZZV 052153Z AUTO 06006KT 10SM -RA
OVC050 01/M09 A3018 RMK AO2 UPB46E48RAB48 SLP227 P0000
T00111089=**

[1753 EST] METAR KZZV 052253Z AUTO 10006KT 10SM -RA FEW048
SCT060 OVC080 01/M08 A3014 RMK AO2 RAE10B50UPB51E52
SLP213 P0000 T00061078=

The bold type observations decoded in plain language were as follows:

KZZV weather at 1553 EST, automated, wind from 080° at 7 knots, visibility 10 miles or greater, overcast ceiling at 5,000 ft agl, temperature of 1°C, dew point temperature -9°C, and an altimeter setting of 30.18 inHg. Remarks, automated station with a precipitation discriminator, sea level pressure 1022.9 hPa, temperature 1.1°C, dew point temperature -9.4°C, 3-hourly pressure tendency decreased 3.8 hPa.

KZZV weather at 1653 EST, automated, wind from 060° at 6 knots, visibility 10 miles or greater, light rain, overcast ceiling at 5,000 ft agl, temperature of 1°C, dew point temperature -9°C, and an altimeter setting of 30.18 inHg. Remarks, automated station with a precipitation discriminator, unknown precipitation began at 1646 and ended at 1648 EST, rain began at 1648 EST, sea level pressure 1022.7 hPa, temperature 1.1°C, dew point temperature -8.9°C.

The observations from the KLHQ ASOS around the accident time identified MVFR⁸ conditions with a period of unknown precipitation, rain and moderate freezing rain. VFR conditions were noted at KZZV with temperatures above freezing through 1753 with light rain.

⁸ The NWS and the FAA Aeronautical Information Manual (AIM) section 7-1-7 defines the following general flight categories:

- Low Instrument Flight Rules (LIFR*) – ceiling below 500 ft above ground level (agl) and/or visibility less than 1 statute mile.
- Instrument Flight Rules (IFR) – ceiling between 500 to below 1,000 feet agl and/or visibility 1 to less than 3 miles.
- Marginal Visual Flight Rules (MVFR**) – ceiling from 1,000 to 3,000 ft agl and/or visibility 3 to 5 miles.
- Visual Flight Rules (VFR) – ceiling greater 3,000 ft agl and visibility greater than 5 miles.

* By definition, IFR is a ceiling less than 1,000 ft agl and/or visibility less than 3 miles while LIFR is a sub-category of IFR.

**By definition, VFR is a ceiling greater than or equal to 3,000 ft agl and visibility greater than 5 miles while MVFR is a sub-category of VFR.

3.0 Upper Air Sounding

A High-Resolution Rapid Refresh (HRRR)⁹ model sounding was created¹⁰ for the approximate accident site coordinates for 1600 EST. The HRRR sounding was plotted on a standard Skew-T Log P diagram¹¹ from the surface to 600-hPa (or approximately 14,000 ft) using the RAOB¹² software package and is included as figure 3. The sounding depicted an elevation of 984 ft over the grid point. The sounding depicted the lifted condensation level (LCL)¹³ at 5,149 ft and the convective condensation level (CCL)¹⁴ at 20,394 ft. The freezing level was located at 1,316 ft. The precipitable water value was 0.67 inches.

⁹ The HRRR is a NOAA real-time three-kilometer resolution, hourly-updated, cloud-resolving, convection-allowing atmospheric model, initialized by three-kilometer grids with three-kilometer radar assimilation. Radar data is assimilated in the HRRR every 15 minutes over a one-hour period.

¹⁰ HRRR sounding was created using NOAA Air Resource Laboratory: [READY Archived Meteorology \(noaa.gov\)](https://ready.arl.noaa.gov/).

¹¹ Skew T log P diagram - is a standard meteorological plot using temperature and the logarithmic of pressure as coordinates, used to display winds, temperature, dew point, and various indices used to define the vertical structure of the atmosphere.

¹² RAOB - (The complete Rawinsonde Observation program) is an interactive sounding analysis program developed by Esonde Research Services, The Villages, Florida.

¹³ LCL - The height at which a parcel of moist air becomes saturated when it is lifted dry adiabatically.

¹⁴ CCL - The level in the atmosphere to which an air parcel, if heated from below, will rise dry adiabatically, without becoming colder than its environment just before the parcel becomes saturated.

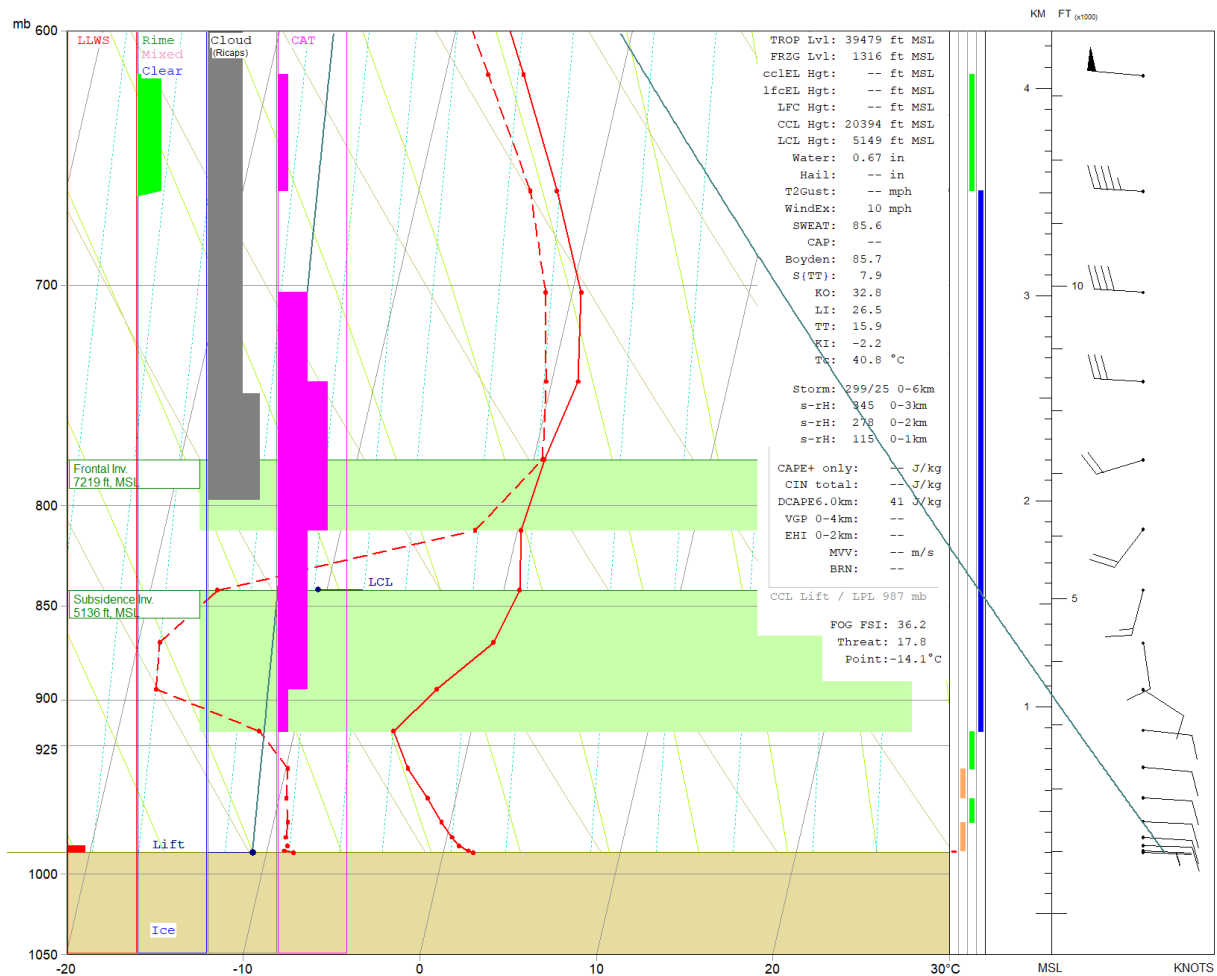


Figure 3. 1600 EST HRRR sounding.

The 1600 EST HRRR sounding indicated an unstable to conditionally unstable atmosphere from the surface through 3,000 ft, then a stable atmosphere from 3,000 ft through 11,500 ft with several inversions noted (shaded in green). The top of a subsidence inversion¹⁵ was indicated at 5,136 ft with the top of a frontal inversion noted at 7,219 ft. The temperature was above freezing between 4,500 ft and 10,000 ft. RAOB indicated cloud cover above 6,500 ft. Rime icing was noted in-cloud above 12,000 ft.

¹⁵ Inversion - A departure from the usual decrease of the value of an atmospheric property with increasing altitude; also, the layer through which this departure occurs (the "inversion layer"), or the lowest altitude at which the departure is found (the "base of the inversion").

The 1600 EST HRRR sounding wind profile indicated a near-surface wind from 090° at 7 knots with the wind remaining east through 3,000 ft. The wind veered¹⁶ to the west by 7,000 ft. The wind speed increased 20 knots by 6,000 ft then all the way to 50 knots by 13,500 ft.

4.0 National Radar Imagery

A regional view of the NWS National Reflectivity Mosaic is included as figure 4 for 1625 EST with the approximate location of the accident site marked by a red circle. The mosaic imagery depicted echoes of 20 to 40 dBZ¹⁷ above the accident site.

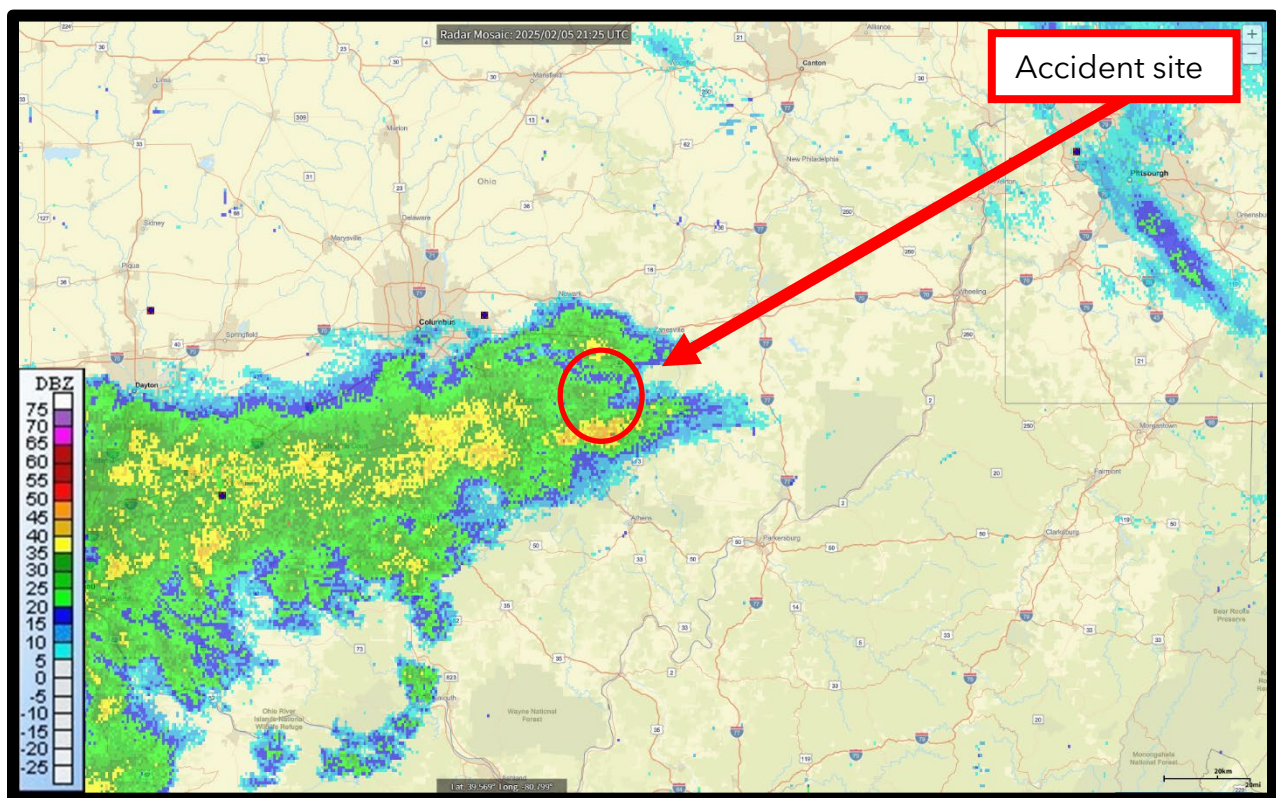


Figure 4. National Reflectivity Mosaic for 1625 EST.

¹⁶ Veered - Wind turning clockwise with height.

¹⁷ dBZ - A non-dimensional "unit" of radar reflectivity which represents a logarithmic power ratio (in decibels or dB) with respect to radar reflectivity factor, Z.

5.0 Significant Meteorological Information

There was a Convective Significant Meteorological Information (SIGMET)¹⁸ 10C valid for the accident site at the accident time. Convective SIGMET 10C issued at 1555 EST (and valid through 1755 EST) forecast an area (figure 5) of embedded thunderstorms with tops to FL400¹⁹ with the SIGMET box moving from 260° at 35 knots:

WSUS32 KPCI 052055
SIGC
-MKCC WST 052055
CONVECTIVE SIGMET 10C
VALID UNTIL 2255Z
OH TN KY IN IL MO AR
FROM 30E APE-40NNW MSL-30NNW MEM-40NE AXC-30E APE
AREA EMBD TS MOV FROM 26035KT. TOPS TO FL400.

OUTLOOK VALID 052255-060255
FROM 30WNW IND-50S VUZ-50SW SQS-40NNE STL-30WNW IND
WST ISSUANCES EXPD. REFER TO MOST RECENT ACUS01 KWNS FROM STORM
PREDICTION CENTER FOR SYNOPSIS AND METEOROLOGICAL DETAILS.

¹⁸ Significant Meteorological Information is a weather advisory that contains meteorological information concerning the safety of all aircraft. There are two types of SIGMETs: convective and non-convective. A US SIGMET advises of weather, other than convective activity, that is potentially hazardous to all aircraft. SIGMETs are issued (for the lower 48 states and adjacent coastal waters) for the following weather-impacted reasons:

- Severe Icing
- Severe or Extreme Turbulence
- Dust Storms and/or Sand Storms lowering visibility to less than 3 miles
- Volcanic Ash

If the total area affected during the forecast period is very large, only a small portion of this total area may be affected at any one time. SIGMETs are issued for 6 hour periods for conditions associated with hurricanes and 4 hours for all other events. If conditions persist beyond the forecast period, the SIGMET is updated and reissued. Convective SIGMETs are issued hourly for thunderstorm-related aviation hazards.

¹⁹ Flight Level - A Flight Level (FL) is a standard nominal altitude of an aircraft, in hundreds of ft. This altitude is calculated from the International standard pressure datum of 1013.25 hPa (29.92 inHg), the standard sea-level pressure, and therefore is not necessarily the same as the aircraft's true altitude either above mean sea level or above ground level.

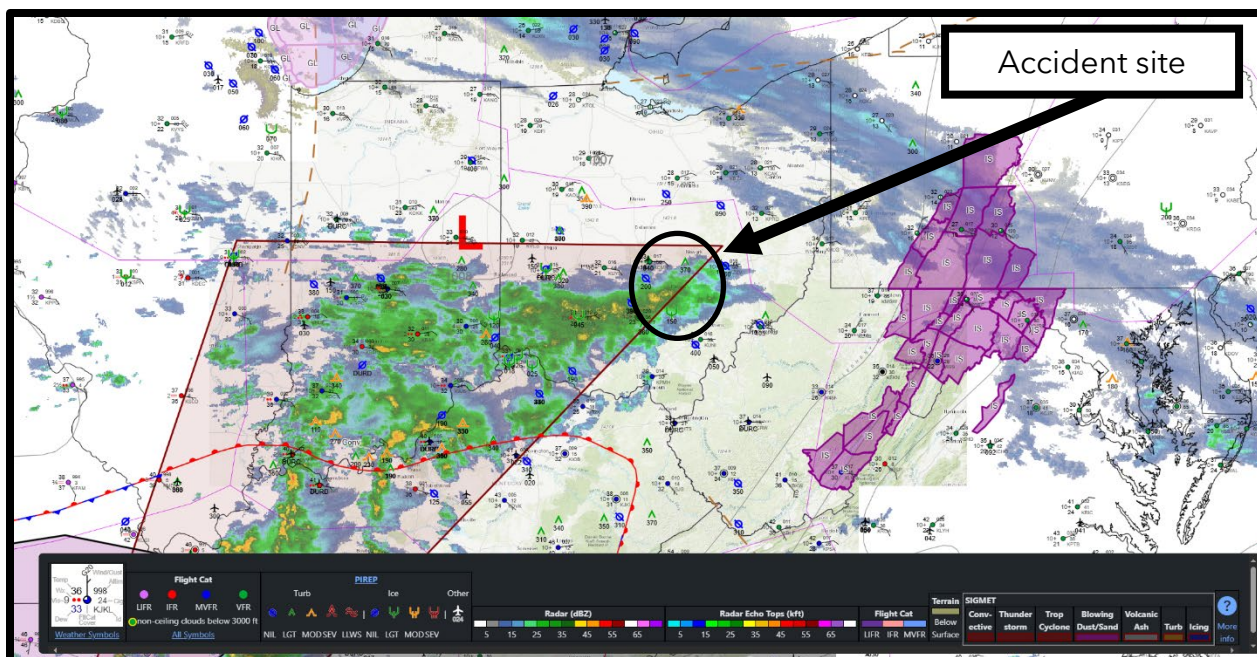


Figure 5. Aviation Weather Center observation page valid at 1630 EST with fronts, PIREPs, and the area of SIGMET 10C highlighted. The location of the accident site is marked by the black circle.

6.0 Center Weather Service Advisories

The Indianapolis (ZMA) Air Route Traffic Control Center (ARTCC) Center Weather Service Unit (CWSU) was responsible for the accident region. There was no Center Weather Advisory (CWA) valid for the accident site at the accident time.

7.0 Graphical Forecasts for Aviation

The Graphical Forecasts for Aviation (GFA) products issued by the AWC before the accident flight and valid at 1600 and 1900 EST and issued around 1100 EST are shown in figures 6 through 9. The GFA surface forecasts applicable at 1600 and 1900 EST for the accident site indicated VFR visibilities with an east wind of 10 knots. By 1900 EST, freezing rain was likely (greater than 60 percent chance). The GFA cloud forecast applicable to the accident site for 1600 EST indicated broken clouds at the accident site with bases at 7,000 ft and clouds to FL340 with cirrus above. The GFA cloud forecast applicable to the accident site for 1900 EST indicated overcast cloud cover at the accident site at 6,000 ft with clouds tops FL340 and cirrus clouds above. The Graphical AIRMETs²⁰ (G-AIRMET) Zulu valid at 1600 EST located west of the

²⁰ Graphical AIRMETs found on the Aviation Weather Center webpage at <http://aviationweather.gov>, are graphical forecasts of en-route weather hazards valid at discrete times no more than 3 hours apart for a period of up to 12 hours into the future (for example, 00, 03, 06, 09, and 12 hours). G-AIRMETs are snap shots at discrete time intervals as defined above. The text AIRMET is the result of the production of the G-AIRMET but provided in a time smear for a 6hr valid period.

accident site and at 1900 EST G-AIRMET Zulu was located south of the accident site. The only human-generated information reflected in the two GFA products were the G-AIRMETs.

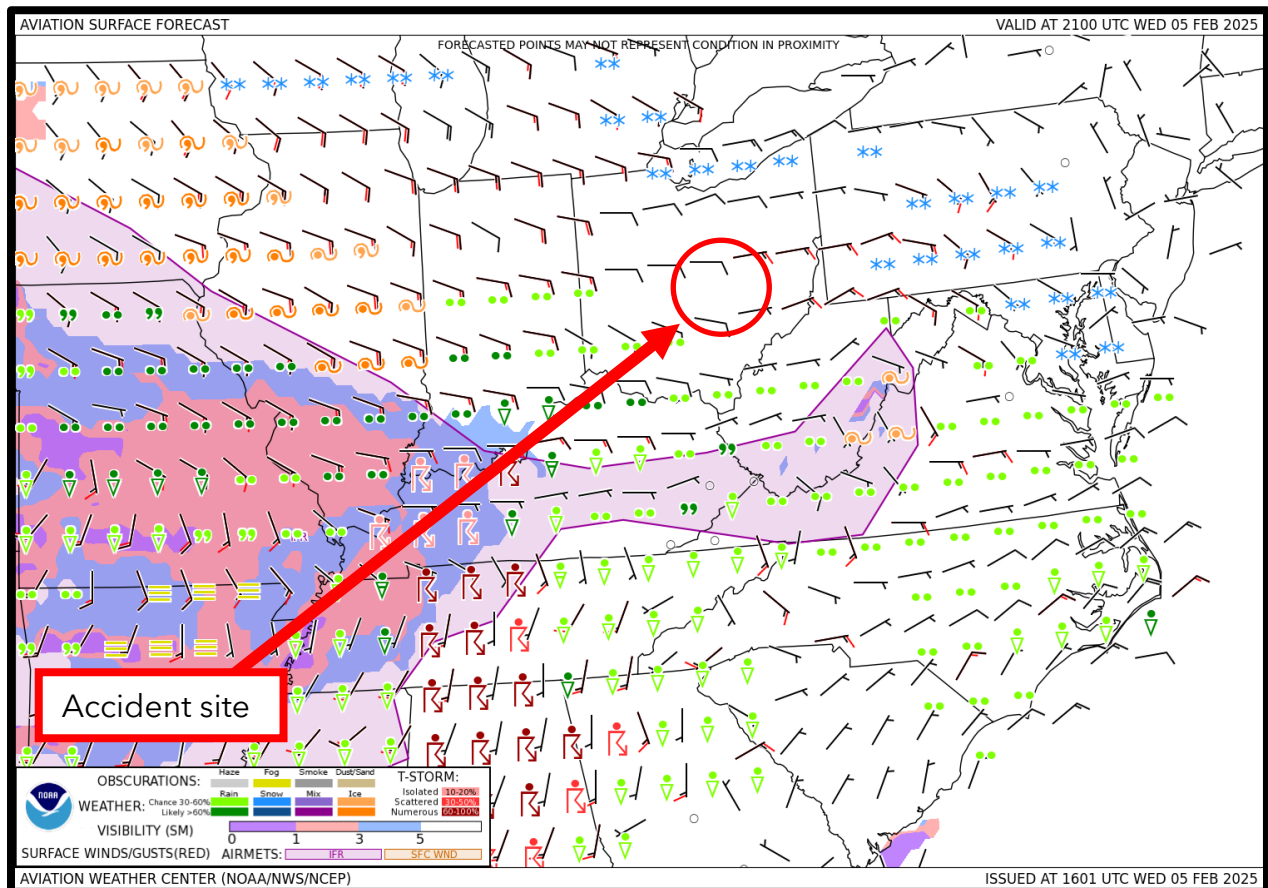


Figure 6. GFA Surface Forecast valid at 1600 EST with forecast issued at 1101 EST.

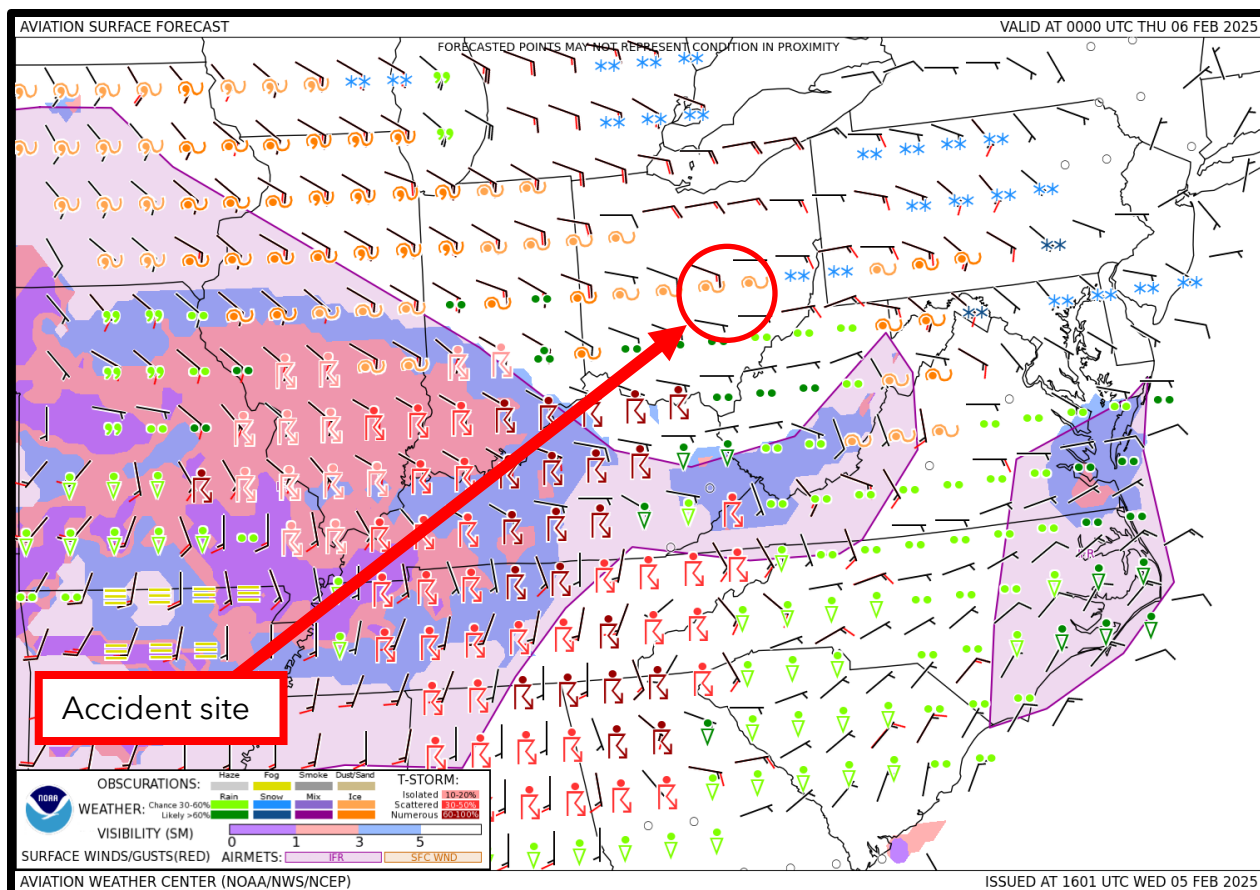


Figure 7. GFA Surface Forecast valid at 1900 EST with forecast issued at 1101 EST.

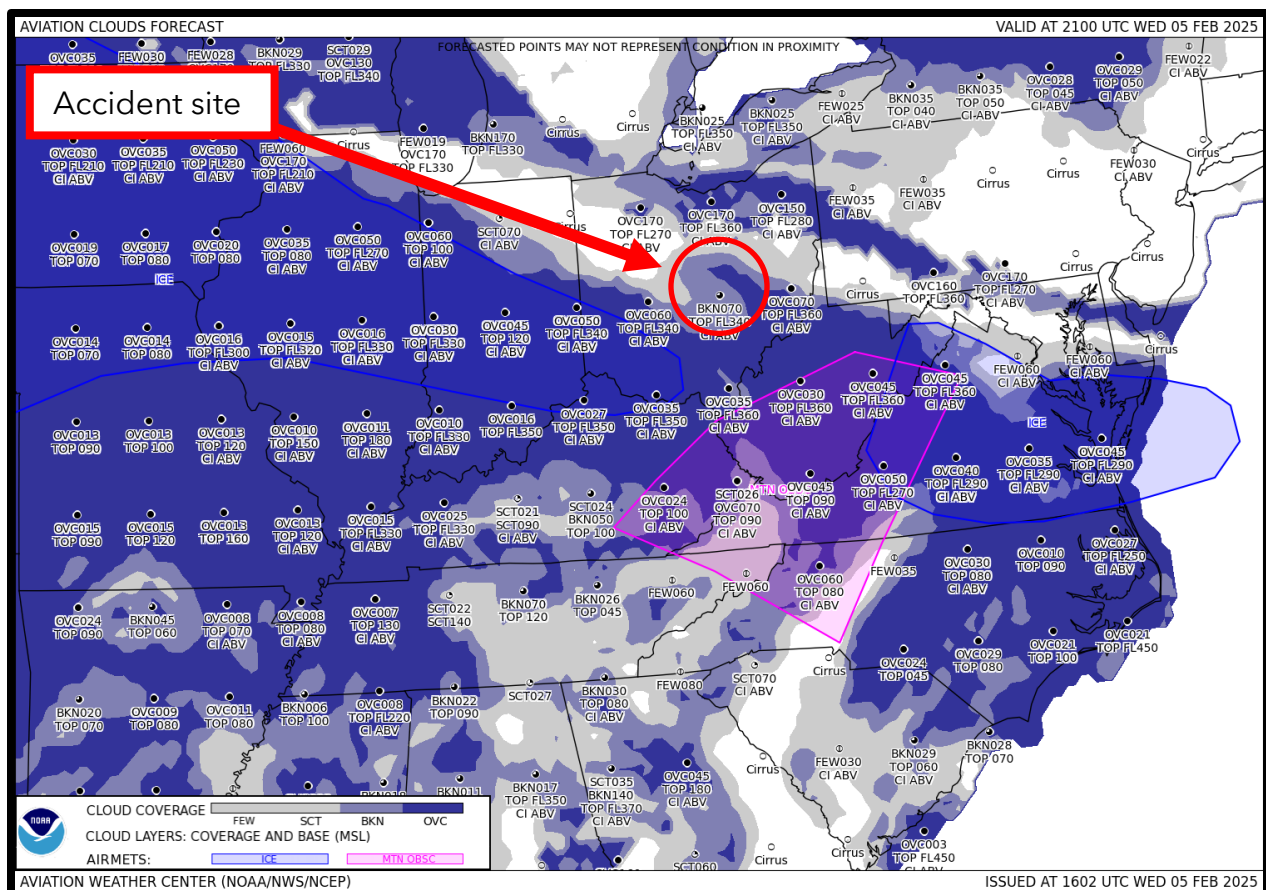


Figure 8. GFA Aviation Clouds Forecast valid at 1600 EST with forecast issued at 1102 EST.

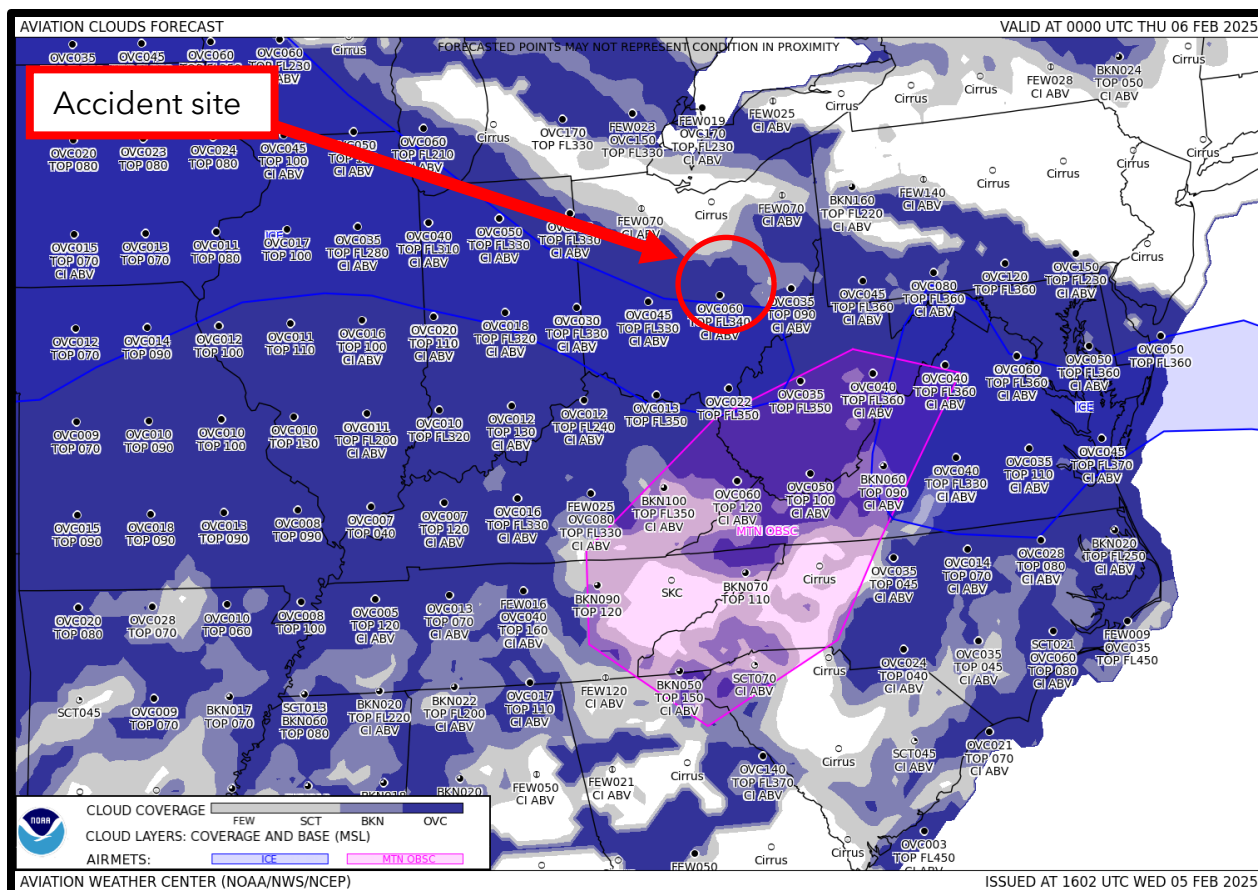


Figure 9. GFA Aviation Clouds Forecast valid at 1900 EST with forecast issued at 1102 EST.

8.0 Astronomical Data

The astronomical data obtained for the accident site on February 5, 2025, indicated the following:

SUN

Begin civil twilight	0704 EST
Sunrise	0732 EST
Sun transit	1243 EST
Accident time	1626 EST²¹
Sunset	1754 EST
End civil twilight	1822 EST

²¹ Inserted accident time for reference and context.

E. LIST OF ATTACHMENTS

None.

Submitted by:

Paul Suffern
Senior Meteorologist