

MEMORANDUM FOR:	Matthew M. Kuzemchak, NWS NEPA Coordinator
FROM:	Jessica Schultz, Radar Focal Point, National Weather Service
SUBJECT:	Finding of No Significant Impact for Lowering the Minimum Scan Angle of the KCLE Weather Surveillance Radar - Model 1988 Doppler (WSR-88D) serving the Cleveland, OH, area – DECISION MEMORANDUM

Based on the subject environmental assessment, I have determined that no significant environmental impacts will result from the proposed action. I request your concurrence in this determination by signing below. Please return the memorandum for our files.

1. I concur \_\_\_\_\_ //signed 7/25/18// \_\_\_\_\_ Date

2. I do not concur \_\_\_\_\_ Date

Attachment

## MEMORANDUM

**TO:** All Interested Government Agencies and Public Groups

Under the National Environmental Policy Act, an environmental review has been performed on the following action.

**TITLE:** Lowering the Minimum Scan Angle of the KCLE Weather Surveillance Radar - Model 1988 Doppler (WSR-88D) serving the Cleveland, OH, area

**LOCATION:** Cleveland Hopkins International Airport, Cleveland, Cuyahoga County, OH

**SUMMARY:**

The National Weather Service (NWS) owns and operates the existing Weather Surveillance Radar, Model 1988 Doppler (WSR-88D) serving the Cleveland, OH, area. The radio call letters of the radar are KCLE and the radar is located at Cleveland Hopkins International Airport, 10 miles southwest of downtown Cleveland. The KCLE WSR-88D was commissioned in 1995 and is one of 159 WSR-88Ds in the nationwide network.

The KCLE WSR-88D antenna transmits a narrow focused main beam with a width of 1 degree. In normal operation, the WSR-88D antenna rotates horizontally to cover all directions (i.e. azimuths). The radar antenna also varies the scan angle at which it points with respect to the horizon. The scan angle is measured along the axis of the main beam and can be changed in 0.1 deg increments. Currently, the KCLE radar operates at a minimum of scan angle of +0.5 degrees (deg) above the horizon. NWS proposes to reduce the minimum scan angle of the KCLE WSR-88D from the current minimum of +0.5 deg to +0.4 deg (the proposed action). Lowering the minimum scan angle would provide enhanced coverage of the lower portions of the atmosphere. No construction activities or physical modification of the KCLE WSR-88D would be required to implement the proposed action; the only change would be to the radar's operating software.

**RESPONSIBLE OFFICIAL:** Jessica Schultz, Radar Focal Point, National Weather Service, 1200 Westheimer Drive, Norman, OK 73069, Tel. (405)573-8808, email: [Jessica.a.schultz@noaa.gov](mailto:Jessica.a.schultz@noaa.gov)

The environmental review process led us to conclude that this action will not have a significant effect on the human environment. A copy of the finding of no significant impact, including the supporting environmental assessment is enclosed for your information. Please submit any comments to the responsible official named above by **August 31, 2018**.

Also, please send one copy of your comments to me in 1325 East-West Highway, Room 3353, Silver Spring, MD 20910.

Sincerely

Matthew M. Kuzemchak  
NWS NEPA Coordinator

Enclosure

**FINDING OF NO SIGNIFICANT IMPACT (FONSI)**  
**LOWERING THE MINIMUM SCAN ANGLE OF THE WEATHER**  
**SURVEILLANCE RADAR-MODEL 1988, DOPPLER (WSR-88D)**  
**SERVING THE CLEVELAND, OH, AREA**

**ENVIRONMENTAL ASSESSMENT (EA) SUMMARY**

**Purpose and Need**

NWS is part of the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce. NWS operates a nationwide network of 159 Doppler weather radars, which collect data on atmospheric conditions, and include precipitation type and intensity, wind speed and direction, and storms, from near ground level to above 10,000 ft in elevation above the ground. NWS staff uses these data to prepare daily forecasts and issue severe weather watches and warnings, and to further NWS's mission to protect and enhance life and property and the nation's economy. The WSR-88D serving the Cleveland, OH, area has radio call letters KCLE and is located at Cleveland Hopkins International Airport, 10 miles southwest of downtown Cleveland, OH. Operating this radar at lower scan angles would increase the area of radar coverage, providing additional data on atmospheric conditions to NWS forecasters and other data users. The area covered at 2,000 ft above site level (ASL) would increase by 23.8%. Additionally, the floor of radar coverage over Erie, PA, would decrease from the current 5,410 ft above ground level to 4,470 ft.

**Description of Proposed Action**

The KCLE WSR-88D is an S-band Doppler, dual polarized weather radar, which NWS uses to collect meteorological data to support weather forecasts and severe weather warnings for Northeastern Ohio and northwestern Pennsylvania. The KCLE WSR-88D antenna transmits a narrow focused main beam with a width of 1 degree. In normal operation, the WSR-88D antenna rotates horizontally to cover all directions (i.e. azimuths). The radar antenna also varies the scan angle at which it points with respect to the horizon. The scan angle is measured along the axis of the main beam and can be changed in 0.1 deg increments. Currently, the KCLE radar operates at a minimum scan angle (at the center of the beam) of +0.5 degrees (deg) above the horizon. NWS proposes to reduce the minimum scan angle of the KCLE WSR-88D from the current minimum of +0.5 deg to +0.4 deg (the proposed action). Lowering the minimum scan angle would provide enhanced coverage of the lower portions of the atmosphere. No construction activities or physical modification of the KCLE WSR-88D would be required to implement the proposed action; the only change would be to the radar's operating software.

**Alternatives Considered**

NWS evaluated the benefits and potential impacts of lowering the minimum scan angle of the

KCLE WSR-88D to each angle between +0.4 and -0.2 deg in 0.1 degree increments. That analysis found that a minimum scan angle of +0.4 deg would result in improvement of radar coverage while not causing significant environmental impacts. Operating the KCLE WSR-88D at center of beam minimum scan angles at or below +0.3 deg (i.e. between +0.3 and -0.2 deg) could cause direct main beam exposure of the Burrell Observatory at Baldwin-Wallace University. Astronomical observatories can be sensitive to RF exposure and direct illumination of the Burrell Observatory would have the potential to cause electromagnetic interference with observatory equipment. Operating the KCLE WSR-88D at center of beam minimum scan angles at +0.3 deg or lower (i.e. between +0.2 and -0.2 deg) would also result in the WSR-88D's main beam impinging on the ground surface about 5,500 ft south of the radar, which is within the safety setback distance for electro-explosive devices (EEDs). The proposed action would avoid these impacts. Based on this information, NWS selected a minimum scan angle of +0.4 deg as the proposed action.

The no action alternative consists of continued operation of the KCLE WSR-88D at the existing minimum scan angle of +0.5 dg. The improvements in radar coverage would not be achieved and the project objectives would not be met. The proposed action would result in increased RF exposure at certain portions of the atmosphere while the no-action alternative would not change RF exposure levels from existing levels. Four structures at Cleveland Hopkins International Airport would be directly illuminated by the WSR-88D main beam under both the proposed action and the no-action alternative. During normal operation of the KCLE WSR-88D with a rotating antenna) radiofrequency (RF) exposure at all of these structures would conform to safety levels for the general public and workers established by American National Standards Institute / Institute of Electrical and Electronics Engineers (ANSI/IEEE), Occupational Health and Safety Administration (OSHA), and Federal Communications Commission (FCC).

### **Environmental Consequences**

NWS prepared an Environmental Assessment (EA) analyzing the potential environmental consequences of the implementing the proposed action in compliance with the President's Council on Environmental Quality (CEQ) National Environmental Policy Act implementing regulations (40 Code of Federal Regulations Parts 1500 – 1508) and NOAA Administrative Order (NOA) 216-6A: *Compliance with the National Environmental Policy Act , Executive Orders 12114, Environmental Effects Abroad of Major Federal Actions; 11988 and 13690, Floodplain Management; and 11990 Protection of Wetlands.* (April 22, 2016).

Lowering the minimum scan angle of the KCLE WSR-88D would not require physical changes to the radar, vegetation removal, or ground disturbance. The proposed action would not result in significant effects in the following subject areas:

- Land Use and Coastal Zone Management
- Geology, Soils, and Seismic Hazards
- Drainage and Water Quality
- Transportation

- Air Quality
- Flood Hazards
- Wetlands
- Biological Resources / Protected Species
- Cultural and Historic Resources
- Environmental Justice Socioeconomic Impacts
- Farmlands
- Energy Consumption
- Visual Quality/ Light Emissions
- Solid and Hazardous Waste
- Wild and Scenic Rivers.

The lower minimum scan angle of +0.4 deg would not result in the KCLE WSR-88D main beam impinging on the ground within three miles of the WSR-88D. The WSR-88D main beam could impinge on the uppermost portions of five structures at the airport:

- Roof of the National Aeronautics and Space Administration (NASA) hangar 550 ft north-northeast of the WSR-88D
- Precision Runway Monitor (PRM) tower 1,100 ft southwest
- Airport Traffic Control Tower (ATCT) 5,300 ft south-southeast
- Ramp control tower 5,800 ft east-southeast
- Roof of International Exposition Center 5,300 ft south-southeast.

During normal operation with the antenna rotating, RF exposure levels at all four of these structures would conform to ANSI/IEEE, OSHA, and FCC safety standards. NWS may infrequently operate the WSR-88D with a stationary antenna for calibration purposes. Operation with a stationary antenna would not cause RF levels exceeding RF safety levels at the ATCT, Ramp control tower, or International Exposition Center. RF safety levels could be exceeded at the NASA hangar and PRM during stationary antenna operation. To avoid that impact, NWS will implement Mitigation Measure 1:

**MITIGATION MEASURE 1:** During infrequent stationary antenna operation, the WSR-88D antenna would not be directed at the PRM tower to the southwest (azimuths 218 to 220) or the NASA hangar to the north-northeast (azimuths 0 to 30).

Because the KCLE WSR-88D operates in a frequency band dedicated to government relocation services and the main beam would not impinge on the ground surface in the radar vicinity, the proposed action would have low potential to cause radio interference with television, radio, cellular telephone, personal communications devices (PCDs), electro-explosive devices, fuel handling, active implantable medical devices, or astronomical observatories.

## **Public and Agency Review of the Draft EA**

The NWS distributed the Draft EA to interested members of the public and government agencies for review and comment. Comments on the Draft EA were accepted by NWS during a 39-day comment period ending on June 29, 2018. No comments were received on the Draft EA.

## **FINDING OF NO SIGNIFICANT IMPACT**

The CEQ Regulations state that the determination of significance using an analysis of effects requires examination of both context and intensity, and lists ten criteria for intensity (40 CFR 1508.27). In addition, NAO 216-6A, Section 6.01(b) 1 – 11, provides eleven criteria, the same ten as the CEQ Regulations and one additional for determining whether the impacts of a proposed action are significant. Each criterion is discussed below with respect to the proposed action and considered individually as well as in combination with the others.

*1. Can the proposed action reasonably be expected to cause both beneficial and adverse impacts that overall may result in a significant effect, even if the effect will be beneficial?*

No. The EA report analyzes the potential for implementation of the proposed action to cause environmental consequences based on established standards and criteria. The proposed action would not require construction or vegetation removal and would not result in ground disturbance. The only environmental consequence would be a slight increase in RF power density in a small portion of the atmosphere. During normal operations, WSR-88D RF emissions would comply with national and international safety standards for human exposure. During infrequent stationary antenna operation, NWS would implement Mitigation Measure 1. This measure would ensure that RF levels at elevated structures in the vicinity of the WSR-88D would conform to safety standards for human exposure.

*2. Can the proposed action be expected to significantly affect public health or safety?*

No. The lower minimum scan angle would not result in the KCLE WSR-88D main beam impinging on the ground in the vicinity of the WSR-88D site. The proposed action would slightly increase RF exposure levels in the vicinity of the KCLE WSR-88D. As described in the answer to question 1 above, RF emissions from the WSR-88D operating at a minimum scan angle of +0.4 deg would conform to ANSI/IEEE, FCC, and OSHA safety standards at all ground locations and structures in the vicinity of the WSR-88D. RF emissions from the WSR-88D would also comply with RF exposure standards for implantable medical devices established by the FCC and the Association for Advancement of Medical Instrumentation and would not interfere with operation of those devices.

*3. Can the proposed action reasonably be expected to result in significant impacts to unique*

*characteristics of the geographic area, such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas?*

No. The proposed action's area of potential effect (APE) is defined as area within 5,947 ft of the WSR-88D where RF hazards to potentially RF-sensitive activities could result. The nearest place listed on the National Register of Historic Places (NRHP) is the Fairview Community Park Historic District, located 1.7 miles north of the radar and outside the APE. The North Campus of Baldwin-Wallace University in Berea, OH, is listed on NRHP, but is 2.6 miles south of the WSR-88D and outside the APE (Ohio History Connection, 2018). No historic places are within the APE and none would be affected by the proposed action.

*4. Are the proposed action's effects on the quality of the human environment likely to be highly controversial?*

No. The proposed action would not result in construction or ground disturbance and would comply with safety standards for human exposure to RF emission. The WSR-88D can cause harmful electromagnetic interference (EMI) with charge-couple devices (CCDs) which electronically record data collected by astronomical telescopes. The potential for harmful EMI would arise if the WSR-88D's main beam would directly impinge on an astronomical observatory during low angle scanning. NWS identified all astronomical observatories within 150 miles of the WSR-88D and analyzed the potential for a lower scan angle to result in the main beam impinging on each observatory. No observatories would be affected at the proposed +0.4 deg lower scan angle. A lower scan angle of +0.3 deg or lower could result in the WSR-88D main beam impinging on the Burrell Observatory at Baldwin-Wallace University; therefore NWS decided against operating the WSR-88D at +0.3 deg or lower.

*5. Are the proposed action's effects on the human environment likely to be highly uncertain or involve unique or unknown risks?*

No. The proposed action would not increase the radar's power output, but would spread those emissions over a larger portion of the atmosphere. RF power densities at the newly covered area would be the same as at existing covered portions of the atmosphere. The EA contains detailed calculations of RF exposure levels and compares projected exposure levels to safety standards for RF exposure of the general public and workers, potentially RF sensitive activities (e.g. fuel handling, use or transport of electro-explosive devices), and active implantable medical devices. The proposed action would comply with all safety standards. The WSR-88D main beam would also not directly illuminate any astronomical observatories and would not have the potential to affect their operation. There is very little potential for unknown or uncertain impacts to result.

*6. Can the proposed action reasonably be expected to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?*

No. The proposed action is limited to lowering the minimum scan angle of the existing KCLE WSR-88D serving the Cleveland, OH, area, and the EA analysis is specific to that radar. If the NWS were to consider lowering the minimum scan angle of another WSR-88D in the nationwide network, they will perform a site specific analysis of potential effects for that radar in compliance with NEPA and NAO 216-6A. No precedents would result for future actions with significant effects or a decision in principle about a future consideration.

*7. Is the proposed action related to other actions that when considered together will have individually insignificant but cumulatively significant impacts?*

No. The Final EA report evaluates the potential for the proposed action, in conjunction with past, present, and reasonably foreseeable future actions to cause significant environmental effects. The proposed action is not reliant upon or connected to other actions, nor is it relied upon for the occurrence of other actions. Therefore, the proposed action will not result in a significant cumulative impact to the human environment.

*8. Can the proposed action reasonably be expected to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources?*

No. As discussed in the answers to questions 3 and 4, no historic places occur with the proposed action's APE and no electromagnetic effects impacts would result to astronomical observatories.

*9. Can the proposed action reasonably be expected to have a significant impact on endangered or threatened species, or their critical habitat as defined under the Endangered Species Act of 1973?*

No. Based on information obtained from the U.S. Fish and Wildlife Service, the proposed action would not adversely affect threatened and endangered species or critical habitat.

*10. Can the proposed action reasonably be expected to threaten a violation of Federal, state, or local law or requirements imposed for environmental protection?*

No. The effect of the proposed action on the human environment has been analyzed relative to applicable Federal, state and local environmental laws or regulations. No regulatory violations or other significant environmental effects are expected to result.

*11. Can the proposed action reasonably be expected to result in the introduction or spread of a non-indigenous species?*

No. The proposed action has no potential to cause the transport, release, propagation or

spread of non-indigenous species.

### **DETERMINATION**

After careful and thorough consideration of the Final EA report, the undersigned finds that lowering the minimum scan angle of the KCLE WSR-88D serving the Cleveland, OH, area from the current +0.5 deg to +0.4 deg is consistent with existing national environmental policies and objectives set forth in sections 101(a) and 101(b) of NEPA and will not significantly affect the quality of the human environment or otherwise result in any condition requiring consultation pursuant to section 102(2) (c) of NEPA.

As described in section 5.03c of NOA 216-6A, a Finding of No Significant Impact is supported and appropriate for lowering the minimum scan angle of the KCLE WSR-88D from the current +0.5 deg to +0.4 deg. as analyzed in the EA report. Preparation of an environmental impact statement for this action is not necessary.

//signed 7/25/18// \_\_\_\_\_  
Jessica Schultz  
Radar Focal Point  
Radar Operations Center  
National Weather Service

\_\_\_\_\_  
Date