Final

UNITED STATES AIR FORCE F-35A OPERATIONAL BEDDOWN AIR NATIONAL GUARD ENVIRONMENTAL IMPACT STATEMENT

Volume II Appendices
February 2020

Appendix A - Correspondence

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Appendix A1

Agency Correspondence

DEPARTMENT OF THE AIR FORCE
WASHINGTON DC

OFFICE OF THE ASSISTANT SECRETARY
SAF/IEI
1665 Air Force Pentagon
Washington, DC 20330-1665

SEP 2 2 2017

Mr. Elliott Black
Director, Office of Airport Planning and Programming (APP-1)
Federal Aviation Administration National Headquarters
800 Independence Ave SW
Orville Wright Bldg (FOB10A)
Washington, DC 20591

Dear Mr. Black,

The Air Force requests the Federal Aviation Administration's participation as a cooperating agency in preparation of an environmental impact statement (EIS) for the F-35A Operations 5 and 6 basing alternative locations. The alternative locations are Boise Municipal Airport, Boise, ID; Montgomery Regional Airport, Montgomery, AL; Jacksonville International Airport, Jacksonville, FL; Dane County Regional Airport, Madison, WI; and Selfridge ANGB, Harrison Charter Township, MI.

This participation arrangement is described in the Council on Environmental Quality National Environmental Policy Act Regulations, 40 CFR § 1501.6, *Cooperating Agencies*. As a cooperating agency, the Air Force requests the Federal Aviation Administration participate in various portions of the EIS development. Specifically, the Air Force asks for your support as a cooperating agency by:

- Participating in the scoping process
- Assuming responsibility, upon request by the Air Force, for developing information and preparing analyses on issues for which the Federal Aviation Administration has special expertise
- Making staff support available to enhance interdisciplinary review capability and provide specific comments (40 CFR §1503.3)
- Provide review and comments within the timelines prescribed in the program milestone schedule
- Responding, in writing, to this request

Our points of contact for this matter are Mr. Jack Bush at (703) 614-0237 (jack.bush@us.af.mil) and Ms. Christel Johnson at (240) 612-8508 (christel.johnson@us.af.mil).

Sincerely,

Jennifer L Miller

JENNIFER L. MILLER
Deputy Assistant Secretary of the Air Force
(Installations)

BREAKING BARRIERS...SINCE 1947

U.S. Department of Transportation
Federal Aviation Administration

Office of Airport Planning and Programming

800 Independence Ave., SW.
Washington, DC 20591

NOV 17 2017

Ms. Jennifer Miller
Deputy Assistant Secretary of the Air Force (Installations)
SAF/IEI
1665 Air Force Pentagon
Washington, DC 20330

Dear Ms. Miller:

Thank you for your September 22 letter requesting Federal Aviation Administration (FAA) participation as a cooperating agency in preparation of an Environmental Impact Statement (EIS) for F-35A operations and basing alternatives.

The FAA supports the Air Force decision to prepare an EIS for this proposal and agrees to be a cooperating agency. The FAA will participate in accordance with 40 CFR § 1501.6, *Cooperating Agencies,* from the Council on Environmental Quality's Regulations on the National Environmental Policy Act (NEPA) and FAA's NEPA Procedures (FAA Orders 1050.1F, *Environmental Impacts: Policies and Procedures* and FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Actions*).

The airports being considered in this EIS include:

- Boise Air Terminal/Gowen Field Airport, Boise ID;
- Montgomery Regional Airport, Montgomery AL;
- Jacksonville International Airport, Jacksonville FL;
- Dane County Regional-Truax Field Airport, Madison, WI; and
- Selfridge Air National Guard Base[1], Harrison Charter Township, MI.

These locations span multiple FAA Regional Airports Divisions and Airports District Offices (ADOs). Therefore, we ask the Air Force direct all communications on the EIS to FAA Headquarters' Airport Planning and Environmental Division (APP-400). The APP-400 point of contact will coordinate with our Regions/ADOs and consolidate FAA input on the EIS.

[1] Please note that this location is not a civil airport, and therefore, the FAA does not normally have jurisdiction over airport issues.

The FAA point of contact for this EIS is Ms. Jean Wolfers-Lawrence, Environmental Specialist, APP-400, at (202) 267-9749 or jean.wolfers-lawrence@faa.gov.

Sincerely,

Elliott Black
Director, Office of Airport Planning
and Programming

The sample scoping letter following was distributed to the list below:

115th Fighter Wing, Madison, Wisconsin

Mr. Kurt Thiede, Interim Secretary, Wisconsin Department of Natural Resources, Central Office, 101 S Webster Street, Madison WI 53707-7921
Mr. Sanjay Olson, Division Administrator, Wisconsin Department of Natural Resources, Fish, Wildlife, & Parks Division, Central Office, 101 S Webster Street, Madison, WI 53707-7921
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Mr. Matthew Mikolajewski, Director, City of Madison Economic Development Division, 30 W. Mifflin St., Suite 502-507, Madison, WI 53703
Mr. Robert Kaplan, Acting Administrator, U.S. Environmental Protection Agency, Region 5, 77 W. Jackson Boulevard, Mail Code: R-19J, Chicago, IL 60604-3507
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Col. Sam Calkins, District Commander, U.S. Army Corps of Engineers, St. Paul District, 180 5th St. East, Ste. 700, St. Paul, MN 55101-1678
Brigadier General Mark Toy, Division Commander, U.S. Army Corps of Engineers, Great Lakes and Ohio River Division, 550 Main Street, Room 10524, Cincinnati, OH 45202-3222
Ms. Angela Biggs, State Conservationist, U.S. Department of Agriculture, Wisconsin Natural Resources Conservation Service, 8030 Excelsior Drive, Suite 200, Madison WI 53717-2906
Mr. Russell Strach, Center Director, U.S. Geological Survey, Great Lakes Science Center, 1451 Green Road, Ann Arbor, MI 48105
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The Honorable Sean Duffy, U.S. House of Representatives, 2330 Rayburn House Office Building, Washington, DC 20515
The Honorable Gwen Moore, U.S. House of Representatives, 2252 Rayburn House Office Building, Washington, DC 20515

124th Fighter Wing, Boise, Idaho

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The Honorable Susan B. Chew, Representative, Idaho House of Representatives, District 17, House Seat B, 1304 Lincoln Avenue, Boise, ID 83706
The Honorable Melissa Wintrow, Representative, Idaho House of Representatives, District 19, House Seat B, 1711 Ridenbaugh St, Boise, ID 83702
The Honorable Ilana Rubel, Representative, Idaho House of Representatives, District 18, House Seat A, 2750 Migratory Dr, Boise, ID 83706
The Honorable Hy Kloc, Representative, Idaho House of Representatives, District 16, House Seat B, 3932 Oak Park Pl, Boise, ID 83703
The Honorable John Gannon, Representative, Idaho House of Representatives, District 17, House Seat A, 2104 S Pond St, Boise, ID 83705
The Honorable Phylis K. King, Representative, Idaho House of Representatives, District 18, House Seat B, 2107 Palouse St, Boise, ID 83705
The Honorable Lynn M. Luker, Representative, Idaho House of Representatives, District 15, House Seat A, 514 South El Blanco Drive, Boise, ID 83709
The Honorable Mathew Erpelding, Representative, Idaho House of Representatives, District 19, House Seat A, PO Box 1697, Boise, ID 83701
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The Honorable Grant Burgoyne, Senator, Idaho Senate, District 16, 2203 Mountain View Dr, Boise, ID 83706
The Honorable Janie Ward-Engelking, Senator, Idaho Senate, District 18, 3578 S Crosspoint Ave, Boise, ID 83706
The Honorable Cherie Buckner-Webb, Senator, Idaho Senate, District 19, 2304 W Bella St, Boise, ID 83702
The Honorable Chuck Winder, Senator, Idaho Senate, District 20, 5528 N Ebbetts Ave, Boise, ID 83713
The Honorable Maryanne Jordan, Senator, Idaho Senate, District 17, 312 N Atlantic St, Boise, ID 83706
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The Honorable Brandon Woolf, State Controller, State of Idaho, PO Box 83720, Boise, ID 83720-0011
The Honorable Brad Little, Lt. Governor, State of Idaho, State Capitol Building, Boise, ID 83702-0057
The Honorable Lawrence Wasden, Attorney General, State of Idaho, PO Box 83720, Boise, ID 83720-0010
The Honorable C.L. "Butch" Otter, Governor of Idaho, PO Box 83720, Boise, ID 83720
The Honorable Kate Brown, Governor of Oregon, 900 Court Street, Suite 254, Salem, OR 97301-4047
The Honorable Brian Sandoval, Governor of Nevada, 101 N. Carson Street, Carson City, NV 89701
The Honorable Cliff Bentz, Senator, Oregon Senate, District 30, PO Box 1027, Ontario, OR 97914
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The Honorable Jeff Merkley, U.S. Senate, 313 Hart Senate Office Bldg, Washington, DC 20510
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The Honorable Stephen Hartgen, Idaho House of Representatives, District 24, 1681 Wildflower Lane, Twin Falls, ID 83301
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Mr. John Pafenbach, Administrator, Mobile County, PO Box 1443, Mobile, AL 36633
County Commissioners, Monroe County, PO Box 8, Monroeville, AL 36461
County Commissioners, Perry County, 300 Washington St., Marion, AL 36756
County Commissioners, Sumter County, PO Box 70, Livingston, AL 35470
County Commissioners, Washington County, PO Box 146, Chatom, AL 36518
County Commissioners, Wilcox County, PO Box 488, Camden, AL 36726
Ms. Betty Carlisle, Administrator, Forrest County Planning Department, PO Box 1310, Hattiesburg, MS 39403-1310
Board of Supervisors, Forrest County, 641 Main St., Hattiesburg, MS 39401
Board of Supervisors, George County, 329 Ratliff Street, Lucedale, MS 39452
Mr. Ken Flanagan, Director, Community Development, George County, 329 Ratliff Street, Lucedale, MS 39452
Board of Supervisors, Greene County, PO Box 460, Leakesville, MS 39451
Board of Supervisors, Perry County, 103 1st St., New Augusta, MS 39462
Mr. Randy Melton, Planning and Building Department, Stone County, 220 East Cavers Ave., Wiggins, MS 39577
Board of Supervisors, Stone County, 220 East Cavers Ave., Wiggins, MS 39577
Ms. Nancy Carnley, Commission Chairman, Alabama Indian Affairs Commission, 771 S Lawrence St, Ste 106, Montgomery, AL 36130
The Honorable April Weaver, Alabama House of Representatives, District 49, 11 South Union Street, Suite 417-J, Montgomery, AL 36130-2950
The Honorable Elaine Beech, Alabama House of Representatives, District 65, 11 South Union Street, Suite 427-E, Montgomery, AL 36130-2950
The Honorable Artis "A.J." McCampbell, Alabama House of Representatives, District 71, 11 South Union Street, Suite 539-F, Montgomery, AL 36130-2950
The Honorable Thomas Jackson, Alabama House of Representatives, District 68, 11 South Union Street, Suite 437-D, Montgomery, AL 36130-2950
The Honorable Prince Chestnut, Alabama House of Representatives, District 67, 11 South Union Street, Montgomery, AL 36130-2950
The Honorable Alan Harper, Alabama House of Representatives, District 61, 11 South Union Street, Suite 403-B, Montgomery, AL 36130-2950
The Honorable Ralph Howard, Alabama House of Representatives, District 72, 11 South Union Street, Suite 525-A, Montgomery, AL 36130-2950
The Honorable Randall Davis, Alabama House of Representatives, District 96, 11 South Union Street, Suite 417-G, Montgomery, AL 36130-2950
The Honorable Adline Clarke, Alabama House of Representatives, District 97, 11 South Union Street, Suite 540-B, Montgomery, AL 36130-2950

The Honorable Napoleon Bracy, Alabama House of Representatives, District 98, 11 South Union Street, Suite 540-A, Montgomery, AL 36130-2950
The Honorable James E. Buskey, Alabama House of Representatives, District 99, 11 South Union Street, Suite 540-C, Montgomery, AL 36130-2950
The Honorable Victor Gaston, Alabama House of Representatives, District 100, 11 South Union Street, Suite 519-E, Montgomery, AL 36130-2950
The Honorable Chris Pringle, Alabama House of Representatives, District 101, 11 South Union Street, Suite 417-E, Montgomery, AL 36130-2950
The Honorable Jack W. Williams, Alabama House of Representatives, District 102, 11 South Union Street, Suite 524-F, Montgomery, AL 36130-2950
The Honorable Barbara Drummond, Alabama House of Representatives, District 103, 11 South Union Street, Suite 536-C, Montgomery, AL 36130-2950
The Honorable Margie Wilcox, Alabama House of Representatives, District 104, 11 South Union Street, Suite 524-E, Montgomery, AL 36130-2950
The Honorable David Sessions, Alabama House of Representatives, District 105, 11 South Union Street, Suite 417-I, Montgomery, AL 36130-2950
The Honorable Harry Shiver, Alabama House of Representatives, District 64, 11 South Union Street, Suite 526-D, Montgomery, AL 36130-2950
The Honorable Larry Byrd, Mississippi House of Representatives, District 104, 17 Byrd Rd., Petal, MS 39465
The Honorable Chris Johnson, Mississippi House of Representatives, District 87, PO Box 18247, Hattiesburg, MS 39404
The Honorable Missy W. McGee, Mississippi House of Representatives, District 102, PO Box 19089, Hattiesburg, MS 39404
The Honorable Percy W. Watson, Mississippi House of Representatives, District 103, PO Box 1767, Hattiesburg, MS 39403
The Honorable Doug McLeod, Mississippi House of Representatives, District 107, 1211 Bexley Church Rd., Lucedale, MS 39452
The Honorable Roun S. McNeal, Mississippi House of Representatives, District 105, PO Box 1435, Leakesville, MS 39451
The Honorable Manly Barton, Mississippi House of Representatives, District 109, 7905 Pecan Ridge, Moss Point, MS 39562
The Honorable Shane Barnett, Mississippi House of Representatives, District 86, PO Box 621, Waynesboro, MS 39562
The Honorable Timmy Ladner, Mississippi House of Representatives, District 93, 6 Michael D. Smith Road, Poplarville, MS 39470

Sample Scoping Letter

NATIONAL GUARD BUREAU
3501 FETCHET AVENUE
JOINT BASE ANDREWS MD 20762-5157

FEB – 1 2018

NGB/A4AM

Environmental Review Coordinator
USEPA, Region 4
61 Forsyth St. SW
Atlanta, GA 30345

Dear Sir/Madam

The National Guard Bureau (NGB) is preparing an Environmental Impact Statement (EIS) for the beddown of F-35A aircraft at two of five potential locations. The Secretary of the Air Force (SECAF) proposes to beddown F-35A aircraft for the fifth and sixth operations at two of five alternative locations. The F-35A would replace the Air National Guard's F-15, F-16, and A-10 fighter attack aircraft at the selected locations with 18 assigned aircraft and 2 backup aircraft at each of the two selected installations. The five alternative ANG locations for this beddown are:

- 115th Fighter Wing (115 FW) at Truax Field, Madison, Wisconsin;
- 124th Fighter Wing (124 FW) at Gowen Field, Boise, Idaho;
- 125th Fighter Wing (125 FW) at Jacksonville International Airport, Jacksonville, Florida;
- 127th Wing (127 WG) at Selfridge Air National Guard Base (ANGB), Michigan; and,
- 187th Fighter Wing (187 FW) at Dannelly Field, Montgomery, Alabama.

The SECAF has announced that the two preferred alternatives are Truax Field and Dannelly Field, pending results of the EIS.

The proposed action also includes construction and/or modification of facilities on the installations that support the beddown. In addition, there would be an Air Force Active Duty Associate Unit based with the selected alternative installations, which would include approximately 50 Active Duty personnel who would conduct 3-year rotations with the ANG unit. F-35A aircraft would conduct training operations within established airspace of each proposed location. This undertaking does not propose new airspace, nor does it seek to reconfigure any of the existing airspace parcels. Those will remain unchanged.

Sample Scoping Letter

The NGB invites you to attend a public scoping meeting at one of the times and locations listed below. For your convenience, the NGB has set aside two sessions for local, state, and federal agencies. We welcome your attendance during either time. The addresses for the public scoping meetings are:

Selfridge Air National Guard Base February 21, 2018 2 to 4 p.m. and 5 to 8 p.m. L'Anse Creuse Public Schools Wheeler Community Center 24076 Frederick V. Pankow Boulevard Clinton Township, MI 48036	**Gowen Field** February 27, 2018 2 to 4 p.m. and 5 to 8 p.m. Wyndham Garden Boise Airport Hotel Convention Center 3300 South Vista Avenue Boise, ID 83705
Dannelly Field March 1, 2018 2 to 4 p.m. and 5 to 8 p.m. Montgomery Regional Airport First Floor Rotunda and Conference Room 4445 Selma Highway Montgomery, AL 36108	**Truax Field** March 8, 2018 2 to 4 p.m. and 5 to 8 p.m. Crowne Plaza Madison Hotel Three Lakes Ballroom 4402 E. Washington Ave. Madison, WI 53704
Jacksonville International Airport March 13, 2018 2 to 4 p.m. and 5 to 8 p.m. DoubleTree Hotel, Jacksonville Airport Aviation Ballroom 2101 Dixie Clipper Dr. Jacksonville, FL 32218	

Please forward your written comments to Ms. Christel Johnson, the F-35A EIS Project Manager at 3501 Fetchet Avenue, Joint Base Andrews MD 20762-5157. You may also submit comments via the project website at www.ANGF35EIS.com. Submit all comments within 30 days from the date of this letter. Thank you for your assistance.

Sincerely,

Christel Johnson, NGB/A4AM
Plans and Requirements Branch

OFFICE OF THE GOVERNOR

KAY IVEY
GOVERNOR

STATE OF ALABAMA

ALABAMA DEPARTMENT OF ECONOMIC AND COMMUNITY AFFAIRS

KENNETH W. BOSWELL
DIRECTOR

February 6, 2018

Ms. Christel Johnson, NGB/A4AM
F-35A EIS Project Manager
National Guard Bureau
3501 Fetchet Avenue
Joint Base Andrews, MD 20762-5157

Re: Project: F-35A Environmental Impact Statement
187th Fighter Wing at Dannelly Field
Montgomery, AL

Dear Ms. Johnson:

Thank you for the opportunity to review the proposed project plans for the Environmental Impact Statement (EIS) of the beddown of F-35A aircraft. We have reviewed the plans and do not have any comments to submit at this time. If we may be of further assistance, please let us know.

Sincerely,

J. Brian Atkins

J. Brian Atkins, P.E.
Division Chief
Office of Water Resources

401 Adams Avenue • Suite 580 • P.O. Box 5690 • Montgomery, Alabama 36103-5690 • (334) 242-5100

USDA United States Department of Agriculture

Natural Resources Conservation Service

Michigan State Office

3001 Coolidge Road
Suite 250
East Lansing, MI
48823-6321

Telephone:
(517) 324-5270
Fax:
(855) 701-4363

www.mi.nrcs.usda.gov

February 8, 2018

Christel Johnson
F-35A EIS Project Manager
3501 Fetchet Avenue
Joint Base Andrews, Maryland 20762-5157

RE: F-35A Environmental Impact Statement (EIS)

Dear Ms. Johnson:

The Natural Resources Conservation Service (NRCS) under Part 523 of the Farmland Protection Policy Act has reviewed the proposed construction and/or modification of facilities at Selfridge Air National Guard Base. This review was conducted with respect to the effect(s) that the proposal may have on prime and/or unique farmland. Subpart B of Part 523 of the Farmland Protection Policy Act states that 'Lands identified as "urbanized area" (UA) on the Census Bureau maps' are not covered by the act. Since Selfridge Air National Guard Base is UA on the 2010 Census Bureau Reference Map for Detroit, MI, we have concluded that this proposal will have no negative impact on prime and/or unique farmland.

Should the scope of the project change to where expansion will occur, please resubmit the proposal for our review.

Sincerely,

GARRY LEE
State Conservationist

cc:
Christina Nickola, District Conservationist, NRCS, Kimball, MI
Albert Jones, Area Conservationist, NRCS, Flint, MI

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5528 N. EBBETTS AVE.
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(208) 853-9090

STATE CAPITOL
P.O. BOX 83720
BOISE, IDAHO 83720-0081
(208) 332-1305
cwinder@senate.idaho.gov

Idaho State Senate

SENATOR CHUCK WINDER
MAJORITY LEADER

February 15, 2018

Christel Johnson
Manager, F-35A EIS Project
National Guard Bureau
3501 Fetchet Ave
Joint Base Andrews, MD 20762-5157

Dear Ms. Christel Johnson:

Thank you for sending information to my office regarding the beddown of F-35A. This is an issue I have followed for some time. As a naval aviator, I am familiar with the Saylor Creek Range and the quality of combat-like training it offers. I am confident the beddown of F-35A would be a great fit for Gowen Field. The current aircraft at Gowen Field, the A-10, needs to be replaced with a long-term mission.

I hope the Air Force will strongly consider Gowen Field for the beddown of the F-35A. Please do not hesitate to call or e-mail me with any questions or to discuss the matter. You may contact me at CWinder@Senate.Idaho.Gov, or call my cell phone at 208-866-0113.

Sincerely,

Senator Chuck Winder
Majority Leader
Idaho State Senate

DEPARTMENT OF THE ARMY
WALLA WALLA DISTRICT, CORPS OF ENGINEERS
BOISE REGULATORY OFFICE
720 EAST PARK BOULEVARD, SUITE 245
BOISE, IDAHO 83712-7757

February 28, 2018

Regulatory Division

SUBJECT: NWW-2015-00021, Gowen Field – F-35A EIS Project

Christel Johnson
F-35A EIS Project Manager
National Guard Bureau
3501 Fetchet Avenue
Joint Base Andrews, Maryland 20762-5157

Dear Ms. Johnson:

This is in response to your February 1, 2018 letter requesting scoping comments on the proposed *F-35A EIS Project*. Thank you for providing the Corps of Engineers (Corps) the opportunity to provide comment. According to the information provided, the proposed project is the preparation of an Environmental Impact Statement (EIS) for the construction and/or modification(s) of facilities on the installation that support the beddown of the 124th Fighter Wing (124 FW) F-35A aircraft at Gowen Field.

The site is located at Gowen Field, within Section(s) 28, 29, 32 and 33 of Township 3 North, Range 2 East, near latitude 43.563624° N and longitude -116.229996° W, in Ada County, in Boise, Idaho. Your project has been assigned Department of Army (DA) File # NWW-2015-00021, which should be referred to in all future correspondence.

AUTHORITY

The DA exerts regulatory jurisdiction over waters of the United States (U.S.), including wetlands, pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344). Section 404 of the Clean Water Act requires a DA permit be obtained prior to discharging fill material into Waters of the U.S., which includes most perennial and intermittent rivers and streams, natural and man-made lakes and ponds, irrigation and drainage canals and ditches that are tributaries to other waters, and wetlands.

Given that the National Guard Bureau has submitted only a general letter of the proposed EIS and beddown of the 124 FW, the Corps cannot at this time provide any substantive comment. However, we do want to make you aware of a water resource feature located near the project area. It should be made known that Fivemile Creek flows from east to west through the Gowen Field facility, and should future plans require

the discharge of fill material into Fivemile Creek or if any other type of work will alter or affect this waterway, or other jurisdictional waterways, DA approval maybe required for this work.

You should also be aware that Slickspot peppergrass (Lepidium papilliferum) and Yellow-billed Cuckoo (Coccyzus americanus), a plant and avian species currently listed as Threatened under the Endangered Species Act (ESA), have the potential to occur in proximity to Gowen Field. For additional information on the distribution of this plant species contact Mr. Bob Kibler with the US Fish and Wildlife Service at (208) 378-5255.

CUSTOMER SERVICE

If you have any questions or need additional information about this permit, you can contact Ms. Megan Biljan at (208) 433-4469, by mail at the address in the letterhead, or email at megan.biljan@usace.army.mil.

Sincerely,

Gregory J. Martinez
Deputy Chief
Regulatory Division

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1208-B Main Street
Daphne, Alabama 36526

IN REPLY REFER TO
2018-TA-0415

FEB 2 8 2018

Ms. Christel Johnson
F-35A EIS Project Manager
Plans and Requirements Branch
3501 Fetchet Avenue
Joint Base Andrews, MD 20762-5157

Dear Ms. Johnson:

Thank you for your letter, dated February 1, 2018, requesting comments for your development of an Environmental Impact Statement for the beddown of the F-35A aircraft at Dannelly Field, Montgomery County, Alabama. We have reviewed your information and are providing the following comments in accordance with the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), and the Migratory Bird Treaty Act of 1918, as amended (40 Stat. 755; 16 U.S.C. 703 et seq.)(MBTA).

Based on the information provided, the following species may occur but are not expected to be present in the project area due to the lack of suitable habitat:

Wood stork *(Mycteria americana)* – Endangered
Southern clubshell *(Pleurobema decisum)* – Endangered
Georgia rockcress *(Arabis georgiana)* – Threatened

The wood stork was recently documented at Maxwell Air Force Base, which is approximately 10 miles away from the project area. Wood storks are generally found along wetlands and rivers, which do not exist at Dannelly Field. Based on the lack of streams/rivers and suitable soils at the site, there appears to be no suitable habitat on the property for the other two species.

For questions or comments regarding this correspondence, please contact Mr. Matt Laschet, at (251) 441-5842 or via email matthias_laschet@fws.gov.

Sincerely,

William J. Pearson
Field Supervisor
Alabama Ecological Services Field Office

PHONE: 251-441-5181 FAX: 251-441-6222

IDAHO DEPARTMENT OF FISH AND GAME
SOUTHWEST REGION
3101 South Powerline Road
Nampa, Idaho 83686

C.L. "Butch" Otter / Governor
Virgil Moore / Director

March 30, 2018

Ms. Christel Johnson
National Guard Bureau
NGB/ A4AM Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews MD 20762–5157

Re: Department of Defense Notice of Intent To Prepare an Environmental Impact Statement for F–35 Operational Beddown—Air National Guard

Dear Ms. Johnson,

This letter is the Idaho Department of Fish and Game's (Department) response to a request for scoping comments announced in the Department of Defense Notice of Intent To Prepare an Environmental Impact Statement (EIS) for F–35 Operational Beddown—Air National Guard. The National Guard Bureau (NGB) proposes to beddown F-35A aircraft at two of five alternative locations. The124th Fighter Wing (124 FW) at Gowen Field, Boise, Idaho, is identified as one of the five alternatives, and comments in this letter pertain to the 124 FW operations in Idaho. According to the materials provided on the project website (www.ANGF35EIS.com), the proposed action would involve the beddown of one F-35A squadron consisting of 18 aircraft and 2 backup aircraft. The NGB would implement construction projects associated with the aircraft beddown at the selected installation. The website states: "As a result of the Proposed Action, there would be a change to the type of aircraft based at the selected installation; a change to the mix of aircraft using the associated special use airspace; changes to staffing and manpower at the selected location; changes to the number of airfield operations; as well as minor necessary construction, building renovation, and facility demolition."

The purpose of these comments is to assist the decision-making authority by providing technical information addressing potential effects to fish, wildlife, and habitats and how any adverse effects might be mitigated. It is not the purpose of the Department to support or oppose this proposal. Resident species of fish and wildlife are property of all Idaho citizens, and the Department and the Idaho Fish and Game Commission are expressly charged with statutory responsibility to preserve, protect, perpetuate and manage all fish and wildlife in Idaho (Idaho Code 36-103(a)). In fulfillment of our statutory charge and direction as provided by the Idaho Legislature, we offer the following general and specific comments.

General Considerations and Resources

The Department's 2015 Strategic Plan outlines the Department's mission and drives IDFG management direction. The Department developed the Strategic Plan with public input, and the plan was approved by the Idaho Fish and Game Commission. Primary Department goals are to sustain Idaho's wildlife and the habitats on which they depend and to meet the demand for fish and wildlife recreation. Department management plans outline specific management objectives. Relevant and important management plans include *Bighorn Sheep Management Plan 2010*, *Fisheries Management Plan 2013 – 2018*, *Idaho Elk Management Plan 2014 – 2024*, *Idaho Mule Deer Management Plan 2008* – 2017, *2006 Conservation Plan for the Greater Sage-grouse in Idaho*, and *Idaho's Sage-grouse Management Plan*. Additionally, the *State Wildlife Action Plan, 2016* provides information regarding Species of Greatest Conservation Need and priority strategies and actions needed to support resource management.

Analysis associated with the EIS should assess how potential effects to fish, wildlife, and associated recreation may aid or detract from the Department's ability to meet our public trust responsibility to manage these resources for public benefit. Specific management objectives outlined in the Department's management plans serve as analysis metrics. Copies of management plans and Strategic Plan are available on the Department's website (http://fishandgame.idaho.gov/) or upon request from Department staff.

Specific comments regarding a change to aircraft using the associated special use airspace.

Use of F35 aircraft may result in changes to flight altitude, speed, flight paths, flight frequency and duration, intensity of aircraft noise, or other characteristics of over-flights having the potential to affect wildlife populations, as well as people involved in fish and wildlife recreation. An analysis of effects on wildlife should consider the timing, duration, and intensity of noise and its effect on wildlife behavior and ecology. For example, changes in aircraft use could affect animal condition (e.g. changes in foraging behavior), mortality rates (e.g., reduced predator detection and avoidance), or reproduction (disruption of breeding displays or parental care). Analysis should also consider the potential to displace wildlife from suitable habitat, especially key seasonal use areas.

Similarly, analysis should consider the potential to displace fish- and wildlife-based recreation. The Department offers general season and controlled hunt opportunities for upland game, elk, mule deer, pronghorn, and bighorn sheep within the area encompassed by special use airspace. The Department requests that any economic analysis include the economic contribution of wildlife-based recreation in the analysis area, including fishing, hunting, trapping, and wildlife viewing.

Southwest Idaho contains a large proportion of the State's sage-grouse habitat, including a large number of active sage-grouse leks, as well as sage-grouse nesting, brood-rearing, and winter habitats. The State of Idaho Executive Order No. 2015-04 adopts *Idaho's Sage-Grouse Management Plan*. Affected areas include a mix of Core, Important, and General sage-grouse habitat as identified in *Idaho's Sage-Grouse Management Plan*. The analysis should consider potential effects to sage-grouse seasonal behaviors and habitat requirements, demographics, as well as actions required to mitigate negative effects. Specific management objectives outlined in *Idaho's Sage-grouse Management Plan* indicate the State's management direction and provide analytical metrics. Please refer to the *2006 Conservation Plan for the Greater Sage-grouse in Idaho* if the Idaho Sage-grouse Management Plan is silent on an issue.

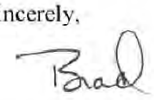
Specific comments related to potential changes in Airfield Operations

Gowen Field is situated in Ada County, Idaho. Gowen Field and lands to the south and west of Gowen Field through southern Ada County support high densities of rodents and rabbits associated with xeric shrub- and grass-dominated rangelands. A keystone species in this ecosystem is the Piute ground squirrel (*Urocitellus mollis*), which serves nutrient cycles, disturbance regimes, and food web dynamics. Populations of this burrowing rodent reach high density and is a food source supporting large numbers of meso-carnivores, such as the American badgers (*Taxidea taxus*) and red fox (*Vulpes vulpes*), as well as raptors, such as the prairie falcon (*Falco mexicanus*) and golden eagle (*Aquila chrysaetos*). The high density of nesting raptors along the Snake River south of Gowen Field led to the 1993 establishment of the Morley Nelson Snake River Birds of Prey National Conservation Area, administered by the Bureau of Land Management.

The mammalian and avian predators attracted to high-density Piute ground squirrel populations at Gowen Field present a safety risk, and airfield activities include hazing and lethal removal of animals presenting hazards on runways or in airspace (e.g., Boise Airport Wildlife Hazard Management Plan 2010). Analysis of environmental impacts should include evaluating the effects of airfield operations on local wildlife populations with particular consideration of control activities required for hazard management. In addition to raptors, larger-bodied birds prevalent in Ada County and potentially subject to control activities to reduce strike hazards would include waterfowl, long-billed curlew (*Numenius americanus*; a grassland-nesting species), and burrowing owl (*Athene cunicularia*; a species that nests in abandoned badger burrows). Pertinent resources to support this analysis would include records of past wildlife control activities at Gowen Field, management plans and wildlife monitoring records related to the National Conservation Area, as well as the *Owyhee Uplands Section* chapter in Idaho's State Wildlife Action Plan (2016; available at https://idfg.idaho.gov/swap).

Thank you for the opportunity to comment. Department staff is available to provide input and assistance at the request of the DOD. Please contact Bill Bosworth in the Southwest Region office at (208)465-8465 or bill.bosworth@idfg.idaho.gov if you have any questions.

Sincerely,



Bradley B. Compton
Southwest Regional Supervisor

BC/wrb
ecc: Kiefer, Vecellio/ HQ
cc: Gold file

Keeping Idaho's Wildlife Heritage

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OWYHEE COUNTY BOARD OF COMMISSIONERS
COURTHOUSE P.O. BOX 128 MURPHY, ID 83650-0128
TELEPHONE (208) 495-2421

District 1 –Jerry Hoagland-P O Box 128, Murphy, ID 83650 318-8308
District 2 –Chairman-Kelly Aberasturi-P O Box 128, Murphy, ID 83650 249-4405
District 3 –Joe Merrick-P O Box 128, Murphy ID 83650 250-9005

March 26, 2018

Ms. Christel Johnson, Environmental Engineer
NGB/A4AM
Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews MD 20762-5157

Re: Owyhee County Scoping Comment on United States Air Force F-35A Operational Beddown - Air National Guard Environmental Impact Statement

Dear Ms. Johnson:

Owyhee County, Idaho provides the following comments for you as our scoping comments on the United States Air Force F-35A Operational Beddown - Air National Guard Environmental Impact Statement (EIS). We do wish to receive a Copy of the Draft EIS.

Owyhee County is potentially affected by the proposed action in that aircraft operating from Gowen Field will operate in airspace above Owyhee County—either while operating on ranges located within Owyhee County, or on flights to and from Gowen Field.

Owyhee County is also potentially affected by impacts to the economy of the Treasure Valley which lies in close proximity to our county. Economic impacts to the larger population of the Treasure Valley has impacts to our regional economy and to our county economy. As the economy of the Treasure Valley improves, we see benefits to our local economy and the same is true when the Treasure Valley economy declines. The Idaho Air National Guard is a major employer in the Treasure Valley, with over 2,800 employees. If selected for F35 basing, Gowen will sustain its current economic impact on southwest Idaho and bring in even more jobs and opportunities.

As citizens of the State of Idaho, Owyhee County citizens benefit from a strong military presence in the state and in the Treasure Valley. National Guard units have both a state and federal mission. Maintaining a viable Air National Guard presence at Gowen benefits the state mission in terms of available forces for local situations and emergencies.

Maintaining a significant Air Guard unit, such as the proposed F 35 Squadron basing, at Gowen benefits the federal mission in that our local area has the benefits of an excellent range complex in very close proximity as well as numerous other available ranges in neighboring states. Airmen based

at Gowen will train more easily due to the available ranges, optimal weather, and less crowded airspace than would be found at other proposed locations. That benefit leads to better prepared and trained aircrews when we next need them in defense of the nation.

Gowen Field has maintained world class facilities in which to house and support the F35 Squadron. The state has maintained facilities formerly used by previous units to ensure that they would be available for future use. Gowen can house the F 35 with little or no, other than aircraft specific items, additional construction.

Southwest Idaho supports the military presence. Sound studies have been accomplished in regard to the potential impact and have shown it to be not an issue for the reduced basing levels now contemplated. The majority of proposed training is to take place Monday through Friday with takeoffs mid-morning to mid-afternoon for a typical mission number of 2 to 6 aircraft. Such operation equates to less than ten minutes of intermittent audible noise per day from the Idaho Air National Guard. Sound contours resulting from Gowen activities have actually contracted over past years and the anticipated F 35 contour will affect significantly fewer homes as a previous contour was nearly 4 times greater in number of homes impacted.

We strongly support the proposed basing of an F 35 Squadron at Gowen as being beneficial for the military and for the community and state.

Sincerely,

Kelly Aberasturi	Jerry L. Hoagland	Joe Merrick
Chairman	Commissioner	Commissioner

LANCE R. LEFLEUR
DIRECTOR

KAY IVEY
GOVERNOR

Alabama Department of Environmental Management
adem.alabama.gov
1400 Coliseum Blvd. 36110-2400 ▪ Post Office Box 301463
Montgomery, Alabama 36130-1463
(334) 271-7700 ▪ FAX (334) 271-7950

February 13, 2018

CHRISTEL JOHNSON
F-35A EIS PROJECT MANAGER
NATIONAL GUARD BUREAU
3501 FETCHET AVENUE
JOINT BASE ANDREWS MD 20762-5157

RE: 187th Fighter Wing (187 FW) at Dannelly Field, Montgomery Alabama
Montgomery County (101)

Dear Ms. Johnson:

The Department's Water Division (WD) has reviewed the information you sent us regarding the above-referenced project. You had requested that we review this information and provide comments.

Attached, please find a copy of WD's proposed project/activity review information.

I hope this information is useful. If you have any questions or need additional information, please contact Andrea Slay **by email at alslay@adem.alabama.gov or by phone at (334) 394-4321.**

Sincerely,

Andrea Slay
Construction Permits Section
Stormwater Management Branch
Water Division

ALS File:PREV

Enclosure: Proposed Project/Activity Review Information
Copy of Review Request Letter
Construction Stormwater NOI

Birmingham Branch
110 Vulcan Road
Birmingham, AL 35209-4702
(205) 942-6168
(205) 941-1603 (FAX)

Decatur Branch
2715 Sandlin Road, S.W.
Decatur, AL 35603-1333
(256) 353-1713
(256) 340-9359 (FAX)

Mobile Branch
2204 Perimeter Road
Mobile, AL 36615-1131
(251) 450-3400
(251) 479-2593 (FAX)

Mobile-Coastal
3664 Dauphin Street, Suite B
Mobile, AL 36608
(251) 304-1176
(251) 304-1189 (FAX)

ADEM CONSTRUCTION STORMWATER

PROPOSED PROJECT/ACTIVITY REVIEW INFORMATION

The Department has received and evaluated the information you sent us regarding the above-referenced project. You had requested that we review this information and provide comments.

Please note that State law and ADEM regulations require that appropriate, effective Best Management Practices (BMPs) for the control of pollutants in stormwater run-off be fully implemented and maintained as needed for all construction and land disturbance activities regardless of permit status or size of the disturbance to prevent/minimize discharges of sediment and other pollutants to waters of the State of Alabama.

A "water of the state" is broadly defined as [§ 22-22-1(b)(2), Code of Alabama 1975, as amended] "All waters of any river, stream, watercourse, pond, lake, coastal, ground, or surface water, wholly or partially within the state, natural or artificial. This does not include waters which are entirely confined and retained completely upon the property of a single individual, partnership, or corporation unless such waters are used in interstate commerce." Discharges of pollutants resulting from failure to implement and maintain effective BMPs are considered unpermitted discharges to state waters.

Please be advised that pursuant to EPA rules and ADEM Construction General Permit (CGP) ALR100000, the operator or owner is required to apply for and maintain valid National Pollutant Discharge Elimination System (NPDES) coverage for stormwater discharges prior to beginning construction or regulated land disturbance that will equal or exceed one (1) acre in size. The regulations also require NPDES registration for disturbance activities less than one (1) acre that are part of, adjacent to, or associated with a larger common plan of development or sale, that may eventually equal or exceed one (1) acre, or if less than one (1) acre in size if stormwater discharges have reasonable potential to be a significant contributor of pollutants to a water of the State or have reasonable potential to cause or contribute to a violation of applicable Alabama water quality standards as determined by the Department. In addition, a Construction Best Management Practices Plan (CBMPP) is required to be submitted for priority construction sites as defined in the CGP. The regulated construction disturbance also includes, but is not limited to, associated areas utilized for support activities such as vehicle parking, equipment or supply storage areas, material stockpiles, temporary office areas, and access roads, and pre-construction activities performed in advance or in support of construction such as logging, clearing, and dewatering. Please be advised that an operator or owner must retain NPDES permit coverage until all disturbance activity, including phased construction, is complete.

Additional ADEM air, land, and/or water permits for discharges and regulated impacts resulting from the operation of the completed facility may be required.

Effective Best Management Practices (BMPs), as provided in the *Alabama Handbook For Erosion Control, Sediment Control, And Stormwater Management On Constructions Sites And Urban Areas*, as amended, Alabama Soil and Water Conservation Committee (ASWCC), for prevention and control of nonpoint sources of pollutants must be implemented prior to, during, and after project implementation. Immediately after completion of the project, effective measures to ensure permanent revegetation, cover, and/or effective stormwater quality remediation must be implemented and maintained. The CGP requires that a CBMPP to reduce pollutant discharges to the maximum extent practicable be prepared by a qualified credentialed professional (QCP) as defined in the CGP, and retained onsite. Information regarding construction activities forms, and other helpful information is available on the ADEM WebPage at http://www.adem.state.al.us/programs/water/constructionstormwater.cnt

Tennessee River Watershed - In order to determine whether this project should be covered under an existing CWA Section 404, Nationwide, or General Permit, or Letter of Permission, you should contact the U. S. Army Corps of Engineers, Nashville District by mail at PO Box 1070, Nashville, TN 37202-1070 or by phone at (615) 736-5181. Facilities covered under a U.S. Army Corps of Engineers Individual 404 Permit, Nationwide or General Permit, or Letter of Permission must apply for NPDES stormwater coverage from ADEM, if construction or land disturbance above the Ordinary High Water Mark, or any non-dredge/fill operations below the Ordinary High Water Mark and associated upland dredge disposal sites that will equal or exceed one (1) acre or that are part of a larger common plan of development or sale in which disturbed acreage will eventually equal or exceed (1) acre.

Rev 3/1/05

Page 1 of 2

All Other Alabama Watersheds - In order to determine whether this project should be covered under an existing CWA Section 404, Nationwide, or General Permit, or Letter of Permission, you should contact the U.S. Army Corps of Engineers, Mobile District by mail at PO Box 2288, Mobile, AL 36628-0001 or by phone at (251) 690-2658. Facilities covered under a U.S. Army Corps of Engineers Individual 404 Permit, Nationwide or General Permit, or Letter of Permission must apply for NPDES stormwater coverage from ADEM, if construction or land disturbance above the Ordinary High Water Mark, or any non-dredge/fill operations below the Ordinary High Water Mark and associated upland dredge disposal sites that will equal or exceed one (1) acre or that are part of a larger common plan of development or sale in which disturbed acreage will eventually equal or exceed (1) acre.

ADEM's Coastal Program manages uses and activities having the potential to significantly impact the coastal portions of Alabama and/or its resources. The Coastal Area is comprised of only a portion of Mobile and Baldwin counties and is defined as the lands and waters seaward of the continuous ten-foot contour. ADEM issues Coastal Programs Non-Regulated Use Permits for commercial and residential developments greater than 5 acres in size, construction on Gulf-fronting properties intersected by the Construction Control Line, and groundwater wells that exceed 50 gallons per minute of water withdrawal. ADEM also must certify that permits issued by federal and state agencies, and projects conducted by those agencies, are consistent with the Coastal Program. ADEM accomplishes this by reviewing applications for permits submitted to other agencies. Therefore, it is recommended that applicants having development plans, or even considering development in the Coastal Area, consult with ADEM Coastal Program staff as soon as possible in the project development stage so that the applicant can learn of applicable requirements. Questions involving projects in the coastal area should be directed to the ADEM Coastal Office in Mobile.

You may also wish to contact: (1) the U.S. Fish & Wildlife Service and the Alabama Department of Conservation & Natural Resources. These are the Federal and State agencies, respectively, that have primacy and statutory authority to address potential impacts to endangered or threatened species, (2) the Office Of Water Resources, Alabama Department of Economic and Community Affairs, which is the State agency with primacy and statutory authority to address potential water quantity concerns or issues, (3) the State Fire Marshall and the Alabama Department of Industrial Relations which are the State agencies with primacy and statutory authority to address potential safety considerations regarding blasting, (4) the Alabama Department of Industrial Relations which requires permit coverage and reclamation bonding for most non-coal mining sites, (5) the Alabama Historical Commission which is the State agency with primacy and statutory authority to address preservation or potential impacts to surrounding or onsite historical or archaeological sites, (6) your local county health department for issues related to onsite sewage management, and (7) your local municipal or county government, or local zoning and planning agency, if applicable, for additional approvals that may apply to your project.

In recognition that projects are site specific in nature and conditions can change during project implementation, the Department reserves the right to require the submission of additional information or require additional management measures to be implemented, as necessary on a case–by-case basis, in order to ensure the protection of water quality. Responsibility for compliance with ADEM rules and permit requirements are not delegable by contract or otherwise. The operator or owner must ensure compliance. Any violations resulting from the actions of such person may subject the operator/owner to enforcement action.

ADEM permitting decisions are predicated on current regulatory requirements, established engineering standards and technical considerations, best management practices information, and formal administrative procedures in conformance with Departmental regulations and applicable Alabama law. Issuance of permit coverage by ADEM neither precludes nor negates an operator/owner's responsibility or liability to apply for, obtain, or comply with other ADEM, federal, state, or local government permits, certifications, licenses, or other approvals. ADEM permit coverage does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to persons or property or invasion of other private rights, trespass, or any infringement of Federal, State, or local laws or regulations.

If you have any questions or need additional information regarding construction stormwater permitting, please contact the Water Division in Montgomery at (334) 271-7700 or cswmail@adem.state.al.us.

Page 2 of 2

NATIONAL GUARD BUREAU
3501 FETCHET AVENUE
JOINT BASE ANDREWS MD 20762-5157

RECEIVED
FEB 05 2018
IND / MUN BRANCH

FEB – 1 2018

NGB/A4AM

Glenda Dean
Chief
Alabama Department of Environmental Management (ADEM) - Water Division
P.O. Box 301463
Montgomery, AL 36130-1463

Dear Ms. Dean

The National Guard Bureau (NGB) is preparing an Environmental Impact Statement (EIS) for the beddown of F-35A aircraft at two of five potential locations. The Secretary of the Air Force (SECAF) proposes to beddown F-35A aircraft for the fifth and sixth operations at two of five alternative locations. The F-35A would replace the Air National Guard's F-15, F-16, and A-10 fighter attack aircraft at the selected locations with 18 assigned aircraft and 2 backup aircraft at each of the two selected installations. The five alternative ANG locations for this beddown are:

- 115th Fighter Wing (115 FW) at Truax Field, Madison, Wisconsin;
- 124th Fighter Wing (124 FW) at Gowen Field, Boise, Idaho;
- 125th Fighter Wing (125 FW) at Jacksonville International Airport, Jacksonville, Florida;
- 127th Wing (127 WG) at Selfridge Air National Guard Base (ANGB), Michigan; and,
- 187th Fighter Wing (187 FW) at Dannelly Field, Montgomery, Alabama.

The SECAF has announced that the two preferred alternatives are Truax Field and Dannelly Field, pending results of the EIS.

The proposed action also includes construction and/or modification of facilities on the installations that support the beddown. In addition, there would be an Air Force Active Duty Associate Unit based with the selected alternative installations, which would include approximately 50 Active Duty personnel who would conduct 3-year rotations with the ANG unit. F-35A aircraft would conduct training operations within established airspace of each proposed location. This undertaking does not propose new airspace, nor does it seek to reconfigure any of the existing airspace parcels. Those will remain unchanged.

The NGB invites you to attend a public scoping meeting at one of the times and locations listed below. For your convenience, the NGB has set aside two sessions for local, state, and federal agencies. We welcome your attendance during either time. The addresses for the public scoping meetings are:

Selfridge Air National Guard Base February 21, 2018 2 to 4 p.m. and 5 to 8 p.m. L'Anse Creuse Public Schools Wheeler Community Center 24076 Frederick V. Pankow Boulevard Clinton Township, MI 48036	**Gowen Field** February 27, 2018 2 to 4 p.m. and 5 to 8 p.m. Wyndham Garden Boise Airport Hotel Convention Center 3300 South Vista Avenue Boise, ID 83705
Dannelly Field March 1, 2018 2 to 4 p.m. and 5 to 8 p.m. Montgomery Regional Airport First Floor Rotunda and Conference Room 4445 Selma Highway Montgomery, AL 36108	**Truax Field** March 8, 2018 2 to 4 p.m. and 5 to 8 p.m. Crowne Plaza Madison Hotel Three Lakes Ballroom 4402 E. Washington Ave. Madison, WI 53704
Jacksonville International Airport March 13, 2018 2 to 4 p.m. and 5 to 8 p.m. DoubleTree Hotel, Jacksonville Airport Aviation Ballroom 2101 Dixie Clipper Dr. Jacksonville, FL 32218	

Please forward your written comments to Ms. Christel Johnson, the F-35A EIS Project Manager at 3501 Fetchet Avenue, Joint Base Andrews MD 20762-5157. You may also submit comments via the project website at www.ANGF35EIS.com. Submit all comments within 30 days from the date of this letter. Thank you for your assistance.

Sincerely,

Christel Johnson, NGB/A4AM
Plans and Requirements Branch

United States Air Force
F-35A Operational Beddown - Air National Guard
Environmental Impact Statement

What's Inside this Newsletter?

- An overview of the purpose and need of the proposed action
- An overview of the F-35A Program
- An overview of the Environmental Impact Analysis Process (EIAP) and opportunities for public involvement
- Date and location of upcoming public scoping meetings and how to submit comments

The EIS Timeline

Notice of Intent Published in Federal Register - February 2018

↓

Scoping Period - February 2, 2018 through April 6, 2018

↓

Preparation of Draft Environmental Impact Statement - Summer 2018

↓

Public Comment Period

↓

Preparation of Final Environmental Impact Statement - February to May 2019

↓

Notice of Availability of Final Environmental Impact Statement - May 2019

↓

30-Day Waiting Period

↓

Record of Decision - June 2019

☐ Opportunities for Public Involvement

What is the Proposed Action and Why is it Needed?

The purpose of the proposed action is to efficiently and effectively maintain combat capability and mission readiness as the U.S. Air Force (USAF) faces deployments across a spectrum of conflicts while also providing for homeland defense. Beddown and operation of the F-35A at Air National Guard (ANG) locations would represent a major step toward this goal. The National Guard Bureau (NGB) proposes to beddown two F-35A squadrons consisting of 18 aircraft and 2 backup aircraft each, thereby establishing two F-35A operations at two of five alternative ANG locations. In addition, the NGB would implement necessary construction projects to successfully beddown the aircraft at the selected installations. The five alternative locations are:

- 115 FW at Truax Field, Madison, Wisconsin;
- 124 FW at Gowen Field, Boise, Idaho;
- 125 FW at Jacksonville International Airport, Jacksonville, Florida;
- 127 WG at Selfridge Air National Guard Base, Michigan; and,
- 187 FW at Dannelly Field, Montgomery, Alabama.

The Secretary of the Air Force has announced Truax Field, and Dannelly Field as the two preferred alternatives, pending results of the EIS.
For More Information: www.ANGF35EIS.com

F-35A Program

The USAF has designated the F-35A to replace aging fighter aircraft. In that regard, these new aircraft would fulfill the wide range of roles and missions currently conducted by legacy fighter aircraft. The USAF variant of the F-35 embodies critical combat capabilities to fulfill multiple mission roles and epitomizes the characteristics needed, offering a unique combination of capabilities.

The National Environmental Policy Act

The National Environmental Policy Act (NEPA) is our national charter for making informed decisions based upon potential environmental consequences. NEPA requires all federal agencies to take a good-faith, hard look at potential environmental consequences of a proposal before making a decision. The NGB is preparing a detailed study that analyzes the potential environmental impacts of this proposal.

Public Involvement

Public involvement is an integral part of the Environmental Impact Analysis Process, which requires full disclosure of potential environmental impacts to the public and encourages public involvement. The public has an important role in providing input during this process to help the NGB make more informed decisions about implementing this proposal. The first opportunity for public involvement is the process called "public scoping." The scoping period for this Environmental Impact Statement (EIS) began with publication of the "Notice of Intent" in the Federal Register on February 2, 2018, and will formally extend through April 6, 2018.

Written Scoping Comments are Welcome!

Please send written comments by the end of the public comment period, April 6, 2018, to ensure that your concerns are addressed in the Draft EIS. Nevertheless, we will welcome your comments throughout the entire environmental impact analysis process. Written comments may be submitted by:

a) Attending the scoping meeting and providing written comments at that time

b) By U.S. Mail to:
Ms. Christel Johnson, Environmental Engineer
NGB/A4AM
Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews MD 20762-5157

c) Via the project website at www.ANGF35EIS.com

Please note that by including your name and address on correspondence, it will be used to compile a mailing list for distributing future information regarding the EIS. Names will appear in the EIS. Phone numbers, emails, and physical addresses will not be published. By including your name and address, it will become part of the EIS administrative record.

Public Scoping Meetings

You're invited to attend the public scoping meetings to learn about the proposal, talk with NGB representatives one-on-one, and submit written comments.

Selfridge Air National Guard Base
February 21, 2018 - 5 to 8 p.m.
L'Anse Creuse Public Schools
Wheeler Community Center
24076 Frederick V. Pankow Blvd.
Clinton Township, MI 48036

Gowen Field
February 27, 2018 - 5 to 8 p.m.
Wyndham Garden Boise Airport Hotel
Convention Center
3300 South Vista Ave.
Boise, ID 83705

Dannelly Field
March 1, 2018 - 5 to 8 p.m.
Montgomery Regional Airport
First Floor Rotunda and Conference Room
4445 Selma Highway
Montgomery, AL 36108

Truax Field
March 8, 2018 - 5 to 8 p.m.
Crowne Plaza Madison Hotel
Three Lakes Ballroom
4402 E. Washington Ave.
Madison, WI 53704

Jacksonville International Airport
March 13, 2018 - 5 to 8 p.m.
DoubleTree Hotel, Jacksonville Airport
Aviation Ballroom
2101 Dixie Clipper Dr.
Jacksonville, FL 32218

Ms. Christel Johnson, Environmental Engineer
NGB/A4AM Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews MD 20762-5157

NOTICE OF INTENT – GENERAL PERMIT NUMBER ALR100000

NPDES PERMIT NUMBER ALR100000 IS A GENERAL PERMIT AUTHORIZING DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES THAT RESULT IN A TOTAL LAND DISTURBANCE OF ONE ACRE OR GREATER AND SITES LESS THAN ONE ACRE BUT ARE PART OF A LARGER COMMON PLAN OF DEVELOPMENT OR SALE

Mail to: **Alabama Department of Environmental Management**
Water Division
Stormwater Management Branch
Post Office Box 301463
Montgomery, Alabama 36130-1463

PLEASE COMPLETE ALL QUESTIONS. INCOMPLETE OR INCORRECT ANSWERS, OR MISSING SIGNATURES WILL DELAY PROCESSING. IF SPACE IS INSUFFICIENT, CONTINUE ON AN ATTACHED SHEET(S) AS NECESSARY. ATTACH CBMPP AND OTHER INFORMATION AS NEEDED. PLEASE TYPE OR PRINT LEGIBLY IN INK.

I. PERMITTEE INFORMATION Initial: ☐ Modification: ☐ Transfer: ☐ Renewal: ☐ Previous ALR10 _____

Permittee Name (Legal Name)	Responsible Official Phone Number
Responsible Owner/Operator or Official, and Title	Responsible Official E-Mail Address
Responsible Official (RO) Street/Physical Address	City, State, and Zip Code
Responsible Official (RO) Mailing Address	City, State, and Zip Code
☐ Corporation ☐ Individual ☐Sole Proprietorship ☐ Partnership ☐ LLC ☐ LLP ☐ Government Agency ☐ Other _____	

II. FACILITY INFORMATION

Facility/Site Name	Facility Contact and Title
Facility Street Address or Location Description	Facility Contact Company Name
City Zip Code County(s)	Facility Contact Phone Number
Facility Front Gate Latitude and Longitude (For linear projects, please include coordinates for both the beginning and ending points of the project.)	Facility Contact e-Mail Address:
Detailed Directions to the Site	

III. ACTIVITY DESCRIPTION

Brief Description of Construction / Land disturbance activity(s):	
(For Modifications Only) Brief description of the action/change that has resulted in the request for permit modification:	
Primary SIC Code:	Primary NAICS Code:

IV. PROPOSED SCHEDULE

Anticipated Activity schedule:	Commencement date:	Completion date:
Area of the Registered site:	Total site area in acres:	Total disturbed area in acres:

V. PRIORITY CONSTRUCTION SITE

Is this a Priority Construction Site as defined by Part V of the construction stormwater general permit? Yes ☐ No ☐ If yes, attach/submit a copy of the CBMPP that meets or exceeds the requirements of Parts III A. and E. of the construction stormwater general permit.

ADEM Form 24 08/16 m1 Page 1 of 2

VI. TOPOGRAPHIC MAP SUBMITTAL

Please attach a recent 7.5 minute series USGS topographic map(s) no larger than 11 by 17 inches (several pages may be necessary), showing the location of the Facility including site boundaries, area of disturbance, a 1 mile radius, perennial, intermittent, and ephemeral streams, lakes/springs/wells/wetlands and contour lines. The map should also show the point(s) at which stormwater runoff will exit (outfall) the facility and the point(s) where stormwater runoff from the site will enter the receiving water.

VII. RECEIVING WATERS

Are there any surface waters within 25 feet of your project's land disturbances? YES ☐ NO ☐

List name of receiving water(s), latitude & longitude (decimal or deg, min, sec) of location(s) that run-off enters the receiving water, and the waterbody classification. Please refer to ADEM Admin. Code 335-6-11 for a detailed list of water use classifications. (Attach a separate list if necessary)

Receiving Water	Latitude	Longitude	Waterbody Classification

VIII. GENERAL INFORMATION

Will flocculants or other chemical stabilization products be used on site? Yes ☐ No ☐

IX. QUALIFIED CREDENTIALED PROFESSIONAL (QCP) CERTIFICATION

"I certify under penalty of law that a comprehensive Construction Best Management Practices Plan (CBMPP) for the prevention and minimization of all sources of pollution in stormwater and authorized related process wastewater runoff has been prepared under my supervision for this site/activity, and associated regulated areas/activities. The CBMPP meets the requirements of this permit and if properly implemented and maintained by the operator, discharges of pollutants in stormwater runoff can reasonably be expected to be effectively minimized to the maximum extent practicable according to the requirements of ADEM Administrative Code Chapter 335-6-6-.23 and this Permit. The CBMPP describes the erosion and sediment control measures that must be fully implemented and regularly maintained as needed at the permitted site in accordance with sound sediment and erosion control practices to ensure the protection of water quality."

QCP Designation/Description: _____

Address _____ Registration / Certification: _____

Name and Title (type or Print) _____ Phone Number _____

Signature _____ Date Signed _____

X. OPERATOR - RESPONSIBLE OFFICIAL SIGNATURE

Pursuant to ADEM Administrative Code Rule 335-6-6-.09, this NOI must be signed by a Responsible Official of the permittee who is the operator, owner, the sole proprietor of a sole proprietorship, a general/controlling member or partner, a ranking elected official or other duly authorized representative for a unit of government; or an executive officer of at least the level of vice-president for a corporation, having overall responsibility and decision making for the site/activity. "I certify under penalty of law that this form, the CBMPP, and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the qualified credentialed professional (QCP) and other person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, correct, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine or imprisonment for knowing violations. I certify that this form has not been altered, and if copied or reproduced, is consistent in format and identical in content to the ADEM approved form. I further certify that the proposed discharges described in this registration have been evaluated for the presence of any non-construction and/or coal/mineral mining stormwater, or process wastewaters have been fully identified."

Name and Title (type or Print) _____ Official Title _____

Signature _____ Date Signed _____

ADEM Form 24 08/16 m1 Page 2 of 2

BOARD OF SUPERVISORS
County of Dane
ROOM 106B, CITY-COUNTY BUILDING
210 MARTIN LUTHER KING, JR. BOULEVARD
MADISON, WISCONSIN 53703-3342
608/266-5758 • FAX 266-4361 •
TTY: Call Wisconsin Relay 7-1-1

February 15, 2018

The Honorable Heather Wilson
Secretary of the Air Force
1670 Air Force Pentagon
Washington, D.C. 20330-1670

Dear Secretary Wilson:

We write in support of stationing the new F-35 Lightning II to the Wisconsin 115th Fighter Wing at Truax Air National Guard Base, in the city of Madison, Dane County, Wisconsin. We are pleased to learn that you have selected the 115th Fighter Wing and are continuing with an Environmental Assessment of this location in the near future.

The 115th Fighter Wing has exemplary facilities, with more than 1,200 highly-trained, award-winning members of the Air National Guard, and many full-time and civilian military personnel.

The 115th Fighter Wing is located near training airspace (Volk Field Air National Guard base) and receives convenient air tanker support from the 129th Air Refueling Wing in Milwaukee, Wisconsin. Local training airspace and air fueling capabilities provide significant cost savings for the 115th fighter mission especially when compared to other potential F-35 deployment sites.

Stationing the F-35 fighter aircraft in Dane County has strong support from state, county, and local officials as well as community members. For more than 75 years, Truax is a strong community partner as well as a provider of essential fire and emergency services for our commercial airport – the Dane County Regional Airport.

Dane County, the City of Madison, and the other surrounding communities have supported the base as it provides highly paid jobs, service contracts, and attracts families to live in our region -- directly supporting our economy, schools, services, and diversity. The F-35s will ensure continued economic growth of Dane County and the State of Wisconsin.

The Air National Guard receives extensive economic benefit from the joint use concept at Dane County Regional Airport Truax Field. Annual capital and operating costs of the Airport are funded by Airport revenues or through State and FAA Airport Improvement Grants. Dane County is committed to

providing necessary and outstanding civilian airfield infrastructure to support the 115th Fighter Wing flying mission. For example, the FAA has provided over $300 million dollars since 1970 for Airport Improvement grants for airfield development. During the next five years over $64 million dollars of airfield specific work is planned.

We believe that Truax Field located at the Dane County Regional Airport is the best location for military readiness in the north-central United States and look forward to the deployment of the new F-35 aircraft to our region.

Sincerely,

Maureen McCarville
Paul Rusk
Dan
Mary
Andrea Schauer
Patrick, District 34
Ronald H. Zwell District 15
Mike Willett Dist. 32
Jeff Pertl D17
Dist 14
Dist 35
Danielle Williams, Dist 36
D27

D-20
Bob Salow Dist. 37
Bill Clausius Dist. 19
#3
#7
#28
#26
Shelia Stubbs
D-10

NATIONAL GUARD BUREAU
3501 FETCHET AVENUE
JOINT BASE ANDREWS MD 20762-5157

JUL 3 0 2019

MEMORANDUM FOR INTERESTED INDIVIDUALS, ORGANIZATIONS, PUBLIC GROUPS, GOVERNMENT AGENCIES, AND PUBLIC LIBRARIES

FROM: NGB/A4AM
Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews MD 20762-5157

SUBJECT: Draft United States Air Force F-35A Operational Beddown Air National Guard Environmental Impact Statement

Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended (42 United States Code [USC] 4321, *et seq.*), the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), and Air Force policy and procedures Air Force Instruction (AFI) 32-7061 (as promulgated at 32 CFR Part 989), the National Guard Bureau (NGB) has made available for public review and comment a *Draft United States Air Force F-35A Operational Beddown Air National Guard Environmental Impact Statement*.

The Secretary of the Air Force (SECAF) proposes to beddown F-35A aircraft for the fifth and sixth operations at two of five alternative locations. The F-35A would replace the Air National Guard's F-15, F-16, and A-10 fighter attack aircraft at the selected locations with 18 assigned aircraft and 2 backup aircraft at each of the two selected installations. The five alternative ANG locations for this beddown are:

- 115th Fighter Wing (115 FW) at Dane County Regional Airport, Madison, Wisconsin
- 124th Fighter Wing (124 FW) at Boise Air Terminal (Boise Airport), Boise, Idaho
- 125th Fighter Wing (125 FW) at Jacksonville International Airport (IAP), Jacksonville, Florida
- 127th Wing (127 WG) at Selfridge Air National Guard Base (ANGB), Michigan
- 187th Fighter Wing (187 FW) at Montgomery Regional Airport, Montgomery, Alabama

The SECAF has announced that the two preferred alternatives are Dane County Regional Airport and Montgomery Regional Airport, pending results of the EIS.

The proposed action also includes construction and/or modification of facilities on the installations that support the beddown. In addition, there would be an Air Force Active Duty Associate Unit based with the selected alternative installations, which would include approximately 50 Active Duty personnel who would conduct 3-year rotations with the ANG unit. F-35A aircraft would conduct training operations within established airspace of each proposed

location. This undertaking does not propose new airspace, nor does it seek to reconfigure any of the existing airspace parcels. Those will remain unchanged.

The Draft EIS analyzes potential environmental consequences that could result from the proposed beddown of F-35A aircraft at alternative ANG installations.

The NGB also invites you to participate in the public meetings at one of the times and locations listed below. The addresses for the public meetings are:

August 27, 2019 **5-8 p.m.** Double Tree Hotel, Jacksonville Airport Aviation Ballroom, 2101 Dixie Clipper Drive Jacksonville, FL	**August 29, 2019** **5-8 p.m.** Montgomery Regional Airport First Floor Rotunda and Conference Room 4445 Selma Highway Montgomery, AL
September 5, 2019 **5-8 p.m.** Boise State University Stueckle Sky Center Double R Ranch Club 1910 University Drive MSC 1335 Boise, ID	**September 10, 2019** **5-8 p.m.** L'Anse Creuse Public Schools Wheeler Community Center 24076 Frederick V. Pankow Boulevard Clinton Township, MI
September 12, 2019 **5-8 p.m.** Exhibition Hall at the Alliant Energy Center 1919 Alliant Energy Center Way Madison, WI	

The Draft EIS is included as an attachment to this letter. We invite you to review the Draft EIS and provide comments no later than September 27, 2019. Please forward your written comments to the F-35A EIS Project Manager, NGB/A4AM, Shepperd Hall, 3501 Fetchet Avenue, Joint Base Andrews MD 20762-5157, or usaf.jbanafw.ngb-a4.mbx.a4a-nepa-comments@mail.mil. You may also submit comments via the project website at www.ANGF35EIS.com. Also attached to this letter is a Fact Sheet, which explains more about the project.

Thank you for your consideration and assistance.

Sincerely

RAMÓN E. ORTIZ, P.E., GS-14, DAF
Program Manager
F-35A Operational Beddown

Attachments:
Draft Environmental Impact Statement
Fact Sheet

Comment Details

Name	Marsha Rummel
Email Address	district6@cityofmadison.com
Comment	Please send the Executive Summary with CD of the final EIS to the City of Madison Common Council office 210 Martin Luther King Jr Blvd Room 417 Madison WI 53703
Organization	City of Madison Common Council
Address 1	1029 Spaight St
Address 2	6C
City	Madison
State	WI
Postal Code	53703
Phone Number	6087724555
Mailing List?	Yes
Wants CD?	Yes
Withhold Name?	No
Withhold Address?	No
Date Received	8/3/2019 2:24:21 PM EDT

LANCE R. LEFLEUR
DIRECTOR

KAY IVEY
GOVERNOR

Alabama Department of Environmental Management
adem.alabama.gov

1400 Coliseum Blvd. 36110-2400 ▪ Post Office Box 301463
Montgomery, Alabama 36130-1463
(334) 271-7700 ▪ FAX (334) 271-7950

August 7, 2019

RAMON E ORTIZ, PE
PROGRAM MANAGER
NGB/A4AM
SHEPPERD HALL
3501 FETCHET AVENUE
JOINT BASE ANDREWS MD 20762-5157

RE: United States Air Force F-35A Operational Beddown Air National Guard
Montgomery County (101)

Dear Mr. Ortiz:

The Department's Water Division (WD) has reviewed the information you sent us regarding the above-referenced project. You had requested that we review this information and provide comments.

Attached, please find a copy of WD's proposed project/activity review information.

I hope this information is useful. If you have any questions or need additional information, please contact me **by email at darby.parrish@adem.alabama.gov or by phone at (334) 260-4546.**

Sincerely,

Darby Parrish

Darby Parrish
Construction Permits Section
Stormwater Management Branch
Water Division

jdp File:PREV

Enclosure: Proposed Project/Activity Review Information
Copy of Review Request Letter

Birmingham Branch
110 Vulcan Road
Birmingham, AL 35209-4702
(205) 942-6168
(205) 941-1603 (FAX)

Decatur Branch
2715 Sandlin Road, S.W.
Decatur, AL 35603-1333
(256) 353-1713
(256) 340-9359 (FAX)

Mobile Branch
2204 Perimeter Road
Mobile, AL 36615-1131
(251) 450-3400
(251) 479-2593 (FAX)

Mobile-Coastal
3664 Dauphin Street, Suite B
Mobile, AL 36608
(251) 304-1176
(251) 304-1189 (FAX)

ADEM CONSTRUCTION STORMWATER

PROPOSED PROJECT/ACTIVITY REVIEW INFORMATION

The Department has received and evaluated the information you sent us regarding the above-referenced project. You had requested that we review this information and provide comments.

Please note that State law and ADEM regulations require that appropriate, effective Best Management Practices (BMPs) for the control of pollutants in stormwater run-off be fully implemented and maintained as needed for all construction and land disturbance activities regardless of permit status or size of the disturbance to prevent/minimize discharges of sediment and other pollutants to waters of the State of Alabama.

A "water of the state" is broadly defined as [§ 22-22-1(b)(2), Code of Alabama 1975, as amended] "All waters of any river, stream, watercourse, pond, lake, coastal, ground, or surface water, wholly or partially within the state, natural or artificial. This does not include waters which are entirely confined and retained completely upon the property of a single individual, partnership, or corporation unless such waters are used in interstate commerce." Discharges of pollutants resulting from failure to implement and maintain effective BMPs are considered unpermitted discharges to state waters.

Please be advised that pursuant to EPA rules and ADEM Construction General Permit (CGP) ALR100000, the operator or owner is required to apply for and maintain valid National Pollutant Discharge Elimination System (NPDES) coverage for stormwater discharges prior to beginning construction or regulated land disturbance that will equal or exceed one (1) acre in size. The regulations also require NPDES registration for disturbance activities less than one (1) acre that are part of, adjacent to, or associated with a larger common plan of development or sale, that may eventually equal or exceed one (1) acre, or if less than one (1) acre in size if stormwater discharges have reasonable potential to be a significant contributor of pollutants to a water of the State or have reasonable potential to cause or contribute to a violation of applicable Alabama water quality standards as determined by the Department. In addition, a Construction Best Management Practices Plan (CBMPP) is required to be submitted for priority construction sites as defined in the CGP. The regulated construction disturbance also includes, but is not limited to, associated areas utilized for support activities such as vehicle parking, equipment or supply storage areas, material stockpiles, temporary office areas, and access roads, and pre-construction activities performed in advance or in support of construction such as logging, clearing, and dewatering. Please be advised that an operator or owner must retain NPDES permit coverage until all disturbance activity, including phased construction, is complete.

Additional ADEM air, land, and/or water permits for discharges and regulated impacts resulting from the operation of the completed facility may be required.

Effective Best Management Practices (BMPs), as provided in the *Alabama Handbook For Erosion Control, Sediment Control, And Stormwater Management On Constructions Sites And Urban Areas*, as amended, Alabama Soil and Water Conservation Committee (ASWCC), for prevention and control of nonpoint sources of pollutants must be implemented prior to, during, and after project implementation. Immediately after completion of the project, effective measures to ensure permanent revegetation, cover, and/or effective stormwater quality remediation must be implemented and maintained. The CGP requires that a CBMPP to reduce pollutant discharges to the maximum extent practicable be prepared by a qualified credentialed professional (QCP) as defined in the CGP, and retained onsite. Construction site operators/owners seeking coverage under this general permit must submit a Notice of Intent (NOI) in accordance with the permit requirements. NOIs must be submitted through the Department's current electronic application submittal system. Information regarding construction activities forms, and other helpful information is available on the ADEM WebPage at http://www.adem.state.al.us/programs/water/constructionstormwater.cnt

Tennessee River Watershed - In order to determine whether this project should be covered under an existing CWA Section 404, Nationwide, or General Permit, or Letter of Permission, you should contact the U. S. Army Corps of Engineers, Nashville District by mail at PO Box 1070, Nashville, TN 37202-1070 or by phone at (615) 736-5181. Facilities covered under a U.S. Army Corps of Engineers Individual 404 Permit, Nationwide or General Permit, or Letter of Permission must apply for NPDES stormwater coverage from ADEM, if construction or land disturbance above the Ordinary High Water Mark, or any non-dredge/fill operations below the Ordinary High Water Mark and associated

upland dredge disposal sites that will equal or exceed one (1) acre or that are part of a larger common plan of development or sale in which disturbed acreage will eventually equal or exceed (1) acre.

All Other Alabama Watersheds - In order to determine whether this project should be covered under an existing CWA Section 404, Nationwide, or General Permit, or Letter of Permission, you should contact the U.S. Army Corps of Engineers, Mobile District by mail at PO Box 2288, Mobile, AL 36628-0001 or by phone at (251) 690-2658. Facilities covered under a U.S. Army Corps of Engineers Individual 404 Permit, Nationwide or General Permit, or Letter of Permission must apply for NPDES stormwater coverage from ADEM, if construction or land disturbance above the Ordinary High Water Mark, or any non-dredge/fill operations below the Ordinary High Water Mark and associated upland dredge disposal sites that will equal or exceed one (1) acre or that are part of a larger common plan of development or sale in which disturbed acreage will eventually equal or exceed (1) acre.

ADEM's Coastal Program manages uses and activities having the potential to significantly impact the coastal portions of Alabama and/or its resources. The Coastal Area is comprised of only a portion of Mobile and Baldwin counties and is defined as the lands and waters seaward of the continuous ten-foot contour. ADEM issues Coastal Programs Non-Regulated Use Permits for commercial and residential developments greater than 5 acres in size, construction on Gulf-fronting properties intersected by the Construction Control Line, and groundwater wells that exceed 50 gallons per minute of water withdrawal. ADEM also must certify that permits issued by federal and state agencies, and projects conducted by those agencies, are consistent with the Coastal Program. ADEM accomplishes this by reviewing applications for permits submitted to other agencies. Therefore, it is recommended that applicants having development plans, or even considering development in the Coastal Area, consult with ADEM Coastal Program staff as soon as possible in the project development stage so that the applicant can learn of applicable requirements. Questions involving projects in the coastal area should be directed to the ADEM Coastal Office in Mobile.

You may also wish to contact: (1) the U.S. Fish & Wildlife Service and the Alabama Department of Conservation & Natural Resources. These are the Federal and State agencies, respectively, that have primacy and statutory authority to address potential impacts to endangered or threatened species, (2) the Office Of Water Resources, Alabama Department of Economic and Community Affairs, which is the State agency with primacy and statutory authority to address potential water quantity concerns or issues, (3) the State Fire Marshall and the Alabama Department of Industrial Relations which are the State agencies with primacy and statutory authority to address potential safety considerations regarding blasting, (4) the Alabama Department of Industrial Relations which requires permit coverage and reclamation bonding for most non-coal mining sites, (5) the Alabama Historical Commission which is the State agency with primacy and statutory authority to address preservation or potential impacts to surrounding or onsite historical or archaeological sites, (6) your local county health department for issues related to onsite sewage management, and (7) your local municipal or county government, or local zoning and planning agency, if applicable, for additional approvals that may apply to your project.

In recognition that projects are site specific in nature and conditions can change during project implementation, the Department reserves the right to require the submission of additional information or require additional management measures to be implemented, as necessary on a case–by-case basis, in order to ensure the protection of water quality. Responsibility for compliance with ADEM rules and permit requirements are not delegable by contract or otherwise. The operator or owner must ensure compliance. Any violations resulting from the actions of such person may subject the operator/owner to enforcement action.

ADEM permitting decisions are predicated on current regulatory requirements, established engineering standards and technical considerations, best management practices information, and formal administrative procedures in conformance with Departmental regulations and applicable Alabama law. Issuance of permit coverage by ADEM neither precludes nor negates an operator/owner's responsibility or liability to apply for, obtain, or comply with other ADEM, federal, state, or local government permits, certifications, licenses, or other approvals. ADEM permit coverage does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to persons or property or invasion of other private rights, trespass, or any infringement of Federal, State, or local laws or regulations.

If you have any questions or need additional information regarding construction stormwater permitting, please contact the Water Division in Montgomery at (334) 271-7700 or h2omail@adem.alabama.gov.

NATIONAL GUARD BUREAU
3501 FETCHET AVENUE
JOINT BASE ANDREWS MD 20762-5157

RECEIVED
AUG 05 2019
STORM WATER MANAGEMENT BRANCH

JUL 30 2019

MEMORANDUM FOR INTERESTED INDIVIDUALS, ORGANIZATIONS, PUBLIC GROUPS, GOVERNMENT AGENCIES, AND PUBLIC LIBRARIES

FROM: NGB/A4AM
Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews MD 20762-5157

SUBJECT: Draft United States Air Force F-35A Operational Beddown Air National Guard Environmental Impact Statement

Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended (42 United States Code [USC] 4321, *et seq.*), the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), and Air Force policy and procedures Air Force Instruction (AFI) 32-7061 (as promulgated at 32 CFR Part 989), the National Guard Bureau (NGB) has made available for public review and comment a *Draft United States Air Force F-35A Operational Beddown Air National Guard Environmental Impact Statement*.

The Secretary of the Air Force (SECAF) proposes to beddown F-35A aircraft for the fifth and sixth operations at two of five alternative locations. The F-35A would replace the Air National Guard's F-15, F-16, and A-10 fighter attack aircraft at the selected locations with 18 assigned aircraft and 2 backup aircraft at each of the two selected installations. The five alternative ANG locations for this beddown are:

- 115th Fighter Wing (115 FW) at Dane County Regional Airport, Madison, Wisconsin
- 124th Fighter Wing (124 FW) at Boise Air Terminal (Boise Airport), Boise, Idaho
- 125th Fighter Wing (125 FW) at Jacksonville International Airport (IAP), Jacksonville, Florida
- 127th Wing (127 WG) at Selfridge Air National Guard Base (ANGB), Michigan
- 187th Fighter Wing (187 FW) at Montgomery Regional Airport, Montgomery, Alabama

The SECAF has announced that the two preferred alternatives are Dane County Regional Airport and Montgomery Regional Airport, pending results of the EIS.

The proposed action also includes construction and/or modification of facilities on the installations that support the beddown. In addition, there would be an Air Force Active Duty Associate Unit based with the selected alternative installations, which would include approximately 50 Active Duty personnel who would conduct 3-year rotations with the ANG unit. F-35A aircraft would conduct training operations within established airspace of each proposed

Thank you for your consideration and assistance.

Sincerely

RAMÓN E. ORTIZ, P.E., GS-14, DAF
Program Manager
F-35A Operational Beddown

Attachments:
Draft Environmental Impact Statement
Fact Sheet

LANCE R. LEFLEUR
DIRECTOR

KAY IVEY
GOVERNOR

Alabama Department of Environmental Management
adem.alabama.gov
1400 Coliseum Blvd. 36110-2400 ▪ Post Office Box 301463
Montgomery, Alabama 36130-1463
(334) 271-7700 ▪ FAX (334) 271-7950

August 15, 2019

CERTIFIED MAIL # 91 7199 9991 7039 3030 7835

F-35A EIS Project Manager
NGB/A4AM
Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews, MD 20762-5157

RE: **ADEM Review:** *Draft United States Air Force F-35A Operational Beddown Air National Guard Environmental Impact Statement*, dated August 2019
Montgomery Air National Guard Base, Montgomery, AL
USEPA I.D. Number ALD000648014

Dear Project Manager:

The Alabama Department of Environmental Management (ADEM or the Department) has reviewed the *Draft United States Air Force F-35A Operational Beddown Air National Guard Environmental Impact Statement*, dated August 2019.

The document indicates that new construction is proposed on the site should the 187th Fighter Wing (FW) be chosen to accommodate the F-35A Operational Beddown. Within Table ES-1 of the document, it is stated that a maximum of 4.8 acres will be utilized for new construction while a maximum of 2.9 acres will be required to construct new impervious surfaces. Additionally, the Air Force acknowledges the presence of two (2) Environmental Restoration Program sites and three (3) polyfluoroalkyl substance potential release locations on base. Accordingly, it will be necessary for the 187th FW to consult with ADEM prior to any construction within or near these areas. It should also be noted that there is always the possibility to encounter contaminants that have not been determined by previous investigations. If contamination is suspected and/or encountered, the Department should be notified as soon as possible. The Department requests to be informed of the final decision for the location of the F-35A Operational Beddown.

Birmingham Branch
110 Vulcan Road
Birmingham, AL 35209-4702
(205) 942-6168
(205) 941-1603 (FAX)

Decatur Branch
2715 Sandlin Road, S.W.
Decatur, AL 35603-1333
(256) 353-1713
(256) 340-9359 (FAX)

Mobile Branch
2204 Perimeter Road
Mobile, AL 36615-1131
(251) 450-3400
(251) 479-2593 (FAX)

Mobile-Coastal
3664 Dauphin Street, Suite B
Mobile, AL 36608
(251) 304-1176
(251) 304-1189 (FAX)

If any questions or concerns should arise regarding this matter, please contact William Duke of the Remediation Engineering Section, Governmental Hazardous Waste Branch at (334)-271-7782 or by email at william.duke@adem.alabama.gov.

Sincerely,

Jason Wilson, Chief
Governmental Hazardous Waste Branch
Land Division

JW/ATM/WMD/tlp

Cc/via email: ADEM: Ashley Mastin
Alabama ANG: Captain Sean Rizzo

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Eastern States
Southeastern States District Office
273 Market Street
Flowood, Mississippi 39232
www.blm.gov/eastern-states

IN REPLY REFER TO:
9113 (020) HS

August 16, 2019

F-35A EIS Project Manager
NGB/A4AM, Shepperd Hall
3501 Fetchet Ave
Joint Base Andrews, MD 20762-5157
In Re: Draft United States Air Force F-35A Operations Beddown Air National Guard Environmental Impact Statement (EIS)

To whom it may concern:

The Bureau of Land Management (BLM) Southeastern States District Office is responsible for land management activities in Alabama and Florida. With regards to the impacts occurring at the 125th Fighter Wing at Jacksonville International Airport and the 187th Fighter Wing at Montgomery Regional Airport, the BLM has reviewed the information provided and offers the following comments.

There is no conflict apparent between the BLM's interests and this project. The BLM has no public domain (PD) surface land holdings that will be affected on or near the proposed project site. Likewise, the BLM holds no subsurface mineral rights on or near the proposed project site.

We appreciate the opportunity to comment on the proposed project. Please contact this office (Minerals Section) at (601) 919-4650 if you have further questions.

Sincerely,

Lance R. Brady
Associate District Manager

From: State_Clearinghouse
To: usaf.jbanafw.ngb-a4.mbx.a4a-nepa-comments@mail.mil
Subject: [Non-DoD Source] SAI# FL201908208719C
Date: Wednesday, August 21, 2019 3:41:29 PM

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

To: Ramon Ortiz

Re: Florida State Clearinghouse Project Review

Project SAI#: FL201908208719C
Date Received: 08/12/19
Project Description: DEPARTMENT OF DEFENSE, U.S. AIR FORCE, DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR US AIR FORCE F-35A OPERATIONAL BEDDOWN AIR NATIONAL GUARD, JACKSONVILLE, DUVAL COUNTY, FLORIDA.

The Florida State Clearinghouse has received the above-referenced project and has forwarded it to the appropriate state agencies for review. Please refer to the State Application Identifier (SAI) number in all correspondence with the Florida State Clearinghouse regarding this project. Applicants should expect to receive their State Clearance Letter 30-60 days from the received date. Additional information can be found atCaution-http://dep.state.fl.us/secretary/oip/state_clearinghouse/manual2.htm < Caution-http://dep.state.fl.us/secretary/oip/state_clearinghouse/manual2.htm > .

Please submit all future project applications and correspondence by email tostate.clearinghouse@dep.state.fl.us < Caution-mailto:state.clearinghouse@dep.state.fl.us > . If your submittal is too large to send via email or if you need other assistance, contact Chris Stahl at (850) 717-9076.

< Caution-http://survey.dep.state.fl.us/?refemail=State.Clearinghouse@dep.state.fl.us >

United States Department of the Interior
U.S. Fish and Wildlife Service
Idaho Fish and Wildlife Office - Boise
1387 South Vinnell Way, Suite 368
Boise, Idaho 83709
Telephone (208) 378-5243
www.fws.gov/idaho

F-35A EIS Project Manager
NGB/A4AM
Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews, Maryland 20762-5157

AUG 2 6 2019

Subject: Draft U.S. Air Force F-35A Operational Beddown Air National Guard—Ada, Elmore, and Owyhee Counties, Idaho—National Environmental Policy Act Review
In Reply Refer To: 01EIFW00-2019-CPA-0009

Dear Sir or Madame:

Thank you for your letter dated July 30, 2019, requesting public review and comment on the draft U.S. Air Force F-35A Operational Beddown for the Air National Guard Environmental Impact Statement (DEIS) from the Idaho Fish and Wildlife Office of the U.S. Fish and Wildlife Service (Service). The proposed action includes a beddown of F-35 aircraft for the fifth and sixth operations at two of five alternative locations. Our review comments are limited to the alternative addressing the 124th Fighter Wing at Boise Air Terminal (Boise Airport), Boise, Idaho. Eighteen F-35A aircraft would replace the Air National Guard's 18 A-10 fighter aircraft currently based at this site. Our comments, which are limited to those portions of the DEIS that address species described in the area of the 124th Fighter Wing alternative as currently being listed, proposed, or candidates under the Endangered Species Act (Act) of 1973, as amended, are provided below.

Slickspot Peppergrass

Section ID3.11.1 Installation; Affected Environment; Threatened, Endangered, and Species Status Species. The DEIS includes survey information on *Lepidium papilliferum* (slickspot peppergrass), a species listed as threatened under the Act. The DEIS indicates that slickspot peppergrass "...has been observed in the past on the 124 FW installation in 2002, but has not been documented since...." However, Kinter and Miller (2016, p. 30) state that the original record for the slickspot peppergrass site north of Gowen Road was not in the Idaho Fish and Wildlife Information System (IFWIS) database, and no reference could be found for this location prior to 2006, when it was first mapped in the database. We suggest that the final Environmental Impact Statement (EIS) be updated to state that the slickspot peppergrass location mapped in 2006 (as opposed to 2002) on the north side of Gowen Road within the 124 FW installation has recently been determined by the Idaho Department of Fish and Game to have been mis-mapped

(Kinter and Miller 2016, p. 30), and has subsequently been removed from the IFWIS database. As you know, the Idaho Department of Fish and Game has documented that the slickspot peppergrass sites south of Gowen Road, which are located outside the project area, as valid records since they contained slick spot microsites, and slickspot peppergrass rosettes and/or reproductive plants were present during field assessments in 2014 and/or 2016 (Kinter and Miller 2016, p. 30).

Greater Sage-Grouse

ID3.11.2 Airspace; Affected Environment; Threatened, Endangered, and Species Status Species. The DEIS states that one candidate species (Greater sage-grouse) has been observed or potentially occurs under the proposed airspace. While the Greater sage-grouse is considered a Tier 1 Species of Greatest Conservation Need within the Idaho Department of Fish and Game's 2017 State Wildlife Action Plan, this species currently has no status under the Endangered Species Act. We recommend that the final EIS be updated to indicate that the Greater sage-grouse is currently not listed, proposed, or a candidate for listing under the Endangered Species Act. For additional information on the status of the Greater sage-grouse in Idaho, please contact the Idaho Department of Fish and Game, which has jurisdiction for management of this species in Idaho.

Thank you for the opportunity to provide comments on the DEIS. Please contact Barbara Schmidt of my staff at (208) 378-5259 if you have any questions regarding this letter or require additional technical assistance.

Sincerely,

for Christopher Swanson
Acting State Supervisor

cc: Idaho Department of Fish and Game, Boise (Schriever, Kinter)
Idaho Department of Fish and Game, Nampa (Compton, Bosworth)
FWS, Portland (Stravakas)

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
POST OFFICE BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

September 9, 2019

Regulatory Division
North Permits Branch
Jacksonville Permits Section
SAJ-2010-03511

National Guard Bureau
F-53A EIS Project Manager
NGB/A4AM, Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews, Maryland 20762-5157

Sent Via: usaf.jbanafw.ngb-a4.mbx.a4a-nepa-comments@mail.mil

Dear Sir or Madam:

This correspondence references the *Draft United States Air Force F-35A Operational Beddown Air National Guard Environmental Impact Statement* – August 2019 (DEIS). The U.S. Army Corps of Engineers, Jacksonville District (Corps) reviewed information associated with work under consideration at the 125th Fighter Wing (125 FW) at the Jacksonville International Airport, Jacksonville, Florida.

On page FL-90, the DEIS indicates that a wetland delineation conducted in 2015 identified five isolated, federally non-jurisdictional palustrine emergent and palustrine forested waters of the United States (wetlands) and four federally jurisdictional palustrine forested wetlands. Please be advised, the correspondence authored by the Corps associated with that jurisdictional determination is dated October 30, 2014 (*not 2015*) and expires on October 30, 2019. Therefore, the Corps concludes that a new jurisdictional determination likely would be required prior to, or in conjunction with, any Department of the Army permit application to implement work proposed in the areas previously identified as isolated and non-jurisdictional.

Separately, based on the drawings incorporated into the DEIS, it appears that the work proposed at the 125 FW site would affect wetlands within Federal jurisdiction; and, therefore, a Department of the Army permit would be required. The Corps must consider all practicable alternatives during the evaluation of a Department of the Army permit application. The National Environmental Policy Act (NEPA) and the Section 404(b)(1) Guidelines associated with the Clean Water Act of 1972, as amended, require this review. Under NEPA, the Corps must undertake a detailed consideration of reasonable alternatives that focus on the accomplishment of the applicant's purpose and the public need. The Corps is neither a proponent nor an opponent of the applicant's proposal which is identified as the "applicant's preferred alternative". In addition, the “no-action” alternative, other project designs, and/or restrictions imposed as permit conditions must be evaluated. This review includes project modifications that would eliminate work under the jurisdiction of the Corps as well as the potential denial of the permit. The evaluation of the “no-action” alternative would include other likely uses of the project site should the permit be denied. Alternatives that are unavailable to the applicant, whether or not they require a permit, will be considered to the extent necessary to allow a complete and objective evaluation of the public interest.

It appears that sufficient upland areas are available to accommodate the proposed features without affecting waters of the United States, including wetlands. For example, it appears that the *Munitions Storage Area (MSA) Administration* building (identified as *Project #9*) could be located west or south-southeast of the proposed location onto upland areas; and, the proposed *Explosives Ordinance Disposal (EOD) Range* (identified as *Project #14*) could be rotated in orientation and placed within uplands west of the proposed location. If these alternatives, or any other alternatives that avoid or further minimize adverse effects to onsite wetlands, are not practicable, the Final Environmental Impact Statement should clearly indicate why the alternate designs/locations that avoid or further minimize work affecting wetlands are not practicable. Please note that the proposal of, or implementation of, compensatory mitigation does not obviate the requirement to avoid and minimize work affecting aquatic resources to the maximum extent practicable.

If you have any questions regarding the information in this correspondence, please contact me at the letterhead address, by telephone at 904-232-2028, or by electronic mail correspondence at mark.r.evans@usace.army.mil.

Sincerely,

Mark R. Evans
Senior Project Manager
Jacksonville Permits Section

Department of Planning & Community & Economic Development
Office of the Director
Nan Fey, Interim Director
Madison Municipal Building, Suite 130
215 Martin Luther King, Jr. Boulevard
P.O. Box 2985
Madison, Wisconsin 53701-2985
Phone: (608) 266-4635 www.cityofmadison.com

To: Mayor Rhodes-Conway

From: Nan Fey, Interim DPCED Director

Date: September 10, 2019

Subject: F35 EIS Staff Analysis

This document contains staff's analysis of the draft United States Air Force F-35A Operational Beddown National Guard Environmental Impact Statement (EIS) pertaining to the 115 Fighter Wing at Truax Field. Staff in the Planning Division, Community Development Division, Housing Authority, Engineering Division and Public Health of Madison and Dane County contributed to this report. Since this is not a City of Madison decision, staff is not providing a recommendation for or against the proposed location of F35s at Truax, did not evaluate sections of EIS document pertaining to other communities or compare impacts of various locations. The intent of this document is to provide a clear and objective compilation of relevant facts from the EIS and a greater explanation of how this could impact Madison for you and other elected officials who may wish to provide a comment to the Air National Guard as part of their review and decision process.

Comments can be made online at http://www.angf35eis.com/Comments.aspx through September 27 or at the upcoming meeting on September 12 at the Exhibition Hall in the Alliant Energy Center starting at 5:30 pm.

Noise: Land Use and Neighborhood Impacts

As has been widely discussed, replacement of F16s with F35s would result in an increase in overall loudness in areas near Dane County Regional Airport and Truax Field.

The most discussed statistic in the EIS is Day Night Average Sound Level (DNL), a cumulative measure of multiple flights and engine maintenance that incorporates sound from both military and civilian aircraft. This metric is intended to provide an overall picture of noise exposures, rather than a measure of specific sound events. As a result, it isn't directly comparable to other sound level statistics measured in decibels.

The DNL were calculated on a 500 ft. grid, which was then used to create sound contours (lines of equal sound exposure). These were generated by a model that factors:

- aircraft type and noise profiles
- number of flights for each aircraft type
- frequency of specific approach and departure paths (i.e. how often each runway is used)

In 1983, the FAA published *Noise Control and Compatibility For Airports*, an advisory document addressing aircraft noise and surrounding land uses. The document established a standard methodology for measuring cumulative noise exposure and identifies land uses that are often more sensitive to noise. Through this document, the FAA determined the 65 db DNL contour is the noise exposure level where land use compatibility issues may begin to arise surrounding airports. This document is the source of the land use compatibility table included in the draft EIS on page 3-33.

FAA's advisory document appears tailored toward addressing future use of vacant property and redevelopments surrounding airports by recommending land uses or construction techniques that minimize sound impacts to users. It's important to clarify that the document's use of the term "Incompatible" does not mean uninhabitable, nor is it a substitute for or superseding other local land use decisions. **In effect, FAA designations of incompatible and conditionally compatible land uses with the 65db DNL curve defines where federal funding can be used to minimize and mitigate noise exposure for existing uses.** The document also begins to discuss the Part 150 Noise Compatibility Program, which grants federal Airport Improvement Program funds to airports to carry out federally approved noise mitigation techniques. The Noise Compatibility Program will be discussed in greater detail later in this memo.

Current and Proposed 65 db Contours

The sound contour expansion is attributable to two primary factors: the change in sound level associated with the F35s and the increased number of flights planned. Because the sound contours are Day Night Average Sound Level, increased quantity flight events will increase the cumulative daily sound exposure and result in larger contours.

Long-term, flights are expected to increase from 2,400 to approximately 3,061 annually based on flight time requirements and average flight length, a 27% increase. As part of the 115 FW's alert mission function (rapid defense of domestic airspace), it would temporarily maintain additional F16 flights until the transition to an all F35 fleet is complete. During this transition time, flight activity could increase 47% from the current levels. The EIS doesn't specify how long this transition period will be, but it does state the drawdown of F16s would approximately match the arrival of F35s. The delivery of F35s would occur in 2023 and 2024 so this may be the likely timeline for the additional flight activity. Staff has confirmed the modelling in the EIS is based on the temporary 47% increase. As a result, the long-term impacted area will likely be smaller than the geography shown.

Analysis of Population and Land Use In and Around the 65 db Contours

The EIS provides a basic level analysis of land use and the population that may be impacted within the 65 db curve. To do this, EIS authors manually counted residential structures and used 2016 American Community Survey 5-Year Census block group data to estimate impacted populations. The EIS estimated 1,318 households and 2,766 residents inside the 65 db curve. Demographic data was evaluated at the Census block group level by the EIS, including race/ethnicity, poverty and population under 18. The EIS used 20% of the population in poverty and 50% of the population identifying as a minority as thresholds to flag impacted block groups.

While the 50% minority rate may be a national standard for environmental impact statements, it appears to be a very high bar for measuring impacts on communities of color particularly in Madison and Dane County, where persons of color make up 26% and 20% of the population respectively. Using this metric, the only block groups flagged for having a minority population are west of the airport, generally outside the 65 db curve. **Nearly every impacted area within the City of Madison belongs to a census tract with rates of persons of color well above the city- and county-wide averages.** The block group with the largest expansion of the impacted area (Carpenter Ridgeway) is comprised of 43.9% persons of color. While the EIS acknowledges it has a disproportional impact on persons of color, its methodology results in this issue being understated.

The threshold for poverty appears more in line with Madison (26%) and Dane County (20%) averages. Like the persons of color statistic above, **nearly every block group within the impacted area has poverty rates above the city-wide average**.

It should also be noted that **there are several concentrations of poverty and persons of color just outside the 65 db contour**, including the CDA Truax housing, CDA Webb-Rethke townhomes and other housing near Worthington Park, and near the intersection of Packers Avenue and Northport Drive. While these areas will experience virtually identical noise exposure as residents who live on the contour line, they will not be eligible

for federal sound mitigation funding through the Noise Compatibility Program. If Truax is selected for future F35s, it's a reasonable conclusion that non-mitigated areas immediately adjacent to but outside the 65 db contour may experience more significant impacts than mitigated (soundproofed) residences inside the impacted area.

Rents and home values inside the 65 db contour are significantly more affordable than the City as a whole. Assessments of homes and condominiums inside the impacted area have a median value of $174,400 compared to the Madison median of $254,900. Rents are generally 10-20% lower than Madison's median rent according to census block level 5-year data. With relatively rapid housing cost increases seen across Madison and relative scarcity of affordable neighborhoods, these areas play an important role in Madison's overall housing picture. Preserving these as livable neighborhoods going forward, either through a no change scenario or one with sound impact minimization or mitigation, is certainly in Madison's best interest.

Community Development Authority and Other Low Income Housing

The City of Madison's Community Development Authority (CDA) operates multiple income-restricted housing facilities surrounding the impacted 65 db area. Truax Park Apartments, located at Wright and Straubel Streets, is just outside the 65 db DNL contour. These buildings, which were recently renovated, include 195 income-restricted residential units, and the East Madison Community Center. Also just outside the impacted area, the CDA has 36 townhomes (Webb-Rethke) near Worthington Park. Head of household demographics at Truax and Webb-Rethke are 70% persons of color, 100% low income, 45% disabled and 14% elderly; a total of approximately 600 residents.

In addition to CDA owned properties, there are more than 80 subsidized low-income housing units present in the impacted area. Most of these units are located in the recently built Rethke Terrace, which provides permanent supportive housing for formerly homeless individuals and received significant support from the City's Affordable Housing Fund. In total, nearly 800 subsidized low income housing units are within 1,500 feet of the 65 db contour.

Madison's Zoning Districts and FAA Land Use Compatibility Guidance

While zoning districts can allow a multitude of uses, the districts' primary permitted use type (ie residential, commercial, industrial, etc.) was compared to FAA land use compatibility recommendations to determine the overall level of land use impact. FAA defines land uses as either compatible, not compatible or conditionally compatible with noise mitigating construction techniques. **In the modeling of both the existing and proposed sound contours, the only area receiving the not compatible designation is the mobile home park on Packers Avenue** just west of Dane County Regional Airport, which contains 312 units per City of Madison property data.

Nearly 1,200 residential units and 175 acres of residentially zoned land area are added to one of the conditionally compatible designations. This should not, however, be interpreted as the homes being uninhabitable as has been discussed by some in the community. It's not uncommon for residential units to be within the 65 db contour, particularly in older cities and metro areas were the airport is relatively centrally located. This is the case with other airports in the region including Chicago O'Hare, Milwaukee and Minneapolis Saint Paul. It's not surprising that staff's estimation of residents impacted is different from what is discussed in the EIS, the Air National Guard did not utilize City property databases. With regard to the number of impacted housing units, the two estimates are relatively similar, though.

Health Concerns

Health consequences associated with noise exposure are dependent on the duration of exposure, intensity (decibel level), and how often a population is exposed. **Health impacts associated with long term exposure to noise levels similar to those expected from the F35s include: sleep disturbance, decreased school performance, increased levels of stress, hearing impairment, annoyance, hypertension, and heart disease.** As described below, FAA funding restricts funding for sound mitigation to permanent structures and would

presumably *not* be applicable to the mobile home park on Parkers Avenue, which contains 312 units per City of Madison property data. In addition, this funding would not be applicable to residential units and structures lying just outside the 65 db DNL contour lines, which include subsidized housing units, the Madison College campus and Hawthorne Elementary School. A broader spatial consideration of noise exposure impact and consequences should be considered to protect these vulnerable populations.

		Day Night Average Noise Levels					
		Current			Proposed		
Residential Units		65-70 db	70-75 db	75-80 db	65-70 db	70-75 db	75-80 db
Not compatible		312			312		
Conditionally compatible					1,025	142	
Employees		4,498	936		8,299	2,737	589
Zoning Districts (acres)							
Residential	TR-C1				52.3	14.4	
	TR-C2				17.6		
	TR-C4				14.1	0.7	
	TR-V1				27.8	7.0	
	TR-V2				7.4		
	SR-C3					0.6	
	SR-V1				14.6	0.3	
	SR-V2				16.7	2.2	
	PMHP	44.7			59.3	0.9	
Commercial, Employment	CC-T				33.0	0.2	
	SE	64.5	34.3		78.8	44.0	11.7
	IL	80.0	14.5		169.7	30.2	0.3
	TE				22.7		
Special	AP	215.9	266.3	290.9	172.6	217.5	269.4
	CI	19.3	12.7	0.2	27.5	10.9	
	PD				6.9	3.2	
Open Spaces	A	9.9			29.2	0.2	
	PR	153.0	27.3		157.2	141.9	52.8
	CN	0.1		9.5	13.0	6.4	

	Compatible
	Compatible with noise level reduction techniques integrated into building design
	Where the land use must be allowed, noise level reductions of 25-30 db should be incorporated
	Not compatible
	PD districts in this area are predominately commercial and office, however approximately 4 acres of residential are included in the Carpenter Ridgeway area
Notes:	Residential unit count based on City of Madison parcel data, using parcel centroid and sound curves
	Employment counts from Census OnTheMap, 2015 data, all jobs
	PMHP = Planned Mobile Home Park

Potential Sound Mitigation

Airports around the country have participated in the voluntary 14 CFR Part 150 Noise Compatibility program discussed by the EIS. This can result in changes on and off airport property to mitigate sound exposure for properties contained within the 65 db DNL contour.

Actions may include modifications to airport operations, construction of sound walls, soundproofing for noise sensitive uses (including residential) and voluntary acquisition of property. Several of these actions were approved by the FAA for Milwaukee's General Mitchell International Airport Noise Compatibility Program. The 65 db curve surrounding Milwaukee's airport contains approximately 920 residential structures, many of which have since received soundproofing consisting of new doors and window.

Federally-funded soundproofing residential structures appears to be one of the most common techniques used by airports and associated communities that have applied for Noise Compatibility Program funding. The Part 150 Noise Mitigation Plan for Minneapolis Saint Paul includes some mitigation for residential units above 60 db, a lower noise level. The plan was approved by the FAA but was the result of litigation between the surrounding municipalities and the metropolitan airport commission, so it may not be transferable to Madison.

As Madison continues to see growth pressures and increasing housing costs, it's important to maintain more affordable housing options such as those in the impacted area. Soundproofing may be the most appropriate migration option for impacted areas in Madison if Truax is selected for the F35 beddown, however other options do exist.

Burlington, VT chose to establish a voluntary acquisition program, where homes were purchased by the airport with federal funding and demolished. While this program did not result in any involuntary relocation, it removed a large amount of more affordable housing stock from an already tight housing market (145 homes were demolished since 1997). As part of an updated sound study associated with their arrival of F35s, focus has shifted away from demolition and towards soundproofing as elected officials and staff recognize that upgrading and preserving existing housing stock and neighborhoods have far greater resident and community benefits.

Soundproofing may not be an option for the mobile home park on Packers Avenue, which is in the current 65 db contour and would remain in the impacted area with the potential arrival of F35s. It appears the FAA considers mobile homes non-permanent structures and therefore does not allow soundproofing as a mitigation option.. A limited review of Part 150 Noise Mitigation Plans has shown options for mobile home parks are voluntary acquisition, purchase of sound easements over the property, and assisted relocation of the entire park to a site outside the 65 db contour. Madison's adopted Future Land Use Plan recognizes the potential land use conflict, and if the site redevelops in the future it should shift from residential to an employment use.

While the EIS identifies 14 CFR Part 150 Noise Compatibility program as a potential path to mitigate noise exposure, it does not discuss the process, identify responsible parties or other relevant program details. Without this information, it's not possible to understand the likelihood, timing and potential local costs associated with mitigating impacted properties. The draft EIS places the burden of identifying and understanding the program on those expected to provide comments; it would be far more helpful for the Air National Guard to expand this section and give Madison's residents and elected officials better information on this program.

Staff has learned through discussions with the FAA that individual airports are responsible for initiating noise compatibility studies and mitigation programs. Since the airport is operated by Dane County and controlled by a board appointed by the County Executive, **the City of Madison would have no official role in any potential noise mitigation study or program**. The inability for the City to act on behalf of its residents and in the best interest of City-owned housing is a concern.

Environmental: Stormwater and Contamination

The EIS discusses construction activity needed if Truax is selected to receive F35s. The EIS indicates these changes would add a total of 1.7 Acres of impervious area. Added impervious surface would be near existing Air National Guard (ANG) facilities, outside the significant area of floodplain to the north runway 14-32 and west of the airport.

All construction activity would need to comply with Wisconsin standards including NR-116 (floodplain) and NR-

151 (water quality and limited detention). **Madison ordinances (MGO 37) have significantly more water quality and detention (flood control) requirements than the state standards, however there is limited ability of the City to enforce municipal standards as airports are exempt from compliance under Wisconsin TRANS 401.** Based on the historic rain events experienced on the Westside of Madison and Dane County last year, and the well documented increase in frequency of intense storm events, Madison is currently working to revise its code to include additional stormwater requirements which would likely be in place if and when construction occurs.

One contaminant present on the Air National Guard base is per- and polyfluoroalkyl substances, or PFAs, a bioacumulative, toxic and persistent group of chemicals historically used in firefighting foams. The PFAs investigation on the base has yet to be completed and the WDNR has required additional investigation of soil, surface water, groundwater, and sediment both on and off the base. It is staff's understanding that DNR's request is not being acted upon, and the Department of Defense does not consider this a priority site for mitigation. Based on initial test results, PFAS-contaminated soil and groundwater contamination is widespread and its extent has not been fully defined. Under NR 700, a completed site investigation is required to define the nature and extent of PFAS contamination before remediation activities can be planned.

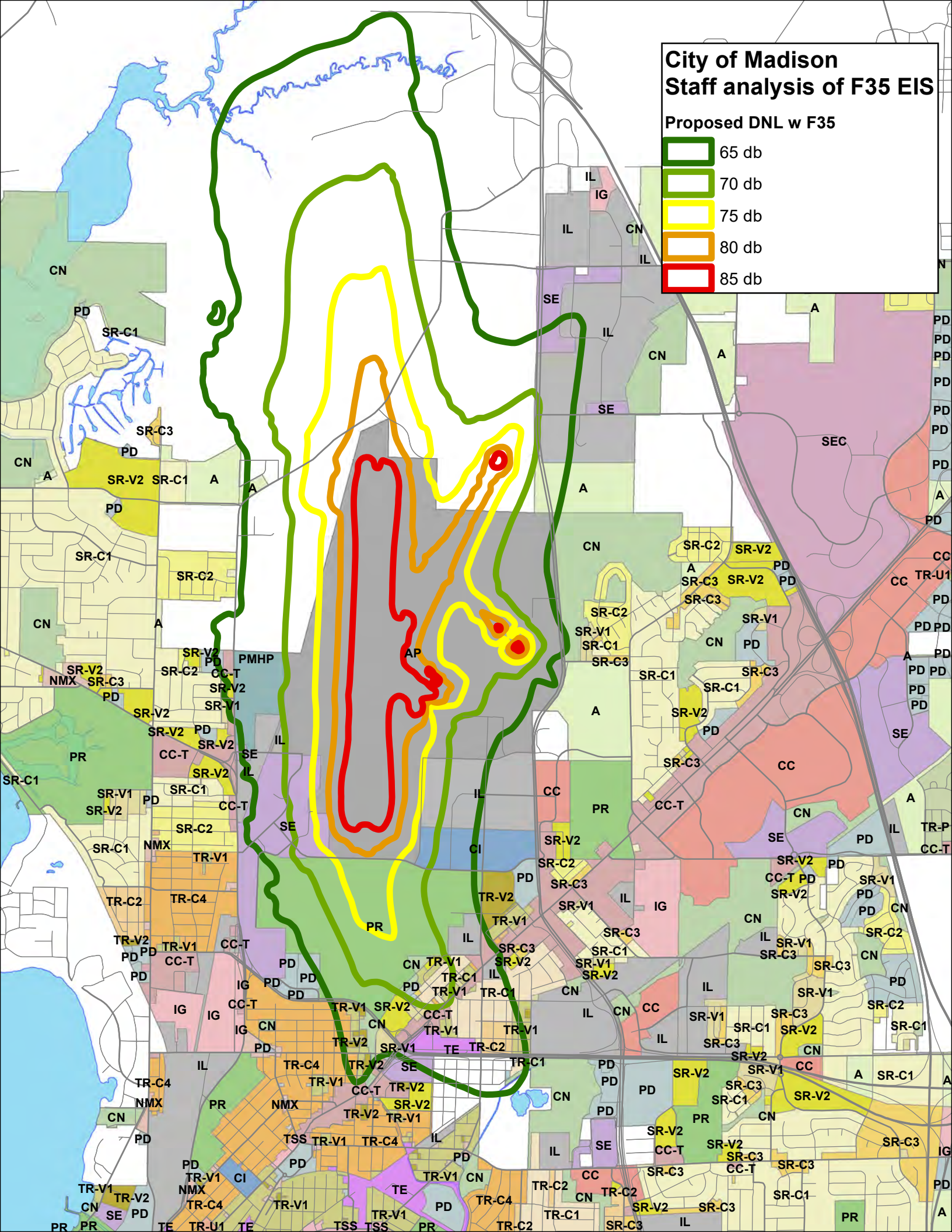
PFAs contamination are impacting City of Madison infrastructure, including Well 15, which was shut down out of an abundance of caution after test results showed elevated levels of PFAs. It will remain shut down except in an extreme water supply emergency until the state standards are established by the Department of Health Services. It is anticipated PFAs from the 115 Fighter Wing will continue to contaminate the City of Madison unit well #15 for decades to come.

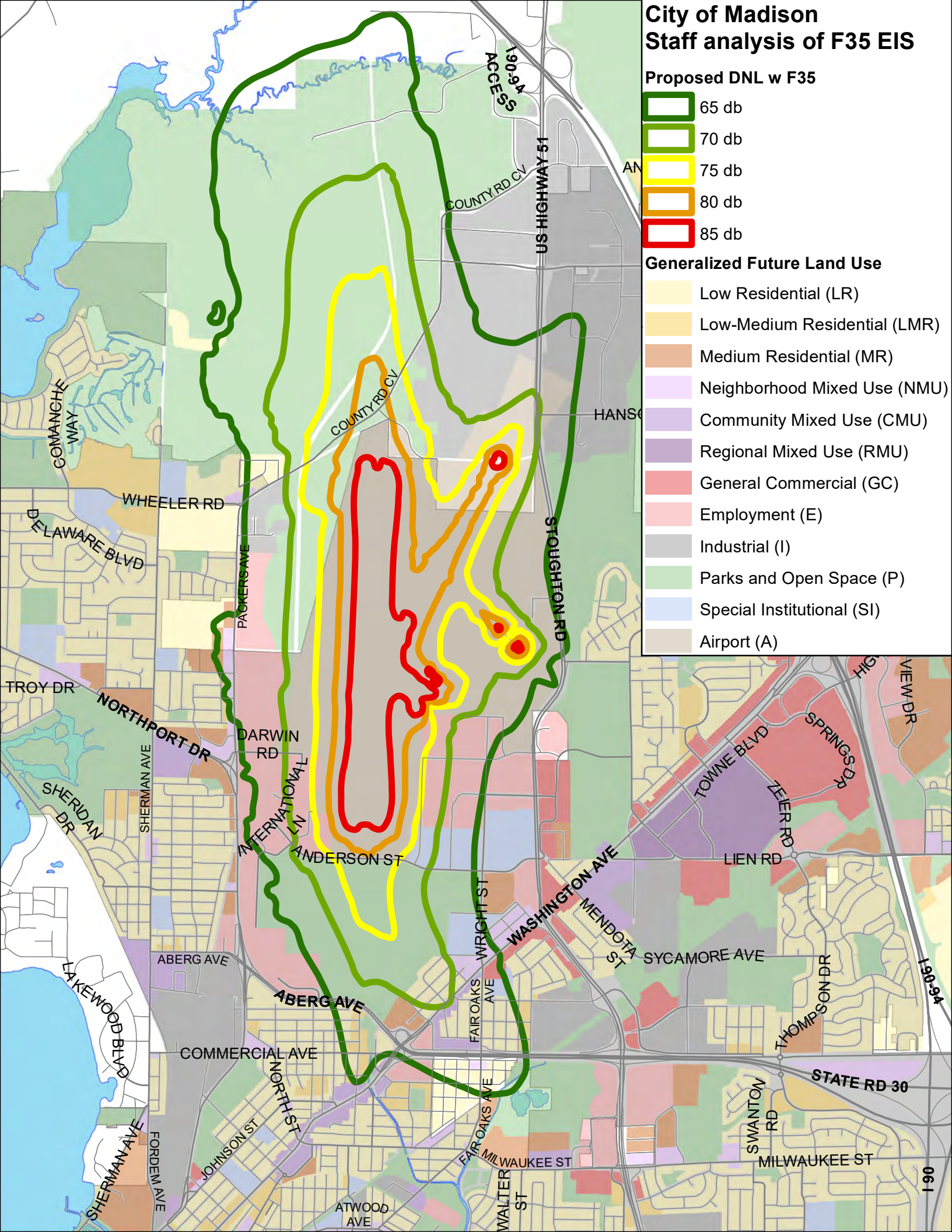
The Department of Defense and the Air National Guard cannot safely and legally perform the planned construction activities without a complete site investigation that defines the extent and nature of PFAs contamination in soil and groundwater. The WDNR will require a materials management plan for any areas of the base impacted by construction, describing how excavated soil and dewatering will be managed. The 115 FW does not have enough information presently to do this. This investigation should be completed with full coordination with WDNR, and remediation of the contamination should take place concurrently in the event of a F-35 transition.

Other areas of concern include two former burn pits on the base. While the Air National Guard has taken responsibility for conducting the site investigation, no additional work has taken place yet. These should occur as soon as possible.

Questions regarding nuclear capacity:

The EIS does not address whether F35s based at Truax would carry nuclear weapons. F35s are designed to carry a wide range of combat weapons, and could eventually carry nuclear weapons. Staff has learned from the Air National Guard that if Truax is selected, the F35s arriving would not be nuclear capable and only units with a nuclear mission would be given the hardware necessary to carry nuclear weapons. The Madison Common Council has gone on record opposing the presence of nuclear weapons, first declaring Madison a nuclear free zoning in 1983 and reaffirming that as recently as August of 2019.


City of Madison
Staff analysis of F35 EIS
Proposed DNL w F35
65 db
70 db
75 db
80 db
85 db


City of Madison
Staff analysis of F35 EIS
Proposed DNL w F35
65 db
70 db
75 db
80 db
85 db
Generalized Future Land Use
Low Residential (LR)
Low-Medium Residential (LMR)
Medium Residential (MR)
Neighborhood Mixed Use (NMU)
Community Mixed Use (CMU)
Regional Mixed Use (RMU)
General Commercial (GC)
Employment (E)
Industrial (I)
Parks and Open Space (P)
Special Institutional (SI)
Airport (A)
I-90-94 ACCESS
US HIGHWAY 51
COUNTY RD CV
COMANCHE WAY
WHEELER RD
DELAWARE BLVD
PACKERS AVE
STOUGHTON RD
TROY DR
NORTHPORT DR
DARWIN RD
SHERMAN AVE
SHERIDAN DR
INTERNATIONAL LN
ANDERSON ST
TOWNE BLVD
SPRINGS DR
VIEW DR
ZEIER RD
LIEN RD
WASHINGTON AVE
WRIGHT ST
MENDOTA ST
SYCAMORE AVE
THOMPSON DR
I-90-94
ABERG AVE
LAKEWOOD BLVD
FAIR OAKS AVE
COMMERCIAL AVE
NORTH ST
JOHNSON ST
FORDEM AVE
SHERMAN AVE
STATE RD 30
SWANTON RD
MILWAUKEE ST
WALTER ST
ATWOOD AVE

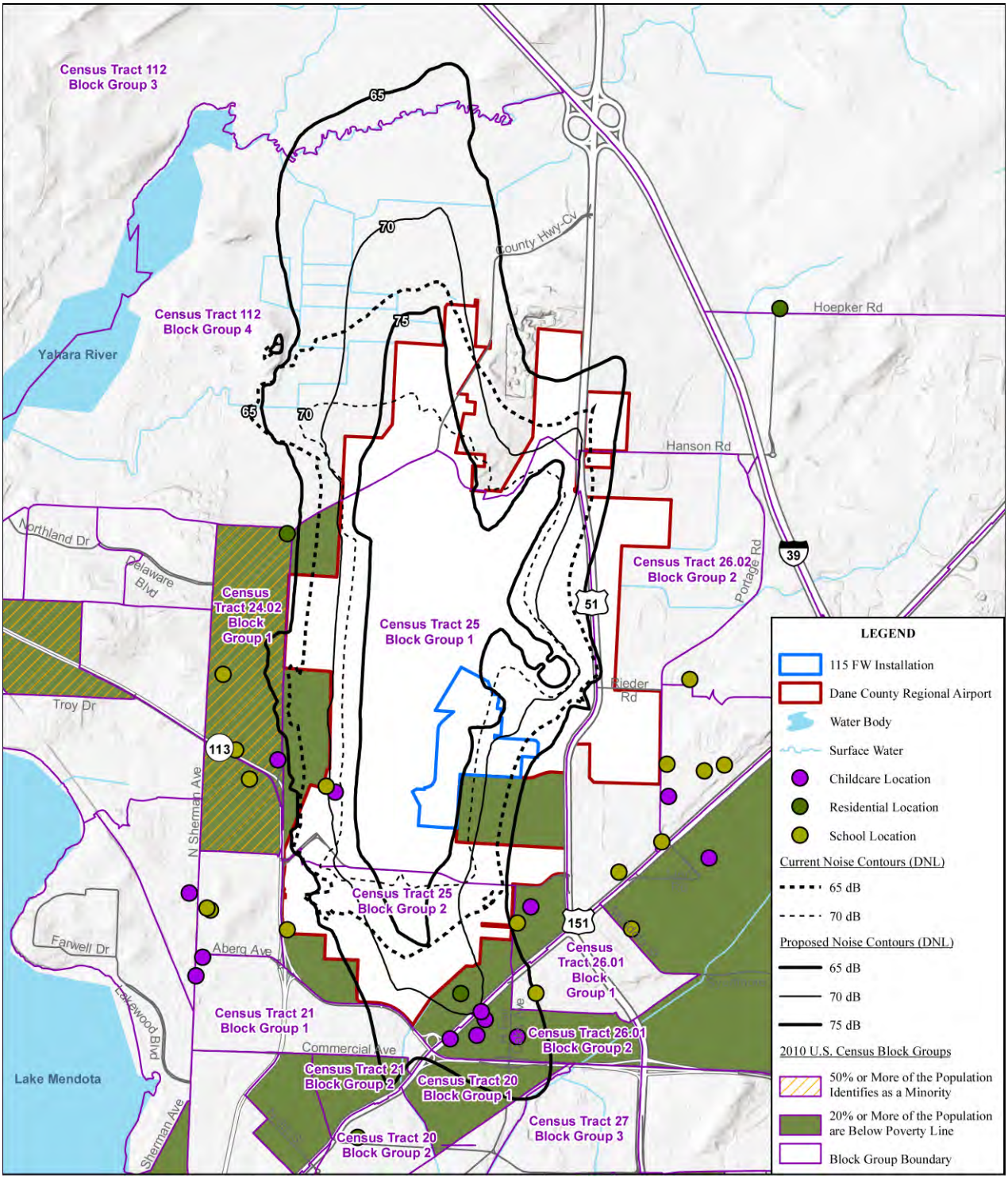
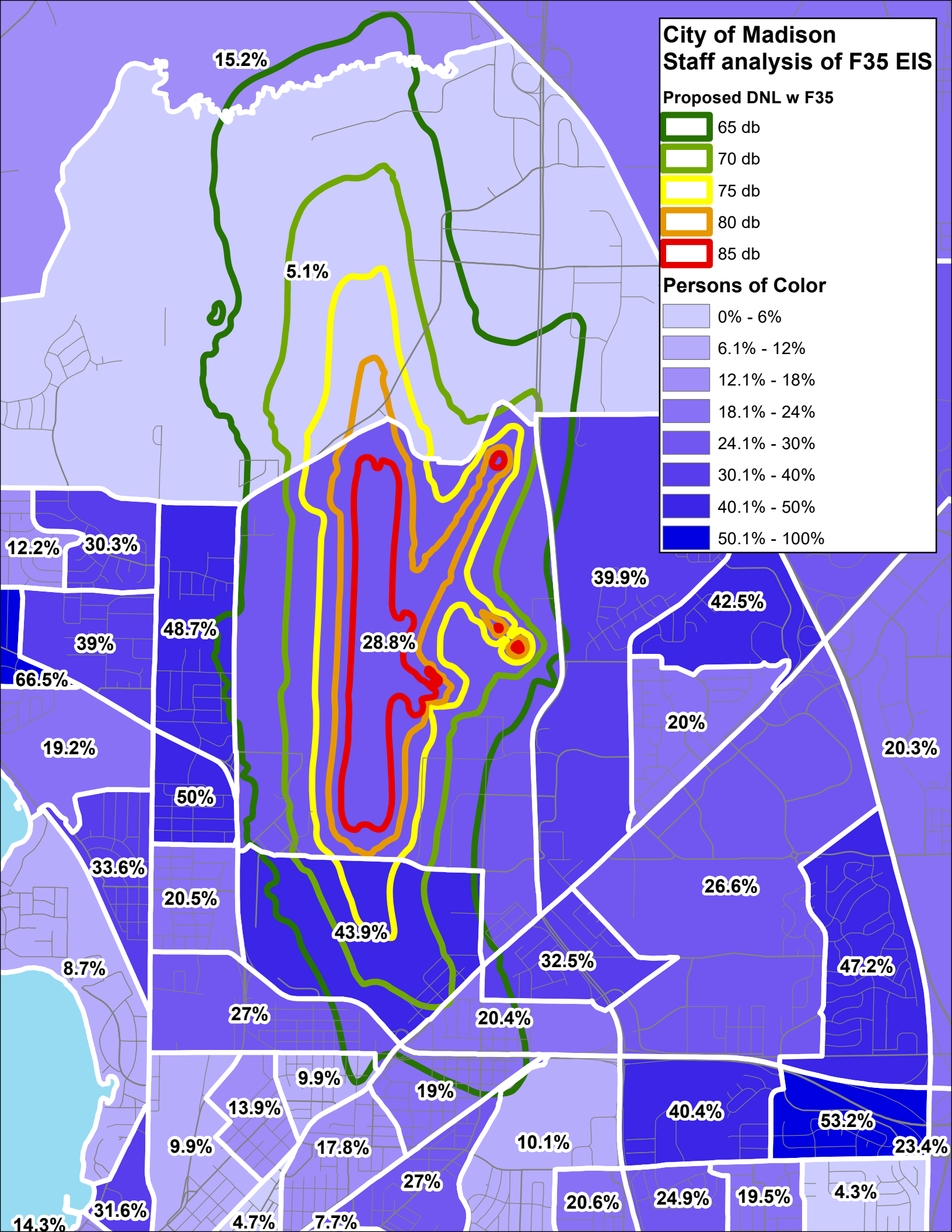
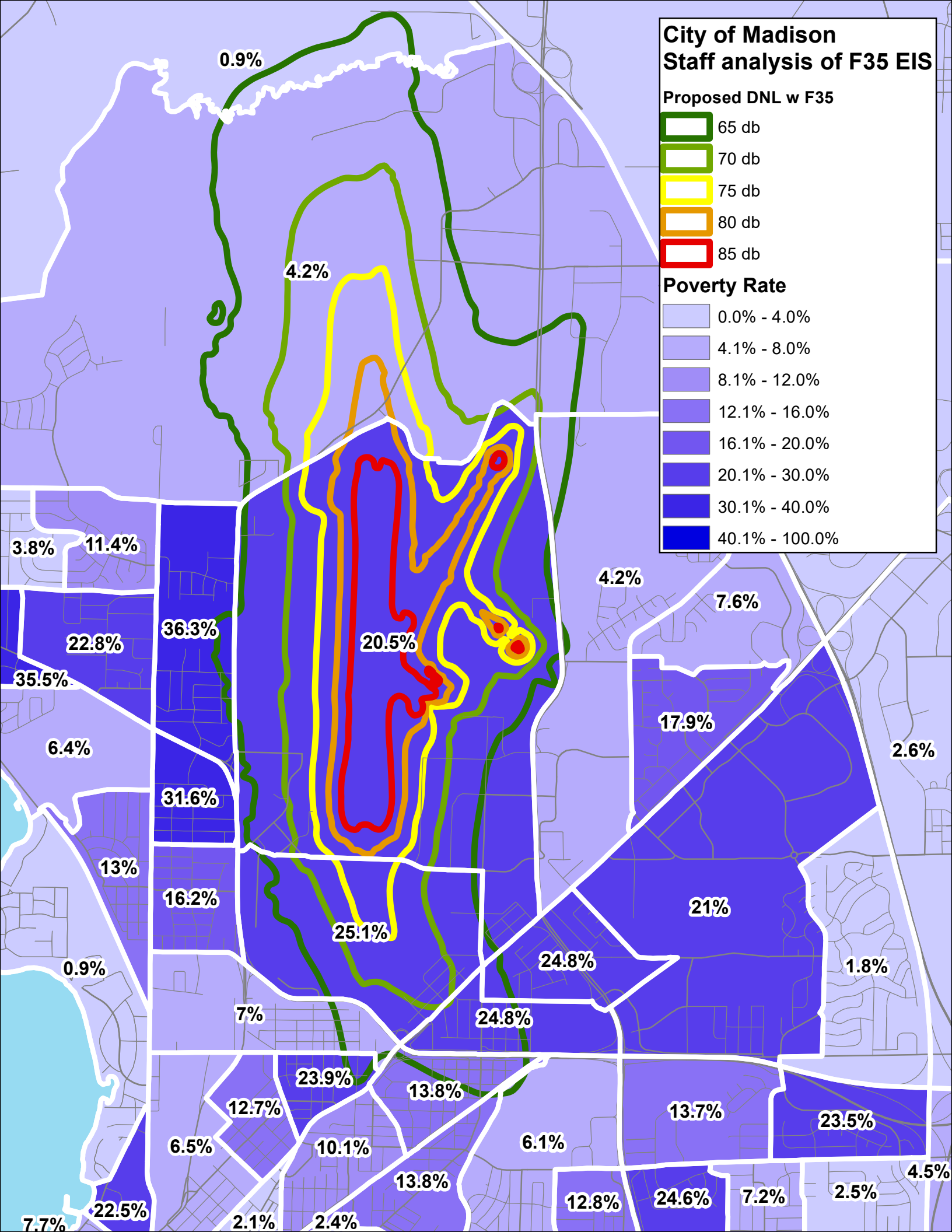
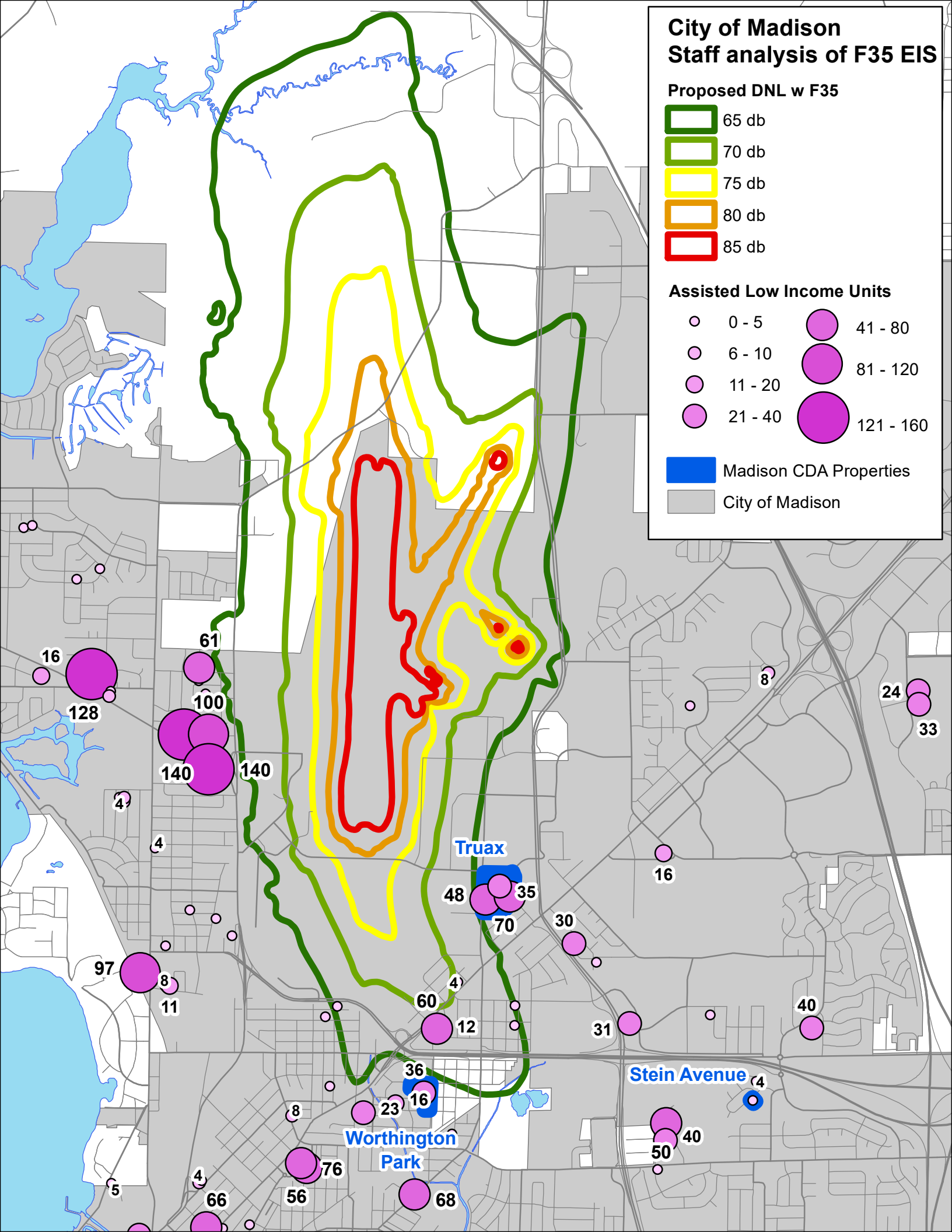


Figure WI3.7-2.
Current and Proposed DNL Noise Contours and Minority and Low-Income Areas near Dane County Regional Airport


City of Madison
Staff analysis of F35 EIS
Proposed DNL w F35
65 db
70 db
75 db
80 db
85 db
Persons of Color
0% - 6%
6.1% - 12%
12.1% - 18%
18.1% - 24%
24.1% - 30%
30.1% - 40%
40.1% - 50%
50.1% - 100%
15.2%
5.1%
12.2%
30.3%
39%
48.7%
66.5%
19.2%
28.8%
39.9%
42.5%
20%
20.3%
50%
33.6%
20.5%
43.9%
26.6%
8.7%
32.5%
47.2%
27%
20.4%
9.9%
19%
13.9%
40.4%
53.2%
9.9%
17.8%
10.1%
23.4%
27%
31.6%
20.6%
24.9%
19.5%
4.3%
14.3%
4.7%
7.7%


City of Madison
Staff analysis of F35 EIS
Proposed DNL w F35
65 db
70 db
75 db
80 db
85 db
Poverty Rate
0.0% - 4.0%
4.1% - 8.0%
8.1% - 12.0%
12.1% - 16.0%
16.1% - 20.0%
20.1% - 30.0%
30.1% - 40.0%
40.1% - 100.0%
0.9%
4.2%
3.8%
11.4%
22.8%
36.3%
20.5%
35.5%
4.2%
7.6%
6.4%
17.9%
2.6%
31.6%
13%
16.2%
25.1%
21%
0.9%
24.8%
1.8%
7%
24.8%
23.9%
13.8%
12.7%
13.7%
23.5%
6.5%
10.1%
6.1%
4.5%
13.8%
22.5%
12.8%
24.6%
7.2%
2.5%
7.7%
2.1%
2.4%


City of Madison
Staff analysis of F35 EIS
Proposed DNL w F35
65 db
70 db
75 db
80 db
85 db
Assisted Low Income Units
0 - 5
6 - 10
11 - 20
21 - 40
41 - 80
81 - 120
121 - 160
Madison CDA Properties
City of Madison
Truax
Stein Avenue
Worthington Park
16
128
61
100
140
140
4
4
8
24
33
16
48
35
70
30
97
8
11
4
60
12
31
40
36
16
23
8
4
40
50
76
56
68
4
5
66

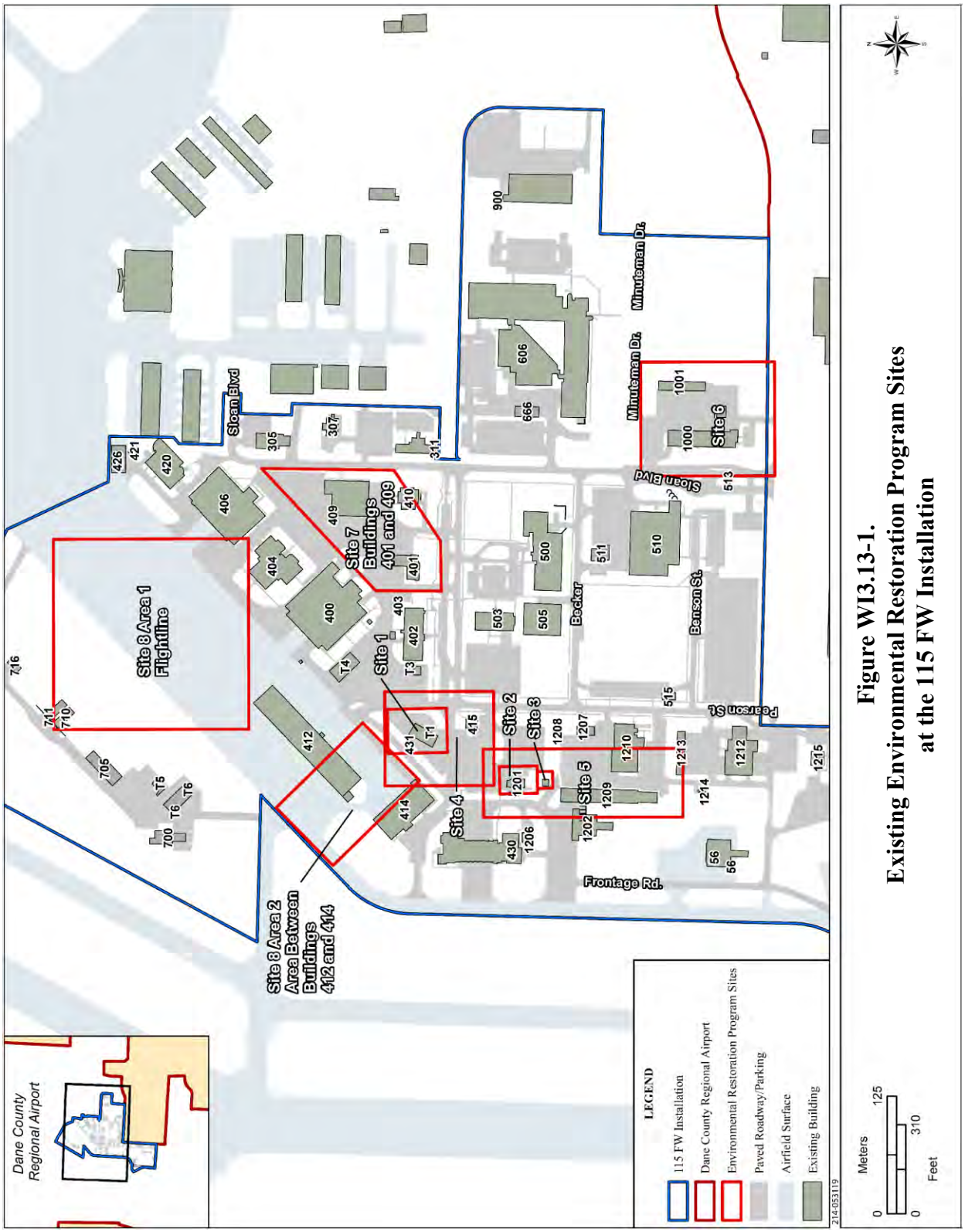


Figure WI3.13-1.
Existing Environmental Restoration Program Sites at the 115 FW Installation

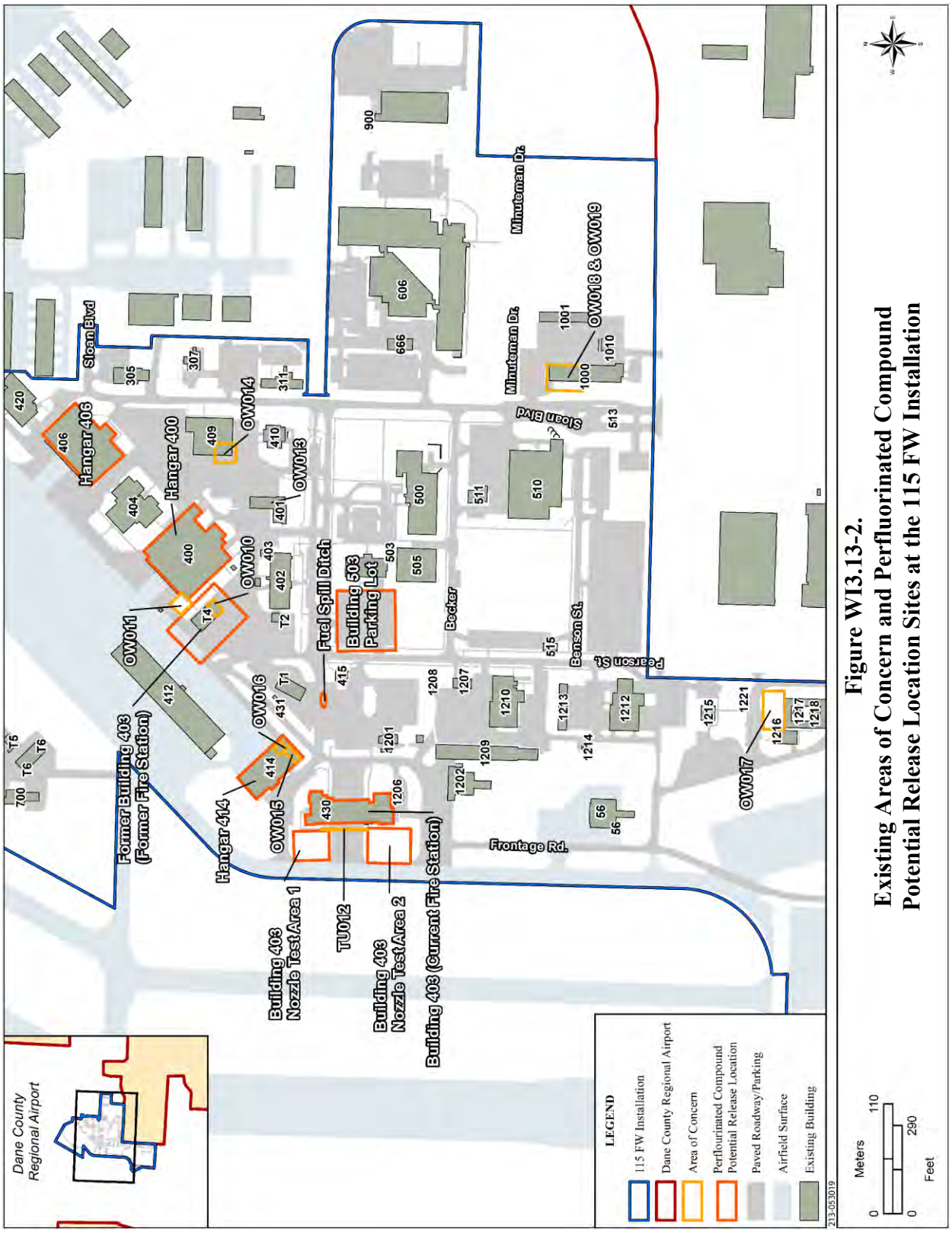


Figure WI3.13-2.
Existing Areas of Concern and Perfluorinated Compound Potential Release Location Sites at the 115 FW Installation

MERIDIAN
IDAHO

Mayor Tammy de Weerd
City Council Members:

Joe Borton	Genesis Milam
Ty Palmer	Luke Cavener
Treg Bernt	Anne Little Roberts

September 13, 2019

F-35A EIS Project Manager
NGB/A4AM
Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews, MD 20762-5157

To Whom It May Concern:

As elected officials of the City of Meridian, we are writing to express our community's support for the U.S. Air Force selecting Gowen Field as the next Air National Guard base for the F-35A.

We believe the decision to locate the F-35A to Gowen Field is in the best interest of our nation's armed services and taxpayers. Southern Idaho's climate is optimal for this mission, with more than 337 VFR flying days per year, a key selection criterion. Southern Idaho provides access to acres of varied terrain with ample and unhindered training airspace close to installations, which enables more training time and less fuel consumption.

Gowen Field's facilities are world-class and include runway space, ramp space, personnel housing and maintenance, and hangar bays necessary to accommodate the new F-35A base. In addition, Gowen Field is largely unencumbered by the encroachment of civilian land use, which lowers the environmental impact on surrounding communities.

It is our belief that having the F-35A training at bases in desert regions should be a consideration based upon realities of our recent military conflicts. This will help prepare our pilots for battle, as they will be familiar with the type of terrain that they may face in a real combat situation.

While any community will see economic benefits associated with this project, not every community has the benefits of an ideal climate to maximize the number of flyable days, access to varied terrain for training, world-class facilities, and an anticipated lower environmental impact due to the unencumbered nature of civilian land use. Further, not every community believes in and supports the mission of our armed services to the level we do in Meridian, the Treasure Valley, and Idaho; we will give the F-35A team a warm welcome.

For these reasons, as the Mayor and City Council of Meridian, we fully support Gowen Field as the next Air National Guard base for the F-35A. We look forward to working with the United States Air Force to ensure a smooth transition into our community.

Sincerely,

Tammy de Weerd
Mayor

Joe Borton
City Council President

Luke Cavener
City Council Vice President

Treg Bernt
Council Member

Anne Little Roberts
Council Member

Genesis Milam
Council Member

Ty Palmer
Council Member

Juneau County Board of Supervisors

Courthouse, 220 East State Street
Mauston, Wisconsin 53948

September 11, 2019

Ms. Christel Johnson
F35 EIS Project Manager
National Guard Bureau
3501 Fletcher AV
Joint Base Andrews MD 20762-5157

Reference: Draft USAF F-35A Operational Beddown ANG Environment Impact Statement

Dear Christel Johnson;

It is our pleasure on behalf of Juneau County, WI to reply to the Secretary of the Air Force and the proposed beddown of the F-35A aircraft for the fifth and sixth operational alternative locations. We are proud and humbled that the Air Force has found Volk Field Counter Land Training Center and its Military Operations Area and Juneau County as a welcome home already to training the F-35 aircraft. We welcome its return every year for operational training and our doors are open for further training with the possible beddown with 115th Fighter Wing.

We have studied the draft document and agree in the most part with the findings of the document. Knowing that this is somewhat a generic document fitting all five possible locations. Truax Field, Volk ANG CLTC and Juneau County offer even greater possibilities for the possible location. Even though Closed Pattern Operations were figured, in the impact statement, many of those operations are carried out at Volk Field offering an area of limited traffic and combat operational runway. Which in turn would decrease the incident of closed pattern work in a commercial/private environment. Several years ago, the Volk Military Operations Area was extended to include all of Juneau County to make it F-35 friendly. The time it takes the F-35 to lift off the runway it is already in the pattern for Volk Field. The additional noise levels that such aircraft have created have not been a problem over our somewhat agrarian County. Juneau County just north of Truax Field offers a varied terrain of natural valleys, cranberry bogs, and intermittent bluffs that not only challenge but thrill the pilots especially at tree top level.

In addition, we are also supported by Fort McCoy an active duty training area offering opportunities for air/ground support of troops in combat maneuvers and the accompanying amenities of an active duty base. Volk CLTC also enjoys a close relationship with Juneau County government with Volk Field Community Council which offers a close relationship with the people of the surrounding area. We also have the support of the 62nd Wing of the Civil Air Patrol in Wisconsin which are well versed in offering support in training to the 115th Fighter Wing, providing aircraft to fly intercept missions.

Whatever support or assistance we may offer during this time of transition please feel free to call on Juneau County. Thank you for your consideration in this process.

Professionally,

Alan K. Peterson

Alan K. Peterson
Chairman Juneau County Board of Supervisors

BOARD OF SUPERVISORS

County of Dane

ROOM 106B, CITY-COUNTY BUILDING
210 MARTIN LUTHER KING, JR. BOULEVARD
MADISON, WISCONSIN 53703-3342
608/266-5758 FAX 266-4361 •
TTY: Call Wisconsin Relay 7-1-1

September 19, 2019

Mr. Matthew Donovan
Acting Secretary of the Air Force
1670 Air Force Pentagon
Washington, D.C. 20330-1670

Dear Acting Secretary Donovan:

In light of the disturbing information regarding noise impacts and environmental racism detailed in the recently released Environmental Impact Statement, we write in opposition to stationing the new F-35 Lightning II to the Wisconsin 115th Fighter Wing at Truax Air National Guard Base, in the city of Madison, Dane County, Wisconsin. We believe these aircraft are simply incompatible with urban, residential land uses. We write with urgency to meet the September 27th deadline for public comment on the proposed siting.

The proposed squadron of F-35A fighter jets at Truax Field would worsen not only existing noise impacts, but also environmental racism as documented in the EIS report: "There would be significant disproportionate impacts to low-income and minority populations as well as children. The increase in noise exposure near the airport would disproportionately impact low-income areas and the increase in noise exposure would disproportionately impact a low-income minority population." Nearly every impacted area within the City of Madison belongs to a census tract with rates of persons of color, as well as poverty rates, well above the city- and county-wide averages.

The proposed squadron could also disproportionately impact children and vulnerable populations. The 65 dB Day Night Average Sound Level (DNL) noise standard used by the EIS does not account for the adverse impacts of noise, including additional stress, sleep disturbance, and a reduction in the educational performance of children.

There is no guarantee the Air Force or other federal agency will provide for noise abatement or the purchase of residences or schools significantly impacted by the aircraft, with estimated costs to the Dane County Regional Airport for noise abatement measures being in the millions of dollars.

Additionally, the F35 aircraft would increase CO2 equivalent emissions in the area. The Draft EIS states that the annual airfield CO2 equivalent emissions would increase by approximately 12,478 tons or 135 percent, equivalent to adding 2,438 more passenger vehicles onto roads, driving 11,500 miles per year on average.

Supporting policies and practices that increase inequities is in direct conflict with the Dane County Board's strong commitment to equity. Therefore, we, the undersigned members of the Dane County Board of Supervisors, oppose the location of the proposed squadron of F-35A fighter jets at Truax Field.

Sincerely,

Paul Rusk

Richard Kilmer

Nichelle Nichols

Kelly Danou

Yogesh Chawla

Huong Nguyen-Hilfiger /KPT

Elizabeth Doyle /KPT

BOARD OF SUPERVISORS
County of Dane

ROOM 106B, CITY-COUNTY BUILDING
210 MARTIN LUTHER KING, JR. BOULEVARD
MADISON, WISCONSIN 53703-3342
608/266-5758 • FAX 266-4361 •
TTY: Call Wisconsin Relay 7-1-1

September 19, 2019

Mr. Matthew Donovan
Acting Secretary of the Air Force
1670 Air Force Pentagon
Washington, D.C. 20330-1670

Dear Acting Secretary Donovan:

I write in support of stationing the new F-35 Lightning II to the Wisconsin 115th Fighter Wing at Truax Air National Guard Base, in the city of Madison, Dane County, Wisconsin. Siting the F35 aircraft would bring economic investment to the county and support the viability of the 115th Fighter Wing in our community for years to come.

The Draft Environmental Impact Statement estimates that construction required to support the F-35A beddown at Truax Field would bring in between $90 and $120 million of new construction activity, creating 315-420 construction jobs. In addition, the current Active Duty Associate Unit would increase by up to 29 positions, and 35 new personnel would be added to provide security and contract oversight.

I understand that the F-16's currently in commission are reaching the end of their service lives, and the air force is replacing them with the F-35's. Without siting the F-35's at the 115th Fighter Wing, I am concerned that the base will be more likely to close in the future. The 115th Fighter Wing provides 1,200 highly paid jobs, service contracts, and attracts families to live in our region -- directly supporting our economy, schools, services, and diversity. The F-35s would ensure continued economic growth of Dane County and the State of Wisconsin.

That said, Dane County values and seeks to protect our natural resources and the environmental impact of PFAs contamination, as well as the increase in noise by the F35s, is of concern. We would expect the Air National Guard to take all possible measures to mitigate the impact of noise and environmental degradation.

The Air National Guard Base provides support in the area of emergency services. For more than 75 years, Truax has been a strong community partner and a provider of essential fire and emergency services for Dane County residents and our commercial airport – the Dane County Regional Airport.

I believe that Truax Field located at the Dane County Regional Airport is the best location for military readiness in the north-central United States and look forward to the deployment of the new F-35 aircraft to our region.

Sincerely,

Andrew Schauer, Dane County Supervisor, District 21

BOARD OF SUPERVISORS
County of Dane

ROOM 106B, CITY-COUNTY BUILDING
210 MARTIN LUTHER KING, JR. BOULEVARD
MADISON, WISCONSIN 53703-3342
608/266-5758 • FAX 266-4361 •
TTY: Call Wisconsin Relay 7-1-1

September 19, 2019

Mr. Matthew Donovan
Acting Secretary of the Air Force
1670 Air Force Pentagon
Washington, D.C. 20330-1670

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Sincerely,

Maureen McCarville District 22
Dane County Board Supervisor

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

SEP 2 0 2019

REPLY TO THE ATTENTION OF:

Ramon Ortiz
National Guard Bureau
NGB/A4AM, Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews, Maryland 20762-5157

Re: **Draft Environmental Impact Statement for F-35A Aircraft Beddown at Truax Field, Madison, Wisconsin; Gowen Field, Boise, Idaho; Jacksonville International Airport, Jacksonville, Florida; Selfridge Air National Guard Base, Harrison Township, Michigan; and Dannelly Field, Montgomery, Alabama. CEQ No. 20190183**

Dear Mr. Ortiz:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the referenced project, dated August 1, 2019, which was prepared by the National Guard Bureau (NGB). Our review is pursuant to our authorities under the National Environmental Policy Act (NEPA), Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act.

The proposed project involves the beddown of two F-35A aircraft squadrons, each of which would contain eighteen F-35A aircraft and two backup aircraft inventory. NGB is proposing these beddown activities at two of the following candidate locations: Truax Field, Madison, Wisconsin; Gowen Field, Boise, Idaho; Jacksonville International Airport, Jacksonville, Florida; Selfridge Air National Guard Base, Harrison Township, Michigan; and Dannelly Field, Montgomery, Alabama. The proposed project would also include construction, demolition, and renovation activities.

In a March 28, 2018 letter, EPA provided scoping comments on a Notice of Intent (NOI) for this project. Topics included water quality, stormwater management and resiliency, air quality strategies, demolition, construction and renovation, best management practices (BMPs), agency coordination, and future NEPA documents. We appreciate NGB addressing many of these comments; and commend NGB's decision to implement BMPs such as using green infrastructure and permeable pavement, installing sources of renewable energy, implementing an anti-idling policy for construction vehicles, and implementing erosion control.

Based on our review of the DEIS, we offer the following comments:

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Wetlands and Streams

The DEIS does not discuss how sequencing established by the Clean Water Act Section 404(b)(1) guidelines (40 CFR Part 230) was applied to each of the five sites. These guidelines require impact avoidance first, then demonstration of impact minimization, then mitigation for unavoidable, minimized wetland and/or stream impacts.

> **Recommendation:** The Final Environmental Impact Statement (FEIS) should discuss how sequencing established by the Clean Water Act Section 404(b)(1) guidelines was applied to each of the five sites, and how proposed mitigation for unavoidable, minimized wetland and/or stream impacts will occur.

Alternatives Selection

The discussion of alternatives selection criteria and the rationale for each alternative location to be retained or eliminated does not fully describe how children's health and Environmental Justice (EJ) impacts were factored into the final decision.

> **Recommendation:** Discussion of alternatives selection criteria in the FEIS should address how EJ and children's health impacts were weighed when identifying the preliminary preferred alternative.

Environmental Justice[1]

The DEIS includes a well-designed EJ analysis which concludes that there is potential for significant and disproportionately high and adverse impacts at the Madison and Montgomery sites. However, it does not fully discuss steps that will be taken to avoid or reduce impacts to those communities; and does not discuss proactive outreach to impacted communities during alternatives development or preliminary selection.

> **Recommendation:** EPA recommends outreach to all impacted communities with EJ concerns regarding the selection of alternatives, so that NGB may begin to identify mitigation that reflects community input. Information about outreach and community input into the alternatives selection and mitigation measure development process should be included in the FEIS.

Children's Health

Executive Order 13045 on Children's Health and Safety directs each Federal agency, to the extent permitted by law, to make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children; and to ensure that its policies, programs, activities, and standards address these risks. Analysis and disclosure of these potential effects under NEPA is important because some physiological and behavioral traits of children render them more susceptible and vulnerable than adults to environmental health and safety risks[2]. The DEIS outlines potential significant impacts to children, particularly at the Madison site, from noise and vibration during take-off and landing of aircraft. At least one school will experience one more conversation-interrupting event per hour under the preliminary preferred

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[1] For more information relating to environmental justice, please see Executive Order 12898 and the EJ Interagency Working Group's Promising Practices Report on EJ Methodologies in NEPA Reviews.

[2] For more information relating to children's health, see Executive Order 13045.

alternative. Such noise events disrupt the learning environment, outcomes, and child sleep schedules; and cause hearing damage and contribute to teacher voice fatigue.[3] The DEIS does not identify outreach to schools or early childhood learning centers regarding potential impacts or development of mitigation measures.

> **Recommendations:** NGB should work with each airport sponsor and FAA to consider mitigation measures, such as limiting noise- and vibration-inducing events when children are present (i.e., during the school day when in session) and working with the school to identify physical improvements to reduce the impact of noise (such as new windows). The FEIS should address potential health impacts and proposed mitigation relating to children.

Public Outreach

The DEIS does not document early public outreach and involvement. We understand that NGB plans to conduct public outreach after receiving and analyzing DEIS public comments.

> **Recommendations:** To effectively reach the most vulnerable populations and identify considerations that can be addressed in the DEIS, outreach should begin early. To support design of effective outreach to vulnerable populations, consider "Promising Practices for Environmental Justice Methodologies in NEPA Reviews."[4]

Noise Analyses and Mitigation

The DEIS addresses existing conditions and projected noise analysis for each of the five candidate sites. However, it does not include noise contour maps for all airspace.

> **Recommendation:** The FEIS should provide maps that show how noise associated with current daily operations will vary from daily operations of the proposed future operations (the proposed action), at all land areas within the associated airspace.

The DEIS does not propose specific noise mitigation measures. Under FAA regulations at 14 CFR Part 150, individual airport operators may voluntarily implement noise mitigation. We understand the NGB plans to consider noise mitigation strategies in the FEIS based on public feedback received during the DEIS comment period.

> **Recommendations:** Collaborate with each airport operator, the FAA, and potentially impacted communities to hold public information-gathering sessions that provide the opportunity to consider and provide comment on any proposed noise mitigation.

> **Recommendation:** For Selfridge Air National Guard Base, which is not associated with an FAA-regulated civilian airport, the FEIS should explain who is responsible for mitigation and the extent of authority to address noise issues off-base.

> **Recommendation:** The Final EIS should include a comprehensive noise analysis and monitoring program to ensure that the ongoing noise impacts from military flight

[3] See: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2954580/

[4] See footnote 1.

training, including the proposed F-35 operation, are assessed, appropriately addressed, and mitigated. Sensitive areas within the impacted noise contours, such as schools, hospitals, day care centers, and EJ areas, should be equipped with remotely monitored noise sensors to enable ongoing evaluation.

Incompatible Land Use

The DEIS identifies residential land use within areas outside the boundary of each candidate airport that are anticipated to experience routine exposure to noise at or above 65 decibels. The DEIS classifies these areas as "possibly incompatible for residential land use, which would be considered a significant impact."

Recommendation: The FEIS should explain how the expected significant noise impacts were considered in selecting the proposed action.

Recommendation: The FEIS should discuss any mitigation necessary due to pre-existing incompatible land use.

Pollinators, Native Plant Species, and Right-of-Way Maintenance

Pollinators are critical contributors to our nation's economy, food system, and environmental health. The Secretary of Agriculture encourages the protection of pollinators, including through action to "increase the quality and amount of pollinator habitat and forage".[5] Vegetation within the project area can provide much-needed habitat for pollinators, providing food, shelter, and connections to other patches of habitat. Maintenance staff and landscape designers can all take steps to improve the quality of vegetation to benefit pollinators while reducing maintenance costs, maintaining public safety, and gaining public good will.

Recommendation: NGB should construct pollinator habitat at the selected beddown sites. We recognize that any habitat that is created or preserved at or near the flight line must conform to FAA and Department of Defense practices to minimize the risk of wildlife hazards to aircraft.

Best Management Practices

The DEIS describes many different BMPs that can be and typically are employed to reduce environmental, health, and EJ impacts at Air National Guard facilities.

Recommendation: In the FEIS and Record of Decision (ROD), document commitments to apply and appropriately enforce BMPs that address all identified environmental, health, and EJ impacts.

Consultation Records

Volume II of the DEIS does not include all interagency consultation documents for each of the five prospective locations regarding historic and cultural resources, wetlands and streams, and Federal and state threatened and endangered species.

[5] See https://www.usda.gov/sites/default/files/documents/national-pollinator-week-secretary-proclamation.pdf.

Recommendation: The FEIS should include all interagency consultation documents regarding historic and cultural resources, wetlands and streams, and Federal and state threatened and endangered species, for each of the five prospective locations.

EPA is available to discuss the contents of this letter at your convenience. Please feel free to contact Mike Sedlacek of my staff at 312-886-1765 or at sedlacek.michael@epa.gov.

Sincerely,

Kenneth A. Westlake
Deputy Director, Office of Multimedia Programs
Office of the Regional Administrator

cc: Jean Wolfers-Lawrence, FAA HQ
Jacqueline Johnson, FAA HQ
Kim Jones, Airport Director, Dane County Regional Airport
Marshall Taggart, Airport Manager, Montgomery Airport Authority
Rebecca Hupp, Airport Manager, City of Boise
Terry Dlugos, Airport Manager, Jacksonville International Airport

Comment Details

Name	SYED ABBAS
Email Address	jsabbas12@gmail.com
Comment	Bringing F-35 to Truax will have adverse environmental impact. Please consider other locations where impact on minorities and housing is less. Manufacture homes at Packer avenue 312 units will be incompatible to live. This is one example there are several other examples where we can see adverse impact on housing and environment.
Address 1	2513 COOLIDGE STREET
City	MADISON
State	WI
Postal Code	53704
Phone Number	6468085651
Mailing List?	Yes
Wants CD?	Yes
Withhold Name?	No
Withhold Address?	No
Date Received	9/23/2019 11:16:26 AM EDT

Office of the Common Council
Ald. Marsha Rummel, District 6

City-County Building, Room 417
210 Martin Luther King, Jr. Boulevard
Madison, Wisconsin 53703
Phone (608) 266-4071
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district6@cityofmadison.com
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September 24, 2019

F-35A EIS Project Manager
NGB/A4AM Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews, MD 20762-5157

Dear Mr. Ramon Ortiz,

Please accept my comments in response to the draft EIS dated August 2019 regarding the beddown of F-35As at the 115th Fighter Wing (115 FW) at the Dane County Regional Airport, Madison, Wisconsin. My name is Alder Marsha Rummel and I represent residents impacted by the 65 dB DNL noise contour map who live in District 6, located east of E. Washington Avenue and south of Highway 30.

Based on the information in the draft EIS and the disproportionate impacts from noise on surrounding low income neighborhoods, persons of color and children, I am disturbed that Truax continues to be a preferred location for the beddown of F-35As given the clear environmental justice impacts described in the draft EIS. It is alarming to read: "Changes in DNL results in an additional 1,320 acres within the 65 dB noise contour where compatible land use recommendations are triggered. As a result, the number of households located within the 65 dB DNL contour would increase by 1,019 and the number of people exposed would increase by 2,215. One hundred thirty-two of the households and 292 persons would be located in the 70-75 dB DNL contour where housing is incompatible absent an exception," and "There would be significant disproportionate impacts to low-income and minority populations as well as children. The increase in noise exposure to the south of the airport would disproportionately impact low-income areas and the increase in noise exposure to the east of the airport would disproportionately impact a low-income minority population. In addition, the Proposed Action could disproportionately impact children." (Table ES-2). Truax is not an acceptable location. Was there ever any consideration for moving 115 FW to Volk Field?

A recent article appeared in our local media about a leaked memo from Christopher L. Brewster, USAF Chief, Environmental Compliance at Davis-Monthan Air Force Base, Tucson, Arizona that raises the question whether the EIS modeling that assumes 5% afterburner (AB) usage is flawed. ("It might get louder, F-35As could use afterburners more frequently than Air National Guard promises" Isthmus, Howard Hardee, September 19, 2019). If the modeling using 5% AB is inaccurate, the noise contour maps that show the 65 dB lines may be understated and the disproportionate impacts may actually extend to a larger area. How often do the F-35As currently in service take off with afterburners?

I request you redo the draft F-35A EIS to provide modeling of AB usage at 10%, 25%, 50%, etc. I would request information that identifies actual peak noise at the named points of interest identified in Table WI3.1-12 so people understand the maximum dB levels, not the DNL average, with and without afterburners. If the EIS is flawed, it cannot be a source of information to make an informed decision and the EIS is not legally valid.

During the initial EIS scoping period, I served as City of Madison Common Council President and initiated a public engagement process with local city and county elected officials to gather community feedback. As a result of our work, on April 16, 2018, several Madison alderpersons submitted comments to the Air National Guard through Ms. Christel Johnson, Environmental Engineer, based on resident feedback obtained at a February 28, 2018 listening session, information gleaned at the March 8, 2018 scoping meeting, as well as comments received by other members of the Madison Common Council. On April 23, 2018, the Common Council also approved RES-18-00312 - "A Resolution on the Air National Guard F-35A Operational Beddown Environmental Impact Statement". The resolution provided comments about 1) flight paths and plans, 2) the noise impacts especially on low-income neighborhoods and vulnerable communities, 3) the environmental impacts of operations and maintenance of the F-35As including air pollution and runoff into Starkweather Creek, and 4) safety concerns related to crashes and munitions.

Apparently both documents missed the scoping deadline and don't appear in your Documents section. I am resubmitting them for the public record for the draft F-35A EIS.

Some of the questions and comments we raised in the April 16, 2018, document were not clearly addressed in the draft EIS:

1. "The City of Madison would like to see more data and information about the number of F-16 flights that have flown in and out of the south end of Truax Field over the last five years. The ANG has shared the existing flight paths which fly in and out from the north, as a means to reduce noise impacts on dense areas. Nevertheless flight traffic, weather and other circumstances forces ANG to fly in and out of the south end of Truax Field. Information on the frequency of these occurrences would better inform residents regarding current and future noise impacts."

   Residents in my district who reside outside of the 65 dB noise contour recount regular disruptions from F-16s that interfere with work and enjoyment of their property. Will the final EIS include realistic flight paths and noise modeling for those paths based on peak noise from takeoff and arrival?

2. "The EIS should include a record of the Native American burial mound "Truax Air Park Mound" including maps and descriptions. The EIS should also include clear guidelines to avoid impacts on the mound."

   The draft EIS on page WI-106 states: "... The Truax Mound Human Burial Site is located near the 115 FW installation, but not within the proposed construction areas." Did you examine the impacts to this cultural resource if PFAS remediation is required before construction begins?

3. "The EIS report should review the contaminants found in the Starkweather Creek downstream from the airport and determine which chemicals may be coming from Truax Field. The EIS should include an updated runoff, water filtration and monitoring plan to

address contaminants. The UW Starkweather Creek Watershed report offers numerous details and strategies to improve filtration of water and contaminants at sites throughout the Watershed."

The draft EIS on page WI-96 states: "The west branch of Starkweather Creek drains the area around the Dane County Regional Airport and other urbanized portions of Madison. This area of Starkweather Creek received intensive point source discharges of many different toxic substances up to the 1960s and early 1970s. Some of these discharges remain in the sediment of the creek and continue to pose problems for fish and aquatic life (WDNR 2018)." Will the final EIS include an updated monitoring plan to address contaminants created by the base?

4. "In recent years, Southern Wisconsin has had more frequent and intense rain events. The EIS should develop models for extreme weather events including flooding and other environmental hazards at Truax Field, Cherokee Marsh and Starkweather Creek. The EIS should also develop adaptation and response plans for extreme weather events."

   The draft EIS does not appear to discuss plans for extreme weather events. Will the final EIS include a response plan for extreme weather events?

5. "The F-35A's can carry up to 18,000 pounds internally and externally. The EIS should provide information about how much fuel and what type of fuels will be carried. The EIS should also detail what types of armaments will be carried (including nuclear munitions), what would be released from these munitions if the planes crash and/or burn, the environmental and public health effects of these potential releases, and what the types of emergency response will be employed in the event of a crash or accident."

   Members of the 115 FW command staff assured the Common Council that F-35As would not carry nuclear weapons. While WANG staff were clear that initial the Block 3 F-35As were not currently capable of conveying nuclear weapons, they were not as clear about the possibility that Block 3 F-35As could be upgraded to Block 4, which is capable of conveying nuclear weapons. Will the Block 4 upgrade to the F-35As have nuclear capabilities? Is there a possibility that when Block 4 technology is available and deployed in Madison the 115 FW will get a nuclear mission? If so, is the Air Force required to inform the public about this change in mission? Will there be a new EIS process?

   If F-35As carry nuclear weapons, crashes could release radioactive materials into the environment, exposing people and ecosystems and contaminating ecosystems irreversibly. What plans are in place for emergency responders if there is a nuclear spill?

6. "Aircraft operations and maintenance involve a variety of chemicals, emissions and hazardous materials. Chemicals reviewed and discussed in the F-35 EIS for the Pacific Beddown included lead, carbon monoxide, Nitrogen Dioxide, Ozone, Particulate Pollution, Sulfur Dioxide and Benzene. However, the Pacific Beddown EIS does not provide a comprehensive list of chemicals and hazardous materials utilized or generated in the operations and maintenance of the F-35A aircraft."

   In the final EIS, will you provide a complete accounting of the solvents, lubricants, and petroleum products including fuels that are currently in use at the ANG facility at Truax, as well as a list of chemicals that will be used to support operations and maintenance of the F-

35A aircraft and the management of the F-35A armaments, fuels, and emergency response supplies?

7. "The ANG should provide a full assessment of how the health and safety of Air Force and National Guard personnel will be protected in the case of F-35 crashes, explosions, or burning, and plans for responses to these incidents in the EIS." ..." According to the 2015 Air Force Research Laboratory's Composite Material Hazard Assessment at Crash Sites report, "Potential contaminants/hazards include the following: jet fuel, unexploded ordnance, isocyanates, blood-borne pathogens, radioactive material, plastics, polymers composed of organic material, and composite fibers. Aircraft structural alloys include, but are not limited to, beryllium, aluminum, zinc, hydrazine (F-16), magnesium, titanium, and copper released in the form of metallic oxides, which pose an inhalation hazard to unprotected responders." The F-35 is composed of 42% advanced composites will include carbon fibers in the micron and nanosized ranges. Numerous scientific studies have shown that carbon fibers in this size range, when inhaled, can have health effects similar to asbestos."

   Have there ever been any F-35A mishaps at Hill AFB, Eglin AFB or Luke AFB? If so, how many? How frequently can we expect F-35As to crash in Madison given the track record so far? In the event of fire, what are the effects of burning military grade composite materials with which the F-35As are constructed? What toxins do they emit and what is the impact on human health? In the event of a mishap and subsequent fire, what are the effects of burning stealth coating with which the F-35As are constructed? What toxins do they emit? What is the impact on human health?

   If there is an emergency, what are procedures for landing the plane? Would they land at Truax or go elsewhere?

   What special occupational safety gear is required for workers applying stealth coating to F-35As? Why is it required? What special occupational safety gear is required for workers cleaning the outside of the F-35As? Why is it required?

   What are the impacts of stealth coating contaminating the water and soil after the F-35As are washed? Will local maintenance workers at the 115 FW do the cleaning? Or would the manufacturer or their assignees do this work?

8. After the draft F-35A EIS was released, City of Madison Council members whose aldermanic districts surround the airport mailed a postcard invitation to nearby residents to attend a community meeting on September 11, 2019. Over 300 residents attended. We heard testimony from residents within the 65 dB noise contour who were very concerned about the potential decline in property values of their homes and businesses when they were identified in the 65 dB zone. Council members received emails from real estate brokers that this would be an issue that should be disclosed. But the draft states: "Negligible impact on the housing market in the city of Madison." (Table ES-2, page 11).

   How did you arrive at this conclusion? Did you conduct a study on the impact on property values and property taxes within the 65 dB noise contour as a result of the proposed action? If not, I would request that the Air Force issue a revised EIS with that information.

9. At a second community meeting held September 24, 2019, at Hawthorne Elementary School, over 200 people attended. A resident testified she lives within a mile of the airport and only

recently became aware of the proposed F-35A beddown. She said the NGB did not reach out to her. While City of Madison Common Council members mailed postcards to residents within and near the 65dB contour map, we were not able to notify everyone who was affected.

What strategies did the Air Force use to reach out to residents who live close to Truax to let them know about the EIS process? Given the NEPA focus on Environmental Justice, were there conscious strategies to contact the most affected residents?

10. According to the City of Madison F-35 EIS Analysis: "It should also be noted that there are several concentrations of poverty and persons of color just outside the 65 dB contour, including the CDA Truax housing, CDA Webb-Rethke townhomes and other housing near Worthington Park, and near the intersection of Packers Avenue and Northport Drive. While these areas will experience virtually identical noise exposure as residents who live on the contour line, they will not be eligible for federal sound mitigation funding through the Noise Compatibility Program. If Truax is selected for future F35s, it's a reasonable conclusion that non-mitigated areas immediately adjacent to but outside the 65 dB contour may experience more significant impacts than mitigated (soundproofed) residences inside the impacted area." (page 2)

    If nearly 800 subsidized low-income housing units are within 1,500 feet of the 65 dB contour, but not potentially not eligible for remediation, does environmental justice become a mockery?

11. According to the City of Madison F-35 EIS Analysis: "One contaminant present on the Air National Guard base is per- and polyfluoroalkyl substances, or PFAs, a bioacumulative, toxic and persistent group of chemicals historically used in firefighting foams. The PFAs investigation on the base has yet to be completed and the WDNR has required additional investigation of soil, surface water, groundwater, and sediment both on and off the base. It is staff's understanding that DNR's request is not being acted upon, and the Department of Defense does not consider this a priority site for mitigation. Based on initial test results, PFAS-contaminated soil and groundwater contamination is widespread and its extent has not been fully defined. Under NR 700, a completed site investigation is required to define the nature and extent of PFAS contamination before remediation activities can be planned.... The Department of Defense and the Air National Guard cannot safely and legally perform the planned construction activities without a complete site investigation that defines the extent and nature of PFAs contamination in soil and groundwater. The WDNR will require a materials management plan for any areas of the base impacted by construction, describing how excavated soil and dewatering will be managed. The 115 FW does not have enough information presently to do this. This investigation should be completed with full coordination with WDNR, and remediation of the contamination should take place concurrently in the event of an F-35 transition. Other areas of concern include two former burn pits on the base. While the Air National Guard has taken responsibility for conducting the site investigation, no additional work has taken place yet. These should occur as soon as possible." (page 6)

    Will the Air Force conduct a complete site investigation into existing PFAS contamination before commencing construction for the Proposed Action?

Thank you for the opportunity to provide comments about the selection of the 115 FW at Truax. I don't support the selection of Truax. Enclosed is the recently adopted City of Madison Common Council resolution, RES-19-00588. You also will receive a letter from 15 local Dane County Supervisors and a resolution from the Madison Board of Education asking for reconsideration of Truax as a preferred selection for F-35As.

If USAF decision makers continue to consider the 115 FW, they need to redo the EIS to include accurate noise modeling maps that account for more than 5% of afterburner usage, do meaningful outreach to affected low-income and people of color communities, identify the potential for a nuclear mission, address safety issues of this new technology, and cleanup PFAS contamination on site before construction begins, otherwise I would argue the EIS is flawed and not legal.

Respectfully,

Marsha A Rummel

Alder Marsha Rummel
City of Madison Common Council, District 6
1029 Spaight Street, Apt. 6C
Madison, WI 53703

enc: April 16, 2018, comments to Ms. Christel Johnson
RES-18-00312 - "A Resolution on the Air National Guard F-35 Operational Beddown Environmental Impact Statement"
RES-19-00588 - "A Resolution Responding to the Draft Environmental Impact Statement (EIS) for the Air National Guard F-35A Operational Beddown"

April 16, 2018

Ms. Christel Johnson, Environmental Engineer
NGB/A
4AM Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews, MD 20762 - 5157

Dear Ms. Johnson,

Thank you for the invitation to comment on the Environmental Impact Statement (EIS) for the potential Beddown of F-35A aircraft with the 115th Fighter Wing at Truax Field, Madison, WI. The City of Madison is submitting these comments based on resident feedback obtained at the February 28th listening session as well as direct comments received by members of the Common Council. The City of Madison seeks to ensure that resident concerns are carefully considered and sensitive resources are protected.

The Air National Guard (ANG) has had an active presence at Truax Field for more than five decades. The City of Madison recognizes and appreciates the contributions the ANG has made to the area, including but not limited to; employing 1,500 + personnel and providing vital emergency response services at the Dane County Regional Airport. These comments are intended to build on the strong relationship between the ANG and the City and to lend local expertise and information in the spirit of cooperation to support a robust EIS process.

At the City of Madison listening session, Madison residents expressed support for the ANG and its role in national defense. Other residents raised concerns surrounding the role of the 115th Fighter Wing in deployments oversees. Some residents questioned whether the billions of dollars invested in the F-35A could have been better used to support schools and other domestic priorities. We heard concerns about the environmental, economic and social impacts of militarism.

These comments utilize the ANG EIS framework to focus on key resource areas as well as community and health data and noise concerns. The document is divided into the following sections:

1) Neighborhood Characteristics: Health and other data
2) Noise issues
3) Cultural Resources: traditional, Alaska native, archeological, and architectural
4) Water Resources: quantity, quality, stormwater, watersheds, floodplains
5) Hazardous Materials: wastes, toxic substances, and contaminated sites

The recommendations, highlighted on the next page represent the areas of focus as expressed by local residents. In most cases the City is requesting additional information or analysis be included in the EIS. The City appreciates the opportunity to provide input on the EIS on behalf of its residents and looks forward to learning more about the potential impacts of the F-35A Beddown as well as strategies to mitigate any impacts.

LIST OF RECOMMENDATIONS

NEIGHBORHOOD AND HEALTH RECOMMENDATION 1:

In the preparation for the EIS, the City of Madison recommends that the specific economic, demographic and health data detailed in this above and other relevant characteristics of the communities located near Truax Field be included in the report.

NEIGHBORHOOD AND HEALTH RECOMMENDATION 2:

The EIS should include strategies to reduce the air quality impact of ANG activities that may contribute to local particulate matter, air toxicity, diesel particulate matter, cancer risk and respiratory hazards.

NOISE RECOMMENDATION 1:

The City of Madison would like to see more data and information about the number of F-16 flights that have flown in and out of the south end of Truax Field over the last five years. The ANG has shared the existing flight paths which fly in and out from the north, as a means to reduce noise impacts on dense areas. Nevertheless flight traffic, weather and other circumstances forces ANG to fly in and out of the south end of Truax Field. Information on the frequency of these occurrences would better inform residents regarding current and future noise impacts.

NOISE RECOMMENDATION 2:

EIS modeling should address and evaluate the noise impact on sensitive groups and facilities, as illustrated in the City of Madison maps (Appendix B).

NOISE RECOMMENDATION 3:

The City of Madison requests a complete set of previously conducted research on F-35A noise data and modeling. The City also requests a locally tailored noise abatement strategy for Truax Field.

NOISE RECOMMENDATION 4:

City residents have raised concerns about the noise that can cause hearing damage in a relatively short amount of time. The City of Madison urges ANG to include a noise abatement strategy in the EIS to address the possibility of hearing damage related to F-35A takeoffs and landings.

CULTURAL RESOUCES RECOMMENDATION 1:

The EIS should include a record of the Native American burial mound "Truax Air Park Mound" including maps and descriptions. The EIS should also include clear guidelines to avoid impacts on the mound.

WATER RESOURCES RECOMMENDATION 1:

The EIS report should review the contaminants found in the Starkweather Creek downstream from the airport and determine which chemicals may be coming from Truax Field. The EIS should include an updated runoff, water filtration and monitoring plan to address contaminants. The UW Starkweather Creek Watershed report offers numerous details and strategies to improve filtration of water and contaminants at sites throughout the Watershed.

WATER RESOURCES RECOMMENDATION 2:

In recent years, Southern Wisconsin has had more frequent and intense rain events.[1] The EIS should develop models for extreme weather events including flooding and other environmental hazards at Truax Field, Cherokee Marsh and Starkweather Creek. The EIS should also develop adaptation and response plans for extreme weather events.

HAZARDOUS MATERIALS RECOMMENDATION 1:

Military sites and airport facilities often involve work with chemicals utilized for the operation and maintenance of planes, helicopters and jets. The City of Madison requests a list of the solvents, lubricants, petroleum products including fuels that are currently in use at the ANG facility at Truax, as well as a list of chemicals that will be used to support operations and maintenance of the F-35A Aircraft.

HAZARDOUS MATERIALS RECOMMENDATION 2:

The F-35A's can carry up to 18,000 pounds internally and externally. The EIS should provide information about how much fuel and what type of fuels will be carried. The EIS should also detail what types of armaments will be carried (including nuclear munitions), what would be released from these munitions if the planes crash and/or burn, the environmental and public health effects of these potential releases, and what the types of emergency response will be employed in the event of a crash or accident.

HAZARDOUS MATERIALS RECOMMENDATION 3:

The ANG should provide a full assessment of how the health and safety of Air Force and National Guard personnel will be protected in the case of F-35 crashes, explosions, or burning, and plans for responses to these incidents in the EIS.

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[1] Wisconsin Initiative on Climate Change Impacts. Stormwater Working Group. University of Wisconsin-Madison. Retrieved from https://www.wicci.wisc.edu/stormwater-working-group.php

1. Neighborhood Characteristics: Health and Geographic Data

The Truax Field and Dane County Regional Airport are located on Madison's North East Side. The maps in this section, from the City of Madison's Neighborhood Indicators Project and the Capital Area Regional Planning Commission, illustrate the high rates of unemployment and poverty in some of the neighborhoods bordering Truax Field. Poverty, unemployment and other barriers to opportunity contribute to the resiliency of families in the community to withstand environmental, social and economic impacts. The City of Madison urges the ANG to consider the needs of these neighborhoods regarding flight patterns, noise impacts and other operational plans and decisions.

Barriers to Opportunity Map

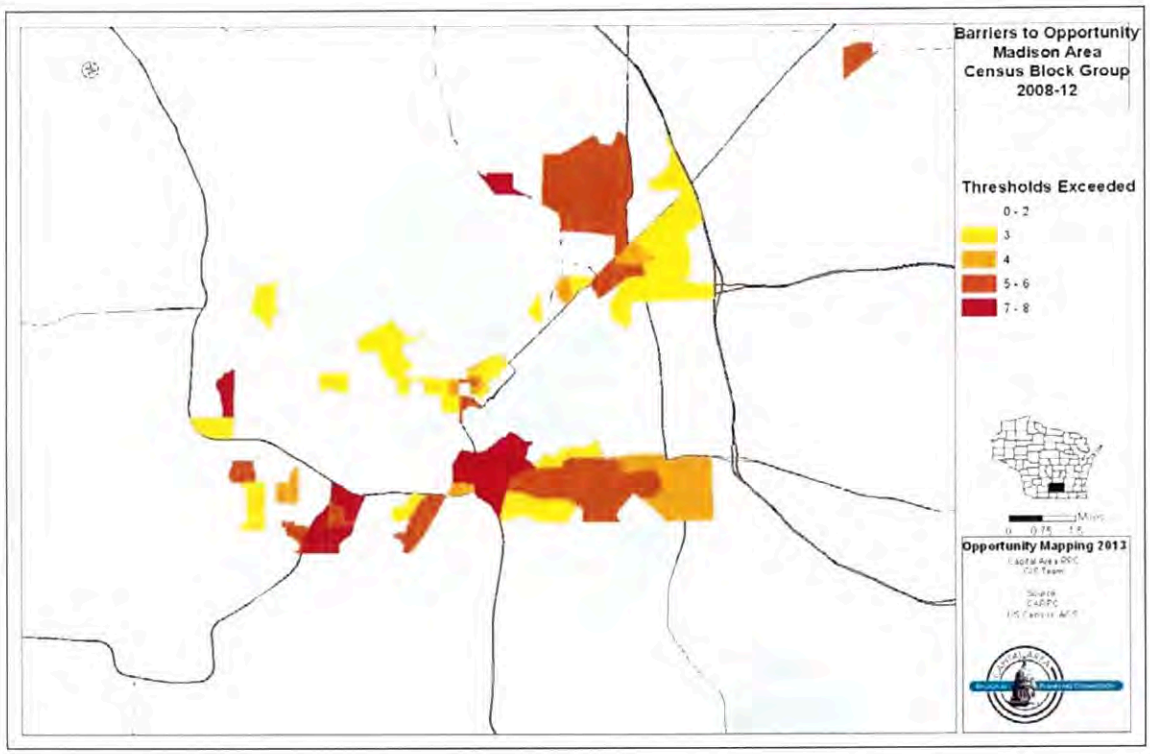

Figure 1. Barriers to Opportunity: Capital Area Regional Planning Council
Source: U.S. Census, American Community Survey 2008-12 and Department of Housing and Urban Development

The study examined eight economic and social characteristics related to opportunity (poverty, education, segregation, unemployment, etc.) and determined the average levels for Dane County. Census Block Groups in which three or more barriers exceed the Dane County averages are denoted in yellow. Census Block Groups with four barriers that exceed the Dane County averages are denoted in orange. The red Census Block Groups face the most barriers to opportunity.

The Barriers to Opportunity Map (Figure 1.) shows Madison neighborhoods that face multiple barriers to opportunity relative to other areas in Dane County. The study evaluated eight economic and demographic characteristics of Census Block Groups; including income, housing costs relative to income, education levels, race, age, English proficiency, employment, and segregation.[2] The study then compared Census Block Groups to the Dane County averages for each characteristic. The map illustrates those Census Block Groups where three or more barriers to opportunity exceed the Dane County averages and face relatively more barriers in housing, employment and education. "Geography of Opportunity paints a picture of unequal access to opportunity in the Madison region – with barriers to accessing opportunity clearly demarcated along racial lines."[3] It is incumbent upon decision makers to understand this information and incorporate it into decision making.

Families in Poverty

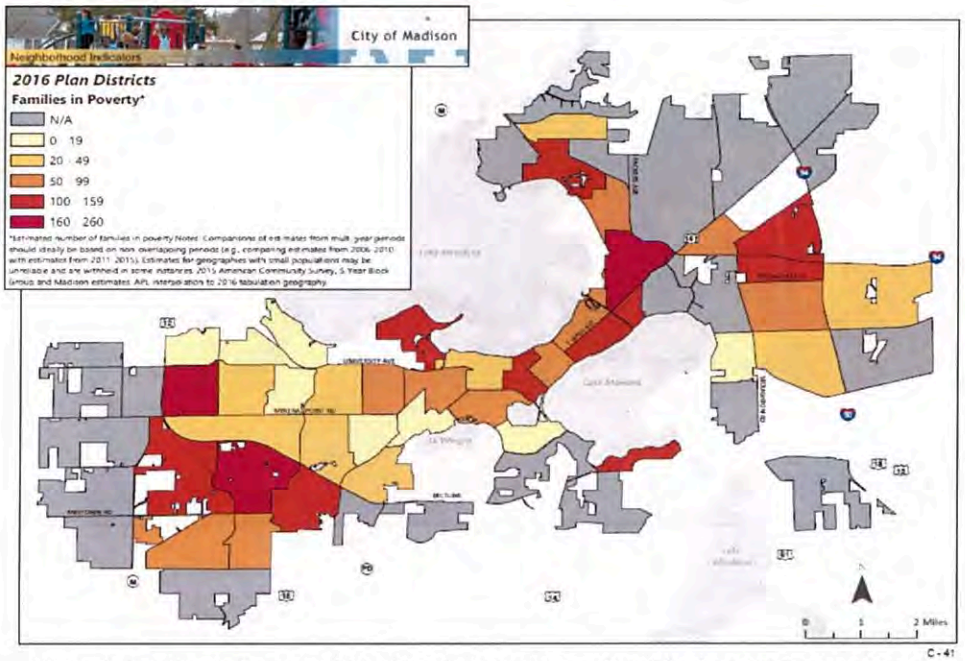

Figure 2. Families in Poverty: 2016 Plan Districts Image: Neighborhood Indicators Maps Source: 2015 American Community Survey, 5 -Year Block Group and Madison estimates. APL interpolation to 2016 tabulation geography. http://madison.apl.wisc.edu/pdfprofiles.php

These maps show certain areas neighboring Truax Field have higher levels of poverty and unemployment than other areas of the City of Madison. Figure 2. Illustrates the number of families in poverty in the Plan Districts surrounding Truax Field and Figure 3. Shows the percentage of unemployment in plan districts.

[2] Capital Area Regional Planning Commission: Geography of Opportunity: A Fair Housing Equity Assessment for Wisconsin's Capital Region. https://danedocs.countyofdane.com/PDF/capd/2014_Postings/FHEA%20Final/FHEA.pdf

[3] Ibid

Research indicates that poverty, unemployment, food security, housing quality, land use/zoning and access to services can influence an individual's response and resilience to pollution. Where an individual lives and their exposures to various buffers and stressors impact health outcomes.[4] Therefore, the EIS must take these various economic and demographic factors of these neighborhoods into consideration as it considers the possible impacts of pollution and noise.

Unemployment

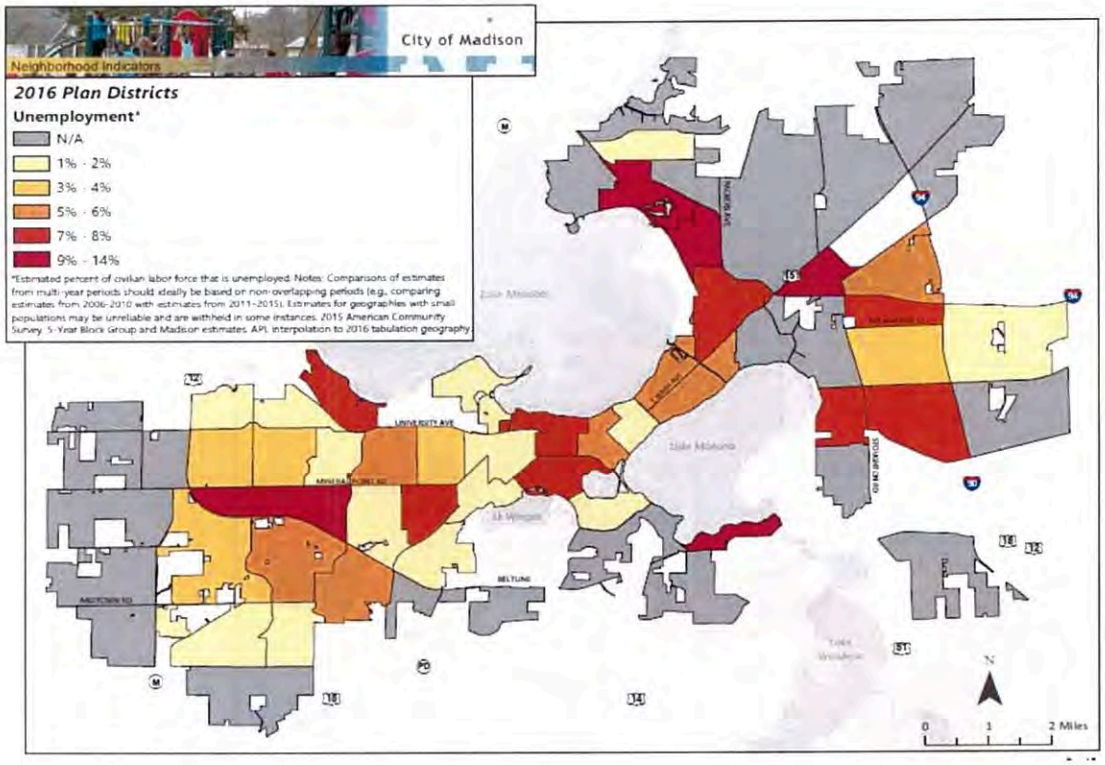

Figure 3. Unemployment: 2016 Plan Districts Image: Neighborhood Indicators Maps
Source: 2015 American Community Survey, 5 -Year Block Group and Madison estimates. APL interpolation to 2016 tabulation geography. http://madison.apl.wisc.edu/pdfprofiles.php

Neighborhoods

The Darbo-Worthington-Starkweather (DWS) Neighborhood is located south east of Truax Field and is likely to face impacts from the F-35A aircraft. A 2017 Health Impact Assessment (HIA) of the neighborhood found that the "DWS Neighborhood experiences a crime rate approximately three or more times the rate per acre of the City of Madison for crimes that affect personal safety." Other key issues for the neighborhood include the Starkweather Creek which is "listed by the Wisconsin Department of Natural Resources (DNR) as an impaired waterway." Residents face a high housing costs for both renters and

[4] Morello-Frosch, R., Shenassa, E.D. *The Environmental "Riskscape" and Social Ineqaulity: Implications for Explaining Maternal and Child Health Disparities.* Environ Health Perspect. 2006 Aug; 114(8): 1150–1153._ Published online 2006 Apr 6.

owners relative to income. Additionally, the HIA identified negative impacts from the sounds of truck traffic in the neighborhood. As portions of this neighborhood are already impacted by noise, it will be crucial for the ANG to identify all opportunities to reduce the impact of the noise from F-35 flights.

The EPA's EJSCREEN Report[5] for the neighborhood, which is 0.69 square miles and home to just over 3,800 people, shows increased risks for particulate matter, National-Scale Air Toxic Assessment (NATA) Diesel PM, NATA Cancer Risk and NATA Respiratory Hazard Index[6] compared to the state averages (See Appendix A). Darbo-Worthington has a Neighborhood Resource Team, which is a team of city staff assigned to serve specific neighborhoods to improve and coordinate government services, promote equity and improve the quality of life for residents.

Tennyson Apartments and Oak Park Terrace Mobile Homes are located west of Truax Field and north of Darwin Road and NorthPort Drive. This neighborhood faces similar air pollution and other hazards. This neighborhood is served by two neighborhood associations: Berkley Oaks and Majestic Oaks. 59% of the population in this neighborhood is low income and just over 21% of the residents have less than a high school education. The EPA's EJSCREEN Report for the neighborhood of just over 1,500 people shows increased risks for particulate matter, NATA Diesel PM, NATA Cancer Risk and NATA Respiratory Hazard Index compared to the state averages (See Appendix A).

The Truax neighborhood is located south and east of Truax Field and the Madison College. The area is bisected by East Washington Avenue which runs through it. The neighborhood is small, with a population of 637 and covers only 0.14 square miles. The EPA's EJSCREEN Report for the neighborhood shows increased risks for particulate matter, NATA Diesel PM, NATA Cancer Risk and NATA Respiratory Hazard Index compared to the state average (See Appendix A).

NEIGHBORHOOD AND HEALTH RECOMMENDATION 1:

In the preparation for the EIS, the City of Madison recommends that the specific economic, demographic and health data detailed above and other relevant characteristics of the communities located near Truax Field be included in the report.

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[5] EPA EJSCREEN is an environmental justice mapping and screening tool that provides EPA with a nationally consistent dataset and approach for combining environmental and demographic indicators. EJSCREEN users choose a geographic area; the tool then provides demographic and environmental information for that area. All of the EJSCREEN indicators are publicly-available data. EJSCREEN simply provides a way to display this information and includes a method for combining environmental and demographic indicators into EJ indexes. Retrieved from https://www.epa.gov/ejscreen/what-ejscreen

[6] Definitions of EPA EJ Screen Environmental Indicators Air Toxics Cancer Risk (NATA Cancer Risk)
Lifetime cancer risk from inhalation of air toxics, as risk per lifetime per million people. Source: EPA 2011 National Air Toxics Assessment
Air Toxics Respiratory Hazard Index (NATA Respiratory HI)
Air toxics respiratory hazard index (the sum of hazard indices for those air toxics with reference concentrations based on respiratory endpoints, where each hazard index is the ratio of exposure concentration in the air to the health-based reference concentration set by EPA). EPA 2011 National Air Toxics Assessments
Diesel Particulate Matter level in air (NATA Diesel PM)
Diesel particulate matter level in air in micrograms per cubic meter (µg/m3). Source: EPA 2011 National Air Toxics Assessments
Retrieved from: https://www.epa.gov/ejscreen/glossary-ejscreen-terms

NEIGHBORHOOD AND HEALTH RECOMMENDATION 2:

The EIS should include strategies to reduce the air quality impact of ANG activities that may contribute to local particulate matter, air toxicity, diesel particulate matter, cancer risk and respiratory hazards.

2. Noise

Noise pollution has an influence on both health and behavior according to the Darbo-Worthington-Starkweather Health Impact Assessment:

> *"Research evidence suggests adverse effects on children's ability to learn due to chronic exposure to noise. Health studies also suggest a higher risk of cardiovascular disease when people are exposed to high levels of noise from road or air traffic noise. Stress from noise affects biological risk factors such as blood pressure, fats and sugar levels, and blood flow. People who experience these factors have a risk of high blood pressure, hardening of the arteries and heart attacks."*

The three neighborhoods profiled in the preceding section face higher levels of traffic proximity and volume than the state average. In the case of Tennyson the value for traffic volume and proximity is twice the state average, while both Truax and Darbo-Worthington-Starkweather have traffic and volume levels more than three times as high as state averages (Appendix A). These neighborhoods surrounding Truax Field face high noise levels which may worsen their health outcomes. The F-35A aircraft, depending on how they are operated may further increase noise exposure in these neighborhoods.

The Pacific Beddown Draft EIS report found that the Beddown of F-35As at Eielson Air Force Base would expose more people and households in residential neighborhoods to noise than had been exposed under baseline conditions.

The City seeks additional information about the F-35A noise levels generally, as well as the anticipated impacts on the local community. Flight paths and the use of afterburners will influence the noise effects, and the city requires more information about these issues. The City seeks more information about the current flight patterns of the F-16s at Truax Field including data, on the frequency of flights that depart and arrive from the south. This information may help the community anticipate how many flights of the F-35A will follow similar flight patterns.

The City of Madison has an interest in ensuring that vulnerable populations especially children, are protected from noise. The City has created several maps of the neighborhoods surrounding Truax Field of the sensitive facilities including schools, private schools, child care centers, hospitals, neighborhood and community centers and assisted living facilities (See Appendix B). The EIS process should utilize this local knowledge when modeling the potential impact of the F-35A noise on the region.

NOISE RECOMMENDATION 1:

The City of Madison would like to see more data and information about the number of F-16 flights that have flown in and out of the south end of Truax Field over the last five years. The ANG has shared the existing flight paths which fly in and out from the north, as a means to reduce noise impacts on dense areas. Nevertheless flight traffic, weather and other circumstances forces ANG to fly in and out of the south end of Truax Field. Information on the frequency of these occurrences would better inform residents of the current and future noise impacts.

NOISE RECOMMENDATION 2:

EIS modeling should address and evaluate the noise impact on sensitive groups and facilities, as illustrated in the City of Madison maps (Appendix B).

NOISE RECOMMENDATION 3:

The City of Madison requests a complete set of previously conducted research on F-35A noise data and modeling, and a locally tailored noise abatement strategy for Truax Field.

NOISE RECOMMENDATION 4:

City residents have raised concerns about the noise that can cause hearing damage in a relatively short amount of time. The City of Madison urges ANG to include a noise abatement strategy in the EIS to address the possibility of hearing damage related to F-35A takeoffs and landings.

3. Cultural Resources: traditional, Alaska native, archeological, and architectural

The City of Madison and Wisconsin are home to Native American burial mounds. According to the WI DNR; "During the Woodland period (about 500 B.C. to A.D. 1100), earthwork or "mound" construction (generally associated with burial of the dead) developed. Wisconsin has a large number of such mounds, although many have been destroyed or otherwise affected by later development and natural processes. In Late Woodland times, Indian peoples began to build animal-shaped or "effigy" mounds–birds, bears and panthers are common forms. Because of the especially dense concentration of effigy mounds in the state, Wisconsin is considered to be the center of what is referred to as "effigy mound culture."[7] Truax Field is home to a native burial mound termed "Truax Air Park Mound" which is located east of lots 4 and 5 (See Appendix C).

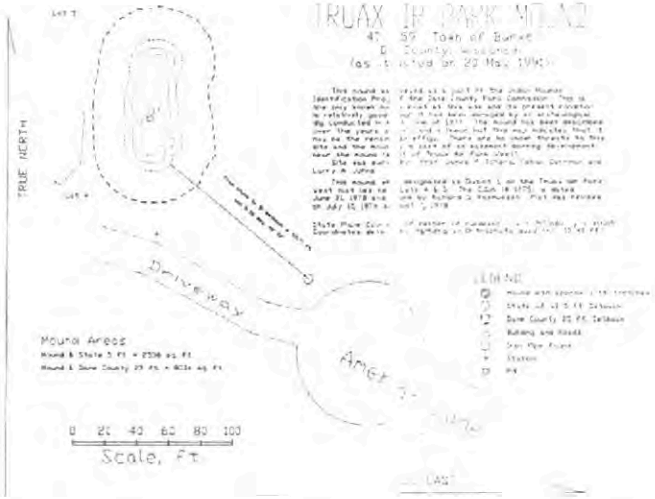

Figure 4. Records of Truax Air Park Mound as listed on 2- May 1991.
Source: Madison Trust for Historic Preservation

CULTURAL RESOUCES RECOMMENDATION 1:

The EIS should include a record of the Native American burial mound "Truax Air Park Mound" including maps and descriptions. The EIS should also include clear guidelines to avoid impacts on the mound.

[7] WI DNR. Cultural Resources Burial Mounds. Retrieved from https://dnr.wi.gov/topic/Lands/CulturalRes/mounds.html

4. Water Resources

Starkweather Creek and its watershed are the defining water resources in the area of Truax Field and the surrounding neighborhoods. The Starkweather Creek map and the Starkweather wetland map in Appendix D illustrate the geography and wetlands of Starkweather Creek and the Starkweather Creek Watershed.

A 2006 report from the University of Wisconsin-Madison[8] describes the Starkweather Creek watershed as:

> *" a 24-square-mile basin in east-central Dane County, it encompasses parts of the City of Madison and the Towns of Burke and Blooming Grove. Starkweather Creek consists of two branches that total nearly 20 miles in length. The headwaters of the West Branch of the creek originate northeast of Interstate 90-94 near Token Creek County Park; the East Branch originates east of Interstate 90-94 approximately four miles southwest of the City of Sun Prairie. The two branches of Starkweather Creek eventually converge near Olbrich Botanical Gardens in Madison and empty into the eastern end of Lake Monona. The basin is part of the Yahara River-Lake Monona Watershed, which is part of the larger Rock River Watershed that drains parts of eleven southeastern Wisconsin counties, including much of Dane County."*[9]

Starkweather has been extensively studied and as a result there is a wealth of data and information available to inform the EIS process. Reports from the WI DNR, UW-Madison and the Darbo HIA referenced earlier and others will all serve as valuable resources for data and mitigation solutions.

The Darbo-Worthington-Starkweather Health Impact Assessment (HIA) summarizes the status of the Creek as an impaired waterway.[10]

> *The Wisconsin Department of Natural Resources (WDNR) lists Starkweather Creek (which is part of the Yahara River and Lake Monona Watershed) as an impaired waterway due to chronic aquatic toxicity, low dissolved oxygen, acute aquatic toxicity and degraded habitat. Pollutants include unspecified metals, chloride, sediment/Total Suspended Solids (TSS) and biochemical oxygen demand. According to WDNR, until the early 1970's, industries directly dumped huge amounts of toxic waste into the Creek (point source pollution). Industries no longer directly discharge into the Creek, however some of the older industrial sites in the area are still causing water quality problems for the Creek. And within the watershed, most of the wetlands that once existed have been developed and are no longer able to filter and clean water that flows into the Creek. ... The lack of filtration stormwater receives before it enters the Creek is one of the reasons Starkweather Creek currently has high chloride and TSS.*
>
> ...

[8] Starkweather Creek Watershed: Current Conditions and Improvement Strategies in an Urban Context. Water Resources Management Practicum 2005, Nelson Institute for Environmental Studies, University of Wisconsin-Madison, 2006

[9] Ibid.

[10] Beckin Binz, MSA Professional Sevices. Darbo-Worthington-Starkweather Neighborhood Plan: Health Impact Assessment. May 2017.

> *Chloride levels in Starkweather Creek ranged from 26.7 to 96.0 mg/L. The US Environmental Protection Agency (EPA) lists 230 mg/L as a desired maximum chloride level. Starkweather Creek has not reached this level, but chloride is becoming an increasing concern as it is nearly impossible to remove from water. This is particularly of concern in Wisconsin due to road salt use during the winter.* [11]

Chlorides, Phosphorous and Dissolved Oxygen are critical issues for the waterways. There are additional concerns regarding contamination from chemicals which may be used for operations and maintenance of aircraft at Truax Field. The solvents, fuels, munitions, and other chemicals utilized for the F-16 and F-35A may impact the Starkweather Creek.

The 2006 University of Wisconsin-Madison Starkweather Creek Watershed report authors conducted water sample testing throughout the watershed. The report included an analysis of chemicals that that "prefer being in fat tissues rather than water. ... These contaminants are of concern due to their toxicity and carcinogenic tendencies. Some cause taste and odor problems in the water supply and others may cause health concerns especially in humans."[12] The study found the following chemicals among others in higher concentrations relative to the concentrations found in the control sample.[13]

9-Methylantracene	Benzo (k)fluoranthene	Methyl Flourene +	Retene
Phenanthrene	Benzo (a)pyrene	Octylcyclohexane	9,10 Anthraquinone
Fluorene	Benzo (e)pyrene	Cyclopenta(cd)pyrene	Benz(a)anthracene-7,12-dione
Fluoranthene	Stigmasterol	Dibenzo(ae)ppyrene	Phthalic acid(M)
Pyrene	Perylene	Dehyroabietic acid	Dodecanoic acid(M)
Benz(a)thracene	Indeno(cd)pyrene	Bezo (a)pyrene	Tetradecanoic acid(M)
Chrysene/triphenylene	Benzo(ghi)perylene	I-methylchrysene +	
Benzo (b)fluoranthene	I-pheynl-napthalene	Benzo(GHI)fluoranthene	

According to the UW Report "the sites within the watershed that showed the worst water quality were the golf course ditch and the site immediately downstream of the airport."

WATER RESOURCES RECOMMENDATION 1:

The EIS report should review the contaminants found in the Starkweather Creek downstream from the airport and determine which chemicals may be coming from Truax Field. The EIS should include an updated runoff, water filtration and monitoring plan to address contaminants. The UW Starkweather Creek Watershed report offers numerous details and strategies to improve filtration of water and contaminants at sites throughout the Watershed.

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[11] Beckin Binz, MSA Professional Sevices. Darbo-Worthington-Starkweather Neighborhood Plan: Health Impact Assessment. May 2017.
[12] Ibid.
[13] Ibid.

WATER RESOURCES RECOMMENDATION 2:

In recent years, Southern Wisconsin has had more frequent and intense rain events.[14] The EIS should develop models for extreme weather events including flooding and other environmental hazards at Truax Field, Cherokee Marsh and Starkweather Creek. The EIS should also develop adaptation and response plans for extreme weather events.

5. Hazardous Materials

Aircraft operations and maintenance involve a variety of chemicals, emissions and hazardous materials. Chemicals reviewed and discussed in the F-35 EIS for the Pacific Beddown included lead, carbon monoxide, Nitgrogen Dioxide, Ozone, Particulate Pollution, Sulfur Dioxide and Benzene. However, the Pacific Beddown EIS does not provide a comprehensive list of chemicals and hazardous materials utilized or generated in the operations and maintenance of the F-35A aircraft. The City of Madison urges the ANG to provide a complete accounting of the hazardous materials utilized in the management of the F-35A including armaments, fuels, and emergency response supplies.

F35 and other high-tech military jet crashes also pose significant environmental and public health risks beyond killing people from the crash itself—especially if the crash creates a fire. The "advanced composite materials" used in F-35s pose heightened risks in a crash that results in a fire. According to the 2015 Air Force Research Laboratory's *Composite Material Hazard Assessment at Crash Sites* report, "Potential contaminants/hazards include the following: jet fuel, unexploded ordnance, isocyanates, blood-borne pathogens, radioactive material, plastics, polymers composed of organic material, and composite fibers. Aircraft structural alloys include, but are not limited to, beryllium, aluminum, zinc, hydrazine (F-16), magnesium, titanium, and copper released in the form of metallic oxides, which pose an inhalation hazard to unprotected responders."

The F-35 is composed of 42% advanced composites will include carbon fibers in the micron and nano-sized ranges. Numerous scientific studies have shown that carbon fibers in this size range, when inhaled, can have health effects similar to asbestos.

The Composite Material report concludes: "Some aircraft should automatically be in the high-risk category due to the high percentage or large quantity of composite materials within the airframe. For example, the B-2, F-22, AV-8B, **and F-35** would be in this category."

Further, in addition to advanced composite materials, F-35s will have a stealth coating made of "advanced aerospace materials" that F-16s do not have. According to the 1995 U.S. Air Force report, "Mishap Risk Control for Advanced Aerospace/Composite Materials" (hereafter called the "Mishap" report), advanced aerospace materials" can include "Radar Absorbent Material (RAM), Beryllium, Depleted Uranium" (radioactive materials). The report notes that "Although advanced composite/aerospace materials represent only one of the many hazards associated with an aerospace mishap (fuel, weapons, metals), they do merit increased awareness because of their hazard potential and persistence. Exposures to the potentially harmful vapors, gases, composite particulates, and airborne fibers generated in a composite mishap need to be controlled because of the symbiotic effect of the dispersion forces and complex chemical mixtures."

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[14] Wisconsin Initiative on Climate Change Impacts. Stormwater Working Group. University of Wisconsin-Madison. Retrieved from https://www.wicci.wisc.edu/stormwater-working-group.php

The "Mishap" report states that "potential health and environmental effects from damaged advanced composites include dermal and respiratory problems, toxic products, contamination, and, in the case of advanced aerospace materials, **radiation**.... Off-gassing, toxic products in the smoke plume, smoldering debris, and airborne fire-damaged particulates are the primary respiratory hazards. Examples of combustion products include: Hydrogen cyanide, sulfur and silicon dioxide, formaldehyde, hydrogen fluoride, ammonia, hydrochloric acid, hydrogen sulfide, isocyanates, halogenated compounds and aromatics."

Further, if planes crash, the weapons carried by the planes can explode and/or release toxic materials from the munitions into the environment, posing risks to wildlife, soils, groundwater, surface water, and public health and safety. F-35s are capable of carrying nuclear weapons, and nuclear weapons have been carried by fighter planes at Truax in the past (as well as stored at the base and also likely at the nearby Armory—next to the low income Truax apartments). If F-35s will carry nuclear weapons, crashes could release radioactive materials into the environment, exposing people and ecosystems and contaminating ecosystems irreversibly.

The health and safety of Air Force personnel who will be intimately involved with F-35 crashes and responses to them are a critical concern that the ANG should address CFR §989.27, Occupational safety and health[15].

HAZARDOUS MATERIALS RECOMMENDATION 1:

Military sites and airport facilities often involve work with chemicals utilized for the operation and maintenance of planes, helicopters and jets. The City of Madison requests a list of the solvents, lubricants, petroleum products including fuels that are currently in use at the ANG facility at Truax, as well as a list of chemicals that will be used to support operations and maintenance of the F-35A Aircraft.

HAZARDOUS MATERIALS RECOMMENDATION 2:

The F-35A's can carry up to 18,000 pounds internally and externally. The EIS should provide information about how much fuel and what type of fuels will be carried. The EIS should also detail what types of armaments will be carried (including nuclear munitions), what would be released from these munitions if the planes crash and/or burn, the environmental and public health effects of these potential releases, and what the types of emergency response will be employed in the event of a crash or accident.

HAZARDOUS MATERIALS RECOMMENDATION 3:

The ANG should provide a full assessment of how the health and safety of Air Force and National Guard personnel will be protected in the case of F-35 crashes, explosions, or burning, and plans for responses to these incidents in the EIS.

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[15] 989.27 Occupational safety and health. Assess direct and indirect impacts of proposed actions on the safety and health of Air Force employees and others at a work site. The EIAP document does not need to specify compliance procedures. However, the EIAP documents should discuss impacts that require a change in work practices to achieve an adequate level of health and safety.

CONCLUSION:

The City of Madison submits these comments to the ANG in an effort to inform the EIS and to share valuable local knowledge of cultural resources, sensitive natural resources and neighborhood characteristics. The recommendations are intended to support the ANG's effort to ensure that all efforts are made to minimize the environmental, noise and health impacts of the F-35A Beddown. The City of Madison values the long-standing relationship with 115th Fighter Wing and looks forward to continued cooperation.

APPENDIX A:

U.S. EPA
Environmental Justice Screen Reports

Darbo-Worthington

Tennyson

Truax

EJSCREEN Report (Version 2017)

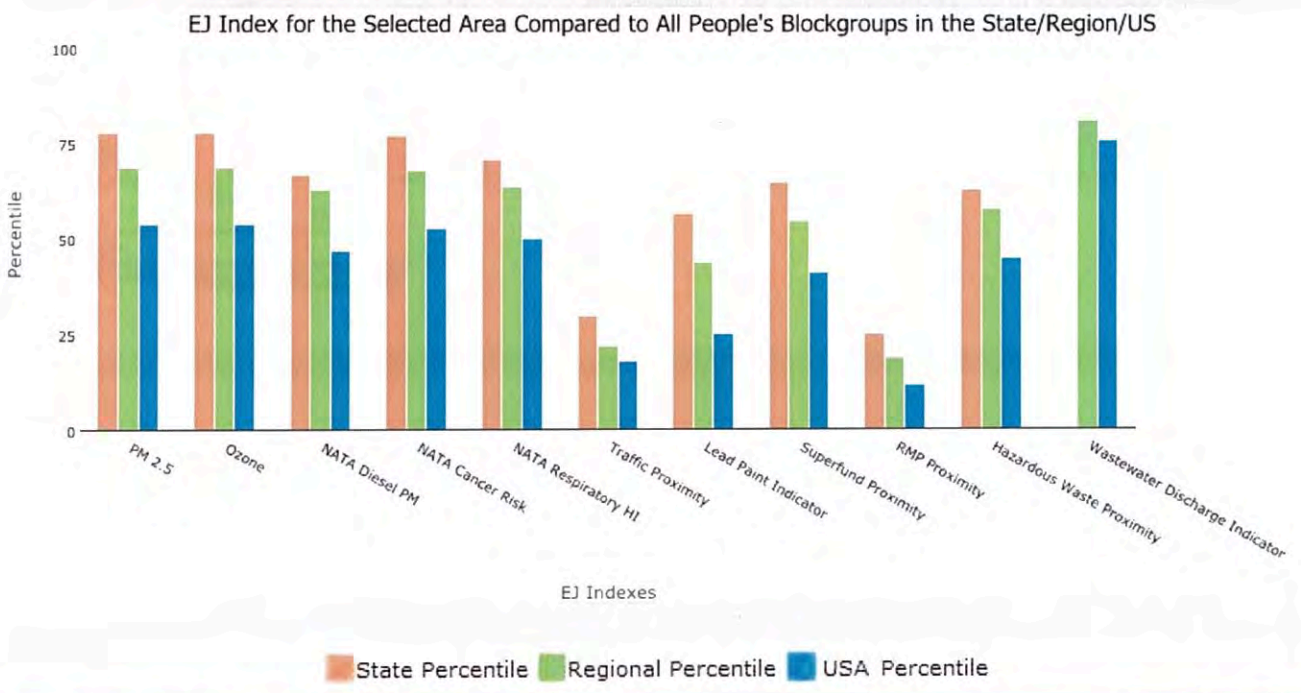
the User Specified Area, WISCONSIN, EPA Region 5

Approximate Population: 3,824

Input Area (sq. miles): 0.69

Darbo-Worthington-Starkweather

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	78	69	54
EJ Index for Ozone	78	69	54
EJ Index for NATA* Diesel PM	67	63	47
EJ Index for NATA* Air Toxics Cancer Risk	77	68	53
EJ Index for NATA* Respiratory Hazard Index	71	64	50
EJ Index for Traffic Proximity and Volume	30	22	18
EJ Index for Lead Paint Indicator	57	44	25
EJ Index for Superfund Proximity	65	55	41
EJ Index for RMP Proximity	25	19	12
EJ Index for Hazardous Waste Proximity	63	58	45
EJ Index for Wastewater Discharge Indicator	N/A	81	76



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

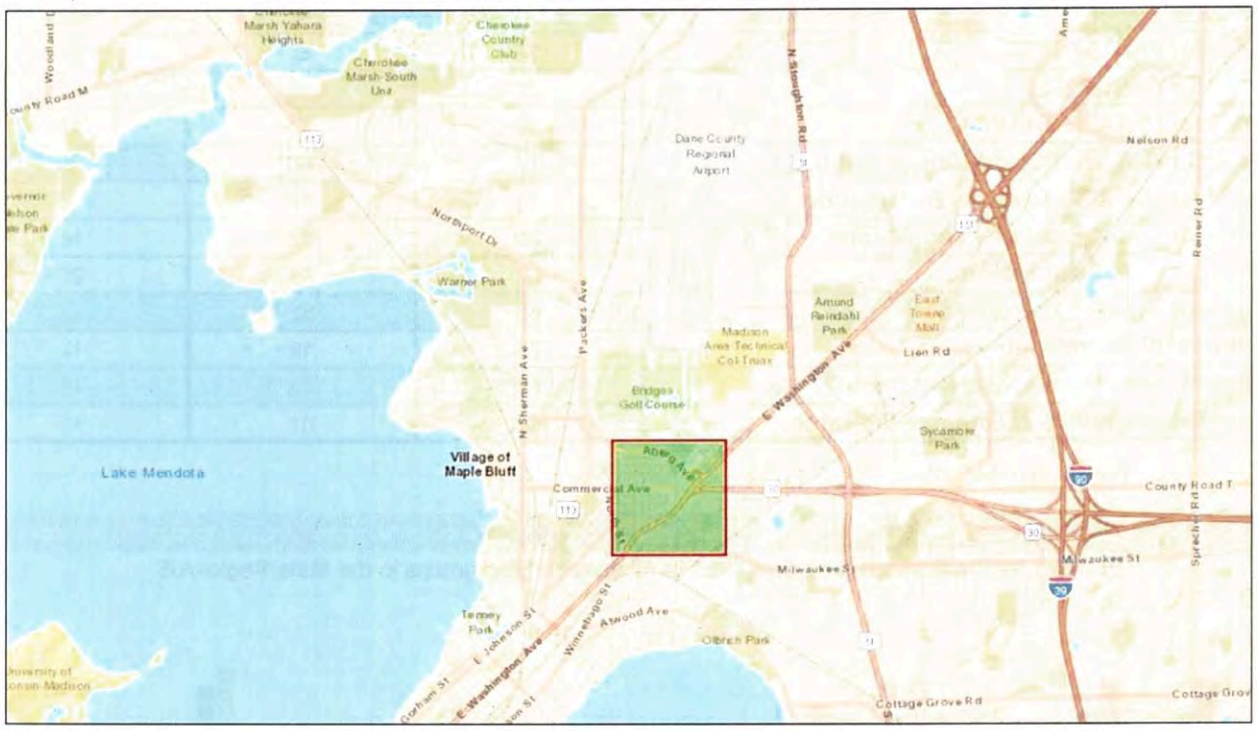
EJSCREEN Report (Version 2017)

the User Specified Area, WISCONSIN, EPA Region 5

Approximate Population: 3,824

Input Area (sq. miles): 0.69

Darbo-Worthington-Starkweather



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2017)

the User Specified Area, WISCONSIN, EPA Region 5

Approximate Population: 3,824

Input Area (sq. miles): 0.69

Darbo-Worthington-Starkweather

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m³)	9.57	8.96	69	10.1	25	9.14	57
Ozone (ppb)	39.8	38.7	73	37.6	88	38.4	73
NATA* Diesel PM (µg/m³)	1.02	0.656	81	0.932	60-70th	0.938	60-70th
NATA* Cancer Risk (lifetime risk per million)	41	29	96	34	80-90th	40	50-60th
NATA* Respiratory Hazard Index	2.3	1.3	96	1.7	80-90th	1.8	70-80th
Traffic Proximity and Volume (daily traffic count/distance to road)	1300	300	95	370	93	590	90
Lead Paint Indicator (% Pre-1960 Housing)	0.68	0.37	81	0.39	79	0.29	86
Superfund Proximity (site count/km distance)	0.13	0.13	75	0.13	77	0.13	74
RMP Proximity (facility count/km distance)	2.8	0.88	92	0.81	94	0.73	95
Hazardous Waste Proximity (facility count/km distance)	0.084	0.071	77	0.091	68	0.093	68
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0	1.2	N/A	4.2	29	30	40
Demographic Indicators							
Demographic Index	34%	24%	80	29%	71	36%	55
Minority Population	24%	18%	79	25%	66	38%	45
Low Income Population	43%	30%	79	33%	72	34%	68
Linguistically Isolated Population	1%	2%	71	2%	65	5%	50
Population With Less Than High School Education	6%	9%	37	11%	34	13%	29
Population Under 5 years of age	7%	6%	68	6%	67	6%	64
Population over 64 years of age	8%	15%	16	14%	19	14%	23

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

EJSCREEN Report (Version 2017)

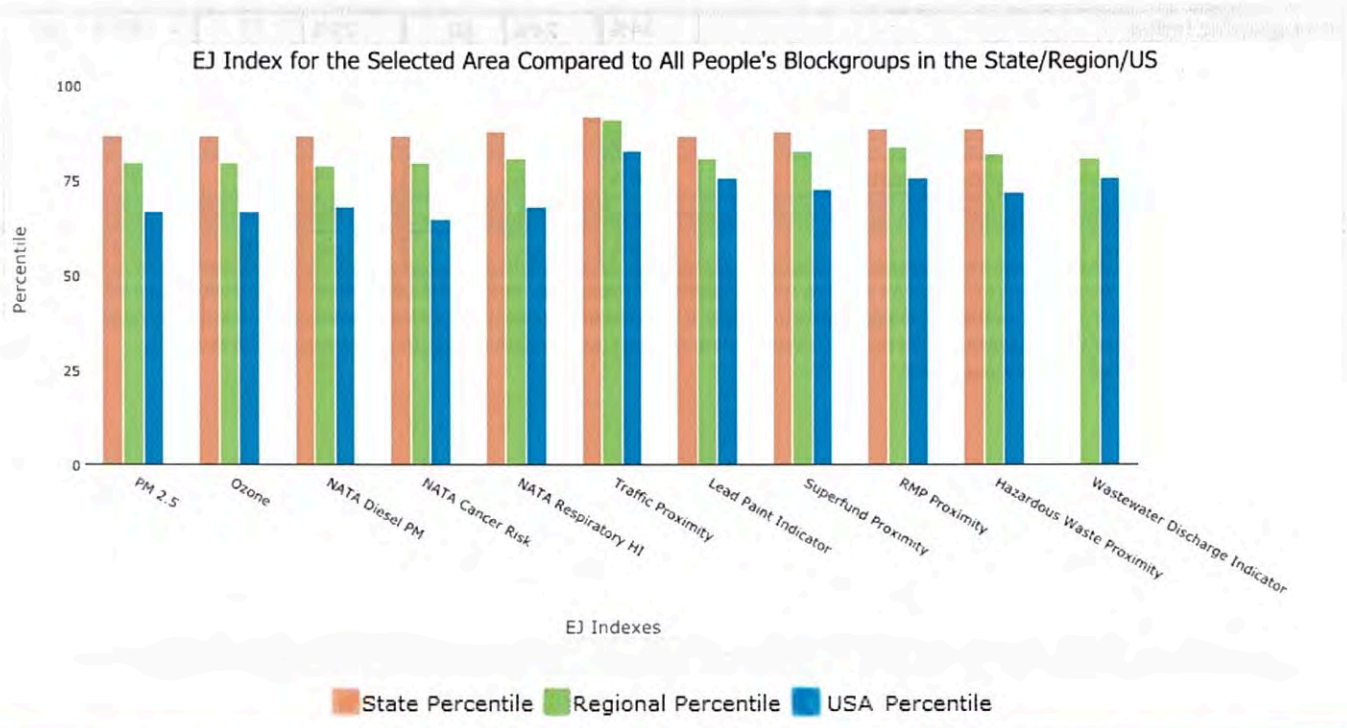
the User Specified Area, WISCONSIN, EPA Region 5

Approximate Population: 637

Input Area (sq. miles): 0.14

Truax

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	87	80	67
EJ Index for Ozone	87	80	67
EJ Index for NATA* Diesel PM	87	79	68
EJ Index for NATA* Air Toxics Cancer Risk	87	80	65
EJ Index for NATA* Respiratory Hazard Index	88	81	68
EJ Index for Traffic Proximity and Volume	92	91	83
EJ Index for Lead Paint Indicator	87	81	76
EJ Index for Superfund Proximity	88	83	73
EJ Index for RMP Proximity	89	84	76
EJ Index for Hazardous Waste Proximity	89	82	72
EJ Index for Wastewater Discharge Indicator	N/A	81	76



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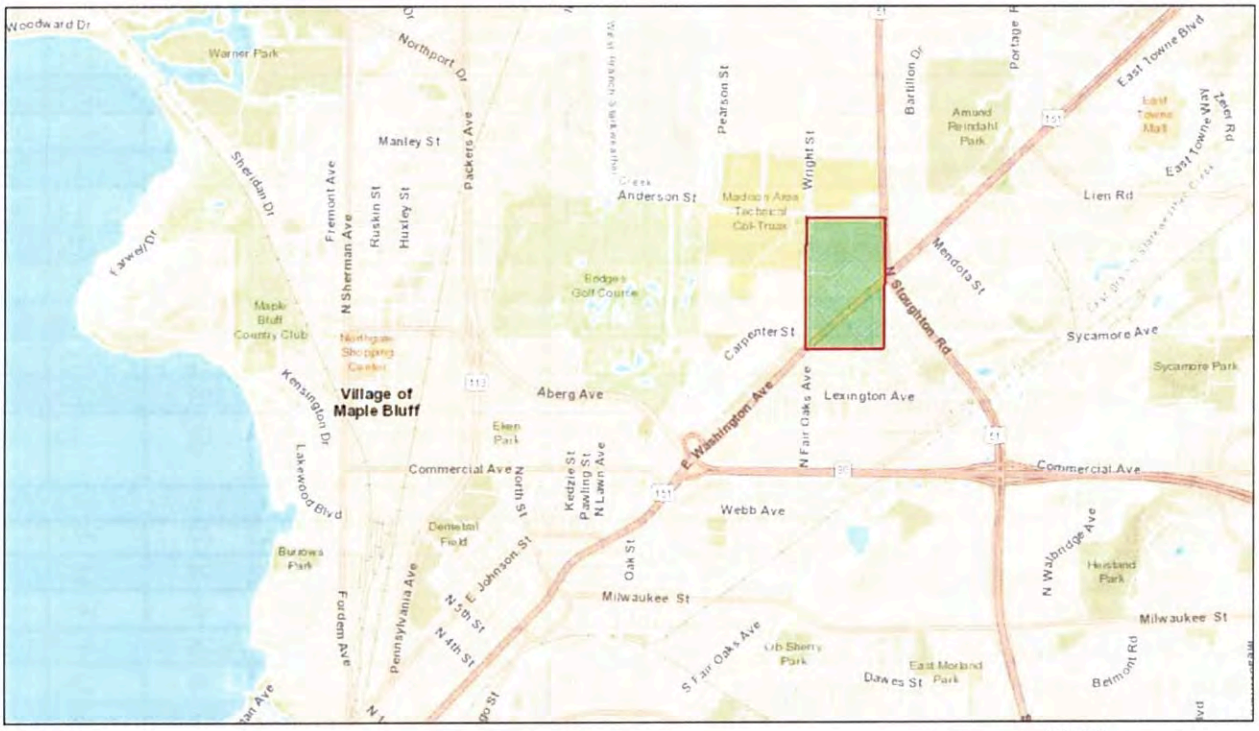
EJSCREEN Report (Version 2017)

the User Specified Area, WISCONSIN, EPA Region 5

Approximate Population: 637

Input Area (sq. miles): 0.14

Truax



April 2, 2018

Digitized Polygon

1:36,112

0 0.3 0.6 1.2 mi

0 0.5 1 2 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2017)

the User Specified Area, WISCONSIN, EPA Region 5

Approximate Population: 637

Input Area (sq. miles): 0.14

Truax

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m³)	9.55	8.96	67	10.1	24	9.14	56
Ozone (ppb)	39.8	38.7	77	37.6	89	38.4	73
NATA* Diesel PM (µg/m³)	0.811	0.656	69	0.932	<50th	0.938	50-60th
NATA* Cancer Risk (lifetime risk per million)	37	29	88	34	60-70th	40	<50th
NATA* Respiratory Hazard Index	2.1	1.3	94	1.7	70-80th	1.8	70-80th
Traffic Proximity and Volume (daily traffic count/distance to road)	1100	300	94	370	92	590	88
Lead Paint Indicator (% Pre-1960 Housing)	0.34	0.37	52	0.39	52	0.29	64
Superfund Proximity (site count/km distance)	0.1	0.13	67	0.13	71	0.13	67
RMP Proximity (facility count/km distance)	1.2	0.88	73	0.81	77	0.73	80
Hazardous Waste Proximity (facility count/km distance)	0.085	0.071	77	0.091	69	0.093	68
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0	1.2	N/A	4.2	29	30	40
Demographic Indicators							
Demographic Index	47%	24%	88	29%	82	36%	71
Minority Population	37%	18%	87	25%	76	38%	57
Low Income Population	58%	30%	89	33%	86	34%	84
Linguistically Isolated Population	3%	2%	83	2%	75	5%	61
Population With Less Than High School Education	17%	9%	87	11%	79	13%	69
Population Under 5 years of age	6%	6%	59	6%	58	6%	55
Population over 64 years of age	11%	15%	32	14%	35	14%	40

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

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EJSCREEN Report (Version 2017)

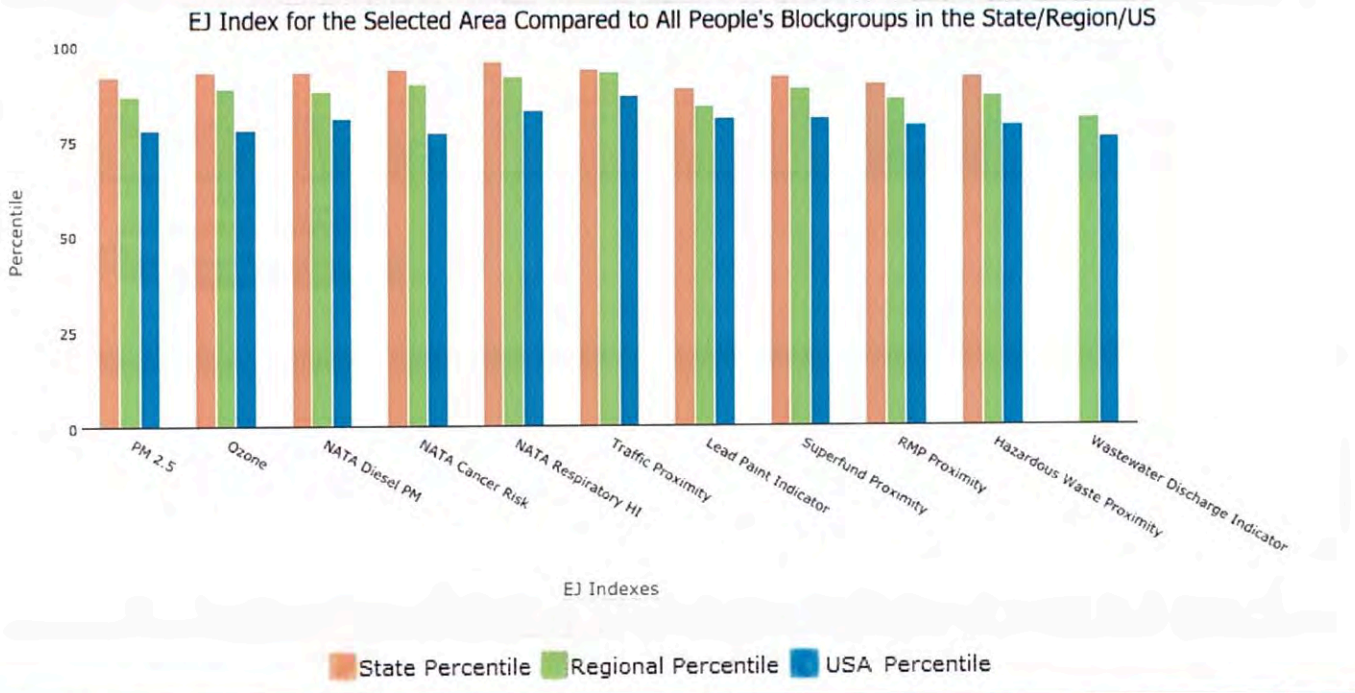
the User Specified Area, WISCONSIN, EPA Region 5

Approximate Population: 1,531

Input Area (sq. miles): 0.69

Tennyson

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	92	87	78
EJ Index for Ozone	93	89	78
EJ Index for NATA* Diesel PM	93	88	81
EJ Index for NATA* Air Toxics Cancer Risk	94	90	77
EJ Index for NATA* Respiratory Hazard Index	96	92	83
EJ Index for Traffic Proximity and Volume	94	93	87
EJ Index for Lead Paint Indicator	89	84	81
EJ Index for Superfund Proximity	92	89	81
EJ Index for RMP Proximity	90	86	79
EJ Index for Hazardous Waste Proximity	92	87	79
EJ Index for Wastewater Discharge Indicator	N/A	81	76



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the User Specified Area, WISCONSIN, EPA Region 5

Approximate Population: 1,531

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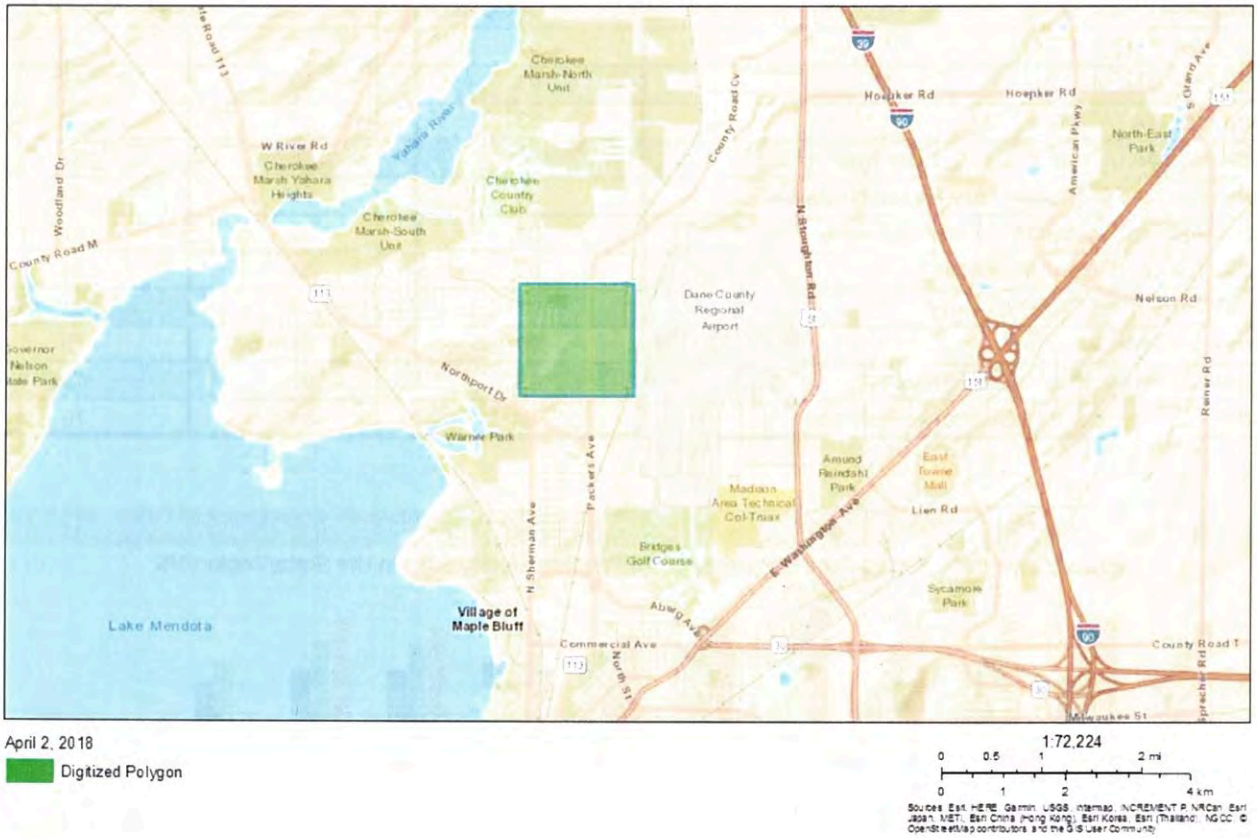
Tennyson



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2017)

the User Specified Area, WISCONSIN, EPA Region 5

Approximate Population: 1,531

Input Area (sq. miles): 0.69

Tennyson

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	9.52	8.96	64	10.1	23	9.14	55
Ozone (ppb)	39.8	38.7	77	37.6	89	38.4	73
NATA* Diesel PM (µg/m^3)	1.18	0.656	89	0.932	70-80th	0.938	70-80th
NATA* Cancer Risk (lifetime risk per million)	43	29	97	34	80-90th	40	60-70th
NATA* Respiratory Hazard Index	2.8	1.3	99	1.7	90-95th	1.8	80-90th
Traffic Proximity and Volume (daily traffic count/distance to road)	620	300	87	370	85	590	81
Lead Paint Indicator (% Pre-1960 Housing)	0.25	0.37	38	0.39	41	0.29	56
Superfund Proximity (site count/km distance)	0.09	0.13	62	0.13	67	0.13	63
RMP Proximity (facility count/km distance)	0.59	0.88	58	0.81	60	0.73	64
Hazardous Waste Proximity (facility count/km distance)	0.071	0.071	71	0.091	63	0.093	62
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0	1.2	N/A	4.2	29	30	40
Demographic Indicators							
Demographic Index	51%	24%	90	29%	84	36%	74
Minority Population	46%	18%	89	25%	81	38%	65
Low Income Population	56%	30%	88	33%	84	34%	82
Linguistically Isolated Population	8%	2%	95	2%	90	5%	80
Population With Less Than High School Education	20%	9%	91	11%	85	13%	77
Population Under 5 years of age	8%	6%	75	6%	73	6%	71
Population over 64 years of age	8%	15%	18	14%	21	14%	25

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

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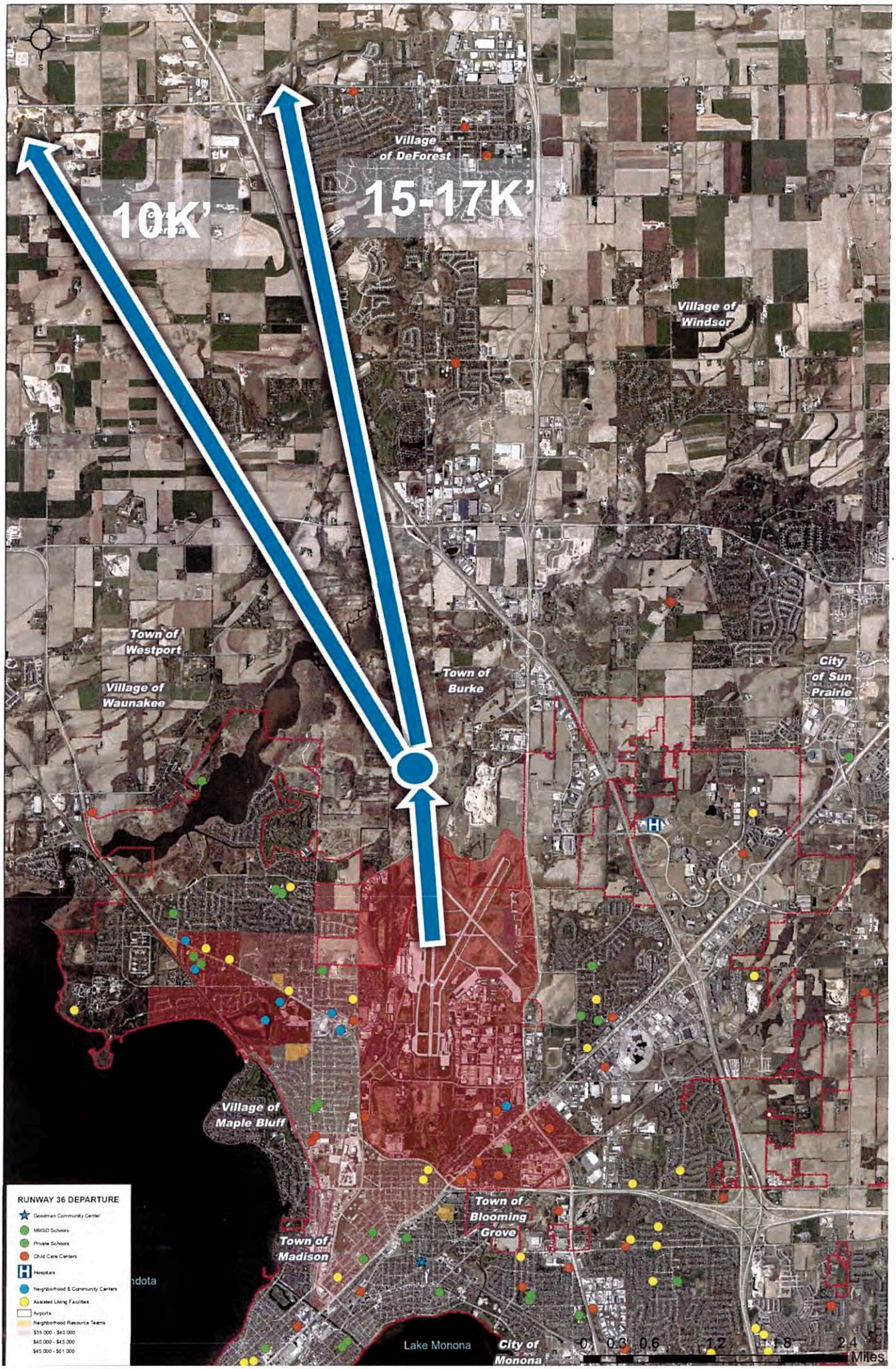
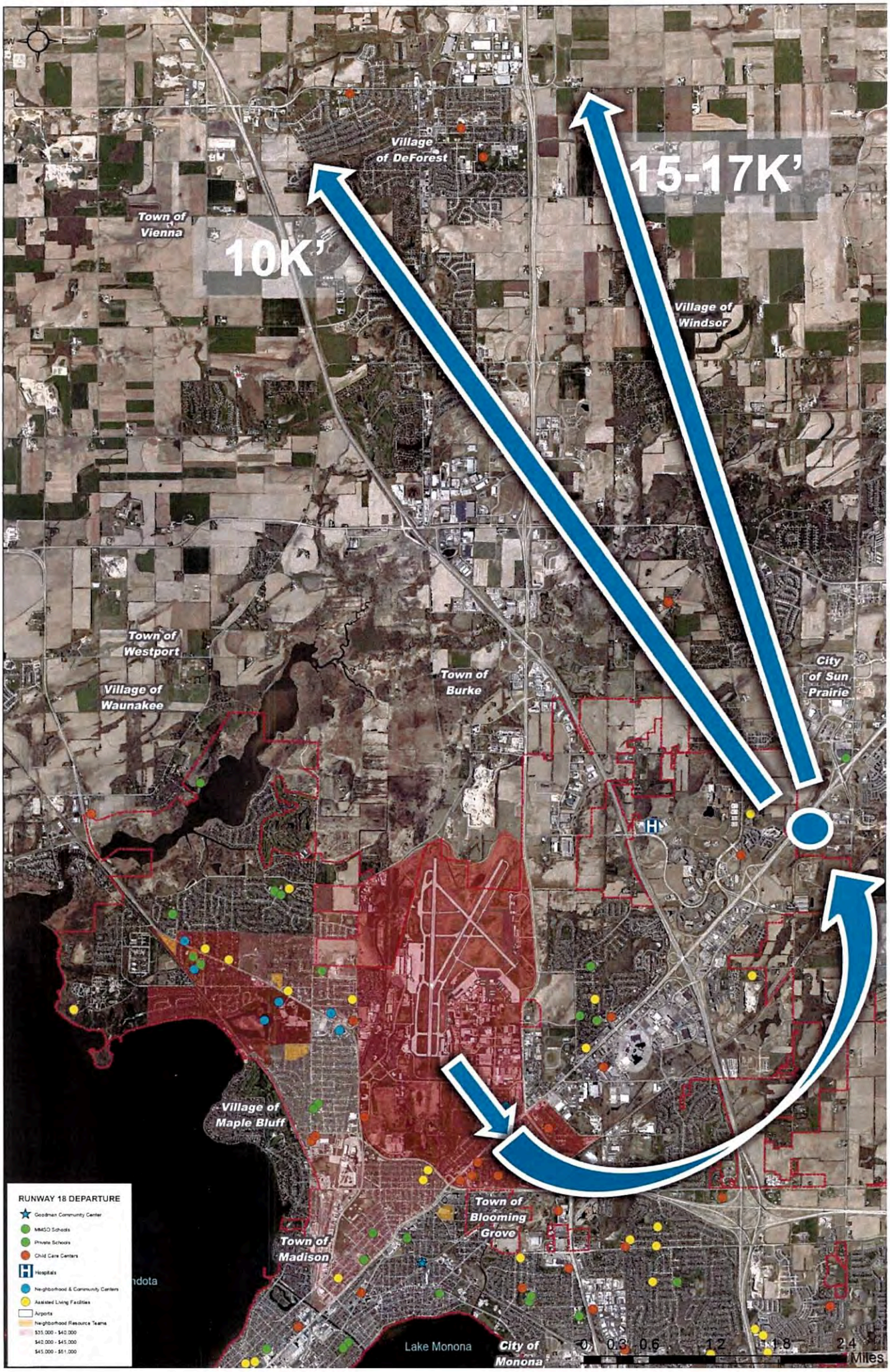
APPENDIX B:

Truax Field
F-16 Flight Plans

Maps prepared by City of Madison

The maps include nearby schools, child care centers, hospitals, and community centers, assisted living facilities and low-income census block groups.


10K'
15-17K'
Village of DeForest
Village of Windsor
Town of Westport
Village of Waunakee
Town of Burke
City of Sun Prairie
Village of Maple Bluff
Town of Blooming Grove
Town of Madison
Lake Monona
City of Monona
RUNWAY 36 DEPARTURE
Goodman Community Center
MMSD Schools
Private Schools
Child Care Centers
Hospitals
Neighborhood & Community Centers
Assisted Living Facilities
Airports
Neighborhood Resource Teams
$35,000 - $40,000
$40,000 - $45,000
$45,000 - $61,000
0 0.3 0.6 1.2 1.8 2.4
Miles


Village of DeForest
15-17K'
Town of Vienna
10K'
Village of Windsor
Town of Westport
Village of Waunakee
Town of Burke
City of Sun Prairie
Village of Maple Bluff
Town of Blooming Grove
Town of Madison
Lake Monona
City of Monona
RUNWAY 18 DEPARTURE
Goodman Community Center
MMSD Schools
Private Schools
Child Care Centers
Hospitals
Neighborhood & Community Centers
Assisted Living Facilities
Airports
Neighborhood Resource Teams
$35,000 - $40,000
$40,000 - $45,000
$45,000 - $51,000
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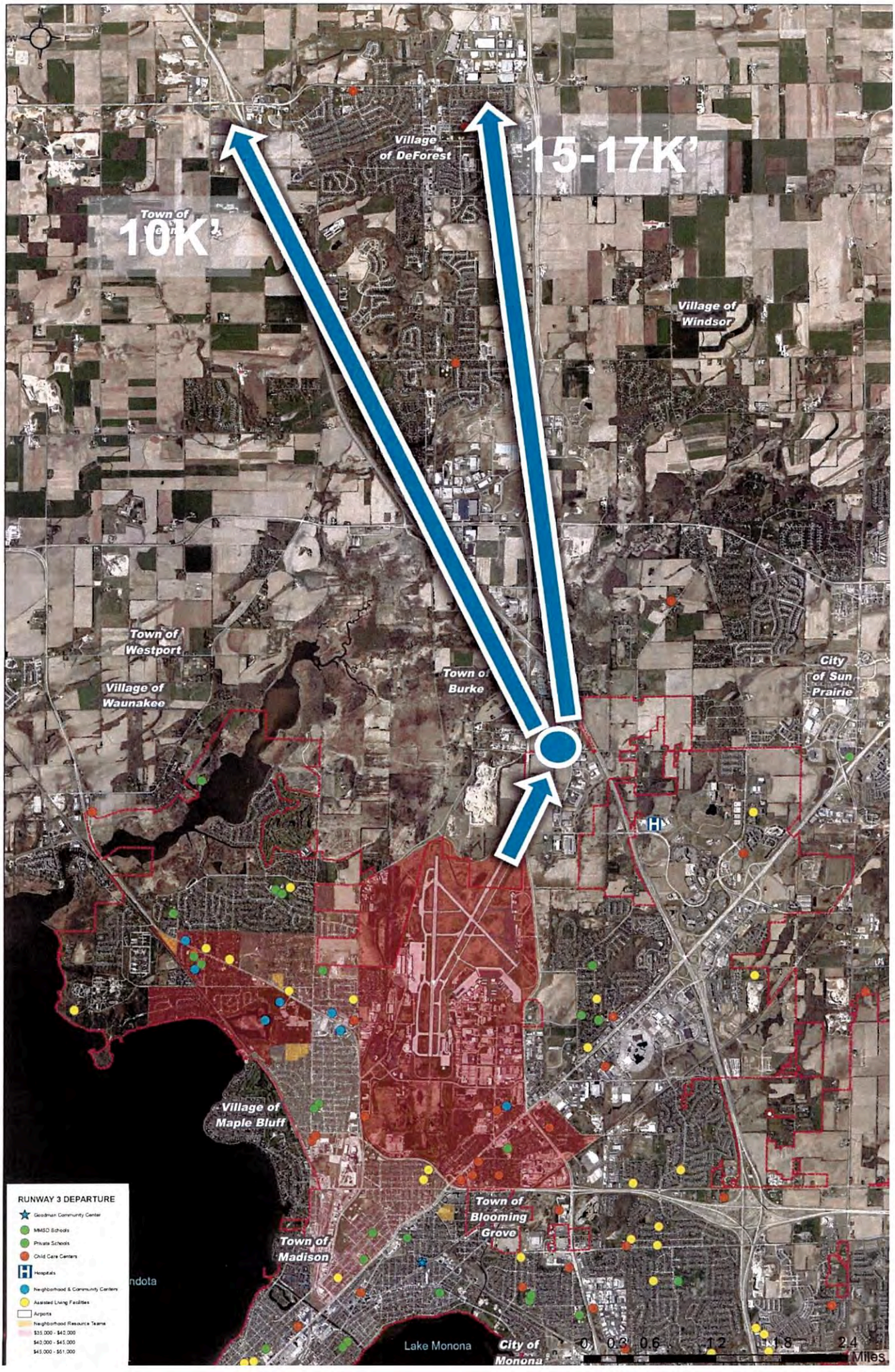
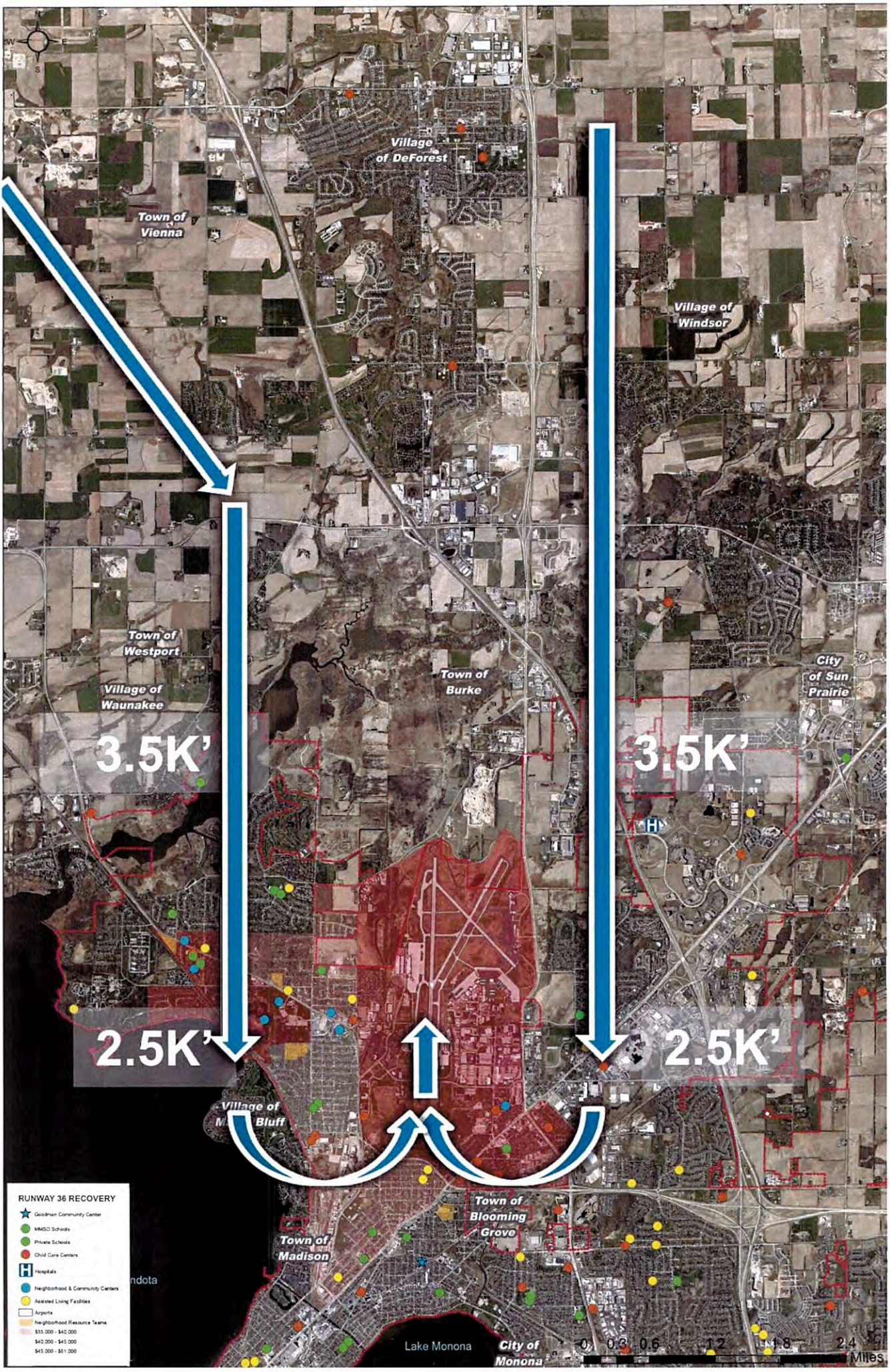
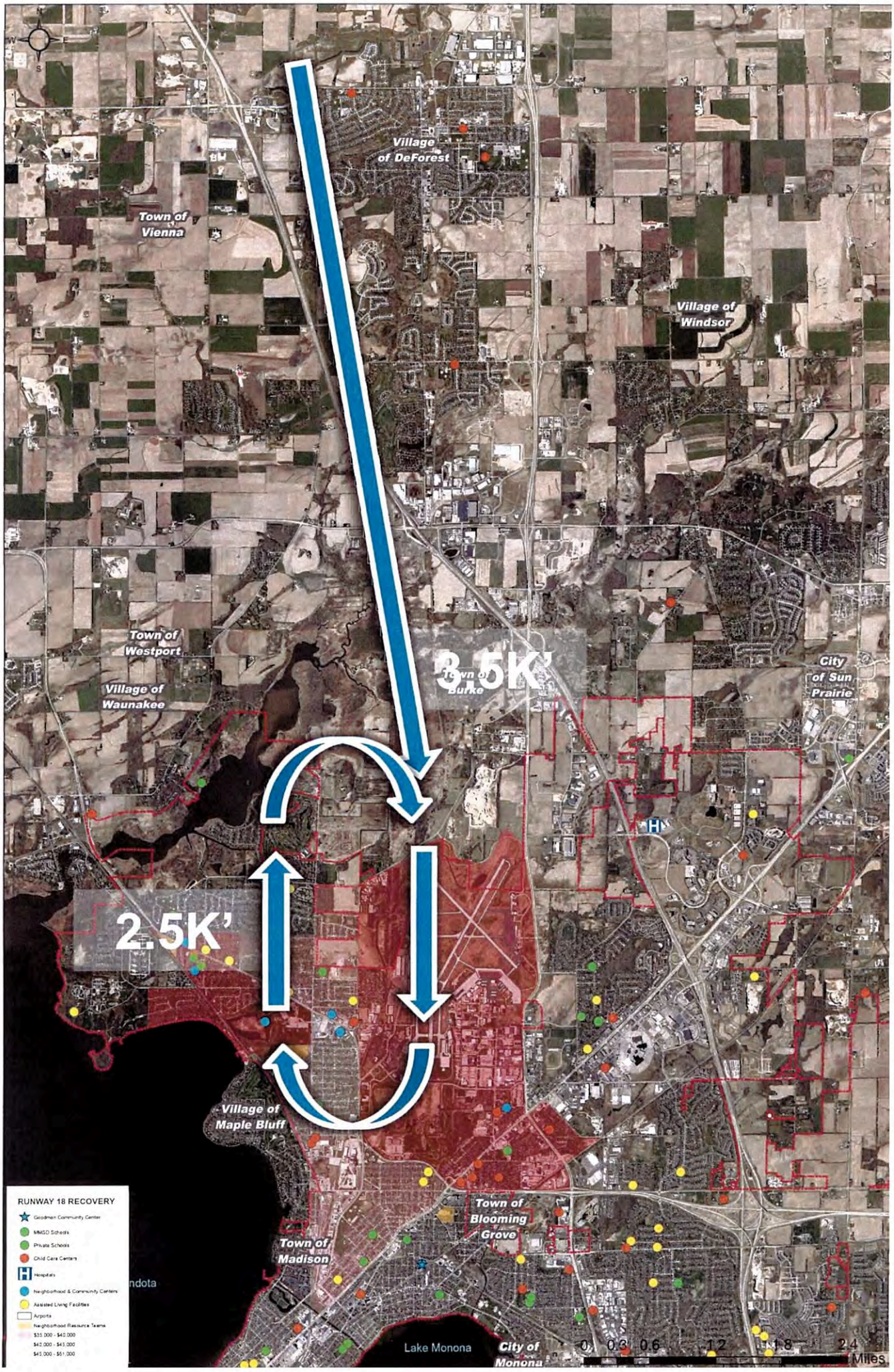
Miles


15-17K'
10K'
Village of DeForest
Village of Windsor
Town of Westport
Village of Waunakee
Town of Burke
City of Sun Prairie
Village of Maple Bluff
Town of Blooming Grove
Town of Madison
Lake Monona
City of Monona
RUNWAY 3 DEPARTURE
Goodman Community Center
MMSD Schools
Private Schools
Child Care Centers
Hospitals
Neighborhood & Community Centers
Assisted Living Facilities
Airports
Neighborhood Resource Teams
$35,000 - $40,000
$40,000 - $45,000
$45,000 - $51,000
0 0.3 0.6 1.2 1.8 2.4
Miles


Village of DeForest
Town of Vienna
Village of Windsor
Town of Westport
Village of Waunakee
Town of Burke
City of Sun Prairie
3.5K'
3.5K'
2.5K'
2.5K'
Village of Bluff
Town of Blooming Grove
Town of Madison
Lake Monona
City of Monona
RUNWAY 36 RECOVERY
Goodman Community Center
MMSD Schools
Private Schools
Child Care Centers
Hospitals
Neighborhood & Community Centers
Assisted Living Facilities
Airports
Neighborhood Resource Teams
$35,000 - $40,000
$40,000 - $45,000
$45,000 - $61,000
0 0.3 0.6 1.2 1.8 2.4
Miles


Village of DeForest
Town of Vienna
Village of Windsor
Town of Westport
Village of Waunakee
Town of Burke
City of Sun Prairie
3.5K'
2.5K'
Village of Maple Bluff
Town of Blooming Grove
Town of Madison
Lake Monona
City of Monona
RUNWAY 18 RECOVERY
Goodman Community Center
MMSD Schools
Private Schools
Child Care Centers
Hospitals
Neighborhood & Community Centers
Assisted Living Facilities
Airports
Neighborhood Resource Teams
$35,000 - $40,000
$40,000 - $45,000
$45,000 - $51,000
0 0.3 0.6 1.2 1.8 2.4
Miles

APPENDIX C:

Cultural Resources
Truax Air Park Mound

Trust's Linear Mound Easement in Truax Park
December, 2017 Comments
Kurt Stege

Since 1979, the Trust has held a perpetual easement "for the purpose of maintaining the Indian Mound located [in Truax Air Park West, Outlot 1. MTHP] agrees to preserve the archaeological and historical character of the Indian Mound; no alteration which may impair the archaeological or historical value of the Mound may be made to the described property without the express written permission of [Dane County] and [MTHP]."

The property is owned by Dane County but they did not consider themselves to be positioned to protect and "maintain" it.

The Trust's file (now in the custody of the Treasurer) includes several copies of a survey map showing the precise location. According to Daniel Einstein, former Trust Vice-President, the mound is pretty close to a building, has a depression in the center, and has invasive trees (buckthorn and honeysuckle) growing on and around it. Daniel suggested that unless the holder of the easement is in a position to both clear the invasives and re-seed the area with something that will take hold and still do follow-up maintenance, it is not worthwhile to just cut the invasive trees.

Daniel provided me further background information about mounds generally and about the Trust's mound.

Linear (long) and conical (round) mounds are viewed as an older rendition of the effigy mounds that also exist in the Madison area and in Wisconsin. Archeological excavations on numerous mounds have established the general rule that all mounds are burial mounds, i.e. have or had human remains.

When Dane County was preparing for airport expansion some years ago, they hired a consultant who surveyed the area and that consultant identified the feature in question as an Indian Mound, even though he may not have been expertly qualified to do so.

Bob Birmingham, former State Archeologist at the Historical Society, advised Daniel several years ago that he had serious doubts the feature covered by the Trust's easement is an "Indian Mound" rather than a naturally occurring shape, possibly due to glacial activity. His opinion is based on the fact that at least at this point, the feature is not near water and does not provide a special view of the surrounding landscape, either one of which was typical of confirmed mounds.

Nevertheless, the feature covered by the Trust's easement is listed in the official inventory so it is definitely subject to all of the restrictions imposed on mounds.

Daniel does not view the Trust as being very well equipped to carry out the responsibilities covered by the easement. He noted that the Wisconsin Archeological

Society holds other such easements and it might make sense for us to look into transferring the easement to them.

Daniel has collected approximately 15 to 20 pages of correspondence relating to the establishment of the Trust's easement and hopes to provide that information to me.

He suggested that it would be worthwhile if the Trust visited the building nearest the site, point out the site to the building occupants and remind them that it is on County property and may not be disturbed.

VOL 1243 PAGE 5

1650114 Rec. 32 4/7/79 C

1627382

1645142

Office of Register of Deeds
Dane County, Wisconsin } ss.
Re-Recorded Nov 28 1979
At 2 11 o'clock P M
Carol R. Mahnke, Register

VOL 1396 PAGE 37

EASEMENT AGREEMENT

DANE COUNTY, a Wisconsin municipal corporation, Grantor, hereby conveys to MADISON TRUST FOR HISTORIC PRESERVATION, INC., Grantee, a perpetual easement in the following described property located in the City of Madison, Dane County, Wisconsin: Truax Air Park West, Outlot 1** ~~Truax Air Park West, Lot 1*~~ ~~Outlot 1 of Replat of Lot 3, Certified Survey Map 1275, recorded in page 23, Volume 50 of Plats in the office of the Dane County Register of Deeds as Document #1599591.~~

This easement is granted for the purpose of maintaining the Indian Mound located on the described property. Grantee agrees to preserve the archaeological and historical character of the Indian Mound; no alteration which may impair the archaeological or historical value of the Mound may be made to the described property without the express written permission of Grantee and Grantor.

Office of Register of Deeds
Dane County, Wisconsin } ss.
Recorded June 27 1979
At 1108 o'clock A.M.
Carol R. Mahnke, Register

*This document is being re-recorded to correct the legal description.

Dated this 21st day of June, 1979.

Subscribed and sworn to me, by my presence, the 21st day of June 1979, a Notary Public in and for the (county) state of Dane-Wisconsin

Patricia C. Koller
Signature
Notary Public
My commission expires Sept. 6, 1981.

DANE COUNTY

By: Francis R. Hebl
Francis R. Hebl
Dane County Clerk

APPROVED
CORP. COUNSEL
as 5.8.79

APPROVED
RISK MNGT
5/8/79
m

MADISON TRUST FOR HISTORIC PRESERVATION, INC.

By: Gary Tipler
Gary Tipler, President

Signature of [redacted] Gary Tipler authenticated this 27th day of June, 1979.

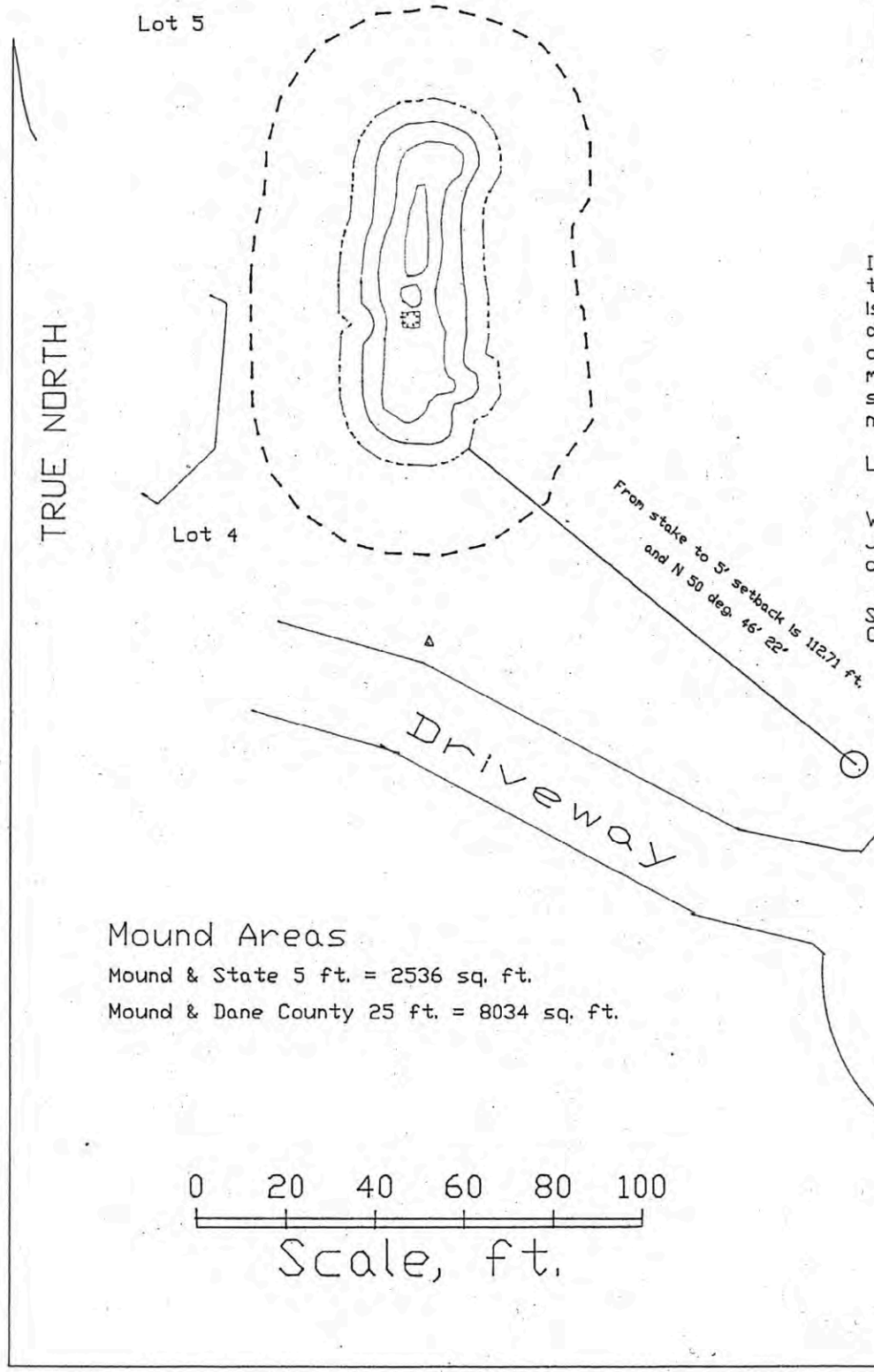
Robert T. Kasdorf
Member, State Bar of Wisconsin

**This document is being re-recorded again to correct the legal description.

This instrument was drafted by Attorney Robert T. Kasdorf.

Office of Register of Deeds
Dane County, Wisconsin } ss.
Re-Recorded Oct 18 1979
At 3 11 o'clock P M
Carol R. Mahnke, Register

VOL 1072 PAGE 581



TRUAX

47 I

Da

(as it

This mound was
Identification Proje
the only known mour
is relatively good a
dig conducted in Ma
over the years as
may be the remains
site and the mound
near the mound (se

Site was surve
Larry A. Johns

This mound, whic
West plat lies betw
June 21, 1978 and w
on July 10, 1978 ano

State Plane Coordin
Coordinates determi

Amer

AIR PARK MOUND

-59 Town of Burke
County, Wisconsin
xisted on 20 May 1991)

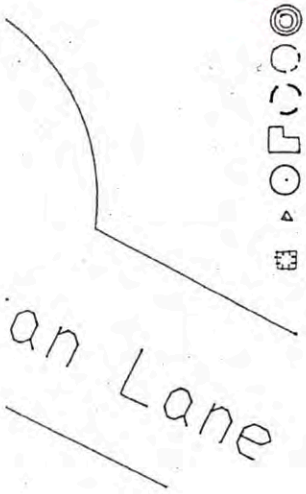
rveyed as a part of the Indian Mounds
of the Dane County Park Commission. This is
to exist at this site and its present condition
ough it has been damaged by an archeological
nd June of 1977. The mound has been described
oval and a linear but this map indicates that it
an effigy. There are no known threats to this
ea is part of an easement barring development
lat of Truax Air Park West).
by: Prof. James P. Scherz, Fabian Carrimon and

s designated as Outlot 1, on the Truax Air Park
Lots 4 & 5. The C.S.M. (# 1275) is dated
done by Richard G. Rasmussen. Plat was revised
igust 7, 1978.

s of center of culdesac - x = 2173180 y = 411019
by digitizing an Orthophoto quad (+/- 10-40 ft.)

LEGEND

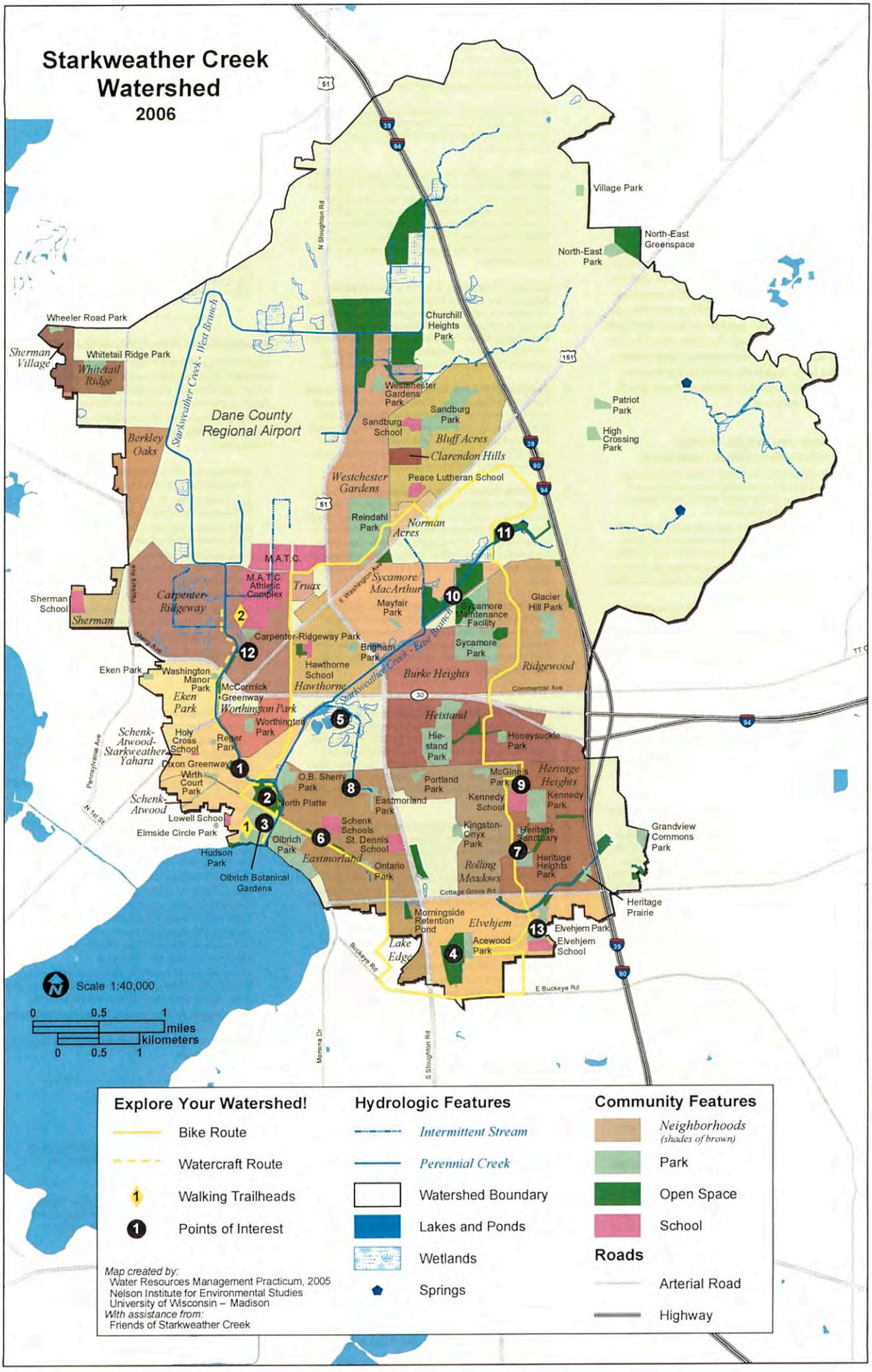
- Mound with approx. 1 ft. formlines
- State of WI 5 ft. Setback
- Dane County 25 ft. Setback
- Building and Roads
- Iron Pipe found
- Station
- Pit



RUE EAST

APPENDIX D:

Starkweather Creek


Starkweather Creek Watershed
2006
Village Park
North-East Greenspace
North-East Park
Wheeler Road Park
Churchill Heights Park
Sherman Village
Whitetail Ridge Park
Whitetail Ridge
Starkweather Creek - West Branch
Dane County Regional Airport
Westchester Gardens Park
Sandburg Park
Sandburg School
Bluff Acres
Clarendon Hills
Patriot Park
High Crossing Park
Berkley Oaks
Westchester Gardens
Peace Lutheran School
Reindahl Park
Norman Acres
M.A.T.C.
M.A.T.C. Athletic Complex
Truax
Sycamore MacArthur
Mayfair Park
Sycamore Maintenance Facility
Glacier Hill Park
Sherman School
Sherman
Carpenter-Ridgeway
Carpenter-Ridgeway Park
Brigham Park
Sycamore Park
Ridgewood
Eken Park
Washington Manor Park
Hawthorne School
Hawthorne
Burke Heights
Starkweather Creek - East Branch
McCormick Greenway
Eken Park
Worthington Park
Worthington Park
Heistand
Schenk-Atwood-Starkweather-Yahara
Holy Cross School
Reiner Park
Hie-stand Park
Honeysuckle Park
Dixon Greenway
Wirth Court Park
O.B. Sherry Park
Portland Park
McGinnis Park
Heritage Heights
Schenk-Atwood
North Platte
Eastmorland Park
Kennedy School
Kennedy Park
Lowell School
Elmside Circle Park
Schenk Schools
St. Dennis School
Kingston-Onyx Park
Heritage Sanctuary
Grandview Commons Park
Olbrich Park
Eastmorland
Hudson Park
Olbrich Botanical Gardens
Ontario Park
Rolling Meadows
Heritage Heights Park
Cottage Grove Rd
Heritage Prairie
Morningside Retention Pond
Elvehjem
Elvehjem Park
Elvehjem School
Lake Edge
Acewood Park
E Buckeye Rd
Scale 1:40,000
0 0.5 1 miles
0 0.5 1 kilometers
Explore Your Watershed!
Bike Route
Watercraft Route
Walking Trailheads
Points of Interest
Hydrologic Features
Intermittent Stream
Perennial Creek
Watershed Boundary
Lakes and Ponds
Wetlands
Springs
Community Features
Neighborhoods (shades of brown)
Park
Open Space
School
Roads
Arterial Road
Highway
Map created by:
Water Resources Management Practicum, 2005
Nelson Institute for Environmental Studies
University of Wisconsin – Madison
With assistance from:
Friends of Starkweather Creek

STARKWEATHER CREEK WATERSHED is the largest watershed in Madison. It encompasses the eastern parts of the city as well as the towns of Burke and Blooming Grove. The creek begins as two branches, the East and West, each fed by springs in the upper watershed. As the branches flow toward Lake Monona, they are augmented by urban runoff that increases the total discharge of the stream. The two branches converge southeast of the intersection of Fair Oaks Avenue and Milwaukee Street and flow into Lake Monona and the larger Rock River. Historically, the watershed was rich in wetland and marsh ecosystems, although less than one-quarter of these wetlands remains today. Although the watershed has experienced serious environmental degradation, with the help of private citizens, businesses, and community groups, some of these conditions can be restored.

Five things you can do to help the Starkweather Creek watershed

1. Install rain gardens and rain barrels at your home, business, school, community center, and place of worship to use precipitation that might otherwise enter the watershed as runoff.
2. Rake and compost leaves and debris regularly so that they are not carried by storm drains into our lakes where their decomposition adds to nutrient loading.
3. Report any illegal or suspicious dumping activities to the Wisconsin Department of Natural Resources (800/TIP-WDNR — 800/847.9367).
4. Take part in the Starkweather Creek cleanup days organized by the Friends of Starkweather Creek and the Dane County Lakes and Watershed Commission
5. Educate yourself, your family, friends, and co-workers about Starkweather Creek watershed.

Sites of interest

Numerous natural and cultural landmarks make the Starkweather Creek watershed a unique landscape in Dane County. The following are just a few locations in the Starkweather Creek Watershed that are worth getting to know.

1. **Madison Gas & Electric Marsh.** A small remnant fen nestled between the Creek's West Branch, the SOO rail line and the MG&E substation, the marsh is a unique example of a wetland that has survived heavy urbanization. It contains to more than forty wetland plant species. *To ensure the continued survival of this wetland, please do not enter—view from the bike/hiking trail that lies along the creek.*

2. **North Platte.** The North Platte, a recent addition to the Olbrich Botanical Gardens holdings, has been home to a number of different industries over the course of Madison's history, including a sugar beet processing plant and Garver Feed and Supply Company. Unfortunately, the North Platte was also used during its industrial phase as an area to dump fill from construction and dredging operations, so it is also home to degraded wetlands, which will become the focus of restoration work in the near future.

3. **Olbrich Botanical Gardens.** One of the premier botanical centers in Wisconsin, Olbrich is dedicated to the creation, conservation, and interpretation of gardens and plant collections hardy to the American Midwest or native to the world's tropics. Olbrich is a leading partner in educating Starkweather Creek watershed and Madison residents about watershed issues via the gardens located on the banks of Starkweather Creek and the shores of Lake Monona.

4. **Acewood Pond and Park.** A small kettle pond located at the southern edge of the watershed, Acewood Pond ranges from open water to shallow emergent marsh at the pond's edge. The pond has a healthy community of floating hydrophytes as well as other wetland species, such as bulrushes, cattails, and broad-leaf arrowheads. Acewood Park borders the pond along the eastern edge and allows some access for fishing as well as for viewing the waterfowl that feed in the pond.

5. **Voit–Blattner Property.** The Voit–Blattner property is one of the largest undeveloped areas in the urbanized central part of the watershed. The area is bounded by Milwaukee Street, Fair Oaks Avenue, and Highways 51 and 30. The property hosts a number of small springs and foxes. One of the main landowners is discussing plans with the city to sell part of the property; surrounding residents and the Friends of Starkweather Creek Watershed are putting forward an environmentally friendly development plan for the area.

6. **Dempsey Ditch.** Running along Hangrove Street and Dempsey Road, the Dempsey Ditch is a concrete lined, open stormwater drainage ditch that drains much of the southern and far eastern parts of the watershed into the natural part of the creek. The manmade channel is dry for part of the year and might one day be the target for restoration to a more natural channel.

7. **Heritage Sanctuary Woods Conservation Area.** An 8.5-acre oak forest stand, Heritage Sanctuary offers a 0.5-mile trail hiking trail. Although the canopy is composed of oak trees, the wildflowers that make up the forest floor are consistent with those that would be found in a maple forest. May is the peak period of trillium bloom and an ideal time to visit.

8. **Eastmorland Park.** Eastmorland Park lies west and south of Woodman's Food Market. The park is used by residents of the Eastmorland neighborhood and also stores stormwater runoff from the neighborhood and Woodman's. Eastmorland Park also has a concrete channel to convey water through the area, and it may be targeted in the near future for restoration.

9. **Kennedy School Prairie Restoration.** Intended as a place to teach fifth-grade students about the environment in conjunction with the Arboretum's Earth Partnership Curriculum, the Kennedy School Prairie was restored six years ago at a cost of $1,000. Today, the prairie provides habitat to many native Wisconsin plants and also contains a number of community gardens.

10. **Lien Wetlands.** The Lien Wetlands lie along the East Branch of Starkweather Creek to the south of Lien Road. This area contains a remnant fen, peat mound, and emergent marshes along retention ponds built to store stormwater runoff. Nearly fifty species of wetland plants can be observed here.

11. **East Towne Mitigation Wetlands.** Created to mitigate wetlands lost during the construction of the East Towne Mall shopping complex, the East Towne Mall Wetlands accept runoff from the parking lots and rooftops on the East Towne property. The entire complex, which extends along East Springs Drive, contains springs and is one of the more pristine stretches of the creek.

12. **Carpenter Ridge Neighborhood Restoration.** In conjunction with the Carpenter Ridge neighborhood, members of the Friends of Starkweather Creek have been involved in restoration work along the West Branch of the Creek across from the Bridges Golf Course. This work involves removing invasive species and returning the creek banks to a more natural state.

13. **Elvehjem Sanctuary.** Connected to the Heritage Prairie and Elvehjem Park, this 9-acre sanctuary has 1.2 miles of trail and a Native American Mound. It is composed of a red oak–basswood forest and boasts exposed sandstone bedrock. Elvejhem Park has a shelter, tennis courts, playing fields, and a playground.

Walking trails

1. Olbrich Park, Botanical Gardens, and the North Platte

- Begin across from Olbrich Botanical Gardens on south side of Atwood Avenue at Olbrich Park. The mouth of the creek is at the edge of the park.
- Cross Atwood Avenue and enter Olbrich Botanical Gardens. Walk along the streambank walkway. Note the watershed signage near the bank.
- Exit Olbrich Botanical Gardens and walk north through the parking lot, across the Capital City Bike Trail and railroad tracks to the North Platte. Notice the large brick Garver Building.
- Walk east, past the Garver Cottage toward Starkweather Creek.
- Walk north along the creek and notice the wetland restoration (in progress). OB Sherry Park lies across the convergence of the two branches of the creek.
- Continue walking along the West Branch of Starkweather Creek through the wooded area of the North Platte.
- Cross South Fair Oaks Avenue. Two blocks north are rain gardens and rain barrels being used by residents.
- Return to south side of the Fair Oaks Avenue creek crossing and head northwest on the trail that follows the stream. On the left side of this trail is the MG&E Marsh.

2. Carpenter Ridgeway

The Carpenter Ridgeway neighborhood is north of East Washington Avenue off Carpenter Street.

- Follow the bike trail northeast toward the tree stands that line the creek.
- On the left side of the paved trail is a gravel trail that leads toward the creek through a wooded area that is being restored by the Friends of Starkweather Creek.
- Follow the creek side trail to the northeast. Across the creek lies Bridges Golf Course, built on a former garbage dump. Water seeping from this area is leaching organic pollutants from the soil into the creek.

Starkweather Creek Watershed Bike Trail

Approximately 15.5 miles long, the Starkweather Creek Watershed Bike Trail visits many natural and cultural landmarks that make the watershed a unique part of Madison. The trail follows the lake bike path for almost its entirety and focuses on the East Branch of the Creek. Signs mark the City bike path and should be followed except where noted.

- Starting point: Olbrich Gardens Graver Building and its intersection with the lake trail (1).
- Start heading east on the lake trail. Notice the Garver Building on the North Platte to the left.
- After crossing Dennett Drive, notice the Dempsey Ditch on either side of the trail (2).
- Continue on the lake trail and follow the trail signs until you reach the intersection of Lakeview Avenue and Buckeye Road; turn left on Buckeye Road.
- At Woodvale Avenue, turn left.
- At Academy Avenue, turn left off the path and continue two blocks to Acewood Pond (3).
- Return to Meadowlark Drive/Path via Eldorado Lane.
- To the right is Elvehjem Sanctuary Conservation Park (4).
- North of Twin Oaks Drive is Heritage Sanctuary Woods Conservation Park (5).
- At Milwaukee Street, turn right off the path and right at Lamplighter Way, where the Kennedy School Prairie Restoration is located (6).
- Return on Milwaukee Street to the path and turn right at Swanton Road.
- North Thompson Drive climbs the ridge that is the source of springs in wetlands along the East Branch (7).
- Zeier Road crosses the East Branch between Lien Road and East Springs Road.
- To the right of East Springs Road is the East Towne Mall Mitigation Wetlands (8).
- East Springs Drive circles around East Towne Mall, a major area of impervious surfaces in the watershed (9).
- Continue following path markers through Reindahl Park and MATC until Wright Street/Fair Oaks Avenue and continue south by turning left.
- At the junction of Fair Oaks Avenue and Milwaukee Street on the northeast corner is the Voit Property, one of the largest undeveloped areas in Madison (10).
- After crossing the East Branch, a small trail leads west to the MG&E Marsh (11).
- Continue on the trail back to the Garver Building and Olbrich Gardens.

Resources

Friends of Starkweather Creek
www.starkweatherfriends.org
For creek cleanups, canoeing/walking/bicycling advice, rain-garden building/monitoring assistance, and streambank-restoration projects.

City of Madison Engineering
✆ 608/266.4751 www.cityofmadison.com/engineering/
For rain-garden building/monitoring assistance, including grant and stormwater utility credit information.

Olbrich Botanical Gardens
✆ 608/246.4550 www.olbrich.org/
For vegetation, gardening, and environmental education activities.

Dane County Lakes and Watersheds Commission
✆ 608/224.3764 www.danewaters.com/
For creek and lake cleanups, watershed events, and education activities.

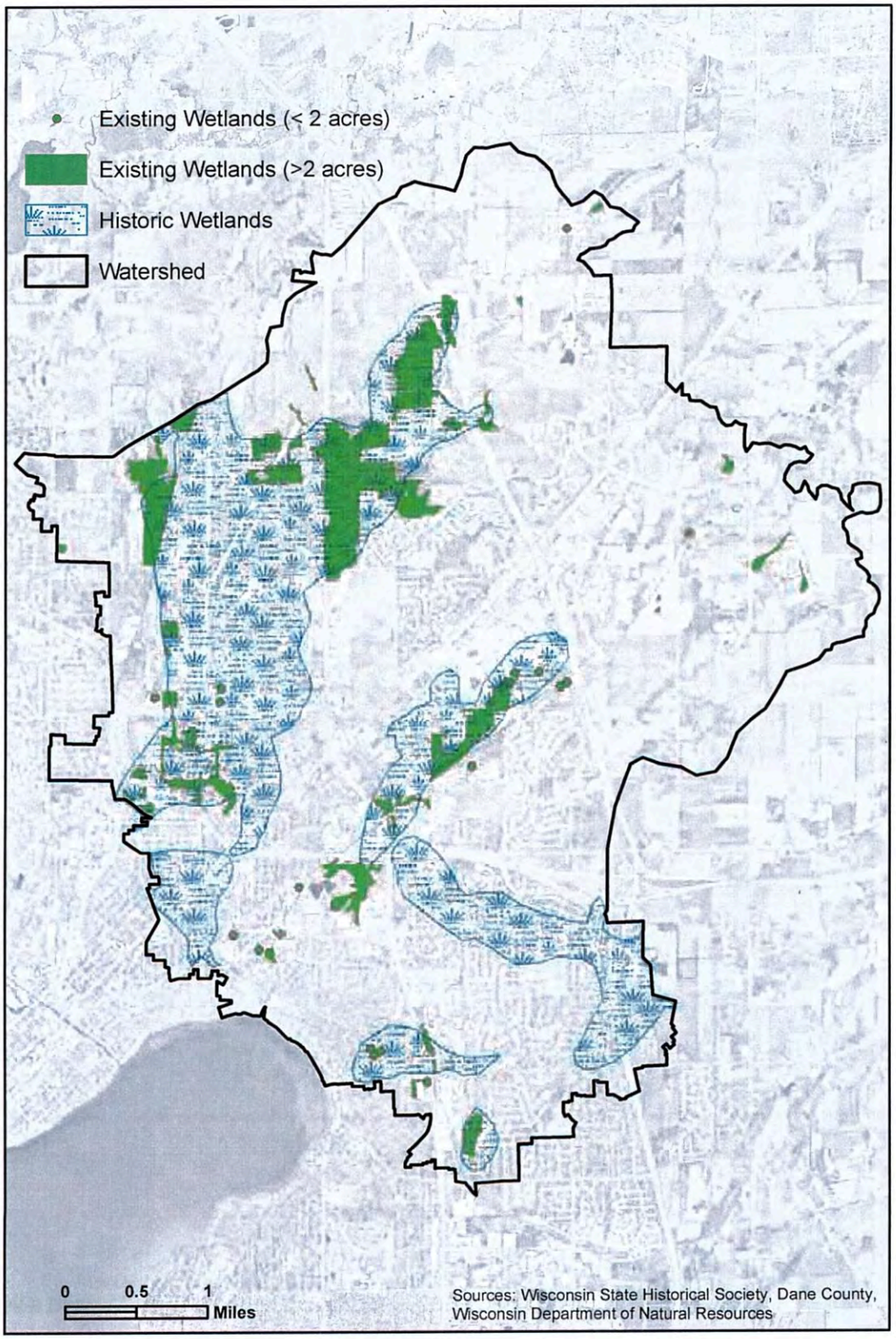


Figure 4-1. *Extent of wetlands loss within Starkweather Creek watershed.*

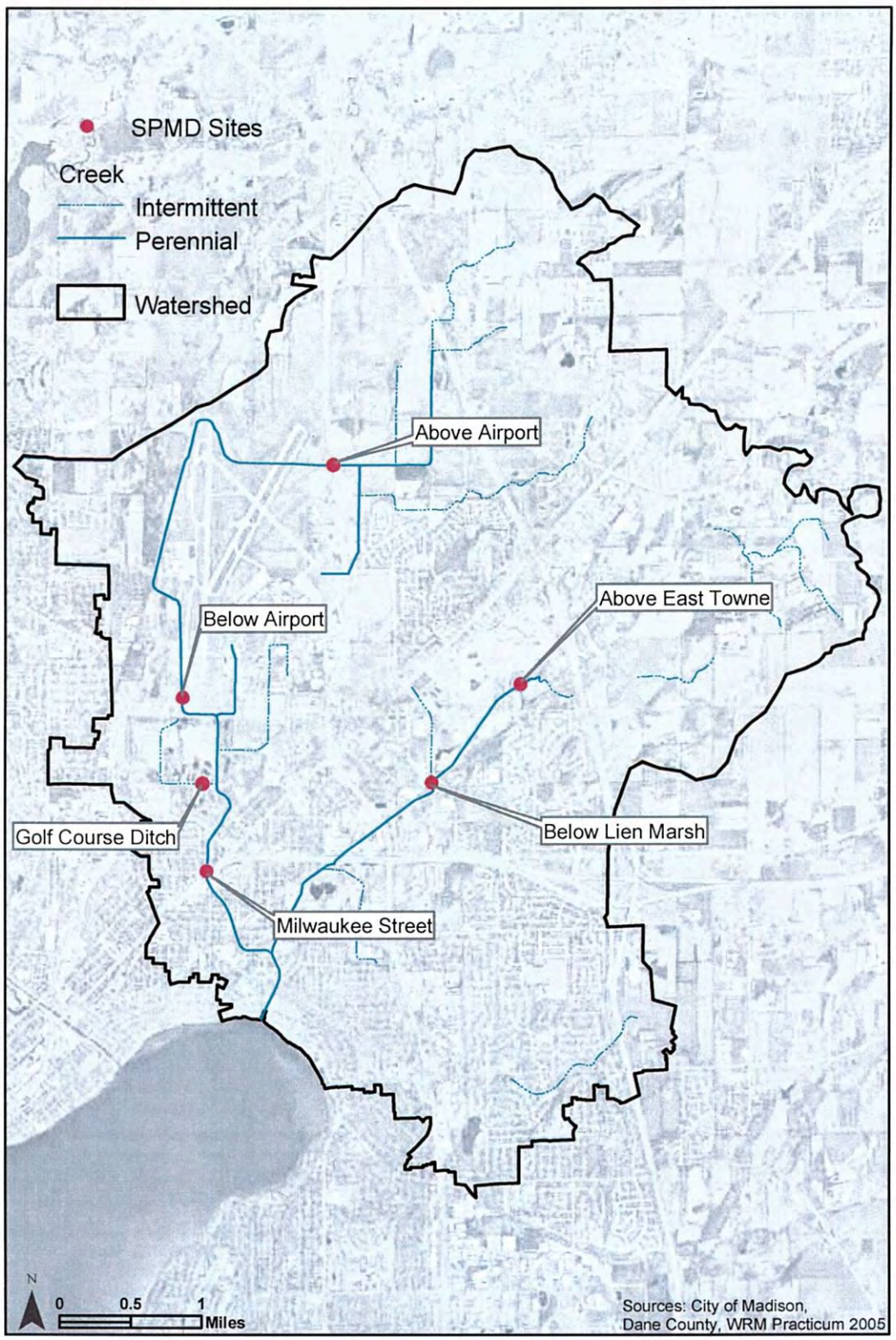


Figure B-1. *SPMD sampling sites.*

City of Madison

City of Madison
Madison, WI 53703
www.cityofmadison.com

Master

File Number: 50973

File ID: 50973 **File Type:** Resolution **Status:** Passed

Version: 4 **Reference:** **Controlling Body:** COMMON COUNCIL

Lead Referral: COMMON COUNCIL **File Created Date :** 03/20/2018

File Name: Substitute Comments to the Air National Guard as Part of the F-35 Operational Beddown Environmental Impact Statement **Final Action:** 04/17/2018

Title: AMENDED SUBSTITUTE - ~~Declaring the City of Madison Common Council's Intent to Submit Submitting Comments to~~ A Resolution on the Air National Guard ~~as Part of the~~ F-35 Operational Beddown Environmental Impact Statement.

Notes:

CC Agenda Date: 04/17/2018

Sponsors: Marsha A. Rummel, Rebecca Kemble, Ledell Zellers and Samba Baldeh **Effective Date:** 04/23/2018

Attachments: FINAL: F-35 EIS Comments 4_16_18.pdf, INFORMATIONAL: 2nd DRAFT F35A EIS Comment 4_9_2018.pdf, INFORMATIONAL: 1st DRAFT F35A EIS Comment 4_5_2018.pdf, 50973 v1.pdf, 50973 v2.pdf, 50973 v3.pdf **Enactment Number:** RES-18-00312

Author: Heather Allen, Council Legislative Analyst **Hearing Date:**

Entered by: lveldran@cityofmadison.com **Published Date:**

Approval History

Version	Date	Approver	Action
2	03/26/2018	Laura Larsen	Approve
3	04/17/2018	Laura Larsen	Approve
4	04/18/2018	Laura Larsen	Approve

History of Legislative File

Version:	Acting Body:	Date:	Action:	Sent To:	Due Date:	Return Date:	Result:
1	Council Office	03/20/2018	Referred for Introduction				
	Notes: Common Council (4/10/18)						

1	COMMON COUNCIL	03/20/2018	Refer to a future Meeting to Adopt	COMMON COUNCIL	04/17/2018	Pass
	Notes: Adopt 4/10/2018					
2	COMMON COUNCIL	04/10/2018	Refer to a future Meeting to Adopt	COMMON COUNCIL	04/17/2018	Pass
2	COMMON COUNCIL	04/17/2018	Place On File Without Prejudice			Fail
4	COMMON COUNCIL	04/17/2018				
4	COMMON COUNCIL	04/17/2018	Amend the Substitue			Pass
	Notes:					
4	COMMON COUNCIL	04/17/2018	Adopt Substitute As Amended			Pass
	Notes:					

Text of Legislative File 50973

Fiscal Note

No fiscal impact.

Title

AMENDED SUBSTITUTE - ~~Declaring the City of Madison Common Council's Intent to Submit Submitting Comments to~~ A Resolution on the Air National Guard ~~as Part of the~~ F-35 Operational Beddown Environmental Impact Statement.

Body

WHEREAS, the Air National Guard has operated a base at Truax Field since the late 1940s, has over five hundred full time personnel and a $99.3 Million local annual economic impact; and,

WHEREAS, Truax Field is located at the Dane County Regional Airport; and,

WHEREAS, the 115th Fighter Wing located at Truax Field conducts state and federal missions including responses to natural disasters and catastrophic events, completes approximately 3000 flights per year, and has executed 5 combat deployments over the past 10 years; and,

WHEREAS, the 115th Fighter Wing provides Fire, Crash and Rescue service for Dane County Regional Airport; and,

WHEREAS, on February 7, 2018, the Air National Guard issued a Notice of Intent to Prepare an Environmental Impact Statement for F-35 Operational Beddown; and,

WHEREAS, the proposed F-35A aircraft would replace the F-16 aircraft located at Truax Field; and,

WHEREAS, the Air National Guard has selected Truax Field in Madison as one of two of five alternative installations for a squadron of 18 F-35A aircraft and two backup aircraft; and,

WHEREAS, **after hearing concerns from residents, City of Madison** Alders from the North and East ~~S~~**sides** of Madison organized a public listening session on February 28th at the East Side Community Center to discuss the proposal; and,

WHEREAS, Alders and community residents attended the Air National Guard scoping meeting on March 8th at the Crown Plaza; and,

WHEREAS, some residents are looking forward to the F-35 Beddown, others have expressed concerns and questions about the potential **environmental** impacts of the F-35 operations at the Truax Field in Madison; and,

WHEREAS, the Alders have collected information and comments related to the **environmental concerns regarding the** F-35 Beddown**; and**,

~~WHEREAS, no other representative governmental body has weighed in on the scope of the EIS on behalf of residents living in the vicinity of Truax Field,~~

~~NOW, THEREFORE BE IT RESOLVED that the City of Madison Common Council intends authorizes Common Council President Marsha Rummel to submit comments the environmental concerns raised by residents at the February 28, 2018 listening session and in follow-up communications to the Air National Guard as part of the F-35 Operational Beddown Environmental Impact Statement; and,~~

BE IT FURTHER RESOLVED that ~~the City of Madison Common Council will submit comments based on the feedback from Madison residents. Those~~ **the** questions and comments ~~**submitted**~~ collected by Alders include but are not limited to the: 1) flight paths and plans, 2) the noise impacts especially on low-income neighborhoods and vulnerable communities, 3) the environmental impacts of operations and maintenance of the F-35s including air pollution and runoff into Starkweather Creek, and 4) safety concerns related to crashes and munitions; and,

BE IT FURTHER RESOLVED that the City of Madison Common Council believe that community involvement is important; and,

BE IT FINALLY RESOLVED, that the City of Madison Common Council will remain engaged throughout the entire Environmental Impact Statement process to ensure that residents are represented in the decision making process.

City of Madison

City of Madison
Madison, WI 53703
www.cityofmadison.com

Master

File Number: 57364

File ID:	57364	**File Type:** Resolution	**Status:** Passed
Version:	9	**Reference:**	**Controlling Body:** Council Office
Lead Referral:	COMMON COUNCIL		**File Created Date :** 09/03/2019
File Name:	Responding to the Draft Environmental Impact Statement (EIS) for the Air National Guard F-35A Operational Beddown.		**Final Action:** 09/17/2019
Title:	FINAL LANGUAGE ADOPTED BY COUNCIL - Responding to the Draft Environmental Impact Statement (EIS) for the Air National Guard F-35A Operational Beddown.		
Notes:			
			CC Agenda Date: 09/17/2019
Sponsors:	Barbara Harrington-McKinney, Sheri Carter, Christian A. Albouras, Shiva Bidar, Keith Furman, Arvina Martin and Donna V. Moreland		**Effective Date:** 09/23/2019
Attachments:	Final Language Adopted by Council.pdf, Draft_F-35A_EIS_Executive_Summary_August_2019.pdf, 9/10/19 F35 EIS City Staff Analysis.pdf, Draft Analysis of Impediments to Fair Housing Report.pdf, 8/3/19-9/14/19 F35 Emails_All Alders_D6_D15.pdf, 9/15/19 F35 Emails_All Alders_D6_D15.pdf, 9/16/19 F35 Emails_All Allder_D6_D15.pdf, 9/17/19 F35 Emails_All Allder_D6_D15.pdf, 57364 v1.pdf, 57364 v3 Alternate.pdf, 57364 v4 Substitute.pdf, 57364 v5, 57364 version 6.pdf, 57364 version 7.pdf, 57364 version 8 tracking all changes.pdf		**Enactment Number:** RES-19-00588
Author:			**Hearing Date:**
Entered by:	lveldran@cityofmadison.com		**Published Date:**

Approval History

Version	Date	Approver	Action
2		Elizabeth York	Approve
3		Elizabeth York	Approve
4		Elizabeth York	Approve

History of Legislative File

Ver-sion:	Acting Body:	Date:	Action:	Sent To:	Due Date:	Return Date:	Result:
1	Council Office	09/03/2019	Referred for Introduction				
	Notes: Common Council (9/17/19)						
1	COMMON COUNCIL	09/03/2019	Refer to a future Meeting to Adopt	COMMON COUNCIL		09/17/2019	
	Notes: Adopt 9/17/19						
4	COMMON COUNCIL	09/17/2019	Adopt Substitute				
3	COMMON COUNCIL	09/17/2019	Substitute the Alternate as the Main Motion				Pass
	Notes:						
3	COMMON COUNCIL	09/17/2019	Amend Alternate				
5	COMMON COUNCIL	09/17/2019	Amend Alternate				Pass
6	COMMON COUNCIL	09/17/2019	Amend Alternate				Pass
7	COMMON COUNCIL	09/17/2019	Amend Alternate				Fail
7	COMMON COUNCIL	09/17/2019	Amend Alternate				Pass
8	COMMON COUNCIL	09/17/2019	Amend Alternate				Fail
8	COMMON COUNCIL	09/17/2019	A vote was taken on the motion to adopt.				Pass

Text of Legislative File 57364

Fiscal Note

There is no fiscal impact by approving this resolution.

Title

FINAL LANGUAGE ADOPTED BY COUNCIL - Responding to the Draft Environmental Impact Statement (EIS) for the Air National Guard F-35A Operational Beddown.

Body

WHEREAS, on December 7, 2016, the US Air Force announced <https://www.af.mil/News/Article-Display/Article/1022605/air-force-releases-candidate-installations-for-next-f-35a-bases/> that the 115th Fighter Wing, Madison, Wisconsin; the 124th Fighter Wing, Boise, Idaho; the 125th Fighter Wing, Jacksonville, Florida; the 127th Wing, Harrison Township, Michigan; and the 187th Fighter Wing, Montgomery, Alabama were the five locations under consideration for the Air National Guard F-35A 5th and 6th Operation Beddowns; and,

WHEREAS, on December 21, 2017, the US Air Force announced the selection of the 115th Fighter Wing, Madison, Wisconsin as one of two preferred alternatives; and,

WHEREAS, on February 7, 2018, the Notice of Intent <http://www.angf35eis.com/Resources/Documents/NOI.pdf> to prepare an Environmental Impact Statement (EIS) was published in the Federal Register; and,

WHEREAS, on February 28, 2018, alderpersons representing residents living in close proximity to Truax Field organized a listening session at the East Madison Community Center at Truax to

hear the comments and concerns of community members; and,

WHEREAS, on March 8, 2018, alderpersons and more than 350 community residents attended the Air National Guard scoping meeting at the Crown Plaza Hotel; and,

WHEREAS, residents who submitted public comments during the scoping phase were overwhelmingly supportive of the basing, with 445 comments in support versus 115 expressing concerns; and,

WHEREAS, on April 16, 2018, alderpersons submitted comments <https://madison.legistar.com/View.ashx?M=F&ID=6200867&GUID=29B2B4A9-2515-4EA0-8AB5-B4D023F5AAF9> to the Air National Guard through Ms. Christel Johnson, Environmental Engineer, based on resident feedback obtained at the February 28, 2018 listening session, information gleaned at the March 8, 2018 scoping meeting, as well as comments received by other members of the Madison Common Council; and,

WHEREAS, on April 23, 2018, the Madison Common Council enacted RES-18-00312 <https://madison.legistar.com/LegislationDetail.aspx?ID=3481565&GUID=0E61D85F-F70C-4C99-9F5C-5B747E77A540&Options=ID%7CText%7C&FullText=1> - *"A Resolution on the Air National Guard F-35 Operational Beddown Environmental Impact Statement"*, concluding, "and, BE IT FINALLY RESOLVED, that the City of Madison Common Council will remain engaged throughout the entire Environmental Impact Statement process to ensure that residents are represented in the decision making process"; and,

WHEREAS, on August 9, 2019, the Notice of Availability <http://www.angf35eis.com/Resources/Documents/Notice_of_Availability.pdf> for the Draft EIS was published in the Federal Register and the Draft EIS was released for public comment; and,

WHEREAS, the Draft EIS analyzes the potential environmental impacts associated with the US Air Force proposed beddown of F-35A aircraft at two of five alternative Air National Guard (ANG) locations; and,

WHEREAS, the Draft EIS estimates that construction required to support the F-35A beddown at Truax Field would bring in between $90 and $120 million of new construction activity, creating 315-420 construction jobs; and,

WHEREAS, the Draft EIS estimates that the current Active Duty Associate Unit would increase by up to 29 positions, and 35 new personnel would be added to provide security and contract oversight; and,

WHEREAS, the Draft EIS concludes that the resulting increases in employment and income to the Madison region would be 'beneficial but negligible'; and,

WHEREAS, the Draft EIS states that under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft, resulting in no additional significant

impacts to socioeconomics; and,

WHEREAS, the Draft EIS states that the Proposed Action would result in an overall increase in the off-airport area affected by noise levels greater than 65 dB DNL by approximately 1,320 acres, the largest affected landmass of all five alternative locations; and,

WHEREAS, the Draft EIS states that approximately 199 acres of residential land use would be included in the 65-75 dB DNL contours, rendering this acreage potentially incompatible for residential use and considered a 'significant impact'; and,

WHEREAS, the Draft EIS states that under the proposed action, 1,019 households and 2,215 people will fall within the 65-70 dB DNL contour, considered potentially incompatible with residential use and eligible for noise mitigation; and,

WHEREAS, the Draft EIS states that additionally, 132 households and 292 people would be located in the 70-75 DNL contour where housing is incompatible absent an exception, the largest number of households and people affected at this level of all five alternative locations; and,

WHEREAS, the Draft EIS states that peak noise levels within the 70-75 DNL contour could reach 116 dB; and,

WHEREAS, the Draft EIS states that several census blocks with the expected changes in off-base noise contours have higher proportions of children and include five newly exposed childcare centers; and,

WHEREAS, the Draft EIS states that the causation of speech interference at schools with increased noise levels may hinder the ability of students (including low-income and minority students) to learn, which would constitute an adverse impact to children to include low-income and minority children; and,

WHEREAS, the Draft EIS states that recent studies on school children indicate a potential link between aircraft noise and both reading comprehension and learning motivation; and,

WHEREAS, the Draft EIS cites the Road Traffic and Aircraft Noise Exposure and Children's Cognition and Health (RANCH) study (Stansfeld et al. 2005; Clark et al. 2005), which found a linear relation between chronic aircraft noise exposure and impaired reading comprehension and recognition memory; and,

WHEREAS, the Draft EIS states that therefore, impacts to children associated with the Proposed Action would be considered disproportionate and significant; and,

WHEREAS, the Draft EIS states that several census block groups associated with the expected changes in off-base noise contours associated with the proposed F-35A beddown at

the 115 Fighter Wing installation are considered to be disproportionately low-income or minority areas; and,

WHEREAS, the Draft EIS states that impacts to environmental justice associated with the Proposed Action would be considered significant; and,

WHEREAS, 'Environmental Constraints' was one of the primary screening criteria used to identify the alternatives for F-35A beddown, stating "the alternative location should be able to: meet the local community's zoning or other land use controls adopted to limit encroachment and protect the public's health, safety, and welfare;" and that the alternative should "have an absence or limited amount of noise-sensitive development located in areas near the airport/installation that are exposed to Day-Night Average Sound Levels (DNL) at and above 65 decibels (dB) and considered by the Federal Aviation Administration (FAA) and DoD as incompatible land uses (USAF 1999; 14 CFR Part 150)"; and,

WHEREAS, the National Environmental Policy Act (NEPA) Sec. 101 [42 USC § 4331] (b) states, "it is the continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may... assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings [and]...attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences"; and,

WHEREAS, Executive Order 12898 <https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf> states that, "To the greatest extent practicable and permitted by law...each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations"; and,

WHEREAS, US Air Force rules <https://www.govinfo.gov/content/pkg/CFR-2017-title32-vol6/pdf/CFR-2017-title32-vol6-sec989-35.pdf> require that, "During the preparation of environmental analyses under this instruction, the EPF should ensure compliance with the provisions of *E.O. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, and *Executive Memorandum of February 11, 1994, regarding E.O. 12898*"; and,

WHEREAS, the Draft EIS states that the USAF does not have authority to expend appropriated funds to mitigate the noise effects on facilities that are not under the direct control of the USAF; and,

WHEREAS, the Draft EIS states that the FAA Part 150 program <https://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=18114> provides a voluntary process an airport sponsor can use to mitigate significant noise impacts from airport users and that, "it is important to note that the Part 150 program is not a guarantee that sound mitigation or abatement will take place"; and,

WHEREAS, according to Lt. Col. Statz of the Air National Guard, under the FAA Part 150 program, properties in the affected areas will only be eligible for abatement and mitigation after the full transition from F-16s to F-35s is complete, a minimum of two years after the introduction of the F-35s; and,

WHEREAS, a City of Madison staff analysis <https://www.cityofmadison.com/mayor/documents/F35%20EIS%20staff%20analysis%209-10-19.pdf> of the Draft EIS concludes that, "While the EIS acknowledges it has a disproportional impact on persons of color, its methodology results in this issue being understated"; and,

WHEREAS, the City of Madison analysis states that, "there are several concentrations of poverty and persons of color just outside the 65 db contour, including the CDA Truax housing, CDA Webb-Rethke townhomes and other housing near Worthington Park, and near the intersection of Packers Avenue and Northport Drive. While these areas will experience virtually identical noise exposure as residents who live on the contour line, they will not be eligible for federal sound mitigation funding through the Noise Compatibility Program."; and

WHEREAS, the City of Madison analysis states that, "Soundproofing may not be an option for the mobile home park on Packers Avenue, which is in the current 65 db contour and would remain in the impacted area with the potential arrival of F35s. It appears the FAA considers mobile homes non-permanent structures and therefore does not allow soundproofing as a mitigation option."; and,

WHEREAS the City of Madison analysis states that, "...the City of Madison would have no official role in any potential noise mitigation study or program. The inability for the City to act on behalf of its residents and in the best interest of City-owned housing is a concern."; and,

WHEREAS the City of Madison analysis states that, "The Department of Defense and the Air National Guard cannot safely and legally perform the planned construction activities without a complete site investigation that defines the extent and nature of PFAs contamination in soil and groundwater. The WDNR will require a materials management plan for any areas of the base impacted by construction, describing how excavated soil and dewatering will be managed. The 115 FW does not have enough information presently to do this."; and,

WHEREAS, Madison is experiencing pronounced, well-documented, and long-term crises in affordable housing and racial inequity; and,

WHEREAS, tens of millions of dollars in public investment have been made in 231 CDA-owned affordable housing units bordering the 65 dB DNL noise contour at Truax Park and Worthington Park, and also in an additional 80 subsidized low-income units at Rethke Terrace; and,

WHEREAS, Madison's 2020 Executive Capital Budget calls for an investment of $1.1 billion to prioritize Affordable Housing, Transportation, Sustainability, and Equity; and,

WHEREAS, the 2020 Executive Capital Budget calls for a $125M investment in the

development of Bus Rapid Transit for the Madison Region to improve the capacity of our transportation system and as a catalyst for economic development along the proposed BRT routes; and,

WHEREAS, the proposed east route runs directly through the area most impacted by the proposed action, including three proposed BRT stations within or adjacent to the area expected to be incompatible with residential use; and,

WHEREAS, the potential for Transit-Oriented Development in that area will therefore be significantly diminished; and,

WHEREAS, on September 11, 2019 Alders Abbas, Foster and Rummel hosted a listening session for people living within the 65dB DNL noise contour attended by more than 300 residents from the affected area and its immediate environs; and,

WHEREAS, residents who spoke and submitted comments were overwhelmingly opposed to the siting of the F-35s in Madison, citing concerns about the health and safety of children, the disproportionate impacts of noise and water pollution on people of color and people with low incomes, property values, property tax base values and the livability of their neighborhoods; and,

WHEREAS, on September 12, 2019, the National Guard Bureau held an open house, formal presentation and public listening session at the Alliant Energy Center where 650 residents attended; and,

WHEREAS, comments at the public listening session by residents, community and business leaders, expressed a mixture of support and opposition to the beddown of the F-35s with the 115th Fighter Wing; and,

WHEREAS, according to a 2015 UW-Extension Study, the total economic impact of Truax Field to the greater Madison area is at least $99.2 million each year and supports more than 1,293 on-site jobs; and,

WHEREAS, it is unclear what the future of the 115th Fighter Wing and Truax Field would be once F-16s are retired and aren't replaced by F-35s; and,

WHEREAS WI Statute 62.11(5) <https://docs.legis.wisconsin.gov/document/statutes/62.11(5)> directs that "the council...shall have power to act for the government and good order of the city, for its commercial benefit, and for the health, safety, and welfare of the public",

NOW THEREFORE BE IT RESOLVED, that the Madison Common Council recognizes that the impacts described in the Draft EIS would substantially reduce the quality and quantity of current affordable housing stock, decrease the value of the property tax base, reduce opportunities for Transit-Oriented Development, disproportionately affect residents who are low income and people of color, and children, and are contrary to the City of Madison's values of equity, sustainability, health and adaptability as codified in our Comprehensive Plan adopted in

2018 <https://www.cityofmadison.com/dpced/planning/documents/Part1_ComprehensivePlan.pdf> the City's Racial Equity and Social Justice Initiative <https://madison.legistar.com/LegislationDetail.aspx?ID=1737326&GUID=CAF0563E-DD7F-46EB-9009-F434F7FD2B93&Options=ID%7CText%7C&Search=Racial%2BEquity%2Band%2BSocial%2BJustice%2BInitiative>, and undermine multiple long-term goals of City policy makers and; and,

BE IT FURTHER RESOLVED, that the Madison Common Council requests that the Air National Guard reconsiders the selection of Truax Field as a preferred location until and unless the findings of the EIS are shown to misrepresent the significant environmental impacts to those living, working, and visiting the north and east sides of Madison; and,

BE IT FINALLY RESOLVED, that the Madison City Clerk send a copy of this resolution to the F-35A EIS Project Manager, Secretary of the Air Force, US Senators Tammy Baldwin and Ron Johnson, Congressman Mark Pocan, Wisconsin Governor Tony Evers, Wisconsin Senators Miller, Risser, Erpenbach, Wisconsin Assembly Representatives Sargent, Taylor, Hesselbein, Anderson, Subeck, Stubbs and Heibl, the Dane County Board & County Executive Parisi, and Dane County Airport Commission.

Comment Details

Name	Marsha Rummel
Email Address	district6@cityofmadison.com
Comment	The Madison School Board passed a resolution 9/23/19 that warns that the cost to soundproof the three affected schools if the jets are located here and the effect on property values of homes within the 65 decibel noise contour, could have an impact on the district's tax base, decrease school enrollment in the affected area, and disproportionately affect children and families of color and people with low incomes," the resolution states. Considering how vulnerable children are to noise impacts, why didn't the draft EIS include Hawthorne and Sandburg Elementary on any of its noise contour maps? Why did the draft EIS say impacts on property values would be neglible? Marsha Rummel, Madison Common Council, District 6.
Organization	City of Madison Common Council
Address 1	1029 Spaight St
Address 2	6C
City	Madison
State	WI
Postal Code	53703
Phone Number	6087724555
Mailing List?	Yes
Wants CD?	Yes
Withhold Name?	No
Withhold Address?	No
Date Received	9/24/2019 10:23:43 PM EDT

Comment Details

Name	Marsha Rummel
Email Address	district6@cityofmadison.com
Comment	NEPA legislation established the responsibility of each Federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low income populations ....". I believe the scoping and draft F-35A public meetings failed to meet federal NEPA standards by doing inadequate outreach to the most affected communities in proximity to Truax. I was told that flyers were posted at nearby gas stations/convenience stores and no transportation was arranged for nearby impacted residents to attend the open house at the Crowne Plaza. I support the request of State Rep Chris Taylor to extend the comment period 60 days to conduct another public meeting at Madison College campus at Truax and provide Spanish and Hmong interpreters and childcare. What is the protocol for outreach to achieve environmental justice goals? Marsha Rummel City of Madison Common Council District 6
Organization	City of Madison Common Council
Address 1	1029 Spaight St
Address 2	6C
City	Madison
State	WI
Postal Code	53703
Phone Number	6087724555
Mailing List?	No
Wants CD?	No
Withhold Name?	No
Withhold Address?	No
Date Received	9/24/2019 10:49:12 PM EDT

From:	Kemble, Rebecca
To:	usaf.jbanafw.ngb-a4.mbx.a4a-nepa-comments@mail.mil
Subject:	[Non-DoD Source] Request for extension of comment period and revised EIS
Date:	Wednesday, September 25, 2019 4:01:28 PM
Attachments:	Letter to Secretary of the Air Force and Ortiz.doc

Dear Mr. Ortiz:

Please see the attached letter I sent to the Acting Secretary of the Air Force requesting an extension of the comment period and a revised EIS related to the 5th and 6th F-35A operation beddowns for the Truax Air National Guard base in Madison Wisconsin. Please consider this an official comment within the EIS process and add it to the administrative record.

I will be sending more specific comments regarding the substance of the EIS shortly.

Thanks you for your consideration,

Rebecca Kemble
District 18 Alder
Madison Common Council
608 347-8097

Comment Details

Name	Marsha Rummel
Email Address	district6@cityofmadison.com
Comment	The F-35A draft EIS is missing information, including information required by NEPA, as compared to Burlington VT's EIS. Both bases are Guard bases and there would not seem to be any reason for information to be withheld from Madison that was provided to Burlington. For example the draft EIS RE Socio-economic impacts says: "There would be no significant impacts to socioeconomics." The 115th FW F-35A EIS lacks an analysis of regional impact - for example on property tax base and revenue. City, county, state and federal decision-makers, and local residents deserve the benefit of a full analysis and it is also required by law. Will the Air Force provide this analysis, as it did with Burlington? Other information we are missing includes the exact acreage and the exact number of people living in the noise contour, both baseline and proposed - with F16s and F35As. Of these numbers, how many are “minority” people, how many are low income people. The draft just relates number of houses or households. How many children are affected, as residents and as attendees at schools and daycare centers in the area? Will the final EIS provide information on the specific health effects of this level of noise on both children and adults? These effects are present whether people like the noise or not and some of the effects persist even if exposure stops. Will the final EIS provide more details? Marsha Rummel City of Madison Common Council District 6
Organization	City of Madison Common Council
Address 1	1029 Spaight St
Address 2	6C
City	Madison
State	WI
Postal Code	53703
Phone Number	6087724555
Mailing List?	Yes
Wants CD?	Yes
Withhold Name?	No
Withhold Address?	No
Date Received	9/25/2019 11:24:49 PM EDT

Comment Details

Name	Marsha Rummel
Email Address	district6@cityofmadison.com
Comment	The draft F-35A EIS states "There is no training requirement for F-35A pilots to utilize afterburner on take-offs" and says that in training runs, afterburner use is required only in "rare cases". From what I have heard during discussion of the the EIS in Madison, pilots need to train using a plane as they would in actual combat missions, and thus would need to substantially train with afterburner use (otherwise they would be left without skills essential to combat missions). Statements by Air Force officials seem to confirm this. Will the final EIS address this inconsistency? Madison residents have also been told by WANG command staff that simulator training would replace some % of training flights. Will the final EIS clarify how much time pilots will train with and without afterburners and how much time they use simulators as a % of flights and training? Marsha Rummel City of Madison Common Council District 6
Organization	City of Madison Common Council
Address 1	1029 Spaight St
Address 2	6C
City	Madison
State	WI
Postal Code	53703
Phone Number	6087724555
Mailing List?	Yes
Wants CD?	Yes
Withhold Name?	No
Withhold Address?	No
Date Received	9/25/2019 11:34:55 PM EDT

Office of the Common Council
Ald. Grant Foster, District 15
City-County Building, Room 417
210 Martin Luther King, Jr. Boulevard
Madison, Wisconsin 53703
Phone (608) 266-4071
Fax (608) 267-8669
district15@cityofmadison.com
www.cityofmadison.com/council/district15

September 26, 2019

The Hon. Matthew P. Donovan
Acting Secretary
United States Air Force
1670 Air Force Pentagon
Washington, DC 20330-1670

Dear Acting Secretary Donovan:

I'm writing regarding the Draft EIS for the F-35A operation beddown at Truax Air National Guard Base in Madison, Wisconsin. I represent District 18 on the Madison Common Council, which is in close proximity to the base.

Please consider this a formal request to extend the comment period for an additional 60 days, as well as a request for the preparation of a revised Draft EIS for Truax.

Sixty Day Extension Request

According to the Title 32 (National Defense) Code of Federal Regulations (CfR) §989.33 (Environmental justice): "During the preparation of environmental analyses…the EPF should ensure compliance with the provisions of E.O. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and Executive Memorandum of February 11, 1994, regarding E.O. 12898. Further, CfR PART 989—Environmental Impact Analysis Process (EIAP) states that during the Draft EIS process, "Where analyses indicate that a proposed action will potentially have disproportionately high and adverse human health or environmental effects on minority populations or low-income populations, the EPF should make special efforts to ensure that these potentially impacted populations are brought into the review process."

The Draft EIS states that impacts to environmental justice associated with the Proposed Action would be considered significant, and yet no special efforts were made to ensure that these potentially impacted populations were brought into the review process. The recent Draft EIS Open House was held 9 miles distant from the impacted area making it extremely difficult for most of the low-income, transit dependent people who live within the 65 dB noise contour to attend.

During the EIS scoping Open House held at the Crowne Plaza hotel on March 8, 2018 my Council colleagues specifically requested that efforts be made to reach out to those living in low-income housing in close proximity to the base. We were told that the Air Force would only host two meetings: the scoping Open House and the Draft EIS Open House and that no special efforts would be made to do any other form of outreach.

Furthermore, materials have all been presented in English. Schools located just outside the 65 dB

noise contour that serve children who live within the contour have a student population of 37% English Language Learners. This means their non-English speaking families who will be most impacted have not had access to this vital information.

I'm therefore requesting a 60 day extension to the comment period so that local officials and community members can do the outreach and share the information in the Draft EIS with the most impacted populations - something the Air Force has thus far failed to do.

Revised EIS Request

Many of our elected officials at the municipal, state and federal level have communicated concerns and questions to you and the EIS Program Manager Mr. Ortiz. Among them are US Sen. Tammy Baldwin, US Rep Mark Pocan, State Reps Chris Taylor and Melissa Sargent, and Madison Mayor Satya Rhodes-Conway.

Just this week the Madison Metropolitan School District Board of Education sent a letter of concern regarding the potential noise impacts on school children, and the Madison Water Utility Board sent a statement about the ongoing PFAs contamination issues on site at Truax indicating that there are many unanswered question about the Air Force's willingness and ability to further study and remediate the already existing soil and water pollution.

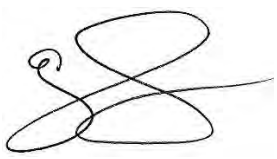
In my formal comments to Mr. Ortiz I listed a number of areas of missing information that require further investigation. Among them are:

- The lack of a study on the impact on property values and property taxes within the 65 dB noise contour
- The lack of realistic modeling concerning afterburner use
- The lack of peak and Lmax dB data for both F-16C and F-35A aircraft in both military power and with afterburner use
- Given the large number of daycares in the area where young children nap, the lack of Probability of Awakening data for the hours between 7am and 10pm
- The lack of safety data for current F-16C operations

For these reasons I'm requesting that a revised EIS be prepared which would address all of these outstanding issues.

Thank you very much for your consideration of these requests.

Sincerely,



Grant Foster

Cc: Mr. Ramon Ortiz, NGB/A4AM, 3501Fetchet Avenue, Joint Base Andrews MD 20762-5157

City of Madison

City of Madison
Madison, WI 53703
www.cityofmadison.com

Certified Copy

Resolution: RES-19-00588

File Number: 57364 **Enactment Number: RES-19-00588**

FINAL LANGUAGE ADOPTED BY COUNCIL - Responding to the Draft Environmental Impact Statement (EIS) for the Air National Guard F-35A Operational Beddown.

WHEREAS, on December 7, 2016, the US Air Force announced <https://www.af.mil/News/Article-Display/Article/1022605/air-force-releases-candidate-installations-for-next-f-35a-bases/> that the 115th Fighter Wing, Madison, Wisconsin; the 124th Fighter Wing, Boise, Idaho; the 125th Fighter Wing, Jacksonville, Florida; the 127th Wing, Harrison Township, Michigan; and the 187th Fighter Wing, Montgomery, Alabama were the five locations under consideration for the Air National Guard F-35A 5th and 6th Operation Beddowns; and,

WHEREAS, on December 21, 2017, the US Air Force announced the selection of the 115th Fighter Wing, Madison, Wisconsin as one of two preferred alternatives; and,

WHEREAS, on February 7, 2018, the Notice of Intent <http://www.angf35eis.com/Resources/Documents/NOI.pdf> to prepare an Environmental Impact Statement (EIS) was published in the Federal Register; and,

WHEREAS, on February 28, 2018, alderpersons representing residents living in close proximity to Truax Field organized a listening session at the East Madison Community Center at Truax to hear the comments and concerns of community members; and,

WHEREAS, on March 8, 2018, alderpersons and more than 350 community residents attended the Air National Guard scoping meeting at the Crown Plaza Hotel; and,

WHEREAS, residents who submitted public comments during the scoping phase were overwhelmingly supportive of the basing, with 445 comments in support versus 115 expressing concerns; and,

WHEREAS, on April 16, 2018, alderpersons submitted comments <https://madison.legistar.com/View.ashx?M=F&ID=6200867&GUID=29B2B4A9-2515-4EA0-8AB5-B4D023F5AAF9> to the Air National Guard through Ms. Christel Johnson, Environmental Engineer, based on resident feedback obtained at the February 28, 2018 listening session, information gleaned at the March 8, 2018 scoping meeting, as well as comments received by other members of the Madison Common Council; and,

WHEREAS, on April 23, 2018, the Madison Common Council enacted RES-18-00312 <https://madison.legistar.com/LegislationDetail.aspx?ID=3481565&GUID=0E61D85F-F70C-4C99-9F5C-5B747E77A540&Options=ID%7CText%7C&FullText=1> - *"A Resolution on the Air National Guard F-35 Operational Beddown Environmental Impact Statement"*, concluding, "and, BE IT FINALLY RESOLVED, that the City of Madison Common Council will remain engaged throughout the entire Environmental Impact

Statement process to ensure that residents are represented in the decision making process"; and,

WHEREAS, on August 9, 2019, the Notice of Availability <http://www.angf35eis.com/Resources/Documents/Notice_of_Availability.pdf> for the Draft EIS was published in the Federal Register and the Draft EIS was released for public comment; and,

WHEREAS, the Draft EIS analyzes the potential environmental impacts associated with the US Air Force proposed beddown of F-35A aircraft at two of five alternative Air National Guard (ANG) locations; and,

WHEREAS, the Draft EIS estimates that construction required to support the F-35A beddown at Truax Field would bring in between $90 and $120 million of new construction activity, creating 315-420 construction jobs; and,

WHEREAS, the Draft EIS estimates that the current Active Duty Associate Unit would increase by up to 29 positions, and 35 new personnel would be added to provide security and contract oversight; and,

WHEREAS, the Draft EIS concludes that the resulting increases in employment and income to the Madison region would be 'beneficial but negligible'; and,

WHEREAS, the Draft EIS states that under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft, resulting in no additional significant impacts to socioeconomics; and,

WHEREAS, the Draft EIS states that the Proposed Action would result in an overall increase in the off-airport area affected by noise levels greater than 65 dB DNL by approximately 1,320 acres, the largest affected landmass of all five alternative locations; and,

WHEREAS, the Draft EIS states that approximately 199 acres of residential land use would be included in the 65-75 dB DNL contours, rendering this acreage potentially incompatible for residential use and considered a 'significant impact'; and,

WHEREAS, the Draft EIS states that under the proposed action, 1,019 households and 2,215 people will fall within the 65-70 dB DNL contour, considered potentially incompatible with residential use and eligible for noise mitigation; and,

WHEREAS, the Draft EIS states that additionally, 132 households and 292 people would be located in the 70-75 DNL contour where housing is incompatible absent an exception, the largest number of households and people affected at this level of all five alternative locations; and,

WHEREAS, the Draft EIS states that peak noise levels within the 70-75 DNL contour could reach 116 dB; and,

WHEREAS, the Draft EIS states that several census blocks with the expected changes in off-base noise contours have higher proportions of children and include five newly exposed

childcare centers; and,

WHEREAS, the Draft EIS states that the causation of speech interference at schools with increased noise levels may hinder the ability of students (including low-income and minority students) to learn, which would constitute an adverse impact to children to include low-income and minority children; and,

WHEREAS, the Draft EIS states that recent studies on school children indicate a potential link between aircraft noise and both reading comprehension and learning motivation; and,

WHEREAS, the Draft EIS cites the Road Traffic and Aircraft Noise Exposure and Children's Cognition and Health (RANCH) study (Stansfeld et al. 2005; Clark et al. 2005), which found a linear relation between chronic aircraft noise exposure and impaired reading comprehension and recognition memory; and,

WHEREAS, the Draft EIS states that therefore, impacts to children associated with the Proposed Action would be considered disproportionate and significant; and,

WHEREAS, the Draft EIS states that several census block groups associated with the expected changes in off-base noise contours associated with the proposed F-35A beddown at the 115 Fighter Wing installation are considered to be disproportionately low-income or minority areas; and,

WHEREAS, the Draft EIS states that impacts to environmental justice associated with the Proposed Action would be considered significant; and,

WHEREAS, 'Environmental Constraints' was one of the primary screening criteria used to identify the alternatives for F-35A beddown, stating "the alternative location should be able to: meet the local community's zoning or other land use controls adopted to limit encroachment and protect the public's health, safety, and welfare;" and that the alternative should "have an absence or limited amount of noise-sensitive development located in areas near the airport/installation that are exposed to Day-Night Average Sound Levels (DNL) at and above 65 decibels (dB) and considered by the Federal Aviation Administration (FAA) and DoD as incompatible land uses (USAF 1999; 14 CFR Part 150)"; and,

WHEREAS, the National Environmental Policy Act (NEPA) Sec. 101 [42 USC § 4331] (b) states, "it is the continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may... assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings [and]...attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences"; and,

WHEREAS, Executive Order 12898 <https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf> states that, "To the greatest extent practicable and permitted by law...each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate,

disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations"; and,

WHEREAS, US Air Force rules <https://www.govinfo.gov/content/pkg/CFR-2017-title32-vol6/pdf/CFR-2017-title32-vol6-sec989-35.pdf> require that, "During the preparation of environmental analyses under this instruction, the EPF should ensure compliance with the provisions of *E.O. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, and *Executive Memorandum of February 11, 1994, regarding E.O. 12898*"; and,

WHEREAS, the Draft EIS states that the USAF does not have authority to expend appropriated funds to mitigate the noise effects on facilities that are not under the direct control of the USAF; and,

WHEREAS, the Draft EIS states that the FAA Part 150 program <https://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=18114> provides a voluntary process an airport sponsor can use to mitigate significant noise impacts from airport users and that, "it is important to note that the Part 150 program is not a guarantee that sound mitigation or abatement will take place"; and,

WHEREAS, according to Lt. Col. Statz of the Air National Guard, under the FAA Part 150 program, properties in the affected areas will only be eligible for abatement and mitigation after the full transition from F-16s to F-35s is complete, a minimum of two years after the introduction of the F-35s; and,

WHEREAS, a City of Madison staff analysis <https://www.cityofmadison.com/mayor/documents/F35%20EIS%20staff%20analysis%209-10-19.pdf> of the Draft EIS concludes that, "While the EIS acknowledges it has a disproportional impact on persons of color, its methodology results in this issue being understated"; and,

WHEREAS, the City of Madison analysis states that, "there are several concentrations of poverty and persons of color just outside the 65 db contour, including the CDA Truax housing, CDA Webb-Rethke townhomes and other housing near Worthington Park, and near the intersection of Packers Avenue and Northport Drive. While these areas will experience virtually identical noise exposure as residents who live on the contour line, they will not be eligible for federal sound mitigation funding through the Noise Compatibility Program."; and

WHEREAS, the City of Madison analysis states that, "Soundproofing may not be an option for the mobile home park on Packers Avenue, which is in the current 65 db contour and would remain in the impacted area with the potential arrival of F35s. It appears the FAA considers mobile homes non-permanent structures and therefore does not allow soundproofing as a mitigation option."; and,

WHEREAS the City of Madison analysis states that, "...the City of Madison would have no official role in any potential noise mitigation study or program. The inability for the City to act on behalf of its residents and in the best interest of City-owned housing is a concern."; and,

WHEREAS the City of Madison analysis states that, "The Department of Defense and the Air

National Guard cannot safely and legally perform the planned construction activities without a complete site investigation that defines the extent and nature of PFAs contamination in soil and groundwater. The WDNR will require a materials management plan for any areas of the base impacted by construction, describing how excavated soil and dewatering will be managed. The 115 FW does not have enough information presently to do this."; and,

WHEREAS, Madison is experiencing pronounced, well-documented, and long-term crises in affordable housing and racial inequity; and,

WHEREAS, tens of millions of dollars in public investment have been made in 231 CDA-owned affordable housing units bordering the 65 dB DNL noise contour at Truax Park and Worthington Park, and also in an additional 80 subsidized low-income units at Rethke Terrace; and,

WHEREAS, Madison's 2020 Executive Capital Budget calls for an investment of $1.1 billion to prioritize Affordable Housing, Transportation, Sustainability, and Equity; and,

WHEREAS, the 2020 Executive Capital Budget calls for a $125M investment in the development of Bus Rapid Transit for the Madison Region to improve the capacity of our transportation system and as a catalyst for economic development along the proposed BRT routes; and,

WHEREAS, the proposed east route runs directly through the area most impacted by the proposed action, including three proposed BRT stations within or adjacent to the area expected to be incompatible with residential use; and,

WHEREAS, the potential for Transit-Oriented Development in that area will therefore be significantly diminished; and,

WHEREAS, on September 11, 2019 Alders Abbas, Foster and Rummel hosted a listening session for people living within the 65dB DNL noise contour attended by more than 300 residents from the affected area and its immediate environs; and,

WHEREAS, residents who spoke and submitted comments were overwhelmingly opposed to the siting of the F-35s in Madison, citing concerns about the health and safety of children, the disproportionate impacts of noise and water pollution on people of color and people with low incomes, property values, property tax base values and the livability of their neighborhoods; and,

WHEREAS, on September 12, 2019, the National Guard Bureau held an open house, formal presentation and public listening session at the Alliant Energy Center where 650 residents attended; and,

WHEREAS, comments at the public listening session by residents, community and business leaders, expressed a mixture of support and opposition to the beddown of the F-35s with the 115th Fighter Wing; and,

WHEREAS, according to a 2015 UW-Extension Study, the total economic impact of Truax Field to

the greater Madison area is at least $99.2 million each year and supports more than 1,293 on-site jobs; and,

WHEREAS, it is unclear what the future of the 115th Fighter Wing and Truax Field would be once F-16s are retired and aren't replaced by F-35s; and,

WHEREAS WI Statute 62.11(5) <https://docs.legis.wisconsin.gov/document/statutes/62.11(5)> directs that "the council...shall have power to act for the government and good order of the city, for its commercial benefit, and for the health, safety, and welfare of the public",

NOW THEREFORE BE IT RESOLVED, that the Madison Common Council recognizes that the impacts described in the Draft EIS would substantially reduce the quality and quantity of current affordable housing stock, decrease the value of the property tax base, reduce opportunities for Transit-Oriented Development, disproportionately affect residents who are low income and people of color, and children, and are contrary to the City of Madison's values of equity, sustainability, health and adaptability as codified in our Comprehensive Plan adopted in 2018 <https://www.cityofmadison.com/dpced/planning/documents/Part1_ComprehensivePlan.pdf> the City's Racial Equity and Social Justice Initiative <https://madison.legistar.com/LegislationDetail.aspx?ID=1737326&GUID=CAF0563E-DD7F-46EB-9009-F434F7FD2B93&Options=ID%7CText%7C&Search=Racial%2BEquity%2Band%2BSocial%2BJustice%2BInitiative>, and undermine multiple long-term goals of City policy makers and; and,

BE IT FURTHER RESOLVED, that the Madison Common Council requests that the Air National Guard reconsiders the selection of Truax Field as a preferred location until and unless the findings of the EIS are shown to misrepresent the significant environmental impacts to those living, working, and visiting the north and east sides of Madison; and,

BE IT FINALLY RESOLVED, that the Madison City Clerk send a copy of this resolution to the F-35A EIS Project Manager, Secretary of the Air Force, US Senators Tammy Baldwin and Ron Johnson, Congressman Mark Pocan, Wisconsin Governor Tony Evers, Wisconsin Senators Miller, Risser, Erpenbach, Wisconsin Assembly Representatives Sargent, Taylor, Hesselbein, Anderson, Subeck, Stubbs and Heibl, the Dane County Board & County Executive Parisi, and Dane County Airport Commission.

I, City Clerk Maribeth Witzel-Behl, certify that this is a true copy of Resolution No. 19-00588, adopted by the Madison Common Council on September 17, 2019.

Maribeth Witzel-Behl

9-26-2019

Date Certified

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, DETROIT DISTRICT
477 MICHIGAN AVENUE
DETROIT, MI 48226-2550

September 26, 2019

F-35A EIS Project Manager
NGB/A4AM, Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews MD 20762-5157

This correspondence is in regard to the August 2019 Draft *United States Air Force, F-35A Operational Beddown, Air National Guard, Environmental Impact Statement* (EIS). We have reviewed the applicable EIS section relative to the Civil Works and Regulatory jurisdictional boundaries of the Detroit District, U.S. Army Corps of Engineers (USACE). Therefore, our review concerns the 127th Wing at Selfridge Air National Guard Base (ANGB), Michigan, one of five alternate sites for the F-35 Operational Beddown project. The following information is provided in accordance with our responsibilities under our Regulatory and Civil Works Programs.

The Draft EIS states that twenty-eight jurisdictional wetlands have been delineated on Selfridge ANGB, but that none of the areas proposed for construction projects occur within these wetlands. If the Selfridge ANGB becomes part of the preferred alternative, then further coordination with our Regulatory Office may be necessary. If any future design refinements result in potential wetland impacts, a Department of the Army Permit may be required prior to construction activities. For further information, contact Mr. Donald Reinke, Chief, Compliance and Enforcement Branch, Detroit District Regulatory Office, at 313-226-6812, and reference Regulatory File Number LRE-2006-01185-250.

The Detroit District maintains a Federal navigation project in the lower Clinton River, extending about 6.5 miles upstream to Mt. Clemens. While the Clinton River is adjacent to the south side of the Selfridge ANGB complex, the proposed construction activities would not impact the Federal navigation project. We do not have any current plans under our Civil Works Program to further develop waterways in the vicinity of Selfridge ANGB; nor do we have any current or proposed flood risk management studies for this area.

The Draft EIS indicates that the proposed plan for Selfridge ANGB includes construction in the 100-year floodplain. Please refer to the National Flood Insurance Program Guidelines and to local building ordinances for construction requirements of structures within a floodplain. We recommend the project be coordinated with local officials and with the Michigan Department of Environment, Great Lakes and Energy (EGLE), Water Resources Division (517-284-5567), regarding the applicability of a floodplain permit prior to construction. This coordination would help ensure compliance

with local and state floodplain management regulations and acts. If you obtain information that any part of your project would adversely impact the floodplain, you should consider alternatives that, to the extent possible, avoid or minimize adverse impacts associated with use of the floodplain.

We appreciate the opportunity to comment on the August 2019 Draft *United States Air Force, F-35A Operational Beddown, Air National Guard, Environmental Impact Statement*. Any other questions may be directed to Mr. Paul Allerding of my staff at 313-226-7590 or me at 313-226-2476.

Sincerely,

Original signed

Charles A. Uhlarik, Chief
Environmental Analysis Branch

Enclosure

Copies furnished:

Mary Weidel, Corps Floodplain Management Services, Detroit
Don Reinke, Corps Regulatory Office, Detroit

Comment Details

Name	Martha Kemble
Email Address	mkemble1@gmail.com
Comment	NO F35s! There are so many reasons that a city the size and density of Madison is NOT the place to house a nuclear-capable 65 decibel DNL fleet of war planes. Your own EIS report states that areas surrounding the runways are uninhabitable. Yet there was NO outreach to folks in those immediate communities who would be most affected, in their language (Hmong and Spanish in particular). The military is supposed to PROTECT us, not create homelessness and loss of jobs when folks are forced out of their homes because they can't afford soundproofing, and businesses in the flight paths are forced to close because they won't be able to conduct business without noise interruption. The military has multiple options on where to house the F35s. Dropping them in the middle of Madison is NOT the answer. Where is the empathy and human concern for all the lives, especially the young lives, that will be harmed on so many levels?
Address 1	4211 School Rd
City	Madison
State	WI
Postal Code	53704
Mailing List?	Yes
Wants CD?	Yes
Withhold Name?	No
Withhold Address?	No
Date Received	9/26/2019 9:18:02 AM EDT

Madison City Clerk's Office

210 Martin Luther King, Jr. Boulevard, Room 103, Madison, WI 53703-3342
voting@cityofmadison.com • licensing@cityofmadison.com • clerk@cityofmadison.com
www.cityofmadison.com/clerk • www.cityofmadison.com/election
PH: 608 266 4601 • FAX: 608 266 4666
We exist to assist.

September 26, 2019

MATTHEW P DONOVAN
ACTING SECRETARY OF THE AIR FORCE
1670 AIR FORCE PENTAGON
WASHINGTON, DC 20330-1670

Re: Madison Common Council Resolution 19-00588

Dear Secretary Donovan,

Please find enclosed a resolution passed by the Madison Common Council on September 17, 2019 regarding the draft environmental impact statement (EIS) for the Air National Guard F-35A operational beddown.

A certified copy of this resolution was emailed to the project manager prior to the close of comments.

Sincerely,

Maribeth Witzel-Behl

Maribeth Witzel-Behl
City Clerk

MLW/eac

Enc.

Cc:

Mr. Ramon Ortiz, project manager
US Senator Tammy Baldwin
US Senator Ron Johnson
Congressman Mark Pocan
Governor Tony Evers
Wisconsin Senator Mark Miller
Wisconsin Senator Fred Risser

Wisconsin Representative Melissa Sargent
Wisconsin Representative Chris Taylor
Wisconsin Representative Dianne Hesselbein
Wisconsin Representative Jimmy Anderson
Wisconsin Representative Lisa Subeck
Wisconsin Representative Gary Hebl
Dane County Board of Supervisors
Dane County Executive Joe Parisi
Dane County Airport Commission

City of Madison

City of Madison
Madison, WI 53703
www.cityofmadison.com

Certified Copy

Resolution: RES-19-00588

File Number: 57364 **Enactment Number: RES-19-00588**

FINAL LANGUAGE ADOPTED BY COUNCIL - Responding to the Draft Environmental Impact Statement (EIS) for the Air National Guard F-35A Operational Beddown.

WHEREAS, on December 7, 2016, the US Air Force announced <https://www.af.mil/News/Article-Display/Article/1022605/air-force-releases-candidate-installations-for-next-f-35a-bases/> that the 115th Fighter Wing, Madison, Wisconsin; the 124th Fighter Wing, Boise, Idaho; the 125th Fighter Wing, Jacksonville, Florida; the 127th Wing, Harrison Township, Michigan; and the 187th Fighter Wing, Montgomery, Alabama were the five locations under consideration for the Air National Guard F-35A 5th and 6th Operation Beddowns; and,

WHEREAS, on December 21, 2017, the US Air Force announced the selection of the 115th Fighter Wing, Madison, Wisconsin as one of two preferred alternatives; and,

WHEREAS, on February 7, 2018, the Notice of Intent <http://www.angf35eis.com/Resources/Documents/NOI.pdf> to prepare an Environmental Impact Statement (EIS) was published in the Federal Register; and,

WHEREAS, on February 28, 2018, alderpersons representing residents living in close proximity to Truax Field organized a listening session at the East Madison Community Center at Truax to hear the comments and concerns of community members; and,

WHEREAS, on March 8, 2018, alderpersons and more than 350 community residents attended the Air National Guard scoping meeting at the Crown Plaza Hotel; and,

WHEREAS, residents who submitted public comments during the scoping phase were overwhelmingly supportive of the basing, with 445 comments in support versus 115 expressing concerns; and,

WHEREAS, on April 16, 2018, alderpersons submitted comments <https://madison.legistar.com/View.ashx?M=F&ID=6200867&GUID=29B2B4A9-2515-4EA0-8AB5-B4D023F5AAF9> to the Air National Guard through Ms. Christel Johnson, Environmental Engineer, based on resident feedback obtained at the February 28, 2018 listening session, information gleaned at the March 8, 2018 scoping meeting, as well as comments received by other members of the Madison Common Council; and,

WHEREAS, on April 23, 2018, the Madison Common Council enacted RES-18-00312 <https://madison.legistar.com/LegislationDetail.aspx?ID=3481565&GUID=0E61D85F-F70C-4C99-9F5C-5B747E77A540&Options=ID%7CText%7C&FullText=1> - *"A Resolution on the Air National Guard F-35 Operational Beddown Environmental Impact Statement"*, concluding, "and, BE IT FINALLY RESOLVED, that the City of Madison Common Council will remain engaged throughout the entire Environmental Impact

Statement process to ensure that residents are represented in the decision making process"; and,

WHEREAS, on August 9, 2019, the Notice of Availability <http://www.angf35eis.com/Resources/Documents/Notice_of_Availability.pdf> for the Draft EIS was published in the Federal Register and the Draft EIS was released for public comment; and,

WHEREAS, the Draft EIS analyzes the potential environmental impacts associated with the US Air Force proposed beddown of F-35A aircraft at two of five alternative Air National Guard (ANG) locations; and,

WHEREAS, the Draft EIS estimates that construction required to support the F-35A beddown at Truax Field would bring in between $90 and $120 million of new construction activity, creating 315-420 construction jobs; and,

WHEREAS, the Draft EIS estimates that the current Active Duty Associate Unit would increase by up to 29 positions, and 35 new personnel would be added to provide security and contract oversight; and,

WHEREAS, the Draft EIS concludes that the resulting increases in employment and income to the Madison region would be 'beneficial but negligible'; and,

WHEREAS, the Draft EIS states that under the No Action Alternative, the ANG would continue to conduct their current mission using existing aircraft, resulting in no additional significant impacts to socioeconomics; and,

WHEREAS, the Draft EIS states that the Proposed Action would result in an overall increase in the off-airport area affected by noise levels greater than 65 dB DNL by approximately 1,320 acres, the largest affected landmass of all five alternative locations; and,

WHEREAS, the Draft EIS states that approximately 199 acres of residential land use would be included in the 65-75 dB DNL contours, rendering this acreage potentially incompatible for residential use and considered a 'significant impact'; and,

WHEREAS, the Draft EIS states that under the proposed action, 1,019 households and 2,215 people will fall within the 65-70 dB DNL contour, considered potentially incompatible with residential use and eligible for noise mitigation; and,

WHEREAS, the Draft EIS states that additionally, 132 households and 292 people would be located in the 70-75 DNL contour where housing is incompatible absent an exception, the largest number of households and people affected at this level of all five alternative locations; and,

WHEREAS, the Draft EIS states that peak noise levels within the 70-75 DNL contour could reach 116 dB; and,

WHEREAS, the Draft EIS states that several census blocks with the expected changes in off-base noise contours have higher proportions of children and include five newly exposed

childcare centers; and,

WHEREAS, the Draft EIS states that the causation of speech interference at schools with increased noise levels may hinder the ability of students (including low-income and minority students) to learn, which would constitute an adverse impact to children to include low-income and minority children; and,

WHEREAS, the Draft EIS states that recent studies on school children indicate a potential link between aircraft noise and both reading comprehension and learning motivation; and,

WHEREAS, the Draft EIS cites the Road Traffic and Aircraft Noise Exposure and Children's Cognition and Health (RANCH) study (Stansfeld et al. 2005; Clark et al. 2005), which found a linear relation between chronic aircraft noise exposure and impaired reading comprehension and recognition memory; and,

WHEREAS, the Draft EIS states that therefore, impacts to children associated with the Proposed Action would be considered disproportionate and significant; and,

WHEREAS, the Draft EIS states that several census block groups associated with the expected changes in off-base noise contours associated with the proposed F-35A beddown at the 115 Fighter Wing installation are considered to be disproportionately low-income or minority areas; and,

WHEREAS, the Draft EIS states that impacts to environmental justice associated with the Proposed Action would be considered significant; and,

WHEREAS, 'Environmental Constraints' was one of the primary screening criteria used to identify the alternatives for F-35A beddown, stating "the alternative location should be able to: meet the local community's zoning or other land use controls adopted to limit encroachment and protect the public's health, safety, and welfare;" and that the alternative should "have an absence or limited amount of noise-sensitive development located in areas near the airport/installation that are exposed to Day-Night Average Sound Levels (DNL) at and above 65 decibels (dB) and considered by the Federal Aviation Administration (FAA) and DoD as incompatible land uses (USAF 1999; 14 CFR Part 150)"; and,

WHEREAS, the National Environmental Policy Act (NEPA) Sec. 101 [42 USC § 4331] (b) states, "it is the continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may... assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings [and]...attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences"; and,

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disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations"; and,

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WHEREAS, the Draft EIS states that the USAF does not have authority to expend appropriated funds to mitigate the noise effects on facilities that are not under the direct control of the USAF; and,

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WHEREAS, according to Lt. Col. Statz of the Air National Guard, under the FAA Part 150 program, properties in the affected areas will only be eligible for abatement and mitigation after the full transition from F-16s to F-35s is complete, a minimum of two years after the introduction of the F-35s; and,

WHEREAS, a City of Madison staff analysis <https://www.cityofmadison.com/mayor/documents/F35%20EIS%20staff%20analysis%209-10-19.pdf> of the Draft EIS concludes that, "While the EIS acknowledges it has a disproportional impact on persons of color, its methodology results in this issue being understated"; and,

WHEREAS, the City of Madison analysis states that, "there are several concentrations of poverty and persons of color just outside the 65 db contour, including the CDA Truax housing, CDA Webb-Rethke townhomes and other housing near Worthington Park, and near the intersection of Packers Avenue and Northport Drive. While these areas will experience virtually identical noise exposure as residents who live on the contour line, they will not be eligible for federal sound mitigation funding through the Noise Compatibility Program."; and

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WHEREAS the City of Madison analysis states that, "...the City of Madison would have no official role in any potential noise mitigation study or program. The inability for the City to act on behalf of its residents and in the best interest of City-owned housing is a concern."; and,

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WHEREAS, Madison is experiencing pronounced, well-documented, and long-term crises in affordable housing and racial inequity; and,

WHEREAS, tens of millions of dollars in public investment have been made in 231 CDA-owned affordable housing units bordering the 65 dB DNL noise contour at Truax Park and Worthington Park, and also in an additional 80 subsidized low-income units at Rethke Terrace; and,

WHEREAS, Madison's 2020 Executive Capital Budget calls for an investment of $1.1 billion to prioritize Affordable Housing, Transportation, Sustainability, and Equity; and,

WHEREAS, the 2020 Executive Capital Budget calls for a $125M investment in the development of Bus Rapid Transit for the Madison Region to improve the capacity of our transportation system and as a catalyst for economic development along the proposed BRT routes; and,

WHEREAS, the proposed east route runs directly through the area most impacted by the proposed action, including three proposed BRT stations within or adjacent to the area expected to be incompatible with residential use; and,

WHEREAS, the potential for Transit-Oriented Development in that area will therefore be significantly diminished; and,

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WHEREAS, comments at the public listening session by residents, community and business leaders, expressed a mixture of support and opposition to the beddown of the F-35s with the 115th Fighter Wing; and,

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the greater Madison area is at least $99.2 million each year and supports more than 1,293 on-site jobs; and,

WHEREAS, it is unclear what the future of the 115th Fighter Wing and Truax Field would be once F-16s are retired and aren't replaced by F-35s; and,

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BE IT FURTHER RESOLVED, that the Madison Common Council requests that the Air National Guard reconsiders the selection of Truax Field as a preferred location until and unless the findings of the EIS are shown to misrepresent the significant environmental impacts to those living, working, and visiting the north and east sides of Madison; and,

BE IT FINALLY RESOLVED, that the Madison City Clerk send a copy of this resolution to the F-35A EIS Project Manager, Secretary of the Air Force, US Senators Tammy Baldwin and Ron Johnson, Congressman Mark Pocan, Wisconsin Governor Tony Evers, Wisconsin Senators Miller, Risser, Erpenbach, Wisconsin Assembly Representatives Sargent, Taylor, Hesselbein, Anderson, Subeck, Stubbs and Hebl, the Dane County Board & County Executive Parisi, and Dane County Airport Commission.

I, City Clerk Maribeth Witzel-Behl, certify that this is a true copy of Resolution No. 19-00588, passed by the Madison Common Council on September 17, 2019.

Maribeth Witzel-Behl 9-26-2019

Date Certified

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, DETROIT DISTRICT
477 MICHIGAN AVENUE
DETROIT, MI 48226-2550

September 26, 2019

F-35A EIS Project Manager
NGB/A4AM, Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews MD 20762-5157

This correspondence is in regard to the August 2019 Draft *United States Air Force, F-35A Operational Beddown, Air National Guard, Environmental Impact Statement* (EIS). We have reviewed the applicable EIS section relative to the Civil Works and Regulatory jurisdictional boundaries of the Detroit District, U.S. Army Corps of Engineers (USACE). Therefore, our review concerns the 127th Wing at Selfridge Air National Guard Base (ANGB), Michigan, one of five alternate sites for the F-35 Operational Beddown project. The following information is provided in accordance with our responsibilities under our Regulatory and Civil Works Programs.

The Draft EIS states that twenty-eight jurisdictional wetlands have been delineated on Selfridge ANGB, but that none of the areas proposed for construction projects occur within these wetlands. If the Selfridge ANGB becomes part of the preferred alternative, then further coordination with our Regulatory Office may be necessary. If any future design refinements result in potential wetland impacts, a Department of the Army Permit may be required prior to construction activities. For further information, contact Mr. Donald Reinke, Chief, Compliance and Enforcement Branch, Detroit District Regulatory Office, at 313-226-6812, and reference Regulatory File Number LRE-2006-01185-250.

The Detroit District maintains a Federal navigation project in the lower Clinton River, extending about 6.5 miles upstream to Mt. Clemens. While the Clinton River is adjacent to the south side of the Selfridge ANGB complex, the proposed construction activities would not impact the Federal navigation project. We do not have any current plans under our Civil Works Program to further develop waterways in the vicinity of Selfridge ANGB; nor do we have any current or proposed flood risk management studies for this area.

The Draft EIS indicates that the proposed plan for Selfridge ANGB includes construction in the 100-year floodplain. Please refer to the National Flood Insurance Program Guidelines and to local building ordinances for construction requirements of structures within a floodplain. We recommend the project be coordinated with local officials and with the Michigan Department of Environment, Great Lakes and Energy (EGLE), Water Resources Division (517-284-5567), regarding the applicability of a floodplain permit prior to construction. This coordination would help ensure compliance

with local and state floodplain management regulations and acts. If you obtain information that any part of your project would adversely impact the floodplain, you should consider alternatives that, to the extent possible, avoid or minimize adverse impacts associated with use of the floodplain.

We appreciate the opportunity to comment on the August 2019 Draft *United States Air Force, F-35A Operational Beddown, Air National Guard, Environmental Impact Statement.* Any other questions may be directed to Mr. Paul Allerding of my staff at 313-226-7590 or me at 313-226-2476.

Sincerely,

Acting Chief

Charles A. Uhlarik, Chief
Environmental Analysis Branch

Enclosure

Copies furnished:

Mary Weidel, Corps Floodplain Management Services, Detroit
Don Reinke, Corps Regulatory Office, Detroit

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
LANSING

GRETCHEN WHITMER
GOVERNOR

LIESL EICHLER CLARK
DIRECTOR

September 27, 2019

VIA E-MAIL

Mr. Ramone Ortiz, P.E., GS-14, DAF
Program Manager
United States Air Force
F-35A Operational Beddown
NGB/A4AM
Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews, Maryland 20762-5157

Dear Mr. Ortiz:

SUBJECT: *Draft United States Air Force F-35A Operational Beddown Air National Guard Environmental Impact Statement pursuant to the 127th Wing*; Selfridge Air National Guard Base, Michigan; MID 099 113 128; Waste Data System Number 398077

Effective April 22, 2019, the Michigan Department of Environmental Quality, Waste Management and Radiological Protection Division, became the Michigan Department of Environment, Great Lakes, and Energy (EGLE), Materials Management Division (MMD).

EGLE has reviewed the *Draft United States Air Force F-35A Operational Beddown Air National Guard Environmental Impact Statement pursuant to the 127th Wing* (EIS) that was submitted by the National Guard Bureau (NGB), on behalf of Selfridge Air National Guard Base (SANGB), on July 30, 2019. The EIS was reviewed for compliance with the Michigan Natural Resources and Environmental Protection Act, 1994 PA 451, as amended; and the *Corrective Action Consent Order No. CAO-WMD-111-02-95*, dated May 23, 1995.

Based on our review of the EIS, EGLE has no specific comments at this time. Should the SANGB be chosen as the location of the Beddown for the F-35A Aircraft, EGLE requests that SANGB continue to coordinate with EGLE to ensure that any necessary environmental remediation is conducted in coordination with required base improvements and renovations.

EGLE looks forward to working with the NGB and the SANGB Environmental Management Office to help implement any renovations and improvement activities should SANGB be selected for these aircraft.

Should you have any questions regarding this review, please contact Mr. Arthur Ostaszewski, Environmental Quality Specialist, Permit and Corrective Action Unit, Hazardous Waste Section, MMD, at 517-936-7991; OstaszewskiA@Michigan.gov; or EGLE, MMD, P.O. Box 30241, Lansing, Michigan 48909-7741.

Sincerely,

Liesl Eichler Clark
Director
517-284-6700

cc: Mr. James King, Program Manager, NGB/A7OR
Mr. Jason Cabra, Engineer, SANGB
Mr. Aaron Etnyre, President, BB&E Consulting Engineers and Professionals
Mr. Aaron B. Keatley, Chief Deputy Director, EGLE
Ms. Mary Ann Dolehanty, EGLE
Mr. Jack Schinderle, EGLE
Ms. Teresa Seidel, EGLE
Ms. Kathleen Shirey, EGLE
Ms. Tracy Kecskemeti, EGLE
Mr. Allan Taylor, EGLE
Ms. Melinda Steffler, EGLE
Ms. Kimberly M. Tyson, EGLE
Ms. Mary Carnagie, EGLE
Ms. Christine Matlock, EGLE
Mr. Arthur Ostaszewski, EGLE
Mr. Ryan Schwarb, EGLE
Mr. Nathan Erber, EGLE
Corrective Action File

BOARD OF SUPERVISORS
County of Dane
ROOM 106B, CITY-COUNTY BUILDING
210 MARTIN LUTHER KING, JR. BOULEVARD
MADISON, WISCONSIN 53703-3342
608/266-5758 • FAX 266-4361 •
TTY: Call Wisconsin Relay 7-1-1

October 3rd, 2019

Mr. Matthew Donovan
Acting Secretary of the Air Force
1670 Air Force Pentagon
Washington, D.C. 20330-1670

Dear Acting Secretary Donovan:

I write in support of stationing the new F-35 Lightning II to the Wisconsin 115th Fighter Wing at Truax Air National Guard Base, in the city of Madison, Dane County, Wisconsin. Siting the F35 aircraft would bring economic investment to the county and support the viability of the 115th Fighter Wing in our community for years to come.

The Draft Environmental Impact Statement estimates that construction required to support the F-35A beddown at Truax Field would bring in between $90 and $120 million of new construction activity, creating 315-420 construction jobs. In addition, the current Active Duty Associate Unit would increase by up to 29 positions, and 35 new personnel would be added to provide security and contract oversight.

I understand that the F-16's currently in commission are reaching the end of their service lives, and the air force is replacing them with the F-35's. Without siting the F-35's at the 115th Fighter Wing, I am concerned that the base will be more likely to close in the future. The 115th Fighter Wing provides 1,200 highly paid jobs, service contracts, and attracts families to live in our region -- directly supporting our economy, schools, services, and diversity. The F-35s would ensure continued economic growth of Dane County and the State of Wisconsin.

That said, Dane County values and seeks to protect our natural resources and the environmental impact of PFAs contamination, as well as the increase in noise by the F35s, is of concern. We would expect the Air National Guard to take all possible measures to mitigate the impact of noise and environmental degradation.

The Air National Guard Base provides support in the area of emergency services. For more than 75 years, Truax has been a strong community partner and a provider of essential fire and emergency services for Dane County residents and our commercial airport – the Dane County Regional Airport.

I believe that Truax Field located at the Dane County Regional Airport is the best location for military readiness in the north-central United States and look forward to the deployment of the new F-35 aircraft to our region.

Sincerely,

Jeremy P. Orin

Dane County Board Supervisor
District 10

Comment Details

Name	joan Kemble
Email Address	tomjoankemble@gmail.com
Comment	Madison is a nuclear free zone. To fulfill its mission the F35 would eventually e carrying neuc weapony. We do not want the planes here
Organization	ms
Address 1	4211 School Rd
City	Madison
State	WI
Postal Code	53704
Phone Number	8607968746
Mailing List?	No
Wants CD?	No
Withhold Name?	No
Withhold Address?	No
Date Received	10/4/2019 1:35:56 PM EDT

BOARD OF SUPERVISORS
County of Dane
Sup. Heidi M. Wegleitner, District 2
wegleitner.heidi@countyofdane.com
ROOM 106B, CITY-COUNTY BUILDING
210 MARTIN LUTHER KING, JR. BOULEVARD
MADISON, WISCONSIN 53703-3342
608/266-5758 FAX 266-4361
TTY: Call Wisconsin Relay 7-1-1

October 8, 2019

Mr. Matthew Donovan
Acting Secretary of the Air Force
1670 Air Force Pentagon
Washington, D.C. 20330-1670

RE: Request for Engagement with Minority and Low Income Populations in their Neighborhoods and Revised EIS

Dear Acting Secretary Donovan:

I represent District 2 on the Dane County Board of Supervisors, which is an area on the Northeast side of Madison, Wisconsin. District 2 includes neighborhoods, schools, parks, play fields, churches, and businesses impacted by current military flight operations and expected to be impacted by the proposed F-35 Beddown at Truax WI Air National Guard Base. The district is home to Madison East High School, Emerson Elementary School, Bashford Church, and Demetral Field. On September 19, 2019, I signed a letter with 14 of my County Board colleagues to communicate our serious concern with the environmental racism documented in the draft EIS and our opposition to the beddown. Today I write to request the following: (1) Fulfill your obligation under federal rules to provide information to and engage with low income and minority communities disproportionately impacted; and (2) Issue a revised EIS to address significant gaps in information as detailed below.

First, the Air Force has not sufficiently informed and engaged with the community of minority and low-income people disproportionately impacted by the proposed beddown as required by 32 CFR § 989.33. As documented in the EIS report: "There would be significant disproportionate impacts to low-income and minority populations as well as children. The increase in noise exposure near the airport would disproportionately impact low-income areas and the increase in noise exposure would disproportionately impact a low-income minority population." Nearly every impacted area within the City of Madison belongs to a census tract with rates of persons of color, as well as poverty rates, well above the city- and county-wide averages. The one public meeting that took place on September 12, 2019 at the Alliant Energy Center was held more than 7 miles from Oak Park Terrace Mobile Home Park and Madison public housing right next door to Truax facilities. It would have taken more than one hour to take a Madison Metro Bus from either location to attend the public meeting.

Moreover, the draft EIS has not been made available in any language other than English even though a significant percentage of people in the area most impacted are non-English speakers. At a minimum, the Executive Summary of the draft EIS should be made available in Spanish and Hmong.

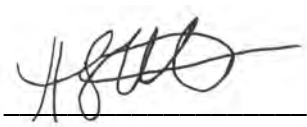
Secondly, I request that a revised EIS be issued. There are many unanswered questions, as communicated to you by federal, state and local officials. The Madison Metropolitan School District Board of Education has communicated its serious concern regarding the potential noise impacts on MMSD students at home and at school. The Madison Water Utility Board has communicated its concern regarding the ongoing PFAs contamination issues on site at Truax and the failure to properly evaluate and remediate the current soil and water pollution.

A revised EIS is needed to provide the public with the following information.

- Peak decibel levels when taking off and landing for both the current F-16s and anticipated for the F-35s.
- Anticipated SEL measures for the F-35s for all daycares, preschools and K-12 schools within the 65 dB contour and within one mile of the border of this contour;
- A recalculation of the noise impact and sound maps with afterburner usage estimated at 10%, 25%, 50%, and above.
- A direct comparison between the peak noise decibel levels of the F-16s currently at the Truax Base and the proposed F-35s for both military power takeoff and landing, and afterburner takeoff and landing for each aircraft type.
- A substantial analysis of the economic impact on the local economy in the draft EIS. There is insufficient information on the impact on property values, the costs to Dane County taxpayers, the impact on our area businesses.
- More information about the physical and cognitive effects of intense noise on children, including children with developmental challenges.
- Whether the Air Force will investigate the pollution of the soil and water from the PFAS "forever chemicals" as required by the Wisconsin Department of Natural Resources (DNR) prior to construction for the base expansion for the beddown and the details regarding such an investigation and remediation.
- How the beddown may displace vulnerable tenants and exacerbate Madison's affordable housing shortage and increase demand for homeless services.

For the reasons stated herein, please fulfill your community engagement obligations and issue a revised draft EIS to address the significant gaps in information. Thank you for your attention to this letter.

Sincerely,



_____

Supervisor Heidi M. Wegleitner
Dane County Board, District 2

Cc: Mr. Ramon Ortiz, NGB/A4AM, 3501 Fetchet Avenue, Joint Base Andrews MD 20762-5157
and via email to: usaf.jbanafw.ngb-a4.mbx.a4a-nepa-comments@mail.mil

From:	Stahl, Chris
To:	usaf.jbanafw.ngb-a4.mbx.a4a-nepa-comments@mail.mil
Cc:	State_Clearinghouse
Subject:	[Non-DoD Source] State_Clearance_Letter_For_FL201908208719C_Draft Environmental Impact Statement for US Air Force F-35A Operational Beddown Air National Guard, Jacksonville, Duval County, Florida
Date:	Friday, October 11, 2019 12:20:13 PM

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

October 11, 2019

Ramon E. Ortiz
Department Of Defence - National Guard Bureau
Shepperd Hall, 3501 Fetchet Ave
Joint Base Andrews, Maryland 20762-5157

RE: Department of Defense, U.S. Air Force, Draft Environmental Impact Statement for US Air Force F-35A Operational Beddown Air National Guard, Jacksonville, Duval County, Florida
SAI # FL201908208719C

Dear Ramon:

Florida State Clearinghouse staff has reviewed the proposal under the following authorities: Presidential Executive Order 12372; § 403.061(42), Florida Statutes; the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended; and the National Environmental Policy Act, 42 U.S.C. §§ 4321-4347, as amended.

This project should be reviewed by the St. Johns River Water Management District (SJRWMD), under the Environmental Resource Permitting Program for the proposed new construction footprint of up to 10.8 acres, and 1.9 acres of new impervious surface. You may contact the SJRWMD office directly at (800) 451-7106. Please note that all permits need to be applied for and received from the ANG/Florida ANG, City Jacksonville/Duval County, Department of Environmental Protection, and the State as required. Communication with all stakeholders (ANG, FANG, FANG Partnering Team, including ANG – FANG – Florida Department of Environmental Protection – contractor representatives) is required during all phases of the project.

If prehistoric or historic artifacts, such as pottery or ceramics, projectile points, dugout canoes, metal implements, historic building materials, or any other physical remains that could be associated with Native American, early European, or American settlement are encountered at any time within the

project site area, the permitted project shall cease all activities involving subsurface disturbance in the vicinity of the discovery. The applicant shall contact the Florida Department of State, Division of Historical Resources, Compliance Review Section at (850)-245-6333. Project activities shall not resume without verbal and/or written authorization. In the event that unmarked human remains are encountered during permitted activities, all work shall stop immediately and the proper authorities notified in accordance with Section 872.05, Florida Statutes. If you have any questions, please contact Rachel Thompson, Historic Sites Specialist, by email atRachel.Thompson@dos.myflorida.com < Caution-mailto:Rachel.Thompson@dos.myflorida.com > , or by telephone at 850.245.6453 or 800.847.7278.

Based on the information submitted and minimal project impacts, the state has no objections to the subject project and, therefore, it is consistent with the Florida Coastal Management Program (FCMP). Thank you for the opportunity to review the proposed plan. If you have any questions or need further assistance, please don't hesitate to contact me at (850) 717-9076.

Sincerely,

Chris Stahl

Chris Stahl, Coordinator
Florida State Clearinghouse
Florida Department of Environmental Protection
3800 Commonwealth Blvd., M.S. 47
Tallahassee, FL 32399-2400
ph. (850) 717-9076
State.Clearinghouse@floridadep.gov < Caution-mailto:State.Clearinghouse@floridadep.gov >

< Caution-http://survey.dep.state.fl.us/?refemail=Chris.Stahl@dep.state.fl.us >

Comment Details

Name	joan Kemble
Email Address	tomjoankemble@gmail.com
Comment	The high noise willimpact many of our most vulnerable citizens. The harmful effets on school children for which there is no mitigation; no air conditioning; children and adults need to be outside at times. This is environmental injustice. The National Guard has polluted our watrs, and so far has made no move to remedy it (if it can be remedied). Wedo not want additional presence of the Guard with even noisier flights
Organization	ms
Address 1	4211 School Rd
City	Madison
State	WI
Postal Code	53704
Phone Number	8607968746
Mailing List?	No
Wants CD?	Yes
Withhold Name?	No
Withhold Address?	No
Date Received	10/24/2019 5:10:47 PM EDT

U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of Airport Planning and Programming

800 Independence Ave, SW.
Washington, DC 20591

October 25, 2019

Ramon Oritz
National Guard Bureau
NGB/A4AM. Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews, Maryland 20762-5157

Re: Draft Environmental Impact Statement for F-35A Aircraft Beddown

Dear Mr, Oritz:

As you know, the Federal Aviation Administration (FAA) agreed to participate as a cooperating agency for the F-35A Operational Beddown Environmental Impact Statement (EIS). The draft EIS has been developed in accordance with United States Air Force (USAF) National Environmental Policy Act (NEPA) implementing regulations which differ from FAA's NEPA policies and procedures[1].

During development of the Draft EIS, the FAA provided input in coordination with the National Guard Bureau (NGB) and USAF. This included reviewing relevant information and analyses, providing comments, and participating in meetings and information sessions. Not all of FAA's comments were resolved during this process. As a result the, FAA would not be able to rely on the information and analysis in the Draft EIS to comply fully with its NEPA policies and procedures.

Should the NGB and USAF select one or more alternatives that would involve FAA action(s) subject to NEPA (e.g., construction that would require FAA approval of changes to an Airport Layout Plan), FAA would need to conduct additional analyses and prepare separate documentation to support FAA's decision.

The FAA is available to discuss the contents of this letter at your convenience. Our point of contact is Ms. Jean Wolfers-Lawrence, Environmental Specialist, FAA Airport Planning and Environmental Division, at (202) 267-9749 or jean.wolfers-lawrence@faa.gov.

Sincerely,

Michael S. Hines
Manager, Airport Planning and Environmental Division

CC: Lt. Col. Joseph Sundy - National Guard Bureau

---

[1] See FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*.

To: Ramon Ortiz, 35A EIS Project Manager

From: City of Madison, WI. October 30, 2019
Sustainable Madison Committee Response to EIS

RE: FR#2018-02468

We, the members of the Sustainable Madison Committee, a committee that takes a leadership role in the promotion of sustainability for the City of Madison, the Madison community, and the region, hereby express concerns regarding details included in the recently released Draft United States Air Force F-35A Operational Beddown National Guard Environmental Impact Statement (EIS) pertaining to the 115 Fighter Wing at Truax Airfield.

Specifically, we note the EIS predicts that upon the basing of the F-35s, the annual Truax airfield CO2 emissions would increase by approximately 12,478 tons or 135 percent versus that which is currently emitted by the F-16 squadron, and that this is equivalent to adding an additional 2,438 passenger vehicles onto our city's roads, driving 11,500 miles per year on average.

Further, because the use of afterburners may be more frequent than accounted for in the draft EIS, the estimated amount of CO2 emissions may in reality be much higher than the calculated amount. According to a USAF memo obtained by the *Isthmus* newspaper, it is very likely that, in practice, F-35 pilots are likely to use their afterburners up to 50% of the time (https://isthmus.com/news/news/f-35s-could-use-afterburners-more-frequently-than-air-national-guard-promises/). The draft EIS uses an estimate of up to 5 percent afterburner use, which is potentially 45 percent lower than actual use.

Please note, the Sustainable Madison Committee helped craft legislation passed by Madison's Common Council in 2017 committing our city to 100% renewable energy and net zero carbon emissions. As Truax is located within the city, the stationing of F-35s, which the draft EIS states will burn more CO2 than the currently-stationed F-16s, counteracts the work that the city is doing to achieve these goals.

As city residents, we take seriously the reality of our climate crisis and the health impacts of air pollution. We further believe all levels of government must commit to

reducing carbon emissions and thereby embrace a sustainable path ensuring the planet's livability for future generations.

Moreover, we are concerned that the F-35 Environmental Impact Statement is lacking in providing a comprehensive assessment on the environmental health impacts to our ecosystem and our community, including serious health risks associated with air and noise pollution, including: poor quality sleep, negative impacts on mood and mental health, decreased school performance, and increases in stress hormones, blood pressure, inflammation, and heart disease. The associated social and economic costs to our community are immense. The environmental impact study acknowledges there will be "significant disproportionate impacts to low-income and minority populations as well as children." Many families who live in the affected area are already burdened by racial inequities, such as poverty, which severely limits their capacity to move and often forces families to rely on open windows for cooling. Some of the lowest income communities affected by this decision may not qualify for mitigation.

The draft EIS does not address one environmental issue that has become quite important to our community. For many years the ANG has used fire-fighting foam containing PFAS chemicals at Truax airport to extinguish fires and in training exercises. These chemicals have been found at very high levels in groundwater at the airport and in Starkweather Creek, which receives waters draining from the airport. The Madison Water utility has stopped utilizing water from one municipal well found to contain levels of PFAs at 9.4 to 12 ppt. The WI Department of Health Services has recommended a groundwater standard for PFOA and PFOS of 20 ppt (https://www.cityofmadison.com/water/water-quality/water-quality-testing/perfluorinated-compounds). While these foams may soon be replaced by other fire-fighting materials, we ask that you include impact analysis for past and future PFAs use and expected replacements at the airport in the final EIS.

We respectfully ask the Air Force to issue a revised EIS clarifying the impacts the basing of the F-35s would have on our city's health and carbon load, specifically addressing means by which these environmental health burdens may be reduced.

Finally, if there are no means for effectively reducing these environmental health burdens, we respectfully oppose the Air Force basing of the F-35s at Truax.

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 S. Webster Street
Box 7921
Madison WI 53707-7921

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

October 30, 2019

F-35A EIS Project Manager
NGB/A4AM
Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews MD 20762-5157

Subject: Comments on Draft Environmental Impact Statement

Dear Sir or Madam:

Thank you for the opportunity to comment on the draft Environmental Impact Statement (dEIS) for the proposed United States Air Force F-35A Operational Beddown, Air National Guard. On behalf of the Wisconsin Department of Natural Resources (DNR), I have coordinated a review of the dEIS and am providing the following comments, related to the proposed operational beddown at the 115th Fighter Wing Installation (115 FW) at Truax Field in the City of Madison.

I. Impacts of Proposed Construction Projects at the 115 FW

A. Hazardous Materials and Wastes

Section WI3.13.1 of the dEIS does not adequately address per- and polyfluoroalkyl substances (PFAS) contamination. Although there is mention of three construction projects associated with potential release locations (PRLs), there is no discussion of the probability that PFAS contamination exists beyond PRLs, of the need for a complete site investigation, or of the potential need for interim and remedial actions. Furthermore, the discussion of media management plans on page WI-120 runs counter to state requirements.

The DNR does not consider the site investigation conducted in 2018 (described on pg. WI-117) to be a complete site investigation as required under Chapter NR 716 Wis. Adm. Code. The discussion of that investigation should clarify that because it was limited to the nine PRLs identified in 2015, the extent and nature of PFAS contamination at the 115 FW has not been fully determined.

Results of the 2018 site investigation indicate that there is a likelihood of PFAS contamination of soil and groundwater across much of the installation. Consequently, all planned construction projects will require a site investigation to determine whether PFAS contamination is present prior to construction. A waste handling plan, and potentially permits, will also be required for any soil or water that contains PFAS or other contamination that will be generated at the site due to construction or other like activities.

On page WI-120, the dEIS states that "media management plans are recommended for any area where soil or groundwater disturbance is expected to occur and site investigations indicate PFAS contamination above federal and/or state regulatory limits." There are currently no state or federal standards for PFAS. As such, the statement quoted above suggests that media management plans would never be recommended. Section NR 722.09, Wis. Adm. Code, however, requires a responsible party to establish site-specific cleanup standards in the absence of promulgated, numeric standards. These standards must be established with approval from the DNR, in

consultation with the state Department of Health Services. Furthermore, ch. 292, Wis. Stats. requires a response action whenever a hazardous substance discharge or environmental contamination is detected in any media.

As such, paragraphs 2 and 3 on page WI-120 should be edited as follows:

> "Three perfluorinated compound PRLs including Hangar 400, Hangar 406, and Hangar 414 overlap with the proposed construction at the aforementioned Hangars (Figure WI3.13-4). These three PRLs have ~~potential~~ perfluorinated compound contamination. ~~The 115 FW will coordinate with the WDNR now that the results of the Site Investigation Report are finalized. If~~ In any areas where contamination is present, construction project managers should coordinate with the 115 FW environmental manager to establish an appropriate course of action for the construction project to ensure that local, federal and state ~~agency requirements are met~~ laws are complied with. This includes proper waste handling of contaminated soil and waters of the state in accordance with local, state and federal laws. Applicable permits for handling such media, such as a WPDES permit for de-watering an excavation, would be required."
>
> "A Media Management Plan is ~~recommended~~ necessary for any area where soil or groundwater disturbance is expected to occur and site investigations indicate Per- and Polyfluoroalkyl Substances contamination ~~above federal and/or state regulatory limits~~ is present. The Media Management Plan would detail the procedures for soil, surface water, and groundwater sampling in accordance with previously approved investigative Work Plans, encountering of contaminated media, site erosion controls, media disposal and federal and state agency notification in accordance with current regulatory requirements at the time of construction."

Similarly, the following edits should be made towards the bottom of page WI-123, under Section WI3.13.3 (Summary of Impacts):

> ~~The 115 FW will coordinate with the WDNR now that the results of the Site Investigation Report are finalized. If~~ In any areas where contamination is present, construction project managers should coordinate with the 115 FW environmental manager to establish an appropriate course of action for the construction project to ensure that local, federal and state agency laws are complied with."

B. Stormwater Permits

Section W12.4 requires several technical corrections. On page WI-14, the first bullet-point should note that the Wisconsin DNR is the permitting authority for purposes of administering the stormwater discharge permit program under the Wisconsin Pollutant Discharge Elimination System (WPDES) permit program.

On page WI-14, the second bullet-point should be edited as follows:

> " ○ For construction activities disturbing ~~greater than 1~~ one or more acres, the project would require the application for, and compliance with Wisconsin's general stormwater permit, "General Permit to Discharge under the WPDES - Land Disturbing Construction Activities." Site-specific stormwater pollution control~~s would be included~~ plans will be developed, and practices implemented, in conformance with the permit~~, as required by~~ and State Regulations NR 151 and 216.

On page WI-14, the fourth bullet-point should be edited as follows:

> " ○ ~~D~~ Additionally, the discharge from two oil/water separators (OWSs) operated by WIANG that discharge to ~~Madison Metropolitan Sewerage District sanitary sewer would be~~ Starkweather Creek are covered under the ~~City of Madison's General WPDES Storm Water Tier 2 Permit (WPDES Permit No. WI-S067857-3)~~ WIANG 2016 permit.

C. Surface Water Resources

Figure WI3.10-1, "Water Resources and Wetlands within the Vicinity of the 115 FW Installation" (pg. WI-90) is missing wetlands included in the Wisconsin Wetland Inventory. The inventory, including geographic information system (GIS) maps, is available at https://dnr.wi.gov/topic/wetlands/invent01y.html.

D. Biological Resources

Construction activities that may impact the big brown bat *(Eptesicus fuscus)*, a state threatened species, will need to follow state endangered species regulations, as applicable, and should be conducted according to the Wisconsin DNR's broad incidental take permit/authorization for Wisconsin cave bats.

II. Impacts of Proposed Aircraft Operations Near the 115 FW

A. Noise Impacts on Public Lands

According to the dEIS, F-35A aircraft operations at the 115 FW would increase the area of land falling within the 65-plus dB DNL noise contour by 1,320 acres. Table WI3.5-2 (pg. WI-69) incorrectly reports that 768 acres (or 58%) of this additionally-impacted land is agricultural with only 17 acres (or 1%) in parks and open space.

In fact, most of the area northwest of the airport represented as "Agriculture" in Figure WI3.5-2 (pg. WI-70) is part of Cherokee Marsh, a 2,000-acre area owned and managed for nature conservation and outdoor recreation by the State of Wisconsin (DNR), City of Madison, and Dane County. Based on a GIS analysis conducted by the Wisconsin DNR, approximately 550 acres (or 42%) of the land that would be added to the 65-plus dB DNL zone lies within the boundaries of three protected areas, including 286 acres of the Cherokee Marsh State Fishery Area, 121 acres of the City of Madison's Cherokee Marsh North Unit, and 143 acres of the Cherokee Marsh State Natural Area (SNA). Of the affected area within the SNA, 107 acres (75%) would experience a larger increase, from the current range of 60-65 dB to a projected range of 70-75 dB.

B. Noise Impacts on Biological Resources

The dEIS provides little substantive information on the potential impacts of increased aircraft noise on wildlife (pg. WI-100) or threatened, endangered, and special status species (pg. WI-101). Although it is difficult to know the nature and severity of specific impacts, and while the Wisconsin DNR does not have regulatory authority over noise from Truax Field, it is likely that there would be some level of impact on a variety of species.

Based on our GIS analysis, approximately 550 acres of preserved marshland and adjacent uplands would be exposed to increased noise levels ranging from 65-75 dB DNL. This area is part of a wetland complex that includes diverse habitat and ecological community types that have been determined to be rare and declining in Wisconsin. These include calcareous fen, southern sedge meadow, wet prairie, and wet-mesic prairie.

Numerous species of common mammals (raccoon, opossum, and meadow vole), amphibians (common frog species and American toad), and birds use the affected area, including species of greatest conservation need identified by the state's Wildlife Action Plan (Bald Eagle, Short-eared Owl, Bobolink, American Woodcock, and Willow Flycatcher) and a state-threatened bird.

In addition to including the above information, the dEIS would be improved by including a summary of findings reported by Shannon et al. (2016): "A synthesis of two decades of research documenting the effects of noise on wildlife" (pp. 982-1005 in *Biological Review*, volume 91). Specifically, the authors analyzed the results of sixty-nine peer-reviewed, empirical studies of noise effects on terrestrial wildlife (published since 1990) and found that 65% of these studies reported at least some degree of biological response (behavior, physiological, population, etc.) at noise levels of 65 dB, while 80% reported responses at 75 dB.

Thank you again for the opportunity to comment on the draft EIS for the United States Air Force F-35A Operational Beddown, Air National Guard. Please contact me at (608) 267-7853 or AdamC.Mednick@Wisconsin.gov with any questions or comments you may have regarding this letter.

Sincerely,

Adam C. Mednick, PhD, AICP
Wisconsin Environmental Policy Act Coordinator

Cc: Darsi Foss, AD/8
Dave Siebert, AD/8
Mark Aquino, SCR

From: Rummel, Marsha
To: usaf.jbanafw.ngb-a4.mbx.a4a-nepa-comments@mail.mil
Subject: [Non-DoD Source] Comments on Draft Environmental Impact Statement United States Air Force F-35A Operational Beddown Truax Field, Madison WI
Date: Thursday, October 31, 2019 11:55:29 PM

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

Mr. Ramon Ortiz
F-35A EIS Project Manager
NGB/A4AM Shepperd Hall
3501 Fetchet Avenue Joint Base Andrews MD 20762-5157

November 1, 2019

Subject: Comments on Draft Environmental Impact Statement United States Air Force F-35A Operational Beddown Truax Field, Madison WI

My name is Alder Marsha Rummel. I represent District 6 in the City of Madison WI Common Council. A corner of my district is within the 65dB contour map and I have spent a lot of time engaging the community to make sure area residents who live within the noise contour map boundaries and those who live nearby have information about the impacts of the F-35A and know how to participate in the process. I have submitted comments and questions previously about a variety of topics regarding the disproportionate impacts identified in the draft EIS but I keep learning more and have new questions. Thank you for extending the comment period to provide more opportunity for residents to give feedback.

The Wisconsin Department of Natural Resources submitted comments to you on October 30, 2019. I have reviewed their letter which raises significant concerns. In particular, I question whether the draft EIS adequately addresses PFAS contamination.

Per the WDNR letter: "Section WI3.13.1 of the dEIS does not adequately address per- and polyfluoroalkyl substances (PFAS) contamination. Although there is mention of three construction projects associated with potential release locations (PRLs), there is no discussion of the probability that PFAS contamination exists beyond PRLs, of the need for a complete site investigation, or of the potential need for interim and remedial actions. Furthermore, the discussion of media management plans on page WI-120 runs counter to state requirements. On page WI-120, the dEIS states that "media management plans are recommended for any area where soil or groundwater disturbance is expected to occur and site investigations indicate PFAS contamination above federal and/or state regulatory limits." There are currently no state or federal standards for PFAS. As such, the statement quoted above suggests that media management plans would never be recommended. Section NR 722.09, Wis. Adm. Code, however, requires a responsible party to establish site-specific cleanup

standards in the absence of promulgated, numeric standards. These standards must be established with approval from the DNR, in consultation with the state Department of Health Services. Furthermore, ch. 292, Wis. Stats. requires a response action whenever a hazardous substance discharge or environmental contamination is detected in any media."

The City of Madison F35 EIS Staff Analysis dated September 10, 2019 also made similar comments "The Department of Defense and the Air National Guard cannot safely and legally perform the planned construction activities without a complete site investigation that defines the extent and nature of PFAs contamination in soil and groundwater." Caution- https://www.cityofmadison.com/mayor/documents/F35%20EIS%20staff%20analysis%209-10-19.pdf < Caution- https://www.cityofmadison.com/mayor/documents/F35%20EIS%20staff%20analysis%209-10-19.pdf >

I was one of four alders whose districts surround Truax invited to tour the 115th Wing ANG base on August 24. We were informed by our hosts that the WANG was planning to construct a new medical facility and that the construction was not connected to the EIS process. We were also told by command staff that given the nature of PFAS as an emerging contaminant on military bases around the country, remediation at Truax was a low priority at the federal level and no funds were available. Given the comments from the WDNR, I question the legality of any construction at Truax until NGB addresses PFAS and there is a thorough site investigation and cleanup standards are established and approved by the DNR. If the funds are not available to address PFAS to coincide with the proposed beddown, then Truax should not be selected.

In addition to construction of the medical building, I recently became aware that there is a draft Environmental Assessment/EA for Construction and Demolition Projects at the 115th Fighter Wing Installation, Dane County Regional Airport, Madison, Wisconsin - April 2019 that proposes 26 other infrastructure improvement projects, including the demolition of 7 facilities. The EA is signed by MARC V. HEWETT, P.E., GS-15, DAF Date Chief, Asset Management Division. He makes a "FINDING OF NO SIGNIFICANT IMPACT: Based on my review of the facts and analysis in this EA, I conclude that the Proposed Action will not have a significant impact on the quality of the human or natural environment or generate significant controversy either by itself or considering cumulative impacts. Accordingly, the requirements of NEPA, the CEQ, and 32 CFR 989 et seq. have been fulfilled, and an Environmental Impact Statement is not necessary and will not be prepared. "

But Section 3.11.2.4 Environmental Restoration Program of the draft EA (page 3-34) states "A Site Investigation was conducted at the 115 FW at the nine perfluorinated compound PRLs in 2018. The results of the Site Investigation Report have not been finalized as the report is still a draft. Three perfluorinated compound PRLs (Building 430 Current Fire Station, Nozzle Test Area 1, and Nozzle Test Area 2) are located in areas of planned construction." Given the WDNR comments, I question the legitimacy and legality of the draft EA's FONSI given the site investigation is not complete. Section 4.11.2.1 (Environmental Restoration Program page 4-29) states "This Proposed Action would be coordinated with the 115 FW Environmental Manager to ensure that no negative effect to future PRL investigations or to human or ecological health occur" but this does not appear to address requirements in Wisconsin statutes and administrative codes referenced above nor does it address

the extent of PFAS contamination on the site and nearby Starkweather Creek.

The EA FONSI for Construction and Demolition Projects at the 115th FW seem premature given the document is still in draft form and outreach was limited primarily to regulatory agencies. I believe making Findings of No Significant Impact is in violation of CFR 989.15. Caution-https://ecfr.io/Title-32/se32.6.989_119 < Caution-https://ecfr.io/Title-32/se32.6.989_119 > According to the EA, a large number of the construction projects serve the beddown of F-35s. These processes are intrinsically related.

US EPA letter dated March 18, 2019 to the NGB regarding the draft EA for Construction and Demolition Projects at the 115th FW (pages A8- A12) outlines their recommendations for meeting the environmental justice goals outlined in EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations (1994). USEPA defines environmental justice as, "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies" (USEPA 2018b). It goes on to clarify that "no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental, and commercial operations or policies."The US EPA advised the NGB to "include a detailed community outreach strategy aimed at local input from all communities that would be affected and specify targeted activities to reach low income and/or minority communities."

Cardno was your consultant for both the draft EIS and draft EA at the 115th FW. I question the existence of a meaningful outreach strategy to contact nearby affected communities or address environmental justice impacts to minority populations and low income populations. In conversation during the scoping session open house, I asked a Cardno representative if they sent postcard notifications to nearby low income and minority neighbors. The answer was 'No, we posted flyers at nearby convenience stores'. As far as I know, no one at community meetings I helped convene this summer and fall received official information from NGB about the draft EIS process, unless they had previously signed up.

I don't believe the NGB has met the legal requirements of Title 32 Part 989.19(3) Where analyses indicate that a proposed action will potentially have disproportionately high and adverse human health or environmental effects on minority populations or low-income populations, the EPF should make special efforts to ensure that these potentially impacted populations are brought into the review process."

I don't believe special efforts were made, as required by law, to conduct meaningful outreach to the most impacted communities. In fact, there is little evidence that any targeted efforts were made at all.

The draft EIS should be revised to address the substantive questions raised in the comment period.

Thank you for your consideration-

Marsha Rummel
City of Madison
District 6
1029 Spaight St #6C
Madison WI 53703

From:	Kemble, Rebecca
To:	usaf.jbanafw.ngb-a4.mbx.a4a-nepa-comments@mail.mil
Subject:	[Non-DoD Source] Comments and Request for Revised EIS
Date:	Thursday, October 31, 2019 10:30:40 PM
Attachments:	10-31 Letter to Secretary Barrett.pdf Draft EIS Questions.pdf

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Dear Mr. Ortiz:

Please see the attached letter I sent to Secretary Barrett requesting that a revised EIS be prepared related to the 5th and 6th F-35A operation beddowns for the Truax Air National Guard base in Madison Wisconsin. Please consider this an official comment within the EIS process and add it to the administrative record.

I have also attached a document containing 64 comments/questions related to the Draft EIS. Please consider these official comments within the EIS process and add them to the administrative record.

Thank you,

Rebecca Kemble
District 18 Alder
Madison Common Council
608 347-8097

From:	Evers, Tag
To:	usaf.jbanafw.ngb-a4.mbx.a4a-nepa-comments@mail.mil
Subject:	[Non-DoD Source] F-35 Statement from Alder Tag Evers
Date:	Thursday, October 31, 2019 4:11:31 PM
Attachments:	F-35 Statement - Tag Evers District 13 Alder.docx

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

Dear Sir or Madam,

I've attached my comments regarding the draft F-35 EIS at Truax airfield.

Please add me to your email list for receiving information regarding the final EIS.

Tag Evers

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October 31, 2019

The Hon. Barbara Barrett
Secretary
United States Air Force
1670 Air Force Pentagon
Washington, DC 20330-1670

Dear Secretary Barrett:

I'm writing regarding the Draft EIS for the F-35A operation beddown at Truax Air National Guard Base in Madison, Wisconsin. I represent District 18 on the Madison Common Council, which is in close proximity to the base.

Please consider this a formal request for the preparation of a revised Draft EIS for Truax.

According to the Title 32 (National Defense) Code of Federal Regulations (CfR) §989.33 (Environmental justice): "During the preparation of environmental analyses…the EPF should ensure compliance with the provisions of E.O. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and Executive Memorandum of February 11, 1994, regarding E.O. 12898. Further, CfR PART 989—Environmental Impact Analysis Process (EIAP) states that during the Draft EIS process, "Where analyses indicate that a proposed action will potentially have disproportionately high and adverse human health or environmental effects on minority populations or low-income populations, the EPF should make special efforts to ensure that these potentially impacted populations are brought into the review process."

The Draft EIS states that impacts to environmental justice associated with the Proposed Action would be considered significant, and yet no special efforts were made to ensure that these potentially impacted populations were brought into the review process. The recent Draft EIS Open House was held 9 miles distant from the impacted area making it extremely difficult for most of the low-income, transit dependent people who live within the 65 dB noise contour to attend.

During the EIS scoping Open House held at the Crowne Plaza hotel on March 8, 2018 my Council colleagues and I specifically requested that efforts be made to reach out to those living in low-income housing in close proximity to the base. We were told that the Air Force would only host two meetings: the scoping Open House and the Draft EIS Open House and that no special efforts would be made to do any other form of outreach.

Furthermore, materials have all been presented in English. Schools located just outside the 65 dB noise contour that serve children who live within the contour have a student population of 37% English Language Learners. This means their non-English speaking families who will be most impacted have not had access to this vital information.

Many of our elected officials at the municipal, state and federal level have communicated concerns and questions to you and the EIS Program Manager Mr. Ortiz. Among them are US Sen. Tammy Baldwin, US Rep Mark Pocan, State Reps Chris Taylor and Melissa Sargent, and Madison Mayor Satya Rhodes-Conway.

The Madison Metropolitan School District Board of Education sent a letter of concern regarding the potential noise impacts on school children, and the Madison Water Utility Board sent a statement about the ongoing PFAs contamination issues on site at Truax indicating that there are many unanswered question about the Air Force's willingness and ability to further study and remediate the already existing soil and water pollution.

Just yesterday the Wisconsin Department of Natural Resources submitted a letter indicating that the Air Force will not be able to proceed with any construction at the Truax site until a full PFAS site investigation has been completed.

In my formal comments to Mr. Ortiz I listed a number of areas of missing information that require further investigation. Among them are:

- The lack of a study on the impact on property values and property taxes within the 65 dB noise contour
- The lack of realistic modeling concerning afterburner use
- The lack of peak and Lmax dB data for both F-16C and F-35A aircraft in both military power and with afterburner use
- Given the large number of daycares in the area where young children nap, the lack of Probability of Awakening data for the hours between 7am and 10pm
- The lack of safety data for current F-16C operations
- The lack of any information on existing PFAS contamination or commitment by the Air Force to conduct a full site analysis

For these reasons I'm requesting that a revised EIS be prepared which would address all of these outstanding issues.

Thank you very much for your consideration of these requests.

Sincerely,

Rebecca Kemble

Rebecca Kemble

Cc: Mr. Ramon Ortiz, NGB/A4AM, 3501Fetchet Avenue, Joint Base Andrews MD 20762-5157

QUESTIONS RE: DRAFT EIS FOR F-35A BEDDOWN AT TRUAX ANG BASE

1) Was there a study done on the impact on property values and property taxes within the 65 dB noise contour as the result of the Proposed Action as part of the EIS?

- If not, we request that the Air Force issues a revised EIS with that information.

2) Have there ever been any F-35 crashes?

- If so, how many?

3) How frequently can we expect F-35s to crash in Madison given the track record so far?

4) When an F-35 crashes on land, how long is it expected to burn?

5) What kinds of fire-fighting chemicals (list specific compound names) are required to put out a burning F-35? What are the impacts of these chemicals on human health and the environment (soil, groundwater, surface water, fish and other wildlife)?

6) What kinds of chemicals (list specific compound names) are required for F-35 maintenance and operations?

7) What are the impacts of these chemicals on human health and the environment (soil, groundwater, surface water, fish and other wildlife)?

8) In the event of a crash on land and subsequent fire, what are the effects of burning military grade composite materials with which the F-35s are constructed? What chemicals do they emit and what are their impacts on human health and the environment (soil, groundwater, surface water, fish and other wildlife)?

9) In the event of a crash on land and subsequent fire, what are the effects of burning stealth coating with which the F-35s are constructed? What chemicals does it emit and what is its impacts on human health and the environment (soil, groundwater, surface water, fish and other wildlife)?

10) What special occupational safety gear is required for workers applying stealth coating to F-35s? Why is it required?

11) What special occupational safety gear is required for workers cleaning the outside of the F-35s? Why is it required?

12) What chemicals other than PFAS (list specific compound names) remain in soils, groundwater, and vapors on the base from past operations there?

13) What are the risks and impacts of stealth coating contaminating the water and soil after the F-35s are washed?

14) Will the Air Force perform a complete site investigation into existing PFAs contamination before commencing construction for the Proposed Action at Truax Field?

15) Will the Air Force remediate the existing PFAs contamination at Truax Field before commencing construction for the Proposed Action?

16) Will the Air Force comply with Wisconsin Department of Natural Resources regulations on soil and water remediation prior to commencing construction at Truax Field?

17) Please describe how the ANG will prevent the release of PFAs and other chemicals remaining on the base into nearby waterways during extreme flooding events.

18) Please describe how the ANG will monitor and report to the public on PFAs and other chemical water contaminants.

19) Has the mission for the 115thFW ever changed?

20) Could the mission for the 115thFW change in the future?

- If so, is the Air Force required to inform the public about this change in mission?

21) Will block 3 F-35s be upgraded to block 4 when block 4 technology is available?

22) What kinds of weapons do block 3 F-35s carry?

23) Will the block 4 upgrade to the F-35s have nuclear capabilities?

24) Is there a possibility that, should the 115th FW be selected for an F-35 mission, when block 4 technology is available and deployed in Madison the 115thFW will get a nuclear mission?

- If so, is the Air Force required to inform the public about this change in mission?

25) If the 115th FW is not selected for the 5th or 6th F-35 beddown will it lose its flying mission?

26) If the 115th FW is not selected for the 5th or 6th F-35 beddown will the base close?

27) If the 115th FW is not selected for subsequent F-35 beddowns will it lose its flying mission?

28) If the 115th FW is not selected for subsequent F-35 beddowns will the base close?

29) Which other flying missions might the 115th FW be eligible for if not selected for the F-35 mission?

30) Which other non-flying missions might the 115th FW be eligible for if not selected for the F-35 mission?

31) Where F-35s are currently flying at Luke, Eglin and Hill Air Force Bases, how frequently do they take off with afterburners?

32) Is modeling noise impacts for the Proposed Action using 5% afterburners realistic and based on how F-35s actually operate at other Air Force Bases?

- If not, we request that a revised EIS be completed with realistic proportion of afterburner usage.

33) Will a different percentage of afterburner use be used in the noise modeling for the 7th and 8th beddown EIS reports?

- If so, why aren't those percentages used for this EIS?

34) The EIS study for the Burlington, VT F-35 beddown included peak and Lmax dB levels. Why were these not included in the Draft EIS for Madison? In the absence of this data, we request that the Air Force issue a revised EIS with the following information:

- What is the peak dB level (as compared to SEL or Lmax) for F-35s in take off and landing in military power?
- What is the peak dB level (as compared to SEL or Lmax) for F-16Cs in take off and landing in military power?
- What is the peak dB level (as compared to SEL or Lmax) for F-35s in take off and landing with afterburners?
- What is the peak dB level (as compared to SEL or Lmax) for F-16Cs in take off and landing with afterburners?

35) Where will maintenance activities take place for the F-35s under the Proposed Action?

36) Who will perform the maintenance activities for the F-35s under the Proposed Action?

37) Will any of the maintenance activities for the F-35s under the Proposed Action be performed by Lockheed Martin or their subcontractors?

38) Will any current 115thFW maintenance positions become redundant and eliminated if maintenance activities for the F-35s are performed directly by Lockheed Martin or their subcontractors off base?

- If so, how many?

39) Does the noise modeling in the Draft EIS represent the worst case scenario?

40) Does the noise modeling in the Draft EIS represent the most likely scenario?

41) Does the noise modeling in the Draft EIS represent the best case scenario?

42) In Table WI3.1-15 Probability of Awakening on page WI-36, what time frame was considered in generating the data?

43) In Table WI3.1-15 Probability of Awakening on page WI-36, if only nighttime hours were considered, given the large number of daycares in close proximity, how is the impact on children's nap times and sleeping hours for shift workers considered?

- If not considered, we request that the Air Force issue a revised EIS with this information.

44) In Section WI4.2.12 the Draft EIS states, "The areas of proposed construction are considered to have no to low probability of containing archaeological resources." How was this probability determined?

45) Is the Air Force aware of the existing effigy mound at the Dane County Regional Airport?

46) Was the Ho Chunk Tribal Historic Preservation Officer consulted in the preparation of the Draft EIS?

47) Please identify all of the solvents, lubricants, and petroleum products including fuels that are currently in use at the ANG facility at Truax, as well as a list of chemicals that will be used to support operations and maintenance of the F-35A aircraft and the management of the F-35A armaments, fuels, and emergency response supplies.

48) Will the F-35s take off with full fuel loads?

- If not, how full will their tanks generally be?

49) Can you guarantee that F-35s will only take off in afterburner 5% of the time?

50) Did you evaluate the number of times that F-16s land at Truax with the assistance of another plane due to safety issues?

- If not considered, we request that the Air Force issue a revised EIS with this information.

51) In the event of safety issues during an F-35 flight requiring the pilot to ditch, where would the F-35 be ditched?

52) The Joint Programme Office stated, regarding F-35As: "Both hardware and software upgrades are required for the weapon system to be dual-capable. These dedicated

modifications are being installed on US Air Force F-35As as baseline design provisions." Is this information correct?

53) Which Block 4 increment is Dual Capable Aircraft (DCA) upgrade aligned with?

54) Does the Air Force plan to ultimately upgrade all (or most) F-35As to DCA capability?

55) Is it possible that, when DCA upgrades occur, dual-capable F35As will be stationed at Truax?

56) Is there any possibility that, in the future, should the 115th FW be selected for an F-35 nuclear mission, that B61 mod12s will be stored at Truax?

57) Pratt & Whitney is defining a new engine upgrade package for the F-35, for increased thrust, to be delivered starting in 2026 (Growth Option 2.0 upgrade for insertion beyond Block 4.2 aircraft). An EIS must cover environmental impacts that are "reasonably foreseeable". What effect will the anticipated engine upgrade on noise pollution and other environmental impacts?

58) How will Block 4 upgrades (4.1-4.4) alter F-35A environmental impacts at Truax?

59) The draft EIS states "There is no training requirement for F-35A pilots to utilize afterburner on take-offs" and says that in training runs, afterburner use is required only in "rare cases". However, pilots need to train in using a plane as they would in actual combat missions, and thus would need to substantially train with afterburner use (otherwise they would be left without skills essential to combat missions). Statements by Air Force officials confirm this. Why do the draft EIS statements appear inconsistent with this?

60) ANG statements imply that they would restrict the frequency of afterburner use during take-offs at Truax (i.e., to maintain a low rate of afterburner use). But this appears to raise a safety issue - see for example a comment by Luke A. Barradell (CDR USN AETC JSF/FI): "A/B takeoffs are a safety of flight concern and the norm for even twin engine fighters. A quicker access, less runway used for T/O and therefore more length to abort or put back down on the runway. Based on temp and fuel weights, this can be anywhere from 1000-1500 foot difference in takeoff roll. This jet can FLCP at MAX fuel weight and therefore heavyweight takeoffs are the norm....Bottomline, the acceleration and additional options afforded a single engine aircraft drive the takeoff to the more appropriate AB go and that is what is being executed by the services currently at Eglin. Not sure why the other OPS tables did not reflect that, even considering the long runways at Eglin."
Does restricting afterburner use during take-off on a shorter runway (such as Truax) increase the risk of a mishap?

61) The draft EIS states: "For this Proposed Action, the USAF has evaluated the requirement for F-35A afterburner use during a departure at each of the five alternative installations based on a basic training configuration, airfield elevation, runway length, and hottest temperature on record." What exactly – in detail – is the "basic training configuration" assumed? Does this

"basic training configuration" reflect the reality of all ANG F-35A take-offs that can be anticipated from Truax (i.e. the F-35A Block 3F, with full fuel loads, munitions loads, etc.)?

62) According to the Title 32 (National Defense) Code of Federal Regulations (CfR) §989.33 (Environmental justice): "During the preparation of environmental analyses…the EPF should ensure compliance with the provisions of E.O. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and Executive Memorandum of February 11, 1994, regarding E.O. 12898. Further, CfR PART 989—Environmental Impact Analysis Process (EIAP) states that during the Draft EIS process, "Where analyses indicate that a proposed action will potentially have disproportionately high and adverse human health or environmental effects on minority populations or low-income populations, the EPF should make special efforts to ensure that these potentially impacted populations are brought into the review process." What special efforts were made to ensure that potentially impacted populations were brought into the review process for the Draft EIS?

63) Has the Air Force evaluated the toxicity of the composite materials used in the F-35s relative to materials used in the construction of the F-16s?

- If so, please provide that information

64) Is it a choice to fly in afterburner or is it a requirement to fly in afterburner under certain conditions?

Comment Details

Name	Tag Evers
Email Address	district13@cityofmadison.com
Comment	Office of the Common Council Ald. Tag Evers, District 13 City-County Building, Room 417 210 Martin Luther King, Jr. Boulevard Madison, Wisconsin 53703-3345 district13@cityofmadison.com www.cityofmadison.com/council/district13 October 31, 2019 My name is Tag Evers, resident of Madison since 1988, and duly-elected member of the Madison Common Council, and District 13 Alder. Upon my election, I was appointed by our city's Mayor, Satya Conway-Rhodes, to the Board of Public Works. The Board of Public Works is charged by Wisconsin state law and Madison municipal ordinance to ensure that our streets and storm water infrastructure are in good working order. In a city that is facing increasingly intense rain events, the Board is further burdened with monitoring the quality of water that flows through our storm sewer infrastructure to our city's lakes. The Board has been following the reports of per- and polyfluoroalkyl substances (PFAS) contamination at Truax Field, as well as the results of the testing of Madison's drinking water wells. Left unremediated and uncontained, it is highly probable this contamination is subject to the impact of rain events and will ultimately affect the water quality of our lakes. On October 7th, 2019, the Wisconsin Department of Natural Resources (WDNR) released PFAS test results of water from Starkweather Creek, which flows adjacent to Truax Field. The WDNR tested six surface water bodies suspected of being contaminated by PFAS, and the concentrations in Starkweather Creek were the highest in the state. Specifically, the study detected perfluorooctane sulfonate (PFOS) at 270 ng/l and perfluorooctanoic acid (PFOA) at 43 ng/l. PFAS contamination is also a concern in Madison's drinking water. Trace PFAS contamination has already been detected in many of Madison's wells, with the highest level of contamination being recorded in well number 15 which is closest to Truax field. The WDNR study identified the only known upstream PFAS source as the Truax Field Air National Guard Base (https://dnr.wi.gov/topic/Contaminants/WaterQuality.html). There is no doubt that PFAS contamination at Truax Field is actively being released into the environment, further contaminating Starkweather Creek, Lake Monona, and groundwater in Madison, WI. As a Board of Public Works member and elected city official, I am very concerned that construction activities on the Truax ANG Base would disturb soil contaminated with PFAS and accelerate further contamination of surface and groundwater. Traditional erosion control measures can stop sediment from entering Starkweather Creek, but they will not stop the movement PFAS contamination. A site investigation conducted under WDNR supervision and in full accordance with the Wisconsin Administrative Code NR 700 Series has not been completed for the base. As such, any excavation
Organization	Common Council -- District 13 Alder
Address 1	2329 Keyes Avenue
City	Madison
State	WI
Postal Code	53711
Phone Number	6082199676
Mailing List?	Yes
Wants CD?	Yes
Withhold Name?	No

Withhold Address?	No
Date Received	10/31/2019 5:12:58 PM EDT

From: Kemble, Rebecca
To: usaf.jbanafw.ngb-a4.mbx.a4a-nepa-comments@mail.mil
Subject: [Non-DoD Source] Draft EIS Comments
Date: Friday, November 1, 2019 1:43:05 PM

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

Dear Mr. Ortiz:

I have two additional questions:

1) Will comments submitted through the Caution-www.angf35eis.com < Caution-http://www.angf35eis.com > website be considered the same way comments submitted via email and US mail will be considered in preparing the Final EIS?

2) In the EIS prepared for the VTANG beddown of F-35s the safety/mishap record of the F-35s was compared with the safety record of the F-22s, claiming it would be similar. Is this still accurate?

- If not, has the F-35 established a safety/mishap record of its own?
- If the F-35 has established a safety/mishap record of its own, how does it compare with the F-22?

Thank you,

Rebecca Kemble
District 18 Alder
Madison Common Council
608 347-8097

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Mr. Ramon Ortiz
NGB/A4AM
3501 Fetchet Avenue
Joint Base Andrews MD 20762-5157

November 1, 2019

Re: Comments Regarding F-35 Draft Environmental Impact Statement FR #2018-02468

Dear Mr. Ortiz,

The official process of finding a location to "bed-down" F-35 fighter jets in the central section of the United States began in 2016 when five locations were taken under consideration. According to Air National Guard testimony at the Madison Common Council public hearing recently, these locations were identified based on characteristics of their facilities including length of runway, types of buildings, personnel available, etc. In December 2017, Madison's Truax Field was chosen as a preferred location for F-35 fighter jets. At that time, the Madison community was invited to identify concerns and provide comments during a "scoping" period; in April 2018 the Madison Common Council provided comments[1] which identified concerns, and urged the anticipated Environmental Impact Statement to address the following issues:

1. Neighborhood Characteristics: health & other data
2. Noise Issues
3. Cultural Issues: traditional, archaeological and architectural
4. Water Issues: quantity, quality, stormwater, watersheds and floodplains
5. Hazardous Materials: wastes, toxic substances and contaminated sites

In the April 2018 comments, the Common Council resolved to "remain engaged throughout the entire EIS process to ensure that residents are represented in the decision-making process".

In August of 2019, the City received notice that the Draft Environmental Impact Statement (EIS) had been released. Written by an engineering consultant, the document provides numerous estimates of

1 2018 Common Council Scoping Comments Document can be accessed at:
https://madison.legistar.com/View.ashx?M=F&ID=6200867&GUID=29B2B4A9-2515-4EA0-8AB5-B4D023F5AAF9

potential impacts on the community in an effort to respond to issues identified by the City during the scoping period the previous year. The Draft EIS notes, among other issues:

- economic impact would be negligible
- peak noise levels could exceed 100 dB
- households on hundreds of acres would be impacted by noise only some of which could be mitigated, and only by the FAA, through a process the City would not be party to
- low-income and minority communities would be disproportionately impacted, including residents of public and subsidized housing
- children in daycare centers, schools and special needs programs are also in the area impacted by noise

On September 10, 2019, staff from five city departments provided a report analyzing some of the information provided in the Draft EIS and raising further issues on the health and land use impacts of noise, potential for noise mitigation, stormwater and contamination, and the potential for nuclear weapons to be on site in the community. Staff also provided more accurate data on the locations of vulnerable populations than had been provided in the Draft EIS.[2]

On September 17, 2019, I issued a statement[3] demanding more thorough information from the United States Air Force/Air National Guard (USAF/ANG), suggesting they take into consideration the adverse impacts identified in the Draft EIS and the City Staff analysis, and potentially re-evaluate their selection of Truax Field if the Final EIS does not respond to those concerns and provide strategies to affirmatively mitigate the noise and other detrimental impacts of siting F-35s there. That evening, the Common Council took testimony from the public for five hours, followed by two hours of discussion on the final terms of a Resolution[4] requesting that the Air Force "reconsider the selection of Truax Field as a preferred location until and unless the findings of the EIS are shown to misrepresent the significant environmental impacts to those living, working, and visiting the north and east sides of Madison".

Highlights from public testimony at the Common Council on the evening of 9/17/19 and into the morning hours of 9/18/19 included the following:

- noise impacts, especially for those most vulnerable (children, refugees, veterans)
- greater noise impact of brief intermittent/stochastic/impulse sound
- relative noise of F-35s compared to F-16s
- unremediated PFAs contamination on the site
- inaccessibility of Alliant Center public input session to impacted residents

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2 That staff report can be found here: https://www.cityofmadison.com/mayor/documents/F35%20EIS%20staff%20analysis%209-10-19.pdf and the associated maps can be found here: https://www.cityofmadison.com/mayor/documents/Maps%20for%20EIS%20analysis%209-10-19.pdf

3 Statement available here: https://www.cityofmadison.com/mayor/news/statement-from-mayor-rhodes-conway-re-f-35-environmental-impact-statement

4 Full text of the 2019 Common Council Resolution available here: https://madison.legistar.com/View.ashx?M=F&ID=7719760&GUID=A53F3230-1F25-42E7-93DC-69AB5E12D8E6

- comparatively less impact on residential areas of other potential air base locations
- key misinformation from the Draft EIS was perpetuated ("uninhabitable homes," etc.)

The entire meeting, including the public comments, is available for viewing online,[5] and I strongly encourage you to view the hearing, as most of the testimony was directed towards, or is directly relevant to, the Air Force's decision making process.

Based on our staff analysis, these comments and more, the City of Madison Mayor's Office hereby submits the following substantive comments with expectations that they will be addressed in the Final EIS, and the Secretary of the Air Force will reconsider listing Truax Field as a preferred location before making a final decision on where to bed-down the F-35 fighter jets.

1. Process Concerns:

Flaws in the EIS process have restricted the time and information available to understand the complex issues involved, the USAF/ANG located the sole public meeting far from residents most likely to be negatively affected, and provided no translation of documents or interpretation for non-English speaking populations.

While the draft EIS may check the box of what public process and participation needs to occur, Madison and its residents expect better and more accurate information and a process accessible to all residents. The USAF/ANG public hearing on September 12 at the Alliant Energy Center was more than an hour via public transportation from the most impacted areas, which is particularly concerning given the higher rate of low-income households impacted. The impacted area contains a significant number of non-English speaking households, but it appears that all documents related to this process are only available in English. Under Executive Order 13166 and Title VI of the Civil Rights Act of 1964, Federal Agencies must provide individuals with limited English proficiency with meaningful access to federally conducted and federally funded programs and activities.

Questions for the USAF/ANG:

1. Why was the Aliant Energy Center selected for the public hearing?
2. What other options closer to the impacted area were investigated?
3. Why didn't the USAF/ANG provide, or coordinate with the City to provide, better transportation options for the often transit-dependent residents living in the areas most impacted?
4. Why wasn't the EIS information translated into other languages? Were any efforts made to comply with Executive Order 13166 and Title VI of the Civil Rights Act of 1964?

5 Video of the full Common Council meeting can be found here: https://media.cityofmadison.com/Mediasite/Showcase/madison-city-channel/Presentation/b003fb5745924c59a0d18f02a60ffd671d

2. Demographics:

The EIS acknowledges disparate impacts on low income Madison residents and communities of color, but our staff analysis suggests its methodology understated their significance. The USAF/ANG should further evaluate the impacts on children in daycare centers, schools and special needs programs in the area as well as residents of low income housing located in the areas most impacted by the noise of jet operations.

The EIS provides a basic level analysis of land use and the population that may be impacted within the 65 dB DNL curve. To do this, EIS authors manually counted residential structures and used 2016 American Community Survey 5-Year Census block group data to estimate impacted populations. The EIS estimated 1,318 households and 2,766 residents inside the 65 dB DNL curve. Demographic data was evaluated at the Census block group level by the EIS, including race/ethnicity, poverty and population under 18. The EIS used 20% of the population in poverty and 50% of the population identifying as a minority as thresholds to flag impacted block groups.

While the 50% minority rate may be a national standard for environmental impact statements, it appears to be a very high bar for measuring impacts on communities of color particularly in Madison and Dane County, where persons of color make up 26% and 20% of the population respectively. Using this metric, the only block groups flagged for having a minority population are west of the airport, generally outside the 65 dB DNL curve. **Nearly every impacted area within the City of Madison belongs to a census tract with rates of persons of color well above the city- and county-wide averages.** The block group with the largest expansion of the impacted area (Carpenter Ridgeway) is comprised of 43.9% persons of color. While the EIS acknowledges it has a disproportional impact on persons of color, its methodology results in this issue being understated.

The threshold for poverty appears more in line with Madison (26%) and Dane County (20%) averages. Like the persons of color statistic above, **nearly every block group within the impacted area has poverty rates above the city-wide average**.

It should also be noted that **there are several concentrations of poverty and persons of color just outside the 65 dB DNL contour**, including the CDA Truax housing, CDA Webb-Rethke townhomes and other housing near Worthington Park, and near the intersection of Packers Avenue and Northport Drive. While these areas will experience virtually identical noise exposure as residents who live on the contour line, they will not be eligible for federal sound mitigation funding through the Noise Compatibility Program. If Truax is selected for future F-35s, it's a reasonable conclusion that non-mitigated areas immediately adjacent to but outside the 65 dB DNL contour may experience more significant impacts than mitigated (soundproofed) residences inside the impacted area.

In addition to CDA owned properties, there are more than 80 subsidized low-income housing units present in the impacted area. Most of these units are located in the recently built Rethke Terrace, which provides permanent supportive housing for formerly homeless individuals and received significant support from the City's Affordable Housing Fund. In total, nearly 800 subsidized low income housing

units are within 1,500 feet of the 65 dB DNL contour.

Rents and home values inside the 65 dB DNL contour are significantly more affordable than the City as a whole. Assessments of homes and condominiums inside the impacted area have a median value of $174,400 compared to the Madison median of $254,900. Rents are generally 10-20% lower than Madison's median rent according to census block level 5-year data. With relatively rapid housing cost increases seen across Madison and relative scarcity of affordable neighborhoods, these areas play an important role in Madison's overall housing picture. Preserving these as livable neighborhoods going forward, either through a no change scenario or one with sound impact minimization or mitigation, is certainly in Madison's best interest.

Finally, aside from Lakeview Elementary and The Richardson School, there are many pre-schools, public, and private schools nearby that may be impacted by increased noise levels that are not accounted for in the EIS. These include, Blackhawk Middle School, Gompers Elementary, Isthmus Montessori Academy, Shabazz High School, Sherman Middle School, Emerson Elementary School, East High School, Hawthorn Elementary School, Lowell Elementary School, Whitehorse Middle School, Schenk Elementary School, St. Dennis Grade School, Madison Baptist Academy, Sandburg Elementary, Eastside Evangelical Lutheran Academy, and potentially others.

A map of these potentially impacted schools is attached.

Questions for USAF/ANG:

1. Why was the arbitrary level of 50% of the population identifying as a minority used as the threshold for identifying impacted block groups?
2. What is the impact of using an alternative definition of any block group that contains more people of color than the area median?
3. Why were concentrations of vulnerable populations, including schools, not taken into account in the draft EIS? How will that be remedied in the final EIS?

3. Impact on Public Housing Investments

The Department of Housing and Urban Development, The Wisconsin Housing and Economic Development Authority, the Madison Community Development Authority, the City of Madison and other private non-profit entities have invested significant funds into the creation of affordable housing in the neighborhoods surrounding Truax Field. The final EIS must take into account these investments and the potential impact of the bed-down on them.

Madison's Community Development Authority (CDA) governs the city's 916 public and multifamily housing units. The focus of this housing is to "provide decent and safe rental housing for eligible low-income families, the elderly, and persons with disabilities." The CDA is charged with upholding Wisconsin State statute (Wis. Stat. § 66.1201) to operate in the public interest of providing safe and sanitary housing for vulnerable residents.

There are multiple CDA properties, as well as many low-income housing units, within or very near to the 65 dB DNL contour presented in the Draft EIS. In particular, the Truax Park Apartments and the Webb-Rethke townhomes are located on the border of the 65 dB DNL contour. Demographics for individuals and families living on this border in CDA public housing properties are as follows:

Resident Demographics

			Head-Of-Household Demographics			
	# Units	# of People	Elderly	Disabled	Persons of Color	Low-Income
Truax Park Apartments	187	476	14%	44%	67%	100%
Webb/Rethke Apartments	36	125	15%	48%	85%	100%
	223	601				

The draft EIS has not adequately analyzed the impact of the proposed F-35 bed-down on these properties. **The draft EIS states that 551 people will be impacted by the 65-70 dB DNL contour (2019, p. WI-24), however, the population at these two properties alone is 600 residents over the total number of affected residents accounted for in the draft EIS.**

Portions of the Truax Park Apartments housing project site received substantial modernization through building rehabilitation in 2011 (71 units) and redevelopment in 2015 (40 units), with approximately $13,602,216 invested in Phase 1 capital improvements and $8,164,777 invested in Phase 2 capital improvements. The remaining 76 functional units at Truax Park Apartments and the Webb-Rethke Townhomes have incurred capital improvement costs of $1,002,954 since 2015. Truax Park Apartments and Webb-Rethke Townhomes must operate as low-income public housing in a heavily regulated environment. Redeveloped units at Truax must also be operated in a manner consistent with its treatment as a partnership for federal and state low-income housing tax credits. The Department of Housing and Urban Development (HUD) emphasizes and measures a public housing project's performance in keeping available units occupied. Being located on the border of the 65 dB DNL contour could result in higher vacancies. The negative impact of maintaining a low occupancy rate at these properties would result in a low performance score with HUD, which in turn, would reduce federal public housing subsidy to Truax Park Apartments and Webb-Rethke Townhomes.

The inclusion of the CDA properties in the final EIS is particularly important because, according to the draft EIS, "upon completion of the Final EIS, a mitigation plan will be prepared" (2019, p. WI-17). Given this stipulation, the 600 residents on the border of the 65 dB DNL contour are at risk of being unacknowledged and left without recourse to possible mitigation considerations.

Considering this information, the CDA is requesting that the USAF/ANG include these public housing complexes in the noise impact analysis in the final version of the environmental impact statement. Not only are these residents potentially impacted by the F-35 bed-down, they are also limited in their ability to move away from the Truax area in the event of adverse impacts.

Questions for USAF/ANG:

1. Why were these critical properties not included in the EIS analysis?
2. Has HUD been consulted in the decision making process around this bed-down, given their investment of significant funds into our community, and this area in particular?

4. Contamination:

Truax Field is known to be contaminated by PFAS chemicals that are already threatening Madison's water supply. Existing contamination must be investigated, documented, and a material management plan developed prior to any construction on the site. The final EIS should specify how the USAF/ANG intends to cooperate with the Wisconsin Department of Natural Resources to complete these steps and comply with applicable regulations.

The most urgent environmental issue at Truax Field is contamination from per- and polyfluoroalkyl substances (PFAS) associated with the long-term and widespread use of aqueous film-forming foam (AFFF). Contamination from PFAS fluorosurfactants in AFFF has extensively contaminated soil and groundwater throughout the base. Base operations appear to have also contaminated the nearby public drinking water well, Unit Well 15, which the City the Madison has temporarily shut down as a precaution. The long-chain PFAS present on the 115th Fighter Wing (115 FW) include perfluorooctanoate (PFOA) and perfluorooctane sulfonate (PFOS), both of which are recognized as environmentally persistent, bioaccumulative, and toxic to human health.

In response to this extensive contamination, the City of Madison has five requests. First, the City of Madison requests that the environmental site investigation into PFAS contamination on the 115 FW to be completed under Wisconsin Department of Natural Resource (WDNR) supervision and in full accordance with the Wisconsin Administrative Code NR 700 Series. The March 2019 report entitled *Final Report FY16 Phase 1 Regional Site Inspections for Perfluorinated Compounds: Truax Field Air National Guard Base, Madison, Wisconsin* was only the first step in a site investigation. The WDNR has clearly communicated that additional sampling is required to define the magnitude and extent of PFAS contamination in soil, shallow groundwater, deep groundwater, surface water, and sediment. A complete investigation shall include sampling off the 115 FW using multi-depth well nests to fully detect and model the contaminant plume migration between the base and Unit Well 15. The investigation shall also include sampling surface water and sediment in the adjacent Starkweather Creek.

Second, as required under Wisconsin Administrative Code ch. NR 718, the 115 FW shall obtain WDNR approval of a Material Management Plan (MMP) prior to the start of any construction. Construction involving the excavation of soil or dewatering of groundwater cannot safely and legally be conducted based on the environmental results presently available. The MMP shall address how soil and groundwater contamination will be managed on and off the 115 FW during construction. Contaminated soil excavated from the 115 FW is a solid waste and shall be managed in compliance with Wisconsin Statutes ch. 292 and Wis. Admin. Code chs. NR 500 to 538.

Third, the City of Madison wants PFAS contamination resulting from actions on the 115 FW to be fully remediated under WDNR supervision and in full accordance with Wis. Admin. Code NR 700 Series. While the 2018 site investigation report identified significant contamination, no remedial action has been planned. Consequently, contamination from the 115 FW is actively being pushed further into the environment with each precipitation event. Groundwater contamination from the 115 FW will impact Unit Well 15 for decades to come; immediate source removal of contaminated soil may lessen these impacts. The City has been notified that because the impacts to Unit Well 15 are less than the Federal EPA's health advisories for PFOA and PFOS, remediation of the 115 FW is "not a priority." The City of Madison does not accept this assessment: 115 FW operations have contaminated soil and groundwater with PFAS on and off the base, and the contamination shall be remediated per federal and state statutes.

Fourth, in a July 25, 2018 letter to the WDNR, the 115 FW accepted responsibility for conducting site investigations into potential PFAS contamination on two former fire training burn pits located at International Lane and Darwin Road and at 1750 Person Street in Madison, WI. However, no additional work has taken place on either site. The City requests that the 115 FW honor its commitment to conduct these historic burn pit site investigations no later than FY2020.

The EIS states that the 115 FW will "coordinate with the WDNR regarding proposed construction near Environmental Repair Program sites, including PFAS PRLs" (p. 2-40). However, the WDNR has made persistent requests to the 115 FW for completion of the PFAS site investigation, investigation into the two former burn pits, and for a Material Management Plan and these requests are being ignored. Historically, the 115 FW and the WDNR have had a productive and cooperative relationship that has led to the remediation of nine other contaminant sites. The City's fifth request is that the EIS specifically outline how the 115 FW will cooperate with the WDNR to: complete the PFAS site investigation, safely manage materials during construction, and remediate the remaining PFAS contamination. The EIS shall include reference the WDNR's Bureau for Remediation and Redevelopment Tracking System (BRRTS) on the web (BOTW) as a place where citizens can download relevant environmental documents associated with remediation of the 115 FW. Specifically, the EIS shall document that the 115 FW is an open contaminant site with the WDNR under BRRTS #02-13-581254.

Last, the Madison Water Utility Board adopted a statement[6] which says, in part, "The Madison Water Utility Board urges the Department of Defense and United States Air Force to complete the PFAs investigation, coordinating fully with WDNR; remediate the contamination, and assume the costs borne by the Madison Water Utility rate payers to provide adequate treatment for PFAs at Well 15 or replace the affected well. We look forward to the Air Force and the 115th Fighter Wing acting as good neighbors, who share our goal of protecting the safety and health of our shared community, before adding additional infrastructure and jet capability at the Truax base."

6 That Water Utility Board statement is available here: https://www.cityofmadison.com/water/news/madison-water-utility-board-statement-on-proposed-air-national-guard-f-35a-operational-beddown

Questions for USAF/ANG:

1. What are the true costs of dealing with existing PFAs contamination? Are those accounted for in the EIS?
2. How will the final EIS address the prevention of future PFAs contamination?

5. Stormwater:

Adding 1.7 acres of impervious surface at Truax Field would increase the risk of flooding in the Starkweather Creek Watershed. To mitigate these negative impacts, the USAF/ANG must comply with the City's stormwater regulations and requirements. Further, it is apparent that runoff from the site is already contaminated by PFAs. The EIS must include the impacts (financial and environmental) of remediating this existing problem in addition to any construction impacts.

The EIS discusses construction activity needed if Truax Field is selected to receive F-35s. The EIS indicates these changes would add a total of 1.7 acres of impervious area. Added impervious surface would be near existing ANG facilities, outside the significant area of floodplain to the north runway 14-32 and west of the airport.

On October 7th, 2019, the Wisconsin Department of Natural Resources (WDNR) released PFAS test results of water from Starkweather Creek,[7] which flows adjacent to Truax Field. The WDNR tested six surface water bodies suspected of being contaminated by PFAS, and the concentrations in Starkweather Creek were the highest in the state. Specifically, the study detected perfluorooctane sulfonate (PFOS) at 270 ng/l and perfluorooctanoic acid (PFOA) at 43 ng/l. The WDNR study identified the only known upstream PFAS source as the Truax Field Air National Guard Base. There is no doubt that PFAS contamination at Truax Field is actively being released into the environment, further contaminating Starkweather Creek, Lake Monona, and groundwater in the City of Madison.

I am concerned that construction activities on the Truax ANG Base will disturb soil contaminated with PFAS. Traditional erosion control measures can stop sediment from entering Starkweather Creek, but they will not stop the movement of PFAS contamination. A site investigation conducted under WDNR supervision and in full accordance with the Wisconsin Administrative Code NR 700 Series has not been completed for the base. As such, any excavation of soil risks releasing more PFAS contamination into Starkweather Creek and Lake Monona, exposing residents who swim in this lake as well as those who fish there for sustenance.

The draft EIS recommends that a "Media Management Plan" be established to monitor PFAS levels and manage the contamination during construction. However, the draft EIS but does not provide estimates for the costs associating with managing the contamination during the construction phase, nor does it provide information as to which agencies would be available to cover these costs. The final EIS

7 Those results are available here:
https://dnr.wi.gov/topic/Contaminants/documents/pfas/SurfaceWaterReport20191015.pdf

must include an analysis of the costs to contain and remediate PFAS on the planned construction site.

All construction activity would need to comply with Wisconsin standards including NR-116 (floodplain) and NR-151 (water quality and limited detention). Madison ordinances (MGO 37) have significantly more water quality and detention (flood control) requirements than the state standards. Based on the historic rain events experienced on the Westside of Madison and Dane County last year, and the well documented increase in frequency of intense storm events, Madison is currently working to revise its code to include additional stormwater requirements which would likely be in place if and when construction occurs.

I strongly recommend that the redevelopment of the 115th Fighter Wing comply with Madison's proposed stormwater management standards and the new development comply with existing standards which for this site would include 80% total suspended solids control, 90% infiltration and 100 year detention.

Draft stormwater requirements state that redevelopment should meet the following criteria:

1. Reduce peak runoff rates from the site by 15% compared to existing conditions during a 10-year design storm.
2. Reduce runoff volumes from the site by 5% comparted to existing conditions during a 10-year design storm.
3. The required rate and volume reductions shall be completed, using green infrastructure that captures at least the first 1/2 inch of rainfall.
4. The following guidance shall be used in interpreting this code:
    a. An intensive greenroof with a media depth of 12" or more shall be considered to result in no runoff during a 10-year design storm and this reduction may be used to offset volumes and rates for the remainder of the site.
    b. An extensive greenroof with media depth of a minimum of 4" shall be considered to be pervious for the purpose of meeting the lot coverage described above.
    c. Pervious pavement designed to comply with the Wisconsin WDNR's guidance for post construction stormwater practices shall be considered to be pervious for the purposes of meeting the percent lot coverage described above.

Questions for USAF/ANG:

1. What are the expected costs to contain and remediate PFAS on the planned construction site?
2. What stormwater management standards does the Air Force anticipate meeting during and after construction?

6. Noise:

The sound modeling provided in the EIS created considerable confusion and deep community concern about the type and levels of noise associated with F-35 operations. The Air National Guard should provide information more specific to its expected operations at Truax Field including number of flights, sound contours, use of afterburners, and more.

As has been widely discussed, replacement of F-16s with F-35s would result in an increase in overall loudness in areas near Dane County Regional Airport and Truax Field. The most discussed statistic in the EIS is Day Night Average Sound Level (DNL), a cumulative measure of multiple flights and engine maintenance that incorporates sound from both military and civilian aircraft. This metric is intended to provide an overall picture of noise exposures, rather than a measure of specific sound events. As a result, it isn't directly comparable to other sound level statistics measured in decibels.
The DNLs were generated by a model that factors:

- aircraft type and noise profiles
- number of flights for each aircraft type
- frequency of specific approach and departure paths (i.e. how often each runway is used)

In 1983, the FAA published Noise Control and Compatibility For Airports, an advisory document addressing aircraft noise and surrounding land uses. The document established a standard methodology for measuring cumulative noise exposure and identifies land uses that are often more sensitive to noise. Through this document, the FAA determined the 65 dB DNL contour is the noise exposure level where land use compatibility issues may begin to arise surrounding airports. This document is the source of the land use compatibility table included in the draft EIS on page 3-33.

FAA's advisory document appears tailored toward addressing future use of vacant property and redevelopments surrounding airports by recommending land uses or construction techniques that minimize sound impacts to users. It's important to clarify that the document's use of the term "Incompatible" does not mean uninhabitable, nor is it a substitute for or superseding other local land use decisions. **In effect, FAA designations of incompatible and conditionally compatible land uses with the 65dB DNL curve defines where federal funding can be used to minimize and mitigate noise exposure for existing uses.** The document also begins to discuss the Part 150 Noise Compatibility Program, which grants federal Airport Improvement Program funds to airports to carry out federally approved noise mitigation techniques. The Noise Compatibility Program will be discussed in greater detail later in this memo.

The sound contour expansion modeled in the EIS is attributable to two primary factors: the change in sound level associated with the F-35s and the increased number of flights planned. Because the sound contours are Day Night Average Sound Level, increased quantity flight events will increase the cumulative daily sound exposure and result in larger contours.

There has been extensive discussion locally related to the assumptions used to create the acoustical modeling and how those reflected or deviated from practices occurring or likely to occur. While it's understood the larger EIS process needs standard assumptions for an apples to apples comparison amongst locations considered, the analysis as presented did not appear to accurately or effectively communicate the sound experience for Madison residents for either the current F-16s or proposed F-35s. The draft EIS states afterburners will not be needed on F-35s, but models them anyway for 5% of takeoffs (down from 60% use on F-16s). It models a 47% temporary increase in flight activity while transitioning and discusses a long-term 27% increase after transitioning to F-35s without any increase in aircraft and only a possibility of adding one additional pilot. It discussed the construction of new

flight simulators, but doesn't account for how many flights this may reduce. Average flight length in the EIS, the basis for estimating how many flights would occur, is 10% shorter than what is currently flow with F-16s. The EIS doesn't reflect the current Air National Guard estimate of a 20% reduction in F-16 arrivals and departures at Truax associated with offsite operations or due to the unique air-to-air refueling operations with Milwaukee's 128th Air Refueling Wing.

Given the above inconsistencies in modeling, and that residents are very accurately pointing out that peak volume levels they hear with the current F-16s are often far louder than 65 dB, the concern for what could happen to Madison's neighborhoods is entirely valid. DNL may be the standard for determining federal mitigation funding, but it's a very poor metric for communicating very loud but relatively infrequent sound experiences. The draft EIS seems to create more questions than it answers, leading many to seek outside information which may or may not be valid or transferable to Madison.

Health consequences associated with noise exposure are dependent on the duration of exposure, intensity (decibel level), and how often a population is exposed. **Health impacts associated with long term exposure to noise levels similar to those expected from the F-35s include: sleep disturbance, decreased school performance, increased levels of stress, hearing impairment, annoyance, hypertension, and heart disease.** FAA rules restrict funding for sound mitigation to permanent structures and would presumably not be applicable to the mobile home park on Parkers Avenue, which contains 312 units per City of Madison property data. In addition, this funding would not be applicable to residential units and structures lying just outside the 65 dB DNL contour lines, which include subsidized housing units, the Madison College campus, and Hawthorne Elementary School. A broader spatial consideration of noise exposure impact and consequences should be considered to protect these vulnerable populations.

Questions for USAF/ANG:

1. Are the noise/sound analyses in the Draft EIS specific to Madison and the conditions and practices of Truax Field?
2. What is the actual average number of locally-based F-16 flight operations at Truax per year? How many additional operations would be expected when there is no anticipated increase in planes and only one additional pilot?
3. How many operations are reduced as a result of offsite operations, deployment, winter weather conditions, aerial refueling with the 128th Refueling Wing and the proposed use of two new training simulators?
4. Please provide a detailed timeline and explanation of how the "alert mission" would be handled with the arrival of F-35s; if F-16s are drawn down with the arrival of F-35s as stated in the EIS, what is the actual increase in flights that could be expected during the transition between fleets?
5. Please provide a map showing existing and proposed contours of peak volumes using the Sound Exposure Level, SEL, or Lmax measures instead of DNL. The draft EIS only includes a table of SEL for select locations.

6. Please provide a map showing the most recent measured DNL at Truax compared to modeling of current F-16s.[8]
7. Please provide a map including 60 and 55dB DNL contours.
8. Under what circumstances would afterburners on the F-35s be required at Truax? How often would these circumstances occur?
9. Under what circumstances would F-35s need to take off to the south using runway 18? How strong of a tailwind can the F-35 safely take off with, if doing so allows it to use runway 36 taking off to the north?
10. What mitigation measures are available for mobile home parks?

7. Environmental Concerns:

Cherokee Marsh Conservation Park and Cherokee Marsh State Natural Area is in the impacted area, but it is not considered in the Draft EIS. Impacts to federally- and state-protected species must be considered in the EIS.

Cherokee Marsh is the largest wetland in Dane County and has been declared a Wetland Gem by the Wisconsin Wetlands Association. Most of Cherokee Marsh's over 2000 acres of wetland lies immediately to the north and west of the north-south runway of the Dane County Airport. The Marsh is home to a multitude of species, including several protected under the Migratory Bird Act, the Bald and Golden Eagle Protection Act, and the Wisconsin Endangered Species Act.[9]

Questions for USAF/ANG:

1. Why is the survey of federal- and state-listed species confined to the airport property?
2. Why are impacts on species in surrounding areas not included in the draft EIS?

Conclusion

The City of Madison, including our Common Council, our School Board,[10] many members of our County Board,[11] our Community Development Authority Board, our Water Utility Board, our Sustainable Madison Committee, multiple community groups, and numerous residents have all expressed grave concerns with the potential impacts of an operational bed-down of F-35s at Truax Field. Even proponents of the bed-down question whether the draft EIS takes into account all the relevant factors. It is critical that the USAF substantially address the issues we have raised here in the final EIS.

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8 An older version of a similar map can be found in this document on pages 21-22: https://www.msnairport.com/documents/pdf/2013-%20OCT%20NAS.pdf

9 A list of potentially impacted species is available at: https://www.safeskiescleanwaterwi.org/comment-from-the-board-of-the-friends-of-cherokee-marsh-about-eis-for-f-35-at-truax/

10 Resolution available here: https://go.boarddocs.com/wi/mmsd/Board.nsf/files/BG7K3Q4FEB29/$file/BOE%20resolution%20on%20F-35s%20at%20Truax-Final.pdf

11 Letter available here: https://drive.google.com/file/d/1cvGmaky9IpxxD-lcBDfG0pMlaNfwo_JE/view

Once the true potential environmental impacts of an F-35 bed-down at Truax Field are known, it is incumbent on the USAF/ANG to consider carefully its choice of preferred location. If there are options that represent less harm to communities and the environment, as it appears in the draft EIS, those options should be preferred. If preferred locations, such as Madison, are known to have significant negative impacts as shown in the final EIS, the USAF must be prepared to prevent and/or fully mitigate those impacts. Absent that, it will not be possible for me to support the selection of Madison for this bed-down.

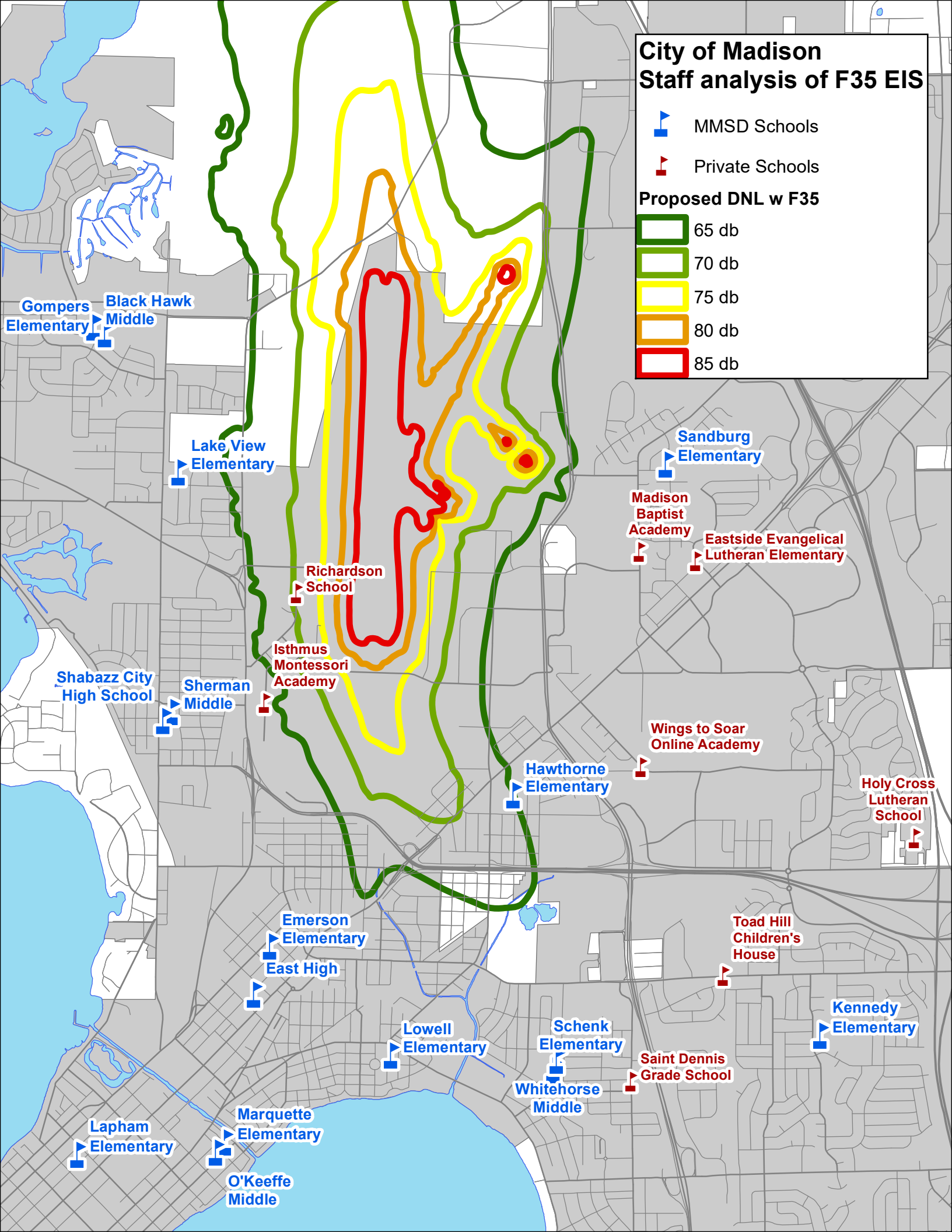
I look forward to your detailed response to these matters.

Sincerely,

Satya Rhodes-Conway
Mayor of Madison, WI

ATTACHMENTS:

Map of Schools Near Truax Field
Revised CDA Statement
Sustainable Madison Committee Statement
Madison Water Utility Board Statement


City of Madison
Staff analysis of F35 EIS
MMSD Schools
Private Schools
Proposed DNL w F35
65 db
70 db
75 db
80 db
85 db
Gompers Elementary
Black Hawk Middle
Lake View Elementary
Sandburg Elementary
Madison Baptist Academy
Eastside Evangelical Lutheran Elementary
Richardson School
Isthmus Montessori Academy
Shabazz City High School
Sherman Middle
Wings to Soar Online Academy
Hawthorne Elementary
Holy Cross Lutheran School
Emerson Elementary
East High
Toad Hill Children's House
Kennedy Elementary
Lowell Elementary
Schenk Elementary
Saint Dennis Grade School
Whitehorse Middle
Marquette Elementary
Lapham Elementary
O'Keeffe Middle

CommunityDevelopmentAuthority

Madison Municipal Building, Suite 161

215 Martin Luther King Jr. Boulevard

Madison, Wisconsin 53703

ph (608)266.4675 fx (608)264.9291

email housing@cityofmadison.com

MEMO

To: Mr. Ramon Ortiz
NGB/A4AM
3501 Fetchet Avenue
Joint Base Andrews MD 20762-5157
Email: usaf.jbanafw.ngb-a4.mbx.a4a-nepa-comments@mail.mil

From: Community Development Authority
City of Madison, Wisconsin

Date: October 30, 2019

RE: FR# 2018-02468

CDA Statement on Proposed Air National Guard F-35A Operational Beddown

Madison's Community Development Authority (CDA) governs the city's 916 public and multifamily housing units. The focus of this housing is to "provide decent and safe rental housing for eligible low-income families, the elderly, and persons with disabilities" (https://www.cityofmadison.com/dpced/housing/public-housing/316/). The CDA is charged with upholding Wisconsin State statute (Wis. Stat. § 66.1201) to operate in the public interest of providing safe and sanitary housing for vulnerable residents.

There are multiple CDA properties, as well as many low-income housing units, within or very near to the 65 dB DNL contour presented in the *Draft United States Air Force F-35A Operational Beddown Air National Guard Environmental Impact Statement*, which was released in August of 2019. In particular, the Truax Park Apartments and the Webb-Rethke townhomes are located on the border of the 65 dB DNL contour. Demographics for individuals and families living on this border in CDA public housing properties are as follows:

Resident Demographics

			Head-Of-Household Demographics			
	# Units	# of People	Elderly	Disabled	Persons of Color	Low-Income
Truax Park Apartments	187	476	14%	44%	67%	100%
Webb/Rethke Townhomes	36	125	15%	48%	85%	100%
	223	601				

The draft EIS has not adequately analyzed the impact of the proposed F-35 beddown on these properties. The draft EIS states that 551 people will be impacted by the 65-70 dB DNL contour (2019, p. WI-24), however, the population at these two properties alone is 600 residents— over the total number of affected residents accounted for in the draft EIS. Portions of the Truax Park Apartments housing project site received substantial modernization through building rehabilitation in 2011 (71 units) and redevelopment in 2015 (40 units), with approximately $13,602,216 invested in Phase 1 capital improvements and $8,164,777 invested in Phase 2 capital improvements. The remaining 76 functional units at Truax Park Apartments and the Webb-Rethke Townhomes have incurred capital improvement costs of $1,002,954 since 2015.

Truax Park Apartments and Webb-Rethke Townhomes must operate as low-income public housing in a heavily regulated environment. Redeveloped units at Truax must also be operated in a manner consistent with its treatment as a partnership for federal and state low-income housing tax credits. The Department of Housing and Urban Development (HUD) emphasizes and measures a public housing project's performance in keeping available units occupied. Being located on the border of the 65 dB DNL contour would likely result in higher vacancies. The negative impact of maintaining a low occupancy rate at these properties would

result in a low performance score with HUD, which in turn, would reduce federal public housing subsidy to Truax Park Apartments and Webb-Rethke Townhomes.

The inclusion of the CDA properties in the final EIS is particularly important because, according to the draft EIS, "upon completion of the Final EIS, a mitigation plan will be prepared" (2019, p. WI-17). Given this stipulation, the 600 residents on the border of the 65 dB DNL contour are at risk of being unacknowledged and left without recourse to possible mitigation considerations.

Considering this information, the CDA is requesting that the US Air Force include these public housing complexes in the noise impact analysis in the final version of the environmental impact statement. Not only are these residents potentially impacted by the F-35 beddown, they are also limited in their ability to move away from the Truax area in the event of adverse impacts.

The Community Development Authority requests that the Air National Guard revise their environmental impact statement to include consideration of CDA properties, particularly the Truax Park apartments and the Webb-Rethke townhomes.

SUBMITTED ELECTRONICALLY

Date: September 24, 2019

To: Ramon Ortiz, 35A EIS Project Manager

From: Lauren Cnare, Madison Water Utility Board President

RE: Madison Water Utility Board Response to EIS
FR#2018-02468

The Madison Water Utility Board (the Board) is established to direct the outcomes of the Madison Water Utility (MWU) in fulfilling its responsibility to provide safe, affordable and adequate water for drinking, household and business uses, and fire protection to the residents and visitors of MWU's service area in Dane County.

Of its many duties, the identification, public communication, monitoring and mitigation of drinking water contamination is a primary activity of the Utility. Monitoring and mitigation are both critical and costly activities, affecting both the affordability and adequacy of water for our area.

In the recent months, MWU, the Board and citizens of Madison have been working together to understand, quantify and assess the effects of per- and polyfluoroalkyl substances, or PFAs, now found in Well 15. The well is located less than a mile from Truax Field, where PFAs chemicals have been detected and reported at high levels in groundwater. In our community, there is considerable concern and demand for action to respond to this risk. The Board is actively engaged in exploring actions and uniting all partners in understanding and plans to protect against a public health threat.

The Air National Guard Base has been identified as a major source of PFAs contamination. While an investigation is underway, steps required by the Wisconsin DNR (WDNR) to further investigate the extent of the contamination have not yet been taken, and the Department of Defense has not considered this a priority site for mitigation.

Further, the Board concurs with the following section of the City of Madison Planning Division F35 EIS Staff Analysis, published September 10, 2019: The Department of Defense and the Air National Guard cannot safely and legally perform the planned construction activities without a complete site investigation that defines the extent and nature of PFAs contamination in soil and groundwater. The WDNR will require a materials management plan for any areas of the base impacted by construction, describing how excavated soil and dewatering will be managed. The 115 FW does not have enough information presently to do this. This investigation should be

completed with full coordination with WDNR, and remediation of the contamination should take place concurrently in the event of a F-35 transition.

This is not an acceptable position for Madison and its residents, who rightfully expect to have clean and safe drinking water available to them without bearing the high cost of additionally treating or replacing productive drinking water wells.

Until further steps are taken to define the extent, nature and probable path of the soil and groundwater contamination, MWU's rate payers are left with an unknown cost and timeline should treatment be needed at Well 15.

The Madison Water Utility Board urges the Department of Defense and United States Air Force to complete the PFAs investigation, coordinating fully with WDNR; remediate the contamination, and assume the costs borne by the Madison Water Utility rate payers to provide adequate treatment for PFAs at Well 15 or replace the affected well. We look forward to the Air Force and the 115 Fighter Wing acting as good neighbors, who share our goal of protecting the safety and health of our shared community, before adding additional infrastructure and jet capability at the Truax base.

Sincerely,

Members of the 2019 Madison Water Utility Board

To: Ramon Ortiz, 35A EIS Project Manager

From: City of Madison, WI. October 30, 2019
Sustainable Madison Committee Response to EIS

RE: FR#2018-02468

We, the members of the Sustainable Madison Committee, a committee that takes a leadership role in the promotion of sustainability for the City of Madison, the Madison community, and the region, hereby express concerns regarding details included in the recently released Draft United States Air Force F-35A Operational Beddown National Guard Environmental Impact Statement (EIS) pertaining to the 115 Fighter Wing at Truax Airfield.

Specifically, we note the EIS predicts that upon the basing of the F-35s, the annual Truax airfield CO2 emissions would increase by approximately 12,478 tons or 135 percent versus that which is currently emitted by the F-16 squadron, and that this is equivalent to adding an additional 2,438 passenger vehicles onto our city's roads, driving 11,500 miles per year on average.

Further, because the use of afterburners may be more frequent than accounted for in the draft EIS, the estimated amount of CO2 emissions may in reality be much higher than the calculated amount. According to a USAF memo obtained by the *Isthmus* newspaper, it is very likely that, in practice, F-35 pilots are likely to use their afterburners up to 50% of the time (https://isthmus.com/news/news/f-35s-could-use-afterburners-more-frequently-than-air-national-guard-promises/). The draft EIS uses an estimate of up to 5 percent afterburner use, which is potentially 45 percent lower than actual use.

Please note, the Sustainable Madison Committee helped craft legislation passed by Madison's Common Council in 2017 committing our city to 100% renewable energy and net zero carbon emissions. As Truax is located within the city, the stationing of F-35s, which the draft EIS states will burn more CO2 than the currently-stationed F-16s, counteracts the work that the city is doing to achieve these goals.

As city residents, we take seriously the reality of our climate crisis and the health impacts of air pollution. We further believe all levels of government must commit to

reducing carbon emissions and thereby embrace a sustainable path ensuring the planet's livability for future generations.

Moreover, we are concerned that the F-35 Environmental Impact Statement is lacking in providing a comprehensive assessment on the environmental health impacts to our ecosystem and our community, including serious health risks associated with air and noise pollution, including: poor quality sleep, negative impacts on mood and mental health, decreased school performance, and increases in stress hormones, blood pressure, inflammation, and heart disease. The associated social and economic costs to our community are immense. The environmental impact study acknowledges there will be "significant disproportionate impacts to low-income and minority populations as well as children." Many families who live in the affected area are already burdened by racial inequities, such as poverty, which severely limits their capacity to move and often forces families to rely on open windows for cooling. Some of the lowest income communities affected by this decision may not qualify for mitigation.

The draft EIS does not address one environmental issue that has become quite important to our community. For many years the ANG has used fire-fighting foam containing PFAS chemicals at Truax airport to extinguish fires and in training exercises. These chemicals have been found at very high levels in groundwater at the airport and in Starkweather Creek, which receives waters draining from the airport. The Madison Water utility has stopped utilizing water from one municipal well found to contain levels of PFAs at 9.4 to 12 ppt. The WI Department of Health Services has recommended a groundwater standard for PFOA and PFOS of 20 ppt (https://www.cityofmadison.com/water/water-quality/water-quality-testing/perfluorinated-compounds). While these foams may soon be replaced by other fire-fighting materials, we ask that you include impact analysis for past and future PFAs use and expected replacements at the airport in the final EIS.

We respectfully ask the Air Force to issue a revised EIS clarifying the impacts the basing of the F-35s would have on our city's health and carbon load, specifically addressing means by which these environmental health burdens may be reduced.

Finally, if there are no means for effectively reducing these environmental health burdens, we respectfully oppose the Air Force basing of the F-35s at Truax.

Appendix A2

Native American Correspondence

The sample tribal scoping letter following was distributed to the list below:

115th Fighter Wing, Madison, Wisconsin

Mr. Robert Blanchard, Chairman, Bad River Band of Lake Superior Chippewa, Chief Blackbird Center, 72682 Maple Street Odanah, WI 54861
Mr. Harold "Gus" Frank, Chair, Forest County Potawatomi Community, 5416 Everybody's Road, Crandon, WI 54520
Mr. Wilfrid Cleveland, President, Ho-Chunk Nation, 9814 West Airport Road, Black River Falls, WI 54615
Mr. Louis Taylor, Chair, Lac Courte Oreilles Band of Lake Superior Chippewa, Tribal Governing Board, 13394 West Trepenia Road, Hayward, WI 54843
Mr. Joseph Wildcat Sr., President, Lac du Flambeau Band of Lake Superior Chippewa, 418 Little Pines Road, Lac du Flambeau, WI 54538
Mr. Gary Besaw, Chairperson, Menominee Indian Tribe of Wisconsin, Menominee Tribal Legislature, W2908 Tribal Office Loop, Keshena, WI 54135-0910
Ms. Shannon Holsey, President, Stockbridge-Munsee Community Band of Mohican Indians, 8476 North Mo He Con Nuck Road, Bowler, WI 54416
Mr. Tehassi Hill, Chairman, Oneida Nation of Wisconsin, PO Box 365, Oneida, WI 54155
Mr. Rick Peterson, Chairman, Red Cliff Band of Lake Superior Chippewa, 88455 Pike Rd., Hwy. 13, Bayfield, WI 54814
Mr. Lewis Taylor, Chair, St. Croix of Lake Superior Chippewa Community, 24463 Angeline Avenue, Webster, WI 54893
Mr. Chris McGeshick, Chairman, Sokaogon Chippewa Community (Mole Lake Band of Lake Superior Chippewa Indians), 3051 Sand Lake Road, Crandon, WI 54520

124th Fighter Wing, Boise, Idaho

Mr. Austin Greene, Chairperson Confederated Tribes of the Warm Springs Reservation of Oregon, 1233 Veterans Street, Warm Springs, OR 97761
Mr. Ted Howard, Chairman, Shoshone-Paiute Tribes Duck Valley Reservation, PO Box 219, 1036 Idaho State Highway 51, Owyhee, NV 89832
Mr. Eric Hawley, Chairman, Burns Paiute Tribe, 100 Pasigo Street, Burns, OR 97720
Mr. Nathan Small, Chairman, Shoshone-Bannock Tribes of the Fort Hall Reservation, Agency Building 82, 1 Pima Drive, Fort Hall, ID 83203
Mr. Tildon Smart, Chairman, Paiute and Shoshone Tribes of the Fort McDermitt Indian Reservation, PO Box 457, McDermitt, NV 89421
Mr. Darren B. Parry, Chairman, Northwestern Band of Shoshone Nation, 707 North Main Street, Brigham City, UT 84302-1449

125th Fighter Wing, Jacksonville, Florida

Mr. Billy Cypress, Chairman, Miccosukee Tribe of Indians, Tamiami Station, PO Box 440021, Miami, FL 33194
Mr. James Floyd, Principal Chief, Muscogee (Creek) Nation, PO Box 580, Okmulgee, OK 74447
Ms. Stephanie Bryan, Chairwoman, Poarch Band of Creek Indians, 5811 Jack Springs Road, Atmore, AL 36502
Mr. Marcellus Osceola, Jr., Chairman, The Seminole Tribe of Florida, 6300 Stirling Road, Hollywood, FL 33024
Mr. Bill John Baker, Principal Chief, Cherokee Nation of Oklahoma, 22361 Bald Hill Road, Tahlequah, OK 74464
Mr. Bill Anoatubby, Governor, Chickasaw Nation of Oklahoma, 520 E. Arlington, Ada, OK 74820
Mr. Gary Batton, Chief, Choctaw Nation of Oklahoma, PO Box 1210, Durant, Oklahoma 74702
Mr. Joe Bunch, Chief, United Keetoowah Band of Cherokee Indians, 18263 W. Keetoowah Circle, Tahlequah, OK 74464
Mr. Lewis Johnson, Assistant Chief, Seminole Nation of Oklahoma, PO Box 1498, Wewoka, OK 74884

127th Wing, Selfridge Air National Guard Base, Michigan

Ms. Isabel Scollon, The Burt Lake Band of Ottawa and Chippewa Indians, Inc., 6461 East Brutus Road, Brutus, MI 49716

The Grand River Bands of Ottawa Indians, 1316 Front Ave., Grand Rapids, MI 49501
Mr. Thurlow S. McClellan, Chairperson, Grand Traverse Band of Ottawa and Chippewa Indians, 2605 N. West Bayshore Drive, Peshawbestown, MI 49682
Mr. Kenneth Meshiguad, Chairperson, Hannahville Potawatomi Indian Community, 14911 North Hannahville B-1 Road, Wilson, MI 49896
Mr. Warren Swartz, Jr., President, The Keewanaw Bay Indian Community, 16429 Beartown Road, Baraga, MI 49908
Mr. Aaron Payment, Chairperson, The Sault Ste. Marie Tribe of Chippewa Indians, 523 Ashmun Street, Sault Ste. Marie, MI 49783
Mr. Larry Romanelli, Ogema, The Little River Band of Ottawa Indians, 2608 Government Center Drive, Manistee, MI 49660
Mr. Scott Sprague, Chairperson, Match-e-be-nash-she-wish Band of Potawatomi Indians of Michigan, 2872 Mission Drive, Shelbyville, MI 49344
Mr. John Warren, Chairperson, The Pokagon Band of Potawatomi Indians, 58620 Sink Road, Dowagiac, MI 49047
Mr. Frank Cloutier, Chief, Saginaw Chippewa Indian Tribe, 7070 E. Broadway, Mt. Pleasant, MI 48858
Mr. Levi Carrick, Sr., President, Bay Mills Chippewa Indian Community, 12140 W. Lakeshore Drive, Brimley, MI 49715
Jamie Stuck, Chairperson, The Nottawaseppi Huron Band of Potawatomi, 1485 Mno-Bmadzewen Way, Fulton, MI 49052
Mr. James Williams, Jr., Chairperson, Lac Vieux Desert Band of Lake Superior Chippewa Indians, PO Box 249, N4698 U.S. Highway 95, Watersmeet, MI 49969
Ms. Regina Casco-Bentley, Chairperson, Little Traverse Bay Bands of Odawa Indians, 7500 Odawa Circle, Harbor Springs, MI 49740

187th Fighter Wing, Montgomery, Alabama

Alabama-Coushatta Tribe of Texas, Ms. Cecelia Flores, Chairperson, 571 State Park Road 56, Livingston, TX 77351
Alabama-Quassarte Tribal Town of the Creek Nation, Mr. Nelson Harjo, Chief, PO Box 187, Wetumka, OK 74883
Kialegee Tribal Town of the Creek Nation of Oklahoma, Mr. Jeremiah (Tiger) Hobia, PO Box 332, Wetumka, OK 74883-0332
Poarch Band of Creek Indians, Ms. Stephanie Bryan, Chairwoman, 5811 Jack Spring Rd, Atmore, AL 36502
Mississippi Band of Choctaw Indians, Ms. Phyliss Anderson, Chief, PO Box 6010, Choctaw, MS 39350
The Muscogee (Creek) Nation, Mr. James Floyd, Principal Chief, PO Box 580, Okmulgee, OK 74447
Absentee-Shawnee Tribe of Indians of Oklahoma, Ms. Edwina Butler-Wolfe, Governor, 2025 South Gordon Cooper Drive, Shawnee, OK 74801-9381
Cherokee Nation of Oklahoma, Mr. Bill John Baker, Principal Chief, PO Box 948, Tahlequah, OK 74464
Chickasaw Nation of Oklahoma, Mr. Bill Anoatubby, Governor, 520 E. Arlington, Ada, OK 74820
Choctaw Nation of Oklahoma, Mr. Gary Batton, Chief, PO Box 1210, Durant, Oklahoma 74702
Coushatta Tribe of Louisiana, Mr. David Sickey, Chairman, PO Box 818, Elton, Louisiana 70532
Eastern Band of Cherokee Indians, Mr. Richard Sneed, Principal Chief, Qualla Boundary Reservation, PO Box 1927, Cherokee, NC 28719
Eastern Shawnee Tribe of Oklahoma, Ms. Glenna J. Wallace, Chief, 2755 S. 705 Rd., Wyandotte, OK 74370
Jena Band of Choctaw Indians, Ms. Beverly Cheryl Smith, Principal Chief, 1052 Chanaha Hina Street, Trout, LA 71371
United Keetoowah Band of Cherokee Indians, Mr. Joe Bunch, Chief, 18263 W. Keetoowah Circle, Tahlequah, OK 74464
Miccosukee Tribe of Indians, Mr. Billy Cypress, Chairman, Tamiami Station, PO Box 44021, Miami, FL 33194
Seminole Tribe of Florida, Mr. Marcellus Osceola Jr., Chairman, 6300 Stirling Road, Hollywood, FL 33024
Seminole Nation of Oklahoma, Mr. Lewis Johnson, Assistant Chief, PO Box 1498, Wewoka, OK 74884
Shawnee Tribe, Mr. Ron Sparkman, Chief, 29 South Highway 69A, Miami, OK 74354
Thlopthlocco Tribal Town of Oklahoma, Mr. Ryan Morrow, Interim Town King, 109009 N. 3830 Rd., Clearview, OK 74880

Sample Tribal Scoping Letter

Bad River Band of Lake Superior Chippewa
Robert Blanchard
Chairman
Chief Blackbird Center
72682 Maple Street
Odanah, WI 54861

Subject: Environmental Impact Statement for F-35 Beddown at Five Alternative Air National Guard Locations

Dear Mr. Blanchard

The National Guard Bureau (NGB) is preparing an Environmental Impact Statement (EIS) for the beddown of two F-35A Air National Guard (ANG) squadrons among five alternative installations. The Environmental Impact Statement will assess the potential environmental consequences of each alternative in support of the operational beddown.

Each squadron would consist of 18 assigned aircraft and 2 back-up aircraft. The F-35A is being acquired in support of the Air National Guard mission. The F-35A would replace the legacy fighter aircraft at the selected installations (A-10, F-15, F-16). The proposed basing alternatives include:

- The 115th Fighter Wing at Truax Field in Madison, Wisconsin
- The 124th Fighter Wing at Gowen Field in Boise, Idaho
- The 125th Fighter Wing at Jacksonville International Airport in Jacksonville, Florida
- The 127th Wing at Selfridge Air National Guard Base in Harrison Township, Michigan
- The 187th Fighter Wing at Dannelly Field in Montgomery, Alabama

The Secretary of the Air Force has announced that the two preferred alternatives are Truax Field, and Dannelly Field, pending results of the EIS.

The proposed action also includes the construction and/or modification of facilities on the installations that are supporting the beddown. In addition, there would be an Air Force Active Duty Associate Unit based with the selected alternative installations, which would include approximately 50 Active Duty personnel who would conduct 3-year rotations with the ANG unit. F-35A aircraft would conduct training operations within established airspace of each proposed location. This undertaking does not propose new airspace, nor does it seek to reconfigure any of the existing airspaces. Those will remain unchanged.

Sample Tribal Scoping Letter

For Truax Field, the proposed action would involve various installation improvement projects and associated training activities in existing airspace. Maps showing the five alternative locations and the 115 FW training airspace are provided in Attachments 1 and 2, respectively.

Per Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs*, this memorandum is being sent to you as part of the intergovernmental review phase of the Environmental Impact Analysis Process (EIAP), which is the ANG's National Environmental Policy Act (NEPA) program. We request your assistance in identifying:

1) the existence of any traditional resources that may be located close to or within Truax Field, or under its associated airspace;
2) historic properties in or near the Areas of Potential Effect (APE) of which we may not be aware; and/or
3) your tribe's interest in participating in Tribal or Section 106 consultation.

To guarantee its consistent compliance with federal laws and regulations, the ANG has developed a transparent and consistent consultation process. For this EIS, we have developed the following contact schedule to contact you several times during the process:

- One phone call to tribal offices to verify contact information and current Senior-level Tribal Officials before any materials are mailed to the tribe for review (complete);
- Sending of this scoping letter and notification of the scoping meetings;
- Sending a letter with a copy of the Draft EIS and notification of the public hearings;
- Sending a letter with a copy of the Final EIS; and
- Sending a letter with the Record of Decision.

You will receive the following after each letter is mailed:

- One phone call to tribal offices to confirm receipt of each review package;
- After receipt of each package is confirmed, two follow-up phone calls to tribal offices to assure questions and concerns are addressed.

We believe these procedures reflect the ANG's commitment to integrate Native American voices and experiences into its planning processes, and we will abide by this schedule even if your tribe chooses not to consult. Furthermore, if your tribe accepts our invitation to consult, the ANG is prepared to adopt customized procedures that meet your tribe's particular requirements. We believe the proposed schedule presents a predictable roadmap on which to orient yourselves within the overall scoping and consultation processes. More importantly, we hope that presenting the schedule up front allows tribes with sufficient time to plan its responses and decide at what point in the process it might want to consult.

Sample Tribal Scoping Letter

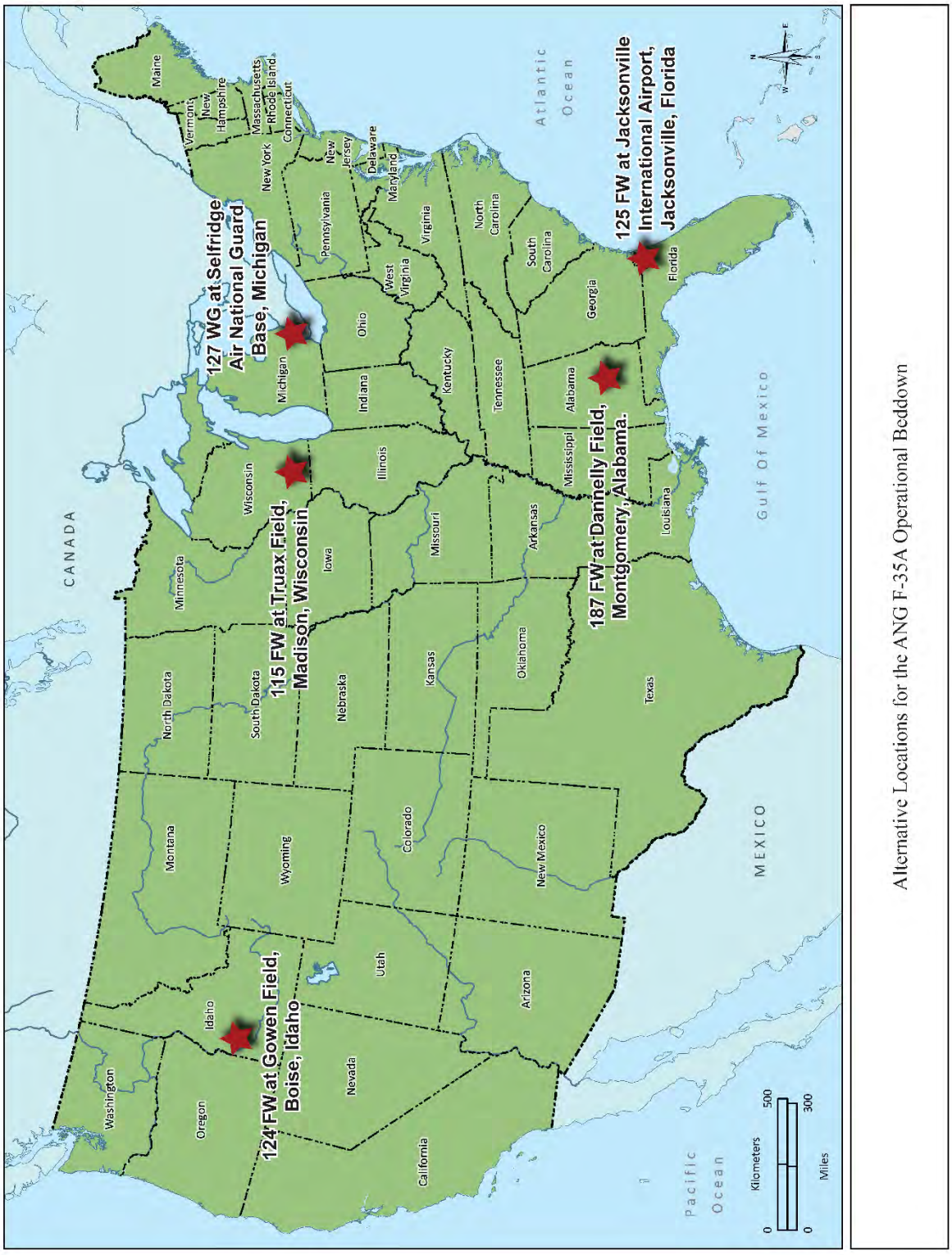
In addition to the above listed schedule, the ANG invites you to attend a public scoping meeting at the time and location listed below. For your convenience, the NGB has set aside two sessions for local, state, and federal agencies. We welcome your attendance during either time:

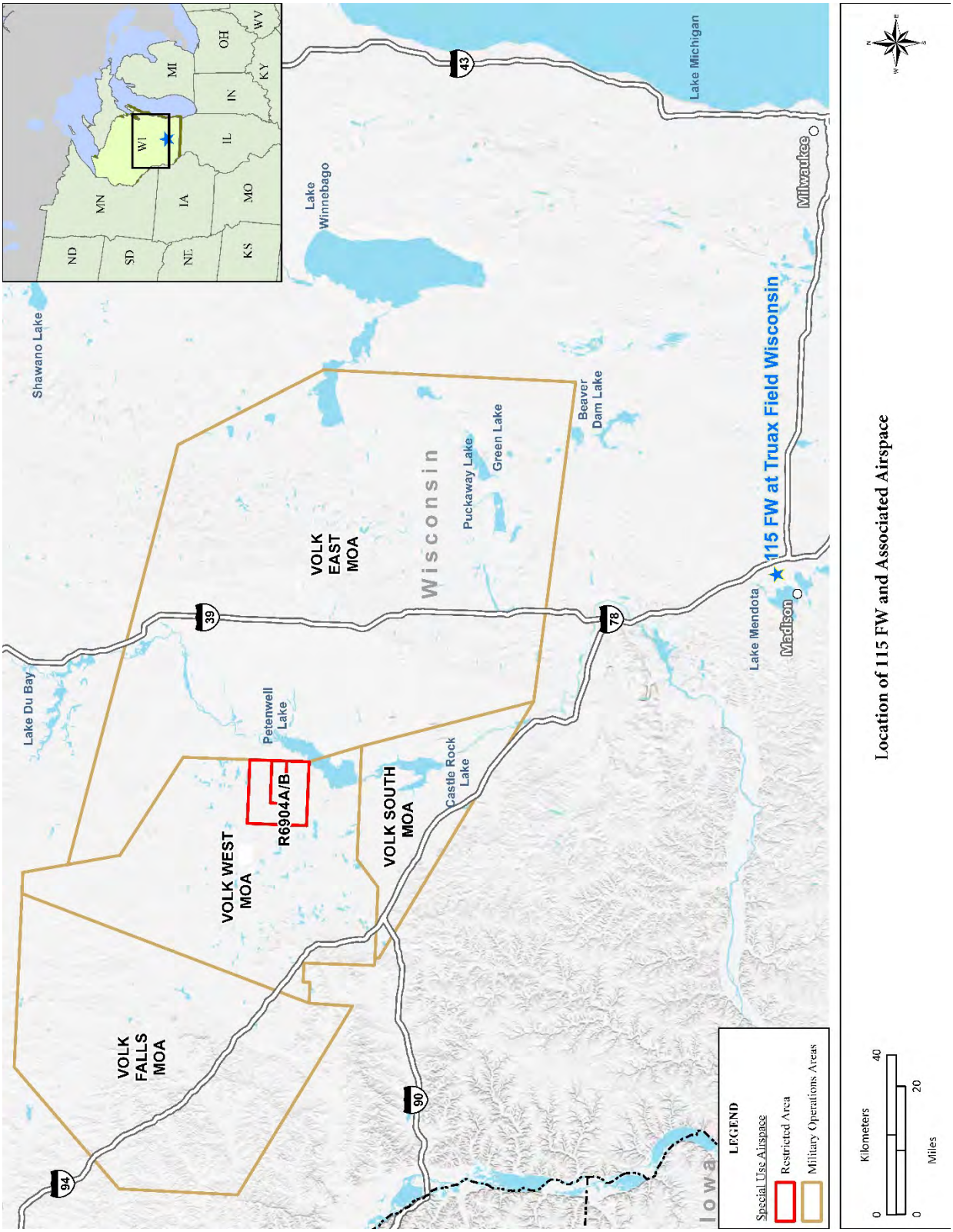
March 8, 2018
2 to 4 p.m. and 5 to 8 p.m.
Crowne Plaza Hotel, Three Lakes Ballroom
4402 East Washington Avenue
Madison, WI 53704

The information that your tribe provides to us will assist the ANG in complying with the NEPA. If you have any questions about this project, please feel free to contact Ms. Christel Johnson, the F-35A EIS Project Manager at 3501 Fetchet Avenue, Joint Base Andrews, Maryland 20762-5157. You may also email your comments to christel.d.johnson.civ@mail.mil. Please type "F-35A EIS Project" in the email's subject line. Thank you for your assistance.

Sincerely,

Attachments:
1 – Alternative Location Map
2 – Truax Field and Airspace Map


127 WG at Selfridge Air National Guard Base, Michigan
115 FW at Truax Field, Madison, Wisconsin
124 FW at Gowen Field, Boise, Idaho
187 FW at Dannelly Field, Montgomery, Alabama.
125 FW at Jacksonville International Airport, Jacksonville, Florida
CANADA
MEXICO
Gulf Of Mexico
Atlantic Ocean
Pacific Ocean
Maine
Vermont
New Hampshire
Massachusetts
Rhode Island
Connecticut
New York
New Jersey
Delaware
Maryland
Pennsylvania
Virginia
North Carolina
South Carolina
Georgia
Florida
West Virginia
Ohio
Michigan
Indiana
Kentucky
Tennessee
Alabama
Mississippi
Louisiana
Wisconsin
Illinois
Missouri
Arkansas
Texas
Minnesota
Iowa
Kansas
Oklahoma
North Dakota
South Dakota
Nebraska
Montana
Wyoming
Colorado
New Mexico
Utah
Arizona
Idaho
Nevada
Washington
Oregon
California
0
500
Kilometers
0
300
Miles
Alternative Locations for the ANG F-35A Operational Beddown


Location of 115 FW and Associated Airspace
115 FW at Truax Field Wisconsin
Madison
Milwaukee
Lake Michigan
Lake Winnebago
Shawano Lake
Lake Du Bay
Petenwell Lake
Castle Rock Lake
Puckaway Lake
Green Lake
Beaver Dam Lake
Lake Mendota
Wisconsin
Iowa
VOLK EAST MOA
VOLK WEST MOA
VOLK SOUTH MOA
VOLK FALLS MOA
R6904A/B
LEGEND
Special Use Airspace
Restricted Area
Military Operations Areas
Kilometers
Miles
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40
20
43
39
78
90
94
WI
MI
IL
IN
OH
WV
KY
MO
IA
MN
ND
SD
NE
KS

-----Original Message-----
From: Theodore Isham [mailto:isham.t@sno-nsn.gov]
Sent: Friday, February 16, 2018 6:16 PM
To: Johnson, Christel D CIV USAF NGB A7 (US) <christel.d.johnson.civ@mail.mil>
Cc: Lewis Johnson <asst.chief@sno-nsn.gov>
Subject: [Non-DoD Source] SNO Response to F-35 EIS Project

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

Ms Christel Johnson,

This Opinion is being provided by Seminole Nation of Oklahoma's Cultural Advisor, pursuant to authority vested by the Seminole Nation of Oklahoma General Council. The Seminole Nation of Oklahoma is an independently Federally-Recognized Indian Nation headquartered in Wewoka, OK.

The Seminole Nation of Oklahoma wishes consultation party status on this project for both the Jacksonville Fl and Montgomery Al F-35 Beddown EIS. The Seminole Nation of Oklahoma requests that a full flora inventory be conducted in each area of interest. Also, the Seminole Nation of Oklahoma requests a face to face meeting to discuss the project.

In keeping with the National Environmental Policy Act (NEPA)d, and Section 106 of the National Historic Preservation Act (NHPA), 36 CFR Part 800, this letter is to acknowledge that the Seminole Nation of Oklahoma has received notice of the proposed project at the above mentioned location. The Seminole Nation of Oklahoma is not aware of any sites of historical significance in the APE of this project as stated. The Seminole Nation of Oklahoma then will concur with SHPO's recommendation. Therefore, we have no comment on the project as proposed.

We do request that if cultural or archeological resource materials are encountered at all activity cease and the Seminole Nation of Oklahoma and other appropriate agencies be contacted immediately.

Furthermore, due to the historic presence of our people in the project area, inadvertent discoveries of human remains and related NAGPRA items may occur, even in areas of existing or prior development. Should this occur we request all work cease and the Seminole Nation of Oklahoma and other appropriate agencies be immediately notified.

Theodore Isham
Seminole Nation of Oklahoma
Historic Preservation Officer
PO Box 1498
Seminole, Ok 74868
Phone: 405-234-5218
Cell: 918-304-9443
e-mail: isham.t@sno-nsn.gov < Caution-mailto:isham.t@sno-nsn.gov >

1

A response email was received on February 20, 2018 from Warren Swartz, President of the Keweenaw Bay Indian Community.

From: Bradley Mueller <bradleymueller@semtribe.com>
Sent: Tuesday, September 24, 2019 9:20 AM
To: usaf.jbanafw.ngb-a4.mbx.a4a-nepa-comments@mail.mil
Cc: David Echeverry
Subject: [Non-DoD Source] Draft United States Air Force F-35A Operational Beddown Air National Guard Environmental Impact Statement

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

SEMINOLE TRIBE OF FLORIDA
TRIBAL HISTORIC PRESERVATION OFFICE
AH-TAH-THI-KI MUSEUM

TRIBAL HISTORIC PRESERVATION OFFICE
SEMINOLE TRIBE OF FLORIDA
AH-TAH-THI-KI MUSEUM
30290 JOSIE BILLIE HIGHWAY
PMB 1004
CLEWISTON, FL 33440
THPO PHONE: (863) 983-6549
MUSEUM PHONE: (863) 902-1113
FAX: (863) 902-1117
THPO WEBSITE: WWW.STOFTHPO.COM
MUSEUM WEBSITE: WWW.AHTAHTHIKI.COM

TRIBAL OFFICERS
MARCELLUS W. OSCEOLA JR.
CHAIRMAN
MITCHELL CYPRESS
VICE CHAIRMAN
LAVONNE ROSE
SECRETARY
PETER A. HAHN
TREASURER

September 24, 2019

Mr. Ramón E. Ortiz, P.E., GS-14, DAF
Program Manager, F-35A Operational Beddown
National Guard Bureau
3501 Fetchet Avenue
Joint Base Andrews, MD 20762-5157

Subject: Draft United States Air Force F-35A Operational Beddown Air National Guard Environmental Impact Statement
THPO Compliance Tracking Number: 0031618

Dear Mr. Ortiz,

Thank you for contacting the Seminole Tribe of Florida – Tribal Historic Preservation Office (STOF-THPO), Compliance Section regarding the availability of theDraft United States Air Force F-35A Operational Beddown Air National Guard Environmental Impact Statement. At least one of the possible alternative beddown locations (125th Fighter Wing at Jacksonville International Airport, Jacksonville, Florida) does fall within the STOF Area of Interest. We have reviewed the documents you provided and while we have no overall objections to the possible selection of the Jacksonville Airport (JA) we do expect that the U.S. Air Force or other appropriate federal agency would continue to consult with the STOF pursuant to Section 106 of the National Historic Preservation Act for any undertakings that might occur at JA that are a consequence of its use as a beddown location. These consultations should take place before any ground disturbing

1

activities occur (such as building construction, infrastructure improvements, etc.). Please continue to keep us updated on the EIS process and feel free to contact us with any questions or concerns.

Respectfully,

Bradley M. Mueller

Bradley M. Mueller, MA, Compliance Specialist
STOF-THPO, Compliance Review Section
30290 Josie Billie Hwy, PMB 1004
Clewiston, FL 33440

Office: 863-983-6549 ext 12245
Fax: 863-902-1117
Email: bradleymueller@semtribe.com < Caution-mailto:bradleymueller@semtribe.com >
Web: Caution-www.stofthpo.com

2

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Appendix A3

State Historic Preservation Office (SHPO) Correspondence

The sample scoping letter following was distributed to the list below:

115th Fighter Wing, Madison, Wisconsin

Ms. Daina Penkiunas, Deputy State Historic, Preservation Officer, Wisconsin Historical Society, Division of Historic Preservation, Office of Preservation Planning, 816 State Street, Madison, WI 53706

124th Fighter Wing, Boise, Idaho

Mr. Travis Pitkin, Curations and Compliance Officer, State Historic Preservation Office, 210 Main Street, Boise, ID 83702
Ms. Christine Curran, State Historic Preservation Office, 725 Sumner St. NE, Suite C, Salem, OR 97301
Ms. Rebecca Plamer, State Historic Preservation Officer, State Historic Preservation Office, 901 South Stewart, Suite 5004, Carson City, NV 89701

125th Fighter Wing, Jacksonville, Florida

Mr. Timothy Parsons, PhD, RPA, State Historic Preservation Officer, Florida Division of Historical Resources, R.A. Gray Building, 500 S Bronough St, Tallahassee, FL 32399-0250
Mr. David Crass, Deputy State Historic Preservation Officer, Historic Preservation Division, 2610 GA Highway 155, SW, Stockbridge, GA 30281

127th Wing, Selfridge Air National Guard Base, Michigan

State Historic Preservation Office, Michigan State Housing Development Authority, 735 E. Michigan Ave., Lansing, MI 48915

187th Fighter Wing, Montgomery, Alabama

Ms. Lee Anne Wofford, Deputy State Historic Preservation Officer, Alabama Historical Commission, 468 S Perry St, Montgomery, AL 36130-0900
Mr. Ken P'Pool, Deputy State Historic Preservation Officer, Mississippi Department of Archives and History, PO Box 571, Jackson, MS 39205-0571

Sample SHPO Scoping Letter

NATIONAL GUARD BUREAU
3501 FETCHET AVENUE
JOINT BASE ANDREWS MD 20762-5157

FEB – 5 2018

NGB/A4AM

State Historic Preservation Office
Michigan State Housing Development Authority
735 E. Michigan Ave.
Lansing, MI 48915

Dear Sir/Madam

The National Guard Bureau (NGB) is preparing an Environmental Impact Statement (EIS) for the beddown of F-35A aircraft at two of five potential locations. The F-35A would replace the Air National Guard's F-15, F-16, and A-10 fighter attack aircraft at the selected locations with 18 assigned aircraft and 2 backup aircraft at each of the two selected installations. The five alternative ANG locations for this beddown are:

- 115th Fighter Wing (115 FW) at Truax Field, Madison, Wisconsin;
- 124th Fighter Wing (124 FW) at Gowen Field, Boise, Idaho;
- 125th Fighter Wing (125 FW) at Jacksonville International Airport, Jacksonville, Florida;
- 127th Wing (127 WG) at Selfridge Air National Guard Base (ANGB), Michigan; and,
- 187th Fighter Wing (187 FW) at Dannelly Field, Montgomery, Alabama.

The Secretary of the Air Force (SECAF) has announced that the two preferred alternatives are Truax Field and Dannelly Field, pending results of the EIS.

The proposed action also includes construction and/or modification of facilities on the installations that are supporting the beddown. In addition, there would be an Air Force Active Duty Associate Unit based with the selected alternative installations, which would include approximately 50 Active Duty personnel who would conduct 3-year rotations with the ANG unit. F-35A aircraft would conduct training operations with established airspace of each proposed location. This undertaking does not propose new airspace, nor does it seek to reconfigure any of the existing airspaces. Those will remain unchanged.

Sample SHPO Scoping Letter

The NGB invites you to attend a public scoping meeting at one of the times and locations listed below. For your convenience, the NGB has set aside two sessions for local, state, and federal agencies. We welcome your attendance during either time. The addresses for the public scoping meetings are:

Selfridge Air National Guard Base February 21, 2018 2 to 4 p.m. and 5 to 8 p.m. L'Anse Creuse Public Schools Wheeler Community Center 24076 Frederick V. Pankow Boulevard Clinton Township, MI 48036	**Gowen Field** February 27, 2018 2 to 4 p.m. and 5 to 8 p.m. Wyndham Garden Boise Airport Hotel Convention Center 3300 South Vista Avenue Boise, ID 83705
Dannelly Field March 1, 2018 2 to 4 p.m. and 5 to 8 p.m. Montgomery Regional Airport First Floor Rotunda and Conference Room 4445 Selma Highway Montgomery, AL 36108	**Truax Field** March 8, 2018 2 to 4 p.m. and 5 to 8 p.m. Crowne Plaza Madison Hotel Three Lakes Ballroom 4402 E. Washington Ave. Madison, WI 53704
Jacksonville International Airport March 13, 2018 2 to 4 p.m. and 5 to 8 p.m. DoubleTree Hotel, Jacksonville Airport Aviation Ballroom 2101 Dixie Clipper Dr. Jacksonville, FL 32218	

Expect that the next correspondence you receive will be our determination of effects and request for concurrence. In the interim, if you have any comments or concerns, please contact Ms. Christel Johnson, the F-35A EIS Project Manager at 3501 Fetchet Avenue, Joint Base Andrews MD 20762-5157. You may also email your comments to christel.d.johnson.civ@mail.mil or via the project website at www.ANGF35EIS.com. Submit all comments within 30 days from the date of this letter. Thank you for your assistance.

Sincerely

Christel Johnson, NGB/A4AM
Plans and Requirements Branch

ALABAMA HISTORICAL COMMISSION

468 South Perry Street
P.O. Box 300900
Montgomery, Alabama 36130-0900
334-242-3184 / Fax: 334-240-3477

Lisa D. Jones
Executive Director
State Historic Preservation Officer

September 5, 2019

F-35A EIS Project Manager
NGB/A4AM
Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews MD 20762-5157

Re: AHC 2018-0512
EIS for Beddown of F-35 A Aircraft / 187th Fighter Wing
Dannelly Field
Montgomery, Alabama

Thank you for submitting information related to the proposal to beddown F-35A aircraft at Dannelly Field in Montgomery. We have determined that the proposed project would not affect any historic or prehistoric resources listed in or eligible for the National Register of Historic Places. Therefore, we concur with the project as submitted.

We appreciate your commitment to helping us preserve Alabama's historic archaeological and architectural resources. Should you have any questions, please contact Amanda McBride at 334.230.2692 or Amanda.McBride@ahc.alabama.gov. Have the AHC tracking number referenced above available and include it with any future correspondence.

Sincerely,

Lee Anne Wofford
Deputy State Historic Preservation Officer

LAW/CWK/WJL/amh

Appendix A4

Congressional Letters

TAMMY BALDWIN
WISCONSIN

COMMITTEES:
APPROPRIATIONS
COMMERCE
HEALTH, EDUCATION, LABOR, AND PENSIONS

United States Senate
WASHINGTON, DC 20510

August 23, 2019

The Honorable Matthew Donovan
Secretary (Acting)
U.S. Air Force
1670 Air Force Pentagon
Washington, DC 20330

Dear Acting Secretary Donovan:

I am writing in regards to the United States Air Force's Draft Environmental Impact Statement (DEIS) for the F-35A mission at Truax Air National Guard Base. The 115th Fighter Wing has a proud history of serving the nation, the State of Wisconsin and the Madison community, and the 115th's many years of experience in the F-16 makes it highly suitable for the F-35 mission. Not only is Truax the most cost-effective location for this mission for the taxpayers, I also understand the importance of the Guard base to the local economy, with an estimated impact of over $100 million annually. While transitioning to the F-35A mission will bring an economic benefit to the region that is welcomed, I also share the concern of some in our community about the potential noise impacts that have been estimated by the DEIS. As the planning process moves forward, the Air Force should provide more clarity on the potential noise impacts to the community. In addition, prior to the release of the final Environmental Impact Statement, the Air Force should publicly outline steps it will take to mitigate impacts to the community.

The draft projects that F-35 training requirements will increase annual air operations from 4,900 (F-16C) to 6,222 air operations (F-35A). However, the DEIS does not take into consideration that, according to historical data, not all air operations take place at Truax ANG Base. For many years, approximately 20% of air operations have been conducted at locations other than Truax. Utilizing an estimate based on 100% home station, the DEIS projects a maximum possible impact to as many as 2,215 residents in a part of the Madison community that faces socio-economic challenges. However, it is my understanding that if air operations were conducted at a rate more in line with historical data, there would be a less severe impact on the community. Regarding the number of air operations, please answer the following questions:

1. What percentage of all F-35A air operations for the 115th will take place at Truax?
2. If the assessment accounted for an 80% home state rate in line with historical data, would that reduce the amount of people affected by noise?
3. How will air operations and associated impacts change over time?

Additionally, the DEIS notes that children in particular may be impacted by noise. The DEIS states that two parks, two schools and three daycare centers fall within the 65 Day, Night, Average Sound Level (DNL)—the point considered to be when aircraft noise has a discernable impact. This is an issue of particular concern for the Madison community and I would appreciate answers to the following questions:

1. When will there be an increase of noise interference, above current missions, that may impact school operations from continuing without interference?
2. What options are there to mitigate potential impacts of noise?

Finally, while I understand that the purpose of the DEIS was to identify the maximum potential impacts, and the scope of the document does not include a mitigation strategy, I would appreciate in writing, the USAF's plan to work with me, the FAA, the State of Wisconsin and the Madison community to mitigate any potential impacts, particularly on children and low-income communities.

I look forward to working with you to provide mitigation efforts for those that may be impacted and to a continued partnership to support America's airmen and women.

Sincerely,

Tammy Baldwin
United States Senator

SECRETARY OF THE AIR FORCE
WASHINGTON

SEP 2 6 2019

The Honorable Mark Pocan
U.S. House of Representatives
Washington, DC 20515

Dear Representative Pocan:

Thank you for your September 17, 2019 letter expressing your concerns and those of your constituents from the Draft Environmental Impact Statement (EIS) for the F-35A operational bed down at Truax Field in Madison, Wisconsin and requesting we conduct a take-off/landing demonstration of an F-16 and F-35 so community members can experience possible noise effects.

We understand your concerns and those of your constituents with regard to the difficulty in assessing our use of the "Day, Night, Average Sound Level" (DNL) metric for measuring changes in noise impacts from the F-35, and are committed to working with you to facilitate a common understanding of these impacts in practical terms. We are mindful of the challenges communities face when hosting a military installation, especially potential noise effects on the community from take-offs and landings. Identification and analysis of those noise impacts is one of the core elements addressed in the Draft EIS.

In an effort to ensure transparent and repeatable evaluation methods, our noise analysis is necessarily based upon a well-established, scientific process. We use this modelling process to assure consistency between the alternative locations that reflect expected flight patterns at each. The results of these complex calculations of noise exposure, known as annualized DNL are tabulated and displayed as noise contour maps within the Draft EIS.

We will not be able to support your request to fly an F-35 at Truax Field. In contrast to the DNL, this would only present a momentary experience of that aircraft's noise which would serve no evaluative purpose. Scientifically, it would not represent the actual cumulative experience over an extended period of time, nor would it be repeatable at other bases being evaluated. The primary reason for this is that noise generated from a single event is influenced by many factors, such as wind speed and direction, air temperature, relative humidity, and take-off weight. Therefore, a single event would not reflect the requisite science, attend to the complexity and sensitivity of human hearing, and would inject subjectivity that would undermine the deliberative environmental analysis.

The Air National Guard supports the Air Force by maintaining well-trained, well-equipped units ready for prompt mobilization during wartime and national emergencies. To this end, they must train with the most current and capable aircraft. We are grateful to the City of Madison for its strong support to our Airmen and their families based at Dane County Regional

Airport. This historic partnership contributed to the Air Force decision to consider basing our most advanced fighter aircraft at this airfield.

Thanks for your support of our mission, our Airmen and their families.

Sincerely,

Matthew P. Donovan
Acting Secretary of the Air Force

cc:
SAF/AA

MARK POCAN
2ND DISTRICT, WISCONSIN

COMMITTEE ON APPROPRIATIONS

SENIOR WHIP

10 EAST DOTY STREET, SUITE 405
MADISON, WI 53703
(608) 258-9800

1421 LONGWORTH HOUSE OFFICE BUILDING
WASHINGTON, DC 20515
(202) 225-2906

POCAN.HOUSE.GOV

UNITED STATES
HOUSE OF REPRESENTATIVES

September 17, 2019

The Honorable Matthew P. Donovan
Acting Secretary
United States Air Force
1670 Air Force Pentagon
Washington, DC 20330-1670

Dear Acting Secretary Donovan:

I am writing to follow-up on my August 19, 2019 letter regarding the United States Air Force's Draft Environmental Impact Statement (DEIS) for the F-35A mission at Truax Air National Guard Base. While I have not yet received a response to my previous questions, I continue to hear concerns about the noise impact of the F-35 at Truax. As I hear from more members of the community, it has been brought to my attention that the noise impact is difficult to assess due to the Air Force's use of the Day, Night, Average Sound Level (DNL) metric.

I formally request the Air Force in coordination with the 115th Fighter Wing test the F-35 flight pattern at Truax Air National Guard Base. Specifically, the Air Force should conduct a take-off and landing of the F-16 and the F-35 planes so community members will have a more accurate understanding of the noise impact from the F-35 mission. This test mission should be completed before the public comment period ends on September 27, 2019.

I look forward to working with you on this request.

Sincerely,

Mark Pocan
Member of Congress

PRINTED ON RECYCLED PAPER

SECRETARY OF THE AIR FORCE
WASHINGTON

SEP 24 2019

The Honorable Mark Pocan
United States Representative
Washington, DC 20515

Dear Representative Pocan:

Thank you for your August 19, 2019 letter expressing your concerns and those of your constituents from the Draft Environmental Impact Statement (EIS) for the F-35A operational beddown at Truax Field in Madison, Wisconsin. We are grateful to the City of Madison for its strong support to military Airmen and their families based at the site of the current Dane County Regional Airport for more than 77 years. This historic partnership contributed to the Air Force decision to consider basing our most advanced fighter aircraft at this airfield. However, we are mindful of the challenges communities face when hosting a military installation.

The federal mission of Air National Guard (ANG) units is to support the USAF by maintaining well-trained, well-equipped units available for prompt mobilization during wartime, and to provide assistance during national emergencies. The ANG must train with the current USAF aircraft, operate combat and support aircraft, and train personnel using the requirements established by Air Combat Command through its Ready Aircrew Program. The beddown actions and associated training assures availability of combat-ready pilots to operate the most advanced fighter aircraft in the world.

As you know, the Draft EIS is evaluating potential environmental impacts associated with the proposed beddown of F-35A aircraft at two of five alternative ANG locations. Identification and analysis of alternatives is one of the core elements of the Draft EIS process under National Environment Protection Act and USAF implementing regulations. The Draft EIS was published in August and is open for public comment. All substantive comments received during the public comment period open through September 27th will be considered during preparation of the Final EIS.

In order to be completely transparent and continue to inform the citizens of Madison, I offer the enclosed responses to your questions. We are proud the Wisconsin Air National Guard is being considered to receive state-of-the-art 5th Generation aircraft.

Thanks for your support of our mission, our Airmen and their families.

Sincerely,

Matthew P. Donovan
Acting

Attachment:
Questions and Answers

cc:
SAF/AA

CONGRESSIONAL: ASECAF Letter from CM Pocan re: Ops 5 & 6 Draft EIS – Truax, Madison, Wisconsin

NOISE:

Q1: "How does the U.S. Air Force (USAF) define 'incompatible for residential land use?'"

A1: Incompatible use" does not mean non-livable conditions. In fact, there are many communities/neighborhoods throughout the country with residential development, and other sensitive land uses, within airport high noise areas or zones. In general sound levels greater than 65 dB Day-Night Average Sound Level (DNL) are considered to be incompatible with residential land use. The federal government has established guidelines to help assess land use compatibility with aircraft noise exposure. For example, the Department of Housing and Urban Development labels community noise exposure between 65 dB and 75 dB as "Normally Unacceptable." Federal project assistance is permitted for residential development with additional attenuation (beyond normal construction) in the building's shell (24 CFR 51.104(a)(1)). Compatibility, in relation to military readiness, can be defined as the balance and / or compromise between community and military needs and interests. The goal of compatibility planning is to promote an environment where both entities can coexist successfully. These guidelines are intended as a planning tool, and as such provide general indications as to whether particular land uses are appropriate for certain predicted noise exposure levels.

Q2: "In layman's terms, what does this mean for families currently living in this area?"

A2: The DNL is a metric designed to express in a single number all the noise that occurs over the course of a 24-hour period. Furthermore, it recognizes that noise at night is more disruptive than daytime noise by penalizing sounds experienced between 10 p.m. and 7 a.m. with a weighting factor. Aircraft noise does not happen continuously; it is a series of individual events. A higher DNL in this case means that there are slightly more events expected than there were previously (roughly 2 flights per day) and the individual events will be louder (due to the new aircraft being introduced). A shift of some daytime flights to nighttime flights (with the same number of flights by the same aircraft) would also raise the DNL due to the weighting factor. That does not mean that they would be required to vacate their homes.

This DNL is typically described as an annoyance generally and a minor effect on speech intelligibility for a few seconds during an overflight. According to the Wyle Model, Handbook of Noise Control, 65-75 dB sound level is the equivalent of a vacuum cleaner at 10 feet, automobile at 100 feet or air conditioner unit at 100 feet distance. With the current mission, there are already many households (551 people, 229 households) within the 65-70 dB contour. 65-75 dB is considered "moderately loud" with "very loud" starting at 90 dB (the sound equivalent of a heavy truck at 50 feet distance).

Should the FAA prepare and implement an updated Part 150 Study, specific mitigations could be identified, as needed, and implemented to minimize impacts to residences within the 65 dB and higher DNL noise contours. This FAA program could include

providing noise mitigation to the homes (insulation, windows, etc.), or even purchasing homes in some extreme cases.

Q3: "What recourse is available to those who currently live in the area defined as "potentially incompatible for residential land use?"

A3: Since sound/noise is air pressure, noise mitigation begins with sealing the exterior shell of a structure. Common weatherization improvements that make a home more energy efficient (like caulking windows and installing weatherstripping) also improve its acoustic performance. Many local governments and utility providers offer guidance and funding for weatherization improvements. This is particularly true for low-income residents,

Q4: "Are there strategies the USAF can use to reduce the area of residential land included in the 64-75 dB DNL range?"

A4: There are several operational changes that could reduce the area subjected to additional noise. Steeper departure and approach angles, less nighttime training, less aircraft/sorties, and restricted afterburner use have been effective in other locations.

Q5: "What noise mitigation strategies are available to the affected locations?"

A5: The Wisconsin Department of Administration's, Division of Energy, Housing, and Community Resources funds weatherization programs through the Project Home program (https://www.projecthomewi.org/programs/weatherization/weatherization.html). Project Home funds energy efficiency improvements for qualifying homeowners at no cost. Rental property owners that do not qualify individually are only charged 15% of the project costs.

Dane County Regional Airport has proactively engaged in development of aviation easements within the vicinity of the airport. Numerous aviation easements have been purchased by Dane County Regional Airport in residential areas affected by airport operations. In addition, should the FAA prepare and implement an updated Part 150 Study, other specific mitigations would be identified, if needed, and implemented to minimize impacts to residences within the 65 dB and higher DNL noise contours.

Q6: "What support, including any noise mitigation efforts, will the USAF offer impacted families and communities in Madison?"

A6: The USAF works diligently with the City of Madison and the State of Wisconsin to be a good neighbor and responsible member of the community. Support for the community includes $62M in annual payroll for its 1000 employees as part of $100M in total economic activity.

As discussed in the Draft EIS (Pg. WI-17, §W12.6), the USAF does not have authority to expend appropriated funds on facilities that are not under the direct control of the USAF. However, the FAA has a program that addresses noise and compatible land use near airports. The FAA's regulations implementing the Aviation Safety and Noise Abatement Act of 1979 set forth at 14 C.F.R. Part 150 provide a voluntary process whereby an airport sponsor can use to mitigate significant noise impacts from airport users. It is important to note that this FAA program is not a guarantee that sound mitigation or abatement will take place. Eligibility for sound insulation in noise-

sensitive land uses through the FAA's Airport Improvement Program requires that the impacted property be located within a 65 dB DNL or higher noise contour and meets other FAA sound mitigation guidance.

Operations:

Q1: "Will flight simulators for the new F-35A planes be made available at Truax Field?"

A1: Flight simulators are a part of the proposed action and are included in the Draft EIS. (pg. WI-62 and for other alternatives, ppg. ID-63, FL-60, MI-64, and AL-62).

Q2: "Will simulators reduce the number of annual sorties proposed in the draft EIS?"

A2: Simulators were considered when analyzing the number of air operations. See Draft EIS pages WI-62, as well as similar simulator info for other candidates on Draft IES pages ID-63, FL-60, MI-64, and AL-62. The simulator requirements are in addition to actual flights required. As the F-35 simulators systems mature over time, more tasks may be accomplished in the simulators, but not at this time.

Q3: "What can we actually expect with respect to the number of flights that depart and land in Madison compared to the numbers we currently experience?"

A3: The Draft EIS fully describes the potential impacts of our anticipated F-35A operations at the Dane County Regional Airport, as well as other alternate locations. The number of operations analyzed in the Draft EIS, an increase of approximately 3 percent in total airfield operations, are based on the requirements established by 115 FW, Air Combat Command, and the National Guard Bureau. The Draft EIS indicates there would be no impact to the local air traffic environment or terminal procedures at Dane County Regional Airport due to available capacity in the area. If Truax Field Air National Guard Base is selected for this basing action, further understanding on actual flight operation numbers will become apparent following completion of the beddown.

LATE ADD QUESTION RE NUCLEAR:

Q1: "Does the Air Force plan to store nuclear weapons at Truax Air National Guard base, or make the F-35 jets based at Truax nuclear-capable"

A1: Although the F-35A could eventually be "nuclear capable", the beddown being considered at Traux Air National Guard base does not include nuclear weapons storage.

MARK POCAN
2ND DISTRICT, WISCONSIN

COMMITTEE ON APPROPRIATIONS

SENIOR WHIP

10 EAST DOTY STREET, SUITE 405
MADISON, WI 53703
(608) 258-9800

1421 LONGWORTH HOUSE OFFICE BUILDING
WASHINGTON, DC 20515
(202) 225-2906

POCAN.HOUSE.GOV

UNITED STATES
HOUSE OF REPRESENTATIVES

September 24, 2019

The Honorable Matthew P. Donovan
Acting Secretary
United States Air Force
1670 Air Force Pentagon
Washington, DC 20330-1670

Dear Acting Secretary Donovan:

I write to follow-up on my letters to you dated August 19, 2019 and September 17, 2019 pertaining to the United States Air Force's Draft Environmental Impact Statement (EIS) for the proposed F-35A mission at Truax Air National Guard Base.

I have yet to receive a reply to either of my previous letters, even though the public comment period on the Draft EIS is scheduled to close this Friday. Respectfully, my constituents cannot appropriately comment on the F-35 proposal absent the information I have solicited from you on their behalf. I request an extension of the public comment period to a date that is 30-days after you have relayed the information sought below and in my previous two letters.

In addition to previous requests, I also wish to know the process through which Members of Congress will be able to petition for relief for noise-impacted constituents, and how such constituents can directly apply for noise mitigation support and aid from the federal government. Further, please relay the noise difference between the F-35 and F-16 in percentage terms, not in DNL measurements as it has been previously presented.

Thank you for your attention to this matter. I eagerly await your reply.

Sincerely,

Mark Pocan
Member of Congress

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SECRETARY OF THE AIR FORCE
WASHINGTON

SEP 26 2019

The Honorable Tammy Baldwin
United States Senate
Washington, DC 20510

Dear Senator Baldwin:

Thank you for taking the time to discuss your concerns, and those of your constituents, with the draft F-35A Operational Beddown Air National Guard Environmental Impact Statement (EIS). The draft EIS analyzes the 115th Fighter Wing (FW), Dane County Regional Airport, Madison, Wisconsin; the 124th FW, Boise Air Terminal, Boise, Idaho; 125th FW, Jacksonville International Airport, Jacksonville, Florida; 127th Wing, Selfridge Air National Guard (ANG) Base, Michigan; and the 187th FW, Montgomery Regional Airport, Montgomery, Alabama.

The draft EIS evaluates the potential environmental impacts with the beddown of F-35A aircraft at two of five alternative ANG locations and will be used to inform the final decision. The draft EIS was made available for public review on August 9, 2019 and the comment period ends September 27, 2019. All substantive comments received during the public comment period will be addressed in the final EIS.

To be transparent and responsive to you and the citizens of Madison, I offer the attached answers to the questions from your August 23, 2019 letter and our September 18, 2019 conversation. As you know, hosting a military installation comes with numerous challenges and opportunities. We stand ready to support you and the Madison community in understanding the environmental process, terminology, findings and analysis.

We are proud the Wisconsin ANG is being considered to receive state-of-the-art 5th Generation aircraft. We are grateful to the city of Madison for 77 years of strong support to Airmen and their families based at the site of the current Dane County Regional Airport. This historic partnership contributed to the consideration of basing our most advanced fighter aircraft at this airfield. Thanks for your continuous support of our mission, our Airmen and their families.

Sincerely,

Matthew P. Donovan
Acting

Attachment:
Questions and Answers

cc:
SAF/AA

CONGRESSIONAL: ASECAF Letter from Senator Baldwin re: Ops 5 & 6 Draft EIS – Truax, Madison, Wisconsin

NOISE:

Q1: "What Percentage of All F-35A air operations for the 115th take place at Truax?"

A1: The Draft Environmental Impact Statement (EIS) used 100% of home station air operations to provide a conservative estimate for the initial F-35 qualification training required for 115 FW pilots. After 115 FW pilots are qualified in the F-35, which is expected to take several years, and begin deployments and off-station training, air operations are expected to be reduced to a level closer to historical home station operations. – see Draft EIS on Section WI2.1.2 Page WI-3.

Q2: "If the assessment accounted for 80% home station training in line with historical data, would that reduce the amount of people affected by noise?"

A2: The Draft EIS did not assess noise profiles assuming 80% home station operations in order to provide a conservative estimate for the initial F-35 potential impacts. After 115 FW pilots are qualified in the F-35, and begin deployments and off-station training, air operations are expected to reduce to historical home station operations and could have an associated reduction in noise.

Q3: "How will air operations and associated impacts change over time?"

A3: The change over time is not currently known. However, there is an expectation that operations may be reduced once pilots are qualified which could result in a rate of home station operations closer to historical levels.

Q4: "When will there be an increase of noise interference, above current missions, that may impact school operations from continuing without interference?"

A4: The Air Force expects the noise to be at its greatest once the full complement of F-35s have been based and are fully operational. As discussed in the Draft EIS (See Section WI3.1.1.2 pg WI-33) under the Proposed Action, four school Points of Interest (POI) would experience increases of 1 to 2 dB Equivalent Noise Level (L_{eq}). One school POI would have no change, and one school POI would have a decrease of 2 dB Equivalent Noise Level (L_{eq}). However, approximately 80% to 90% of the interfering events under the Proposed Action would continue to be caused by civil operations. The number of interfering events per hour would remain similar to the affected environment except Lake View Elementary and the Richardson school that would experience one additional event per average hour.

Q5: "What options are there to mitigate potential impacts of noise?"

A5: The USAF works diligently with the City of Madison and the State of Wisconsin to be a good neighbor and responsible member of the community. Support for the community includes $62M in annual payroll for its 1000 employees as part of $100M in total economic activity.

Common weatherization improvements that make a home more energy efficient (like caulking windows and installing weatherstripping) also improve its acoustic performance. The Wisconsin Department of Administration's, Division of Energy, Housing, and Community Resources funds weatherization programs through the Project Home program (https://www.projecthomewi.org/programs/weatherization/weatherization.html). Project Home funds energy efficiency improvements for qualifying homeowners at no cost. Rental property owners that do not qualify individually are only charged 15% of the project costs.

Mitigations identified during development of the EIS will be considered and carried forward to the extent practicable. The USAF would continue working with Dane County Regional Airport and the City of Madison after the EIS is complete and ROD is signed, should Truax be selected.

As discussed in the Draft EIS (Pg. WI-17, §W12.6), the USAF does not have authority to expend appropriated funds on facilities that are not under the direct control of the USAF that would be part of facilities improvement noise mitigation program. However, the FAA has a program that addresses noise and compatible land use near airports. The FAA's regulations implementing the Aviation Safety and Noise Abatement Act of 1979, set forth at 14 C.F.R. Part 150 provide a voluntary process whereby an airport sponsor can use to mitigate significant noise impacts from airport users. It is important to note that this FAA program is not a guarantee that sound mitigation or abatement will take place. Eligibility for sound insulation in noise-sensitive land uses through the FAA's Airport Improvement Program requires that the impacted property be located within a 65 decibels (dB) Day-Night Average Sound Level (DNL) or higher noise contour and meet various other criteria in FAA guidance documents used for sound mitigation.

Should the FAA revise its regulation under Part 150 specific mitigations would be identified, if needed, and implemented to minimize impacts to residences within the 65 dB DNL and higher noise contours. This could include implementing operational procedures that minimize sound levels, providing noise mitigation to the homes (e.g., insulation, windows), or even purchasing homes in some cases.

FOLLOW-UP QUESTIONS FROM 18 SEPTEMBER PHONE CALL:

Q1. Quantify increased air operations in language understandable by the general public. How much will the air operations and noise increase? How does this compare to historic operations? When does the Air Force project operations would return to historical norms?

A1. Proposed annual F-35A flight operations analyzed in the DEIS total 6,222, an increase of 2,290 operations when compared to current operations (or the No Action Alternative). The F-35A aircraft would account for approximately 7 percent of total aircraft (military and civil/commercial) operations at Dane County Regional Airport. We

expect air operations to increase over current levels as the 115 FW familiarizes with the new aircraft. The Draft EIS utilized a conservative estimate - 100% home station air operations - for the initial F-35 qualification training required for 115 FW pilots. After 115 FW pilots are qualified in the F-35, and begin deployments and off-station training, air operations are expected to reduce accordingly closer to historical home station operations (Draft EIS on Section WI2.1.2 Page WI-3). The table below is excerpted from the DEIS showing potential noise impacts.

DNL (dB)	*Proposed Action Alternative Acreage*	*Proposed Action Alternative Estimated Population*	*Proposed Action Alternative Households*	*Change from Current Acreage*	*Change from Current Estimated Population*	*Change from Current Households*
65 – 70	1,456	2,474	1,186	+949	+1,923	+887
70 – 75	413	292	132	+320	+292	+132
75 – 80	51	0	0	+51	0	+0
80 – 85	0	0	0	0	0	0
85+	0	0	0	0	0	0
Total	1,920	2,766	1,318	+1,320	+2,215	+1,019

We anticipate a return to steady-state/historical operations in the 2025-2026 timeframe. With this return to steady-state operations we anticipate the noise profiles will encumber fewer households than reflected in the DEIS. Although the amounts were not analyzed in the DEIS, our noise experts indicate it would be on the order of a 1 - 2 dB drop.

Q2. What does "incompatible use" in the draft EIS mean with regard to housing? Does incompatible use in residential areas equate with non-livable conditions?

A2. "Incompatible use" does not mean non-livable conditions. In fact, there are many communities/neighborhoods throughout the country with residential development, and other sensitive land uses, within airport high noise areas or zones.

Drawing from Housing and Urban Development's terminology, "incompatible use" means that sound attenuation is recommended. At or inside a 65 dB DNL contour line, which is acceptable for all land uses, the attenuation provided by a typical house or apartment wall assures the interior sound level will meet the standard that HUD considers acceptable for speech and sleeping, 45dB. Additional attenuation would be recommended for houses outside a 65 dB DNL contour line. As to outdoor activity, the federal government considers residential yards and similar land uses such as parks, outdoor sports and cultural activities unimpaired by noise exposure up to 75 dB. Ultimately, it is up to local residents to determine an acceptable standard of living in their community, factoring in cost, feasibility, and their development needs while keeping in mind that these levels include an adequate margin of safety.

According to the Wyle Model, Handbook of Noise Control, 65-75 dB sound level is the equivalent of a vacuum cleaner at 10 feet, automobile at 100 feet or air conditioner unit at 100 feet distance. With the current mission, there are already many households (551 people, 229 households) within the 65-70 dB contour. 65-75 dB is considered "moderately loud" with "very loud" starting at 90 dB (the sound equivalent of a heavy truck at 50 feet

distance). Note also that the frequency and timing of "high" noise impact in sensitive areas (schools, daycare, churches etc) ranges between 0.1 low and 7.4 high events per week during daytime. The proposed events per week at night are mostly 0 with a high of 0.2. (Draft EIS on Table WI3.1-10 Page WI-32, Table WI3.1.12 Page WI-34).

MARK POCAN
2ND DISTRICT, WISCONSIN

COMMITTEE ON APPROPRIATIONS

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UNITED STATES
HOUSE OF REPRESENTATIVES

October 3, 2019

The Honorable Matthew P. Donovan
Acting Secretary
United States Air Force
1670 Air Force Pentagon
Washington, DC 20330-1670

Dear Acting Secretary Donovan:

First, thank you for extending the public comment period for the United States Air Force's Draft Environmental Impact Statement for the proposed F-35A mission at Truax Air National Guard Base as I requested in my September 24, 2019 letter to you. This additional time will enable impacted individuals to submit comments based on your responses to my previous inquiries.

Second, I write to strenuously encourage you to reconsider your decision not to conduct a demonstration take-off, flight, and landing of an F-35A – alongside an F-16 – at Truax Air National Guard Base. I believe such a demonstration would allow the citizens of Madison, and surrounding communities, to fully understand the impact an F-35A operational bed down at Truax Field may have on their community.

I thank you for your reconsideration of your position on a flight demonstration and look forward to your reply.

Sincerely,

Mark Pocan
Member of Congress

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SECRETARY OF THE AIR FORCE
WASHINGTON

OCT 29 2019

The Honorable Mark Pocan
United States Representative
Washington, DC 20515

Dear Representative Pocan:

Thank you for your September 24, 2019 letter expressing your concerns and those of your constituents about the Draft Environmental Impact Statement (EIS) for the F-35A operational beddown at Truax Field in Madison, Wisconsin and requesting a 30-day extension to the public comment period.

We want to ensure all interested parties have the opportunity to provide input to our proposed action to beddown F-35s at two of five possible locations, including Dane County Regional Airport, through the environmental impact statement process. Therefore, we are extending the public comment period until November 1, 2019. John Henderson informed me that he spoke with you about the beddown and his support for your extension request.

In your letter, you asked for information on federal programs that can assist you and your constituents with noise mitigations. I refer you to the Federal Aviation Administration's Airport Improvement Program, often referred to as the Part 150 Program, which provides a process to request aid to mitigate significant noise impacts, including insulation for noise effects. Residents, especially low-income families, interested in this program should contact their local airport authority for assistance.

As you are aware, our analysis of potential noise impacts is based upon a well-established, scientifically based modelling process. Some of the results of these complex calculations of noise exposure are expressed as annualized Day-Night Average Sound Level metric, a 24-hour average of all the noise that happens (penalizing nighttime noise) conflated into a single number. As you have pointed out, it is difficult to understand what the difference in these single numbers mean. Attached to this letter is a diagram of common sound sources as related to specific sound levels people typically experience.

Although we can calculate a change percentage between the F-16 and F-35 noise, that calculation would reflect a change in noise energy that cannot be equated to perception of loudness or quietness. Unfortunately, this calculation is not helpful in understanding noise differences. For example, the difference in sound level between an F-35 and an F-16 on take-off

at a 1,000 feet altitude and from 1,000 feet away is approximately 5.6 dB. This equates to a little over 55% difference. This difference in sound will change with both altitude and distance from the origin point; therefore, there is no single percent difference between the two aircraft.

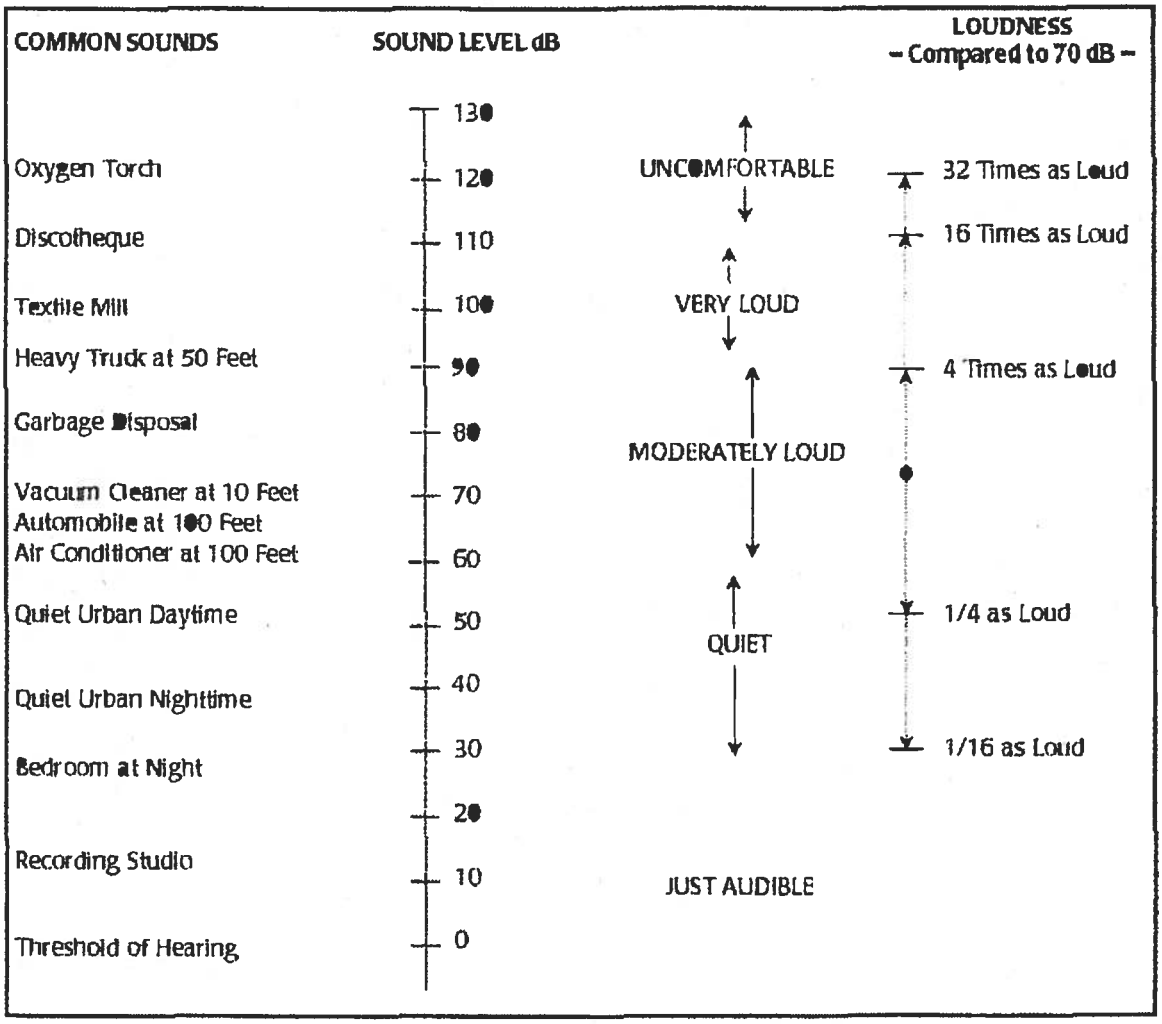
Thanks for your support of our Air Force, our Airmen and their families.

Sincerely,

Barbara Barrett
Secretary of the Air Force

Attachment:
Typical Sound Levels of Common Sounds

cc:
SAF/AA



Source: *Handbook of Noise Control*, C.M. Harris, Editor, McGraw-Hill Book Co., 1979, and FICAN 1992.

SECRETARY OF THE AIR FORCE
WASHINGTON

OCT 24 2019

The Honorable Mark Pocan
U.S. House of Representatives
Washington, DC 20515

Dear Representative Pocan:

Thank you for your October 3, 2019 letter requesting reconsideration of conducting a demonstration flight between an F-16 and F-35 at Truax Field in Madison, WI to help your constituents get a sense of the different sound levels each aircraft creates.

The purpose of the National Environmental Policy Act (NEPA) is to assure an informed decision, with public input, that considers potential impacts to the human environment. The Draft Environmental Impact Study provided detailed, repeatable, and scientifically valid expressions of how much louder the F-35 will be in steady state and how much louder the F-16s/F-35s will be during a transition period. These analyses were conducted by experts, are proven to be sufficient for providing public notification on potential noise impacts, and allow for public comment on these impacts in accordance with federal law. Based on the comments received so far, the public has received the message in sufficient detail to express meaningful opinions.

Supporting demonstration flights as requested would introduce unscientific and subjective expressions of potential noise impacts that would undermine the excellent technical work that has been completed to date, fail to further the purposes of this NEPA action, and lead to unnecessary delay. Therefore, we are not able to support your request for a demonstration flight as stated in my September 26, 2019 letter.

Thanks for your support of our Air Force, our Airmen and their families.

Sincerely,

Barbara Barrett

cc:
SAF/AA

MARK POCAN
2ND DISTRICT, WISCONSIN

COMMITTEE ON APPROPRIATIONS

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UNITED STATES
HOUSE OF REPRESENTATIVES

October 30, 2019

The Honorable Barbara Barrett
Secretary
United States Air Force
1670 Air Force Pentagon
Washington, DC 20330-1670

Dear Secretary Barrett:

I write to submit my formal public comment on the United States Air Force's Draft Environmental Impact Statement (EIS) for the proposed F-35 mission at Truax Air National Guard Base. I previously expressed concerns to your predecessor about the brevity of the originally-noticed public comment period, the inability of an average person to understand the technical descriptions of anticipated noise levels, the potential for nearby homes to become incompatible for residential use, and the lack of noise mitigation assistance for impacted constituents.

I thank you for discussing these concerns with me and for extending the public comment period. Unfortunately, however, as a Member of Congress who has never supported the authorization of funding for the development of the F-35, and who remains deeply disturbed by program cost overruns and other issues, questions and concerns about the proposal remain.

Respectfully, I continue to request a flight demonstration of an F-35 and F-16 at Truax so that differences in noise levels between the two aircraft can be directly observed. I recently learned that multiple F-35 arrivals and departures have occurred in Madison over the past several months, and that the Air Force neglected to alert elected officials or community members who would have benefitted from hearing the differences between the two planes while taking-off and landing. Considering that the Air Force has already brought F-35A planes to Dane County Airport, it should not be difficult to accommodate my request for a comparison test flight of the two planes. I believe it is imperative that there is an F-35 and F-16 take-off and landing comparison at Truax before any final decision is made due to the general public's inability to understand the draft EIS's description of possible noise level increases and their impacts.

Additionally, I continue to be concerned that the Air Force has not committed to financially supporting noise mitigation efforts for households, schools and other community buildings

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impacted by the F-35, including those according to the EIS who will be "incompatible for residential use" due to the proposed F-35 beddown in Madison.

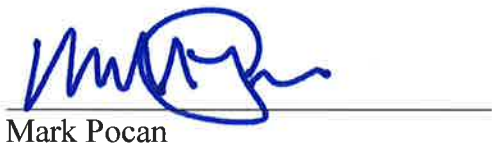
Although the Air Force has listed the Federal Aviation Administration (FAA) Part 150 noise compatibility program as one solution, according to an analysis by the City of Madison, that program is not available for more than 500 homes near the airport, including 312 mobile homes, 195 income restricted apartments and 36 townhomes owned by the Community Development Authority.

Therefore, I believe the Air Force must commit publicly to securing funding for anyone impacted by the placement of the F-35 in Madison.

Without commitments for noise mitigation assistance from the Air Force, it will be difficult to support any potential F-35 mission at Truax Air National Guard Base. I believe this must be addressed to ensure any negative outcomes caused by the F-35 coming to Madison are adequately addressed.

Thank you for your attention to these requests. I look forward to continuing to engage with you on behalf of the people of Wisconsin's Second Congressional District.

Sincerely,



Mark Pocan
Member of Congress

From:	Rep.Taylor
To:	usaf.jbanafw.ngb-a4.mbx.a4a-nepa-comments@mail.mil
Subject:	[Non-DoD Source] Response to Air Force Draft Environmental Impact Statement
Date:	Friday, November 1, 2019 3:59:21 PM
Attachments:	image002.png Attachment A - Questions for Air Force 10.18.19.pdf Letter to Sec. Barrett 10.18.19.pdf Letter to Sec. Donovan 9.24.19.pdf Letter to Mr. Ramon Ortiz 9.24.19.pdf Rep. Taylor Final Comment Letter to Sec. Barrett and Ramon Ortiz 11.1.19.pdf Attachment to Final Comments on dEIS 11.1.19.pdf

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

Mr. Ramon Ortiz,

Please find my final comments on the draft Environmental Impact Statement and a supporting attachment in addition to previous unanswered correspondence I would like to have included in my response.

Sincerely,
Representative Chris Taylor

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CRITICAL INFORMATION NEEDED REGARDING
115TH FIGHTER WING F-35 PROPOSAL

1. The only map based visualization of the F-35 expected noise levels around the airport is of DNL contours, making it difficult for the public to grasp the intensity and frequency of the anticipated F-35 noise. It would be extremely useful to have:
    a. Noise contour maps as set forth in WI3.1-2 that indicated expected DNL within 1 mile of the 65 dB DNL contour line. This is necessary due to the substantial, dense residential and business environment within 1 mile of the existing 65 dB DNL noise contour, as noise does not stop at this contour line. This type of graph is referenced on p. 5 in DOD's DOD's Noise Work Group Technical Bulletin (12/2009).
    b. Noise contour maps similar to WI3.1-2 that is of SEL and Lmax;
    c. A set of noise contour maps showing "Number of Events Above" (NA), with threshold levels of Lmax=55, Lmax=60, Lmax=65 in 5 dB increments up to Lmax=90 dB. This type of graph is referenced on p. 10 in DOD's Noise Work Group Technical Bulletin (12/2009).
    d. A noise contour map showing the number of minutes per day in 10, 20 and 40 minutes that noise levels are exceeded from 55 to 90dB in 5 dB increments. This type of graph is referenced on p. 13 in DOD's Noise Work Group Technical Bulletin (12/2009).
    e. A noise contour map showing one-hour L_{eq} values for each hour throughout the 24- hour day, which would allow the community to understand how average sound levels are affected by high mission levels during various portions of the day.
    f. For each of the F-35 flight tracks depicted in the draft EIS's Final Noise Analysis, Figure A-12 "Modeled Flight Tracks for F-35A at Truax Field," please provide a label showing the identifier of the profile and it's proposed frequency as was used as an input to the NOISEMAP model for generating the maps in the draft EIS.
    g. Noise Contour maps that consider afterburner usage of 5%, 10%, 25% and 50% at 1000 ft. AGL in calculating the:
        i. 65 DNL noise contour map and DNL noise contour within 1 mile of the 65 DNL noise contour;
        ii. Loudest Events at each POI Table 5-1
        iii. Classroom Speech Interference Table 5-2
        iv. Residential Speech interference Table 5-3
        v. Probability of Awakening Table 5-4

2. A comparison of dB levels of the F-16s and the F-35s using the metrics included in the Final EIS for Burlington, Vermont as reflected in Chart BR3.2-1 which includes SEL and Lmax at various takeoff and landing metrics including 1,000 AGL takeoff and 1,500 AGL landing.

3. For each scenario above, please model with current city/county population estimates instead of 2010 census data, as Madison has had substantial population growth over the last 9 years.

4. For each scenario above, please model with expected number of aircraft flying simultaneously in their anticipated formation.

OUTSTANDING QUESTIONS

1. What efforts were made by the US Air Force to ensure that potentially impacted populations, including communities of color and non-English speakers were included into the review process for the Draft EIS?

Mission/Future of Truax

2. If the 115th Fighter Wing isn't selected for the 5th or 6th F-35 beddown, will it lose its flying mission? Will the Truax base close?

3. Will the 115th Fighter Wing have another opportunity to be considered for F-35s should they not be selected for the 5th and 6th missions?

4. What is the Air Force's timetable for rolling out and basing F-35s?

5. How many jobs would remain at Truax if it lost its fighter flying mission?

6. Which other flying missions might the 115th Fighter Wing be eligible for if not selected for the F-35s? Medical? Transport?

7. At some point in the future, could the Air Force change the Truax flying mission for F-35 to include nuclear? What kind of public notice is given when the Air Force changes or proposes a change in mission?

8. Will Block 3 F-35s be upgraded to Block 4 when Block 4 technology is available? What kinds of weapons do block 4 F-35s carry?

9. Where will maintenance activities take place for the F-35s under the Proposed Action? What company or entity will perform and where? Will any of the current 115th Fighter Wing maintenance positions become redundant as a result?

10. Is there a planned new engine upgrade package for the F-35 for increased thrust to be delivered starting in 2026? What effect will the anticipated engine upgrade have on noise pollution and other environmental impacts?

Noise Modeling

11. Other EIS's have specifically compared dB levels of the F-16s and the F-35s. For example, the Final EIS for Burlington, Vermont contains a SEL and Lmax comparison between the F-16C and the F-35A on takeoff with military and afterburner, arrival and

low approach. Chart BR3.2-1 shows that at 1,000 AGL takeoff and 1,500 AGL landing, the F-35 is four times louder than the F-16C. Why wasn't a similar table and analysis included in the draft EIS for Truax?

12. According to the Final Noise Analysis (p. 26), there will be more F-35 jets launched at once. How many F-35 jets will be launched in close proximity for each operation? Does the modeling in the EIS account for the combined peak noise impacts from these multiple military aircraft operations?

13. The Air Force typically applies a dB penalty (i.e., 11 dB) for the startle effects on communities of low flying military aircraft. How does the draft EIS take into account this startle penalty in its noise impact assessment?

14. What percentage of air traffic noise generated by all aircraft flying out of Dane County Regional Airport would be attributable to the F-35s?

15. Does the noise modeling in the draft EIS represent the "worst" case scenario? The most likely scenario? The best case scenario?

16. In Table WI3.1-15, Probability of Awakening, given the over one dozen daycares in close proximity to Truax, how is the impact on children's nap times and sleeping hours for shift workers considered?

After Burner Estimates

17. The draft EIS only assumes afterburner usage from 0-5%. The Air Force revealed in a recently leaked memo that for the Arizona Regional Airspace Optimization EIS, additional afterburner and elevation metrics are needed, including afterburner at 10%, 25%, 50%, etc. Why aren't these same additional factors, including increased afterburner usage, being applied to Truax?

18. Will afterburner usage from 0-5% hold across expected variation of runway length, air temperature and humidity, wind, aircraft loading, and increased aircraft weight?

19. What are the F-35 afterburner use percentages for each F-35 site for each year when F-35s have been flown:

    a. Eglin Air Force Base in Florida;
    b. Edwards AFB in California;
    c. Luke AFB in Arizona
    d. Nellis AFB in Nevada;
    e. Hill AFB in Utah

20. Does restricting the use of afterburners to under 5% on shorter runways like Truax pose additional safety risks?

21. Don't pilots need to train in the afterburner intensity which they may use in an actual combat mission? Why or why not?

Flight Paths

22. While the modeled track for F-35s as reflected in Figure A-12 of the Final Noise Analysis may reasonably represent the path for the lead aircraft, subsequent aircraft in the same formation fly wider approach patterns for landing spacing. This would potentially be exacerbated by the planned larger number of F-35A aircraft departing and arriving simultaneously as indicated in the Final Noise Analysis, p. 26. Why are flight paths modeled in a single overhead-arrival track for formation arrivals that necessarily require individual aircraft to break formation at different points in order to achieve adequate landing spacing?

23. Is the increase in operations attributable to more F-35s flying at one time or additional flights? If it is a mix please indicate a percentage for each.

24. How often will F-35s take off from the North? From the South? From the East? West?

25. How often will F-35s land from the south? North? East? West?

Environment

26. What is the Air Force's plan and timeline to fully identify and mitigate the substantial PFAs contamination found at numerous sites at Truax field that has caused City Well 15 to shut down and resulted in substantial contamination in Starkweather Creek?

27. Will the Air Force perform a complete site investigation into existing PFAs contamination before commencing construction for the Proposed Action at Truax Field?

28. Will the Air Force remediate the existing PFAs contamination at Truax Field before commencing construction for the Proposed Action?

29. What kind of chemicals other than PFAs of which the Air Force or DOD is aware remain in soils, groundwater and vapors on the Truax base from past operations?

Safety

30. Have there been any F-35 crashes? If so, how many?

31. What is the probability of an F-35 based at Truax crashing, given its safety profile?

32. What are the human health and environmental effects of an F-35 that has crashed and is burning on land?

33. What kinds of fire-fighting chemicals and equipment are needed to extinguish a burning F-35?

CHRIS TAYLOR
STATE REPRESENTATIVE ◆ 76th ASSEMBLY DISTRICT

October 18th, 2019

The Honorable Barbara Barrett
Secretary of the Air Force
United States Air Force
1670 Air Force Pentagon
Washington DC, 20330-1670

Dear Secretary Barrett,

I represent the 76th State Assembly District of Wisconsin, which contains some of the communities most negatively impacted by the proposal to commission F-35 jets at the Truax Air National Guard Base in Madison, Wisconsin. I am writing to request from the Air Force information and answers to the questions I have regarding this proposal, and the many concerns I have heard from constituents who live in the impacted communities. I have attached all of the questions I have, in addition to previous correspondence addressed to Acting Secretary Donovan to which I never received a response.

The biggest area of concern currently is the insufficiency of the information contained in the U.S. Air Force's draft Environmental Impact Statement (EIS) and incorporated documents. Simply put, these documents fail to answer the three key questions my community has: 1) How much louder will the F-35 jets be; 2) What areas will be impacted under different scenarios including varying afterburner usage; and 3) How frequently and when will this expected loudness occur? None of these documents clearly answer these fundamental questions regarding the increase and duration in noise F-35s pose to my community. My understanding is that the U.S. Air Force has the ability to run additional models and sound graphs that would be far more helpful than using the average sound decibel over a 24 hour period day night average (DNL). I specifically am asking for additional noise contour graphs as set forth in my enclosed list of needed documents and questions.

As indicated in the attached document, there is also important information that was included in the Burlington, Vermont EIS that is not included in the Truax EIS, including a comparison of the F-35 and F-16 in terms of the noise intensity. That comparison shows the F-35 jets to be four times louder for the Burlington community than the current F-16 jets, which is a helpful measure for a community trying to evaluate the proposal.

The little relevant information presented is divided up into many dense documents, including the full draft EIS, a Final Noise evaluation and various appendices. For example, information about intense aircraft noise effects on children is not described until Appendix E to the Final Noise report, which is not specific to Truax but seems to apply to all sites. Comparison graphs, such as current and proposed DNL Contours are separated by 7 pages, making a side by side comparison for the average person more difficult. The draft EIS in general seems to violate the Department of Defense Noise Technical Working groups own guidelines (2009) that state:

State Capitol: P.O. Box 8953, Madison, WI 53708
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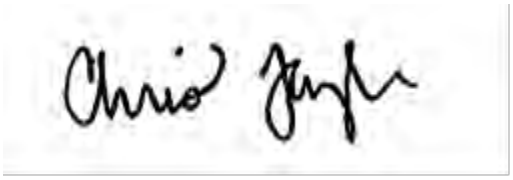
> "Most project stakeholders and the general public do not want to wade through pages of technical data. They respond most positively and proceed more quickly toward project completion when the most straight-forward noise exposure data is presented in the main text with the detailed tabular data in an appendix for those wishing to see the complete technical information" (p. 14)

The result is that it is almost impossible for a layperson to digest and comprehend what little relevant information is presented.

Please let me know if you have any questions. My community is anxious to receive more information, and I look forward to receiving your responses to these critical questions.

Sincerely,



Representative Chris Taylor
76th Assembly District

CHRIS TAYLOR
STATE REPRESENTATIVE ◆ 76th ASSEMBLY DISTRICT

September 24, 2019

The Honorable Matthew P. Donovan
Acting Secretary
United States Air Force
1670 Air Force Pentagon
Washington DC, 20330

Dear Secretary Donovan,

I represent the 76th State Assembly District of Wisconsin, which contains some of the communities most negatively impacted by the proposal to commission F-35 jets at the Truax Air National Guard Base in Madison, Wisconsin. I am writing to you to request: 1) a 60-day extension of the public comment period currently ending Friday, September 27; and 2) a revised Environmental Impact Statement (EIS) to address serious omissions in the original draft of critically important information our community needs to fully assess the impact of F-35s based at Truax.

The Air Force has failed to conduct adequate outreach to the most impacted communities throughout this process, including to communities of color, low-income individuals and families with children. For example, the draft EIS has not been made available in any language other than English, despite the fact that many of the impacted neighborhoods have larger than average populations of non-native English speakers. Hawthorne Elementary, which is in close proximity to one of the neighborhoods where noise from the F-35 is projected to reach 114 dB, has approximately 34% English Language Learners, 67.9% low-income students and 74.3% students of color. It is critical that information from the draft EIS be made available in at least Spanish and Hmong.

It is also critical that the Air Force hold an additional public hearing in an impacted community. The September 12th Open House was many miles away from the communities most impacted, leaving community members without automobiles unable to participate without a lengthy bus trip. One of the Points of Interest identified in the EIS is Ridgeway Church, which the EIS predicts will experience up to 114 dB from the F-35s. This church and the surrounding impacted community is over nine miles from the Alliant Energy Center and requires nearly an hour-long bus ride. The community impacted deserves to be heard in their community.

Further, there is conflicting and contrary information publicly circulating. Corporate interests pushing the F-35 proposal have argued that this draft EIS is the worst case scenario for the communities impacted, yet the City of Madison's own analysis indicates that the number of people impacted and the impact on communities of color is underestimated given the methodology used by the U.S. Air Force. These same business groups also argue that the decision to base F-35s at Truax is a "done deal," and the public's voice will not be considered. Though the Air Force's own process in facilitating and considering public comments repudiates

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these statements, it is confusing to the public. These are just a few examples of confusing, contradictory information circulating that makes it difficult for the public to fully assess the proposal.

Recent correspondence to the U.S. Air Force from elected officials across the board raise significant questions that the public deserves to be answered before the public comment period closes on Friday, September 27th. These officials include U.S. Senator Tammy Baldwin, whose letter was dated August 23rd, 2019, and U.S. Representative Mark Pocan, whose letter was dated September 17th, 2019, in addition to other state and local officials that represent the communities that will be directly impacted. Senator Baldwin has submitted questions to the Secretary of the Air Force, Representative Pocan has called for a flight demonstration, and other officials, including City of Madison Mayor Satya Rhodes-Conway, Madison Alders and Dane County Supervisors, have called for more information on the direct impacts the F-35 proposal will have on our community. There must be a response to these concerns before this process can move forward.

As important, the draft EIS is missing critical information to which the public should be afforded an opportunity to respond. Key pieces of information, including some data points included in a prior EIS prepared for the Burlington, Vermont community, are omitted. I request that a revised EIS include:

- Peak decibel levels when taking off and landing for both the current F-16s and anticipated for the F-35s. Nowhere in the draft EIS does it list peak decibel levels for takeoffs and landings of the F-35s. Instead, the Air Force uses Day, Night, Average Sound Levels (DNL) which do not accurately convey how much of a disruption the F-35s will cause when in use. U.S. Rep. Mark Pocan released a statement echoing these concerns just last week.

- Anticipated SEL measures for the F-35s for all daycares, preschools and K-12 schools within the 65 dB contour and within one mile of the border of this contour;

- A recalculation of the noise impact and sound maps with afterburner usage estimated at 10%, 25%, 50%, and above. A leaked Air Force memo indicates that afterburner usage is being significantly underestimated. As a result, as indicated in the memo, the Air Force is delaying the release of an Arizona EIS. Like Arizona, Wisconsin also deserves to have this information, and I am perplexed as to why this isn't available to our state.

- A direct comparison between the peak noise decibel levels of the F-16s currently at the Truax Base and the proposed F-35s for both military power takeoff and landing, and afterburner takeoff and landing for each aircraft type. My community needs this comparison to more adequately have an idea about expected noise increases by the F-35s.

- A substantial analysis of the economic impact on the local economy in the draft EIS. There is insufficient information on how this proposal could diminish property values, the costs to Dane County taxpayers or the impact on our area businesses.

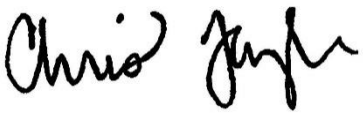
- More information about the physical and cognitive effects of intense noise on children, including children with developmental challenges. The EIS identifies a disparate impact on children, and we need to know the impact on children that this kind of intense noise present.

Given the confusing and conflicting information generated by the F-35 proposal, the lack of efforts to reach marginalized communities and a fair chance for these communities to weigh in, and the absence of key pieces of information to enable the public to fully evaluate this proposal, which has been highlighted by numerous correspondence by elected officials, the public deserves a 60-day extension to submit their comments about this proposal. Further, I am requesting a revised EIS that fully addresses the critical pieces of information omitted from the EIS that must be provided by the Air Force. This is the only fair, equitable way to proceed for our Madison community.

I appreciate your consideration and urge that you grant my requests.

Thank you.

Sincerely,



Representative Chris Taylor
76th Assembly District

CHRIS TAYLOR
STATE REPRESENTATIVE ◆ 76th ASSEMBLY DISTRICT

September 24, 2019

VIA ELECTRONIC MAIL
Mr. Ramon Ortiz
NGB/A4AM
3501 Fetchet Ave
Joint Base Andrews, MD 20762-5157

Dear Mr. Ortiz,

I represent the 76th State Assembly District of Wisconsin, which contains some of the communities most negatively impacted by the proposal to commission F-35 jets at the Truax Air National Guard Base in Madison, Wisconsin. I am writing to you to request: 1) a 60-day extension of the public comment period currently ending Friday, September 27; and 2) a revised Environmental Impact Statement (EIS) to address serious omissions in the original draft of critically important information our community needs to fully assess the impact of F-35s based at Truax.

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I appreciate your consideration and urge that you grant my requests.

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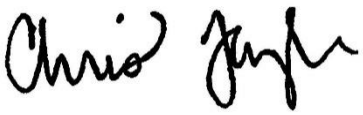

Representative Chris Taylor
76th Assembly District

CHRIS TAYLOR
STATE REPRESENTATIVE ◆ 76th ASSEMBLY DISTRICT

November 1, 2019

VIA REGULAR MAIL
The Honorable Barbara Barrett
Secretary of the Air Force
United States Air Force
1670 Air Force Pentagon
Washington DC, 20330-1670

VIA ELECTRONIC MAIL
Mr. Ramon Ortiz
NGB/A4AM
3501 Fetchet Ave.
Joint Base Andrews, MD
20762-5157

Dear Secretary Barrett and Mr. Ortiz,

As the State Representative for the 76th State Assembly District of Wisconsin, I again write to you in strong opposition to the U.S. Air Force's proposal to base F-35A military jets at the 115th Fighter Wing at Dane County Regional Airport (DCRA). Please consider this letter and attachment, in addition to my September 24, 2019 correspondence to Acting Secretary Donovan and Mr. Ramon Ortiz, and my October 18, 2019 correspondence with attachments to you as part of my formal comments on the draft Environmental Impact Statement (dEIS). Unfortunately, my prior correspondence remain unanswered.

I represent some of Madison's neighborhoods and individuals who the Air Force predicts will be most negatively and substantially impacted by this proposal. It is highly inappropriate and I believe unprecedented to place such jets at an Air National Guard Base in such a dense, residential and urban environment, where an estimated 60,000 individuals live within three miles of the DCRA.

The district I represent strongly opposes this proposal, with 88% out of 353 constituent contacts I have received opposing. The neighborhoods I represent that are substantially negatively impacted, including the Carpenter-Ridgeway neighborhood and the Darbo-Worthington neighborhood, are places where high percentages of people of color, low- and middle-income individuals and children live. These neighborhoods are accessible by public transit, more affordable and host public housing complexes. These are the communities who are least able to afford to move and least likely to have alternative housing choices.

Impacted neighborhoods around the airport, including Eken Park, have been revitalized and are thriving after years of work by dedicated residents. Placing F-35 jets in close proximity to these communities threatens the strides that have been made. The negative, local economic impact of placing F-35s in a dense residential and urban area has been ignored in the dEIS. I have already received a letter from a local small business about their intention to move from my community because of a potential increase in aircraft noise. I am also starting to hear people reconsider moving to our eastside community because of concern about F-35 noise. There is a substantial

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economic cost F-35s pose to our east and north side communities in quality of life, property values, and a healthy property tax base which provides needed funds for our city.

At a bare minimum, because the dEIS fails to consider critical information and consequences, I must again request that the Air Force produce a revised dEIS on which our community has an opportunity to comment and respond. Given your failure to respond to my repeated correspondence and the lack of essential information our community and state needs to fully evaluate this proposal, to proceed with a final EIS and preclude further public comment would constitute a grave injustice. Attached to this letter is an outline of ten areas where the dEIS is inadequate that must be addressed.

At the end of this public comment period, members of my community and I have the same questions we had at the beginning: 1. How much louder will the F-35 be for our north and east side communities?; 2. What areas will be impacted under different flight and afterburner scenarios?; 3. What will be the duration and frequency of the noise on the proposed flight paths? The Air Force has the ability to configure additional noise maps that would be far more helpful than a day-night average sound level to estimate what the public could expect. Further, there were certain helpful charts included in prior EIS's, including for Burlington, Vermont that gave the community a much more comprehensive picture of the noise generated by F-35s in comparison to the F-16s at various points in takeoff and landing which were omitted in our dEIS but should be provided.

Other glaring deficiencies in the dEIS include a failure to consider the substantial impact F-35s could have on dozens of additional K-12 schools and day care centers in or closely around the intense noise area identified in the dEIS. You know the profound, negative impact intense aircraft noise has on children and their learning, and it is incomprehensible that a more comprehensive, rigorous analysis was neglected.

But as important, the Air Force also should be well aware of the persistent, pernicious and continuing racial disparities in our city and state. A recent analysis showed that the opportunity gap between white and black students in Madison, reflected in 8th grade math scores and bachelor degree attainment, are the worst in the nation. Many of our most diverse schools, including Hawthorne Elementary, are in close proximity to areas predicted to experience the most extreme noise. The impact of this disruption to learning must be analyzed in the context of our continued racial inequities.

There is also no mention of the existing environmental contamination from PFAS, much of which originated from the Truax base and resulted in contaminated ground and soil. This necessitated closing a city well and warning individuals to refrain from fishing in Starkweather Creek. The military has been slow to respond and seriously address this grave issue. We must hear an urgent plan to identify the scope of the problem and mitigate the pollution.

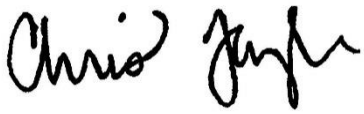
At the close of the public comment period, and after recently returning from Burlington, Vermont to learn more about that community's experience as F-35s are arriving, I have more concerns than ever about the impact this proposal has on my beloved community, and on the thousands of people who call the north or east side of Madison home. I have witnessed firsthand

the stress, uncertainty and chaos being caused in the Burlington communities impacted, and I do not wish that for mine.

Please do not base these F-35 jets in the middle of dense neighborhoods with schools and parks and people. At a minimum, please address the issues I raise in this letter and in previous correspondence. Afford the people an opportunity to get these questions asked, and to be heard before any final decision is made.

Thank you.

Sincerely,



Representative Chris Taylor
76th Assembly District

CRITICAL INFORMATION LACKING IN DRAFT ENVIRONMENTAL IMPACT STATEMENT REGARDING
115TH FIGHTER WING F-35 PROPOSAL
Attachment to Correspondence dated November 1, 2019

The Draft Environmental Impact Statement (dEIS) lacks fundamental information about the proposal to base F-35 jets at the 115th Fighter Wing in Madison, which the public deserves to know. At a minimum, a new dEIS should be released, that allows a public commentary period, to address the following deficiencies in the current dEIS:

1. **More accurate population data**

Instead of using outdated population data from the 2010 census to assess F-35 noise impacts, the U.S. Air Force should utilize more updated data to more accurately predict the number of people affected. The Air Force could easily use data released by the Wisconsin Department of Administration on population growth by zip code and analyze the zip codes that surround the Dane County Regional Airport (DCRA) to more accurately represent the population affected by this proposal. In addition, the US Census Bureau does their own population growth estimates for every year in between the census. There are better measures the Air Force can and should be using to generate the total number of affected persons.

2. **Noise modeling of the intensity, duration and frequency of expected F-35 noise**

The only map-based visualization of the F-35 expected noise levels around DCRA is averaged over a 24-hour time period, making it difficult for the public to grasp the intensity, duration and frequency of F-35 noise. The public should be aware of the intensity, duration and frequency of noise the F-35s create at different flying altitudes during takeoffs and landings compared to the current F-16s. A similar analysis was done in the EIS for Burlington, Vermont in chart BR3.2-1, which predicted that the F-35s would be 17 to 20 dBA louder than the F-16s, or approximately four times louder. The frequency in which people will hear this noise should also be mapped.

The public should have similar noise contour maps as set forth in WI3.1-3 that measures SEL (dBA) to help the public understand the actual intensity and duration of F-35 noise events. Because of the substantial dense residential and business environment in close proximity to the DCRA, SEL (dBA) should also be measured and mapped within 1 mile of the estimated 65 dB DNL contour line, and the frequency of this type of noise should be disclosed. This type of graph is referenced on p. 5 of the Department of Defense's Noise Work Group Technical Bulletin (12/2009).

The Air Force typically applies a dB penalty (i.e., 11 dB) for the startle effects on communities of low flying military aircraft. The dEIS does not seem to take this into account in the noise modeling presented, which I believe it should.

3. **Noise estimates at higher afterburner rates**

The dEIS estimates a maximum afterburner use rate of 5%. Can the Air Force guarantee that rate forever, regardless of weather conditions, altitude, training needs and/or additional F-35 modifications or upgrades that add weight? Will the Air Force guarantee documentation of afterburner usage and regularly disclose this usage to the public? The public deserves additional noise modeling which takes into account possible fluctuations in afterburner usage at 10%, 25% , 50% and 75% for varying takeoff altitudes, including 1000 ft. above ground level.

A revised dEIS should also disclose annual typical afterburner usage at every other testing and operational F-35 site under the Air Force's control.

4. **Noise impact with louder F-35s flying simultaneously**

The Final Noise Analysis in support of the dEIS states that "The increased operations under the Proposed Action would be due to a larger number of aircraft launching at once" (p. 26). What percentage of increased noise will be because of more aircraft launching simultaneously as opposed to more frequent operations? Why are flight paths modeled in a single overhead-arrival track for formation arrivals that necessarily require individual aircraft to break formation at different points in order to achieve adequate landing spacing?

The public should be informed about the number of F-35s you intend to fly at once and the impact on the noise environment. The dEIS must model in SEL (dBA) noise impacts from multiple F-35s launching simultaneously and flying in formation for every expected flight path referenced in the Final Noise Analysis (p. A-17, Figure A-12). The public should be informed about how frequently communities will hear this cumulative noise.

5. **A more accurate analysis on the disproportionate impacts on communities of color and specific outreach to disparately impacted communities**

Despite the Air Force's alarming conclusion that F-35 basing in Madison would have a substantial, disproportionate impact on communities of color, low-income individuals and children, there was no map of percentages of these populations within the 65 dB DNL noise contour. A revised dEIS must include maps with this data.

Given these impacts, I believe that the Air Force's decision to pursue the Proposed Action knowing that it has severe, negative consequences for communities of color presents significant constitutional concerns.

Further, a September 10, 2019 "F-35 EIS Staff Analysis" by the City of Madison underscores that the impact on communities of color is "understated" in the dEIS. The analysis reasons that because persons of color make up 26% and 20% in Madison and Dane County generally, the dEIS use of a 50% minority rate is too high a bar for measuring disparate impacts. The analysis

states that "[N]early every impacted area within the City of Madison belongs to a census tract with rate of persons of color well above the city- and county-wide averages." Hence, a revised dEIS should analyze the disparate treatment of people of color using a more appropriate metric which measures the disparate impact by considering the percentage of people of color in general in the city and county.

There was also no specific outreach efforts by the Air Force to impacted communities of color and low-income individuals. Materials were only printed in English, and the sole Air Force-sponsored public hearing was held miles from the neighborhoods most impacted at a site with limited bus access. This alone should be a basis for pausing this process and conducting critical outreach efforts to the communities most impacted.

6. **Insufficient analysis on the impact on children**

The dEIS fails to consider that in and around the identified 65 dB DNL noise zone, there are nine additional K-12 schools that aren't mentioned in the dEIS, including Isthmus Montessori Academy, Hawthorne Elementary, Sandburg Elementary, Shabazz High School, East High School, Emerson Elementary, Sherman Middle School, Gompers Elementary and Blackhawk middle school. The noise impacts from F-35s on these schools should be measured and considered. Should the estimated noise map shift to the west or south, many other additional K-12 schools, and thousands of additional children, could be impacted.

The dEIS also fails to fully identify day care centers in and around the noise contour, mentioning only three day cares in the dEIS. In fact, there are over 15 registered day care facilities in and around the DCRA. This needs to be more thoroughly considered. Table WI3.1-15, "Probability of Awakening" should consider the F-35s' impact on these centers that care for young children and the impact on their health and sleep.

7. **Environmental impact and PFAS contamination**

As recognized by the Wisconsin Department of Natural Resources, there is extensive PFAS (per-and polyfluoroalkyl substances) contamination of groundwater and soil across much of the Truax base. This contamination has caused the shutdown of a city well and resulted in substantial contamination of Starkweather Creek. A revised dEIS must include a discussion of PFAS contamination, including identifying the scope of this contamination, a plan to clean it up and future plans to prevent additional environmental contamination. The Air Force must commit to performing a complete site investigation into existing PFAS contamination and embark on a plan to clean up this contamination before commencing with any construction for F-35s at Truax Field.

The dEIS should also disclose whether the Air Force or Department of Defense is aware of other environmental contamination in the soil, groundwater and vapors on or around the Truax base.

8. **Impact on wildlife and outdoor spaces**

There is little recognition or consideration of the impact of more intense noise on outdoor spaces, including parks, school playgrounds and athletic fields. Delicate ecosystems and preserved marshland including Cherokee marsh, would be subjected to more intense F-35 noise. This could impact not only hundreds of acres of preserved marshland and rare and diverse habitats, but also rare and diverse animal and plant species. These impacts should be specifically analyzed.

9. **Local economic and housing impact**

There is no analysis in the dEIS about the negative impact on our Madison economy of businesses relocating, home prices around the impacted area declining and our city tax base being reduced. This is a potentially a substantial negative factor that is insufficiently evaluated in the dEIS that must be considered and presented to the community.

The City of Madison has made significant investments in affordable housing, which is in short supply in a tight, expensive rental market. Over the last four years, the historically low rental vacancy rates in Dane County have hovered around 3 percent, which is lower than the national norm of 4 to 7 percent. Some of these units are on the perimeter of the identified high intensity noise zone, including Truax Park apartments, portions of which have recently been substantially renovated, and the Webb-Rethke townhomes, and it is uncertain whether these units would qualify for federal noise mitigation assistance. The hundreds of residents who live in these units would undoubtedly be substantially impacted by F-35 noise, along with the children who live there. Yet these individuals may have no ability to seek other housing options or afford to move somewhere else. The dEIS ignores this reality.

The communities that will be impacted around the DCRA typically offer more affordable housing. It is important to preserve these homes and the quality of life in these neighborhoods, while we work to expand what little affordable housing options are available in City of Madison. There is little analysis of how housing availability would be impacted in the City of Madison should more affordable neighborhoods be significantly denigrated because of intense F-35 noise.

10. **Options for the Truax base**

The dEIS states that the mission of Truax and the 115th Fighter Wing will continue on, regardless of the F-35 basing decision. Should the Truax base not be selected for F-35s, the public needs to know the potential options for the Air National Guard. Could they receive updated F-16s? Is it possible they could be selected for another military mission such as a medical or transport mission?

Congress of the United States

Washington, DC 20510

November 25, 2019

The Honorable Barbara M. Barrett
Secretary of the Air Force
1670 Air Force Pentagon
Washington, DC 20330-1670

Dear Secretary Barrett:

Congratulations on your confirmation as the 25th Secretary of the Air Force. We are writing regarding your upcoming decision on which two locations will host the Air National Guard's next F-35A operational bases following the completion of the Final Environmental Impact Statement (EIS). We urge you to select Selfridge Air National Guard Base (ANGB) in Macomb County, Michigan as one of those locations.

The Air Force's Draft Environmental Impact Statement and Strategic Basing Site Survey Team found Selfridge ANGB well suited to serve as the next Air National Guard F-35A operations base. Selfridge's outstanding airmen, modern facilities, unique training range and low cost of conversion with no risk to the mission make the 127th Wing an ideal choice for bedding down the F-35A. Additionally, Macomb County residents and the surrounding community welcome the people and the mission of the Air National Guard.

As you are aware, during the strategic basing process in December 2017, former Secretary Heather Wilson identified Truax Field Air National Guard Base in Madison, Wisconsin as one of two preferred alternative locations. We understand that last month, the City of Madison submitted a letter with 22 pages of public comments, tasking the Air Force with 25 questions to be resolved in the Final EIS, and requesting that if those questions are not satisfactorily answered, you, as Secretary of the Air Force, reconsider listing Truax Field as a preferred location. In addition to numerous complaints about the F-35 mission from individual Madison residents, the Madison Common Council also passed a resolution raising the community's substantial concerns with basing the F-35A mission at Truax Field.

Macomb County, Michigan's residents and elected officials welcome a potential F-35 mission and have consistently offered community support to Selfridge and its tenants. Selfridge offers the capabilities and facilities ideally suited to sustain F-35 operations.

The 127th Wing has a number of core advantages:

- **People** – As the previous holders of the Spaatz Trophy, awarded to the best flying organization in the Air National Guard, the women and men of the 127th Wing have proven

their mettle in combat. They were also awarded the Meritorious Unit Award, only the third Air National Guard Wing in history to be recognized as such for "outstanding devotion & exceptional performance."

- **Facilities** – Selfridge could immediately, with very minor modifications, beddown the F-35A. Selfridge, a former F-16 base, is the only location under consideration that could house every one of the planned F-35As inside environmentally controlled hangars. The base's large modern operations facilities provide robust and resilient infrastructure to ensure maintenance, operations, and security for unsurpassed readiness.

- **Training** – Selfridge's immediate access to three overland/water military operations areas/Air Traffic Control Assigned Airspaces and three weapons delivery (restricted area) ranges for daily training operations is a substantial asset. The base was determined to be above average in their ability to support F-35 Ready Aircrew Program requirements and can fully support 100% of the requirement. Michigan hosts the largest contiguous joint service range/airspace complex east of the Mississippi River, including supersonic airspace, unique littoral topography, a vast overland joint fires range with all-altitude ordnance capability to an overwater/overland live fire range with moving targets and mobile advanced electronic joint threat emitters. These locations provide tremendous opportunities for development of F-35 close air support tactics and joint training with allies.

  Every year the Michigan National Guard hosts Operation Northern Strike bringing together over 5,000 servicemembers from over 20 states and allies for a joint exercise. This is the only accredited reserve component joint training in the United States.

  The 127th Wing concurrently operates the KC-135 Stratotanker in the global mobility mission offering unparalleled synergy of training, efficiency, and mobility opportunities/operations.

- **Cost** – There are no "double conversions" associated with selecting the 127th Wing. The cost of conversion is minimal and converting Selfridge to the F-35A mission allows the distribution of A-10 aircraft to other Air National Guard units.

We are proud of the men and women serving in the Michigan National Guard, and of our State's contribution to our nation's defense. Over the past decade, the State of Michigan absorbed 25% of the cuts to personnel in the Air Guard. The 110th Wing and 127th Wing of the Michigan Air Guard have overcome many challenges and changes in mission, but are now on a path to become the most advanced wings in the country. A decision to beddown the F-35A at Selfridge will complete the transformation and modernization of these vital national assets, and deepen Michigan's valuable partnership with the U.S. Air Force. We invite you to visit Selfridge to see this commitment firsthand. We would be happy to host you in Michigan and facilitate conversations with relevant stakeholders.

The future F-35 mission has the support of the Michigan Congressional Delegation, state and local leaders and the Macomb County community. The citizens living around Selfridge ANGB

have hosted military airfield operations for 100 years and look forward to welcoming future active duty airmen and their families when an active association for the F-35 is established.

Sincerely,

Debbie Stabenow
United States Senator

Gary C. Peters
United States Senator

Paul Mitchell
Member of Congress

Fred Upton
Member of Congress

Elissa Slotkin
Member of Congress

Jack Bergman
Member of Congress

Brenda L. Lawrence
Member of Congress

Tim Walberg
Member of Congress

Haley M. Stevens
Member of Congress

Bill Huizenga
Member of Congress

Debbie Dingell
Member of Congress

John Moolenaar
Member of Congress

Andy Levin
Member of Congress

Daniel T. Kildee
Member of Congress

Appendix A5

Final EIS Distribution List

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Abbas, Alder Syed
Abbott, Alexander
Acevedo, Orlando
Acker, AmyRose
Ackerman, Kenneth & Jessy
Adams County Board of Supervisors
Adams County Planning and Zoning
Addison, John
Adler, Barry
Agnew, Ken
Agni, Chet
Ahlstrom, Jen
Aiello, Tracy
Akbar, Talib
Albouras, Alder Christian
Albrecht, Thomas
Alcorta, Claudia
Alea, Pat
Alexander, Nanci
Aley, Ian
Allen, Benjamin
Allen, Connie
Allen, Dee, Lac du Flambeau Chippewa Tribe
Allen, Heather
Allord, Julie
Alsum, Pamela
Alvarado, Sara
Alvarenga, Blake
Ambrose, Noelle
Amelong, Kristina
Anacker, Jeremy
Andersen, Danny
Andersen, Jill
Andersen, Julie
Andersen, Levi
Anderson, Eric
Anderson, Erica
Anderson, Jennifer
Anderson, Jimmy, Assembly District 47
Anderson, Katherine
Anderson, Keith
Anderson, Margaret
Anderson, Mark
Anderson, Neil
Anderson, Robert
Anderson, Roger
Anderson, Sydnie-Jo
Andrews, Sara
Andrusz, Joan
Anglin, Robert
Ansell, Sara
Apter, Matt
Arafat, Jody
Archer, Deb
Archer, Deb
Arenz, Chris
Arenz, Christopher
Arndt, Jan
Arnold, Barb
Arrowood, Craig
Ashton, Sara
Askey, Suzanne
Askey, Tim
Astorga, Sue
Audet, Kristen
Augustine, Sybil
Aumanstal, Mason
Ausel, Alan
Austin, Dolores
Avery, Barb
Bach, Donald
Bach, Donald Leo
Bacon, Peter
Bacsi, Mike
Badini, Margaret
Bagwell, Al
Bahl, Michele
Bailey, Michelle
Bailey, Todd
Baker, Raymond
Balazs, Nicholas
Baldeh, Alder Samba
Baldwin, The Honorable Tammy, U.S. Senate
Bandera, Demian
Baranowski, Carrie
Barman, Dave
Barr, Adam
Barr, Adam
Bartel, Dan
Bartol, Matthew
Basso, Anthony
Bathurst, Melanie
Bauer, Rachel
Baumann, Jeffrey
Baumgartner, Sarah
Baun, Ken
Baures, Bill
Baxter, Melissa
Bayer, Florine

Beal, Richard
Becher, Amy
Beck, Bob
Beck, Catherine
Becker, Jon
Beckmann, Jeff
Beckwith, Jean
Behnke, Laura
Behr, Denny
Behrmann, Ann
Belanger, Charles
Beld, Susan
Bellecourt, Michael
Benell, Connie
Benesh, Rita
Benford, Brian
Benford, Lucas
Bennis, Robyn
Bentley, Megan
Benton, Charles
Benton, Ricki
Berenson, Vicki
Bergh, John
Berglund, Carol
Bergmann, Philippa
Berg-Pigrsch, Phyllis
Berkani, Nina
Berman, Tom
Bernards, Doug
Bernards, Paul
Berner, Courtney
Bernstein, Dale
Bernstein, Michael
Bernstein, Richard
Besaw, Gary, Chairperson, Menominee Indian Tribe of Wisconsin
Bessenecker, Janine
Bethke, Lynne
Betterley, Crystal
Beyer, Kat
Beyer, Keith
Bialecki, Jim, Director, Monroe County
Bidar, Alder Shiva, Council President
Bieberstein, Tammy
Biebl-Yahnke, Mary
Bierman, Brian
Biermier, Rusty
Biggs, Angela, State Conservationist, U.S. Department of Agriculture
Bilgere, Fawn
Bird, Chris
Birkeland, Laura
Birkeland, Maureen
Blanchard, Robert, Chairman, Bad River Band of Lake Superior Chippewa
Blau, Judd, President, Village of DeForest
Blodgett, Robert
Bloedorn, Scott
Bloomfield, Christen
Blotz, Richard
Bluhm, Jeremy, Mead & Hunt
Blume, Ed
Blume, Jeff
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Board of Supervisors, Green Lake County
Board of Supervisors, Marathon County
Board of Supervisors, Marquette County
Board of Supervisors, Monroe County
Board of Supervisors, Portage County
Board of Supervisors, Trempealeau County
Board of Supervisors, Waupaca County
Board of Supervisors, Waushara County
Board of Supervisors, Winnebago County
Bodoh, David
Bogatay, Jonathan
Bohling, Ricard
Bohne, Harold
Boldt, Jeff
Bono, Bianca
Books, Steve
Books, Steve
Booth, Carol
Borchardt, Joni
Borzewski, Teri
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Bouchard, Kimberly, Superintendent, Bureau of Indian Affairs
Boucher, Victoria
Bougie, Jerry, Director, Planning and Zoning, Winnebago County
Bourgeois, Alexis
Bowers, Adam
Bowman, Margaret
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Brachman, Richard
Bradley, Casey, Adams County Manager
Bradley, Radhika
Bradley, Sarah
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Braunger, Joe & Barb
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Brown, Ryan, Director, Planning and Zoning, Waupaca County
Browning, Brittany
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Burghardt, D
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Byczek, Matthew
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Calkins, Sam, District Commander, U.S. Army Corps of Engineers
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Capellaro, Jennie
Capital Area Regional Planning Commission
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Carusi, Cris
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Chappell, Donna
Charles, Christina

Chastain, Devon
Chen, Caroline
Cheraghi, Nima
Chesney, Alexandra
Chiono, Kayleigh
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Chris
Christensen, John
Christianson, Peter
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Chye, Huan-Hua
Ciallella, Louise
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Collins, James
Collins, Peter
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Crane, Cindy
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DeGroot, Mary
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Delaney, Richard
DeMars, Matt
Deming, Susan
DeNoyer, Brad & Jennelle
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Denson, Kerry
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Desautels, Philip
Deterding, Rachel

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Donnelly, David, Zoning Administrator, Juneau County
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Douglas, Jackie
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Draheim, Jason, Airport Manager, Stevens Point Municipal Airport
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Elder, Peppi
Eldred, Read
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Ellsworth, Frederick & Cheryl
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Enstad, Nan
Entwhistle, Robert
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Erickson, Roger
Erpenbach, The Honorable Jon, Senate District 27
Escaffi, Eliana
Esh, Sylvan
Eslinger, Rod, Manager, Planning and Development, Eau Claire County
Esparza, Araceli
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Evers, The Honorable Tony, Office of the Governor
Ewig, Mark
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Faltinson, Douglas
Fandel, Jennifer
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Farsetta, Diane

Fasbender, Pete, Field Supervisor, U.S. Fish and Wildlife Service
Faster, Karen
Faust, Victoria
Feasel, Randy & Kim
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Federspiel, Stephanie
Fee, Peter
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Feist, Andrew
Feland, V, Armstead
Felhofer, Thomas
Felicijan, Sheryl
Feltham, Anna
Feltham, Jakob
Fenske, Kathleen
Ferber, Don
Ferin, Lisa
Ferrick, John
Ferris, David
Feucht, Darrel
Fields, Gianofer
Fields, Guy
Figaro, Chris
Finck, Jeffrey
Fink, David
Finn, Jenn
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Fischer, Charles
Fischer, Maj
Fischer, Susan
Fisher, Matthew
Fisher, Michael
Fisher, Mike
Fitters, William
Fitzgerald, The Honorable Scott, Senate District 13
Fitzpatrick, Colleen
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Flanagan, Michael
Flatley, Tim
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Floyd, Shelby
Flynn, Kyle
Fobes, Mike
Foley, Inga
Folger, Ed
Fontella, Robert & Amelia
Foote, Jackson
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Fortier, Holly
Foster, Alder Grant
Fotsch, Tom & Dea
Fourrier, Jennifer
Fowler, Judy
Fox, Justin
Foxborn, Ashley
Foxcroft, Melanie
Foy, Alie
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Fraki, Roberto
Franklin, Elyse
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Fredericksen, Keith
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Freund, Kyle
Freund, Theresa
Fribance, Caroline
Friedman, Rachel
Frieswyk, J.C.
Frikken, Susan
Frisch, Rebecca, Conservation, Planning and Zoning, Marathon County
Fritz, Harold & Marsha
Frolkis, Talia
Fruehling, James
Fryman, Laurie
Fullmer, Thomas
Furman, Alder Keith
Gaber, Jennifer
Gaby, Peter
Gaffaney, Ryan
Gallagher, The Honorable Mike, U.S. House of Representatives
Galligan-Nordquist, Margaret
Gallo, Amanda
Gantner, Carolyn
Garcia Sierra, Mario
Garey, Logan
Garity, Maureen
Garner, Tim
Garrett, Julie
Garrett, Mary
Garrett, Pam
Garvey, Jacob
Gates, Tom & Dramise
Gaumond, Tiffany
Gebhardt, Laura

Gebhardt, Mary Jo Feeney
Gebhardt, Otto
Gegenhuber, David
Gehrmann, James
Geist, Bill
Genevieve, Lynsey
Genske, Terry
George, Kyle
Gerber, Kathy
Gerds, Ben
Germanson, Thomas
Gerothanas, Rebecca
Gest, Josh
Gettinger, Dean, District Manager, Bureau of Land Management
Gibbens, Kevin
Gibson, Charlene
Gibson, William
Giffin, Randolph
Gifford, Larry
Giftos, Mindi
Gilbertson, Sylvia
Giles, Doreen
Giles, Thomas
Gilfillan, Megan
Gill, Cody
Gillian-Daniel, AnneLynn
Gish, Alexander
Gliori, Gemma
Glowac, Wayne
Goedken, Rochelle
Goihl, Timothy
Goldschmidt, Cecilia
Good, James & Laura
Goodman, Michael
Goodman, Michael
Gordon, Mike
Gorman, Paul
Goss, Joe
Gottlieb, Larry
Gould, John
Gould, John & Brenda
Graf, Robert
Graham, John
Grann, James
Grannis, Thomas
Grant, Daniel
Grapentine, Lori
Graper, Gary
Graupner, Christopher
Gray, Amber
Gray, Toni
Green, David
Green, Heather
Green, Jim & Nancy
Green, Lance
Green, Sylvia
Greene, Susan
Greenfield, Lael
Greenwood, Brady
Greiff, Elizabeth
Gresmer, Ryan
Griffeath, David
Griffin, Mark
Griffin, Maureen
Grinsfelder, Mira
Griskavich, Carol
Groessl, Jonathan
Grosso, Julie
Grosspietsch, II, Carl
Grothman, The Honorable Glenn, U.S. House of Representatives
Grubis, Gail
Grueneberg, Jason, Director, Planning and Zoning, Wood County
Guimond, Jen
Gunovich, Blair
Gutierrez, Javier
Guyant, Al
H, Elise
Haber, Darcy
Hack, Janna
Hacker, Daniel
Hackman, Brian
Haefs, Laura
Hagerty, Kay
Hahn, Christopher
Hahn, John
Hahn, Michelle
Hahn, Ron
Haight, William
Haines, Nick
Hall, Deborah
Hall, Laurie
Halsted, Gilman
Halverson, Brett
Halverson, Brett, Madison Chamber of Commerce
Hamilton, Eric
Hamilton, John
Hammel, Patricia
Hanna, Sean

Hansen, Anette
Hanson, Catherine
Hanson, Kyle
Hanson, Robert
Harden, Christine
Hargraves, Elena
Harring, Reta
Harrington-McKinney, Alder Barbara
Harris, Mark, County Executive, Winnebago County
Harris, Wayne
Harrison, Stephanie
Hart, David
Hartjes, Tony
Hasbrouck, Phyllis
Hasse, Richard
Hastreiter, Fritz
Hauda, William
Haukinz, Austin & Malorie
Havens, Haley
Hawk, Jr., James
Hawkins, Jamie
Hawkinz, Austin
Haynes, Douglas
Haza, Trish
Heck, Alder Patrick
Heckman, Sara
Heggelund, Eric, Wisconsin Department of Natural Resources
Heiar, Donn
Heiden, Jonathan
Heidt, Andrew
Heiman, Joel
Heimforth, Keith
Heinowski, John
Heinzel, Math
Heisig, Jeff
Heisler, Laura
Helgesen Lyons, Nancy
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Hermanson, Tracy
Herson, Josie
Hesselbein, Dianne, Assembly District 79
Hess-Molloy, Christine
Hestad, John
Hestad, John
Hicks, Jeff
Hietpas, Ryan
Higgins, Mike
Hill, Kerry
Hill, Melissa
Hill, Rand
Hill, Richard
Hill, Tehassi, Chairman, Oneida Nation of Wisconsin
Hillman, Kai
Hines, Jourdan
Hinterthuer, Adam
Hirn, Gail
Hirsch, Jeffrey
Hlavachek, Jen
Hoag, Amie
Hofeld, Matt
Hofer, Ben
Hoffman, Dana
Hoffman, Susan
Hofheimer, George
Hogg, David
Hoholik, Richard & Mary
Holcomb, Sherry
Holden, Marlena
Holloway, Jeffrey
Holsey, Shannon, President, Stockbridge-Munsee Community Band of Mohican Indians
Holzem, Paul & Maureen
Holzhauer, Steve
Homner, Scott
Homstad, Grace
Hood, Krista
Horne, Jennifer
Hornemann, Peter
House, Orman
Houtman, Kirsten
Hronek, Angela
Hsu, Ming
Huber, Heather
Hudson, Rick
Huismann, Thomas
Hulick, Nancy
Hull, Robert
Humiston, Angela
Humphrey, Gregory

Hunsicker, Haley
Hurley, Samuel
Hussbaum, Mitchell
Hussey, Jillian
Hustad, Jamie
Huth, Will
Imhoff, James
Ingebritson, Frances
Ingersoll, Brad
Ingram, Mrill
Inman, Scott
Irving, Jaime
Ivanova, Rossitza
Jacklitz, Jill
Jacks, Ellen
Jackson County Board of Supervisors
Jackson, Silvia
Jacob, Dorthey
Jacob, Tony
Jacobson, Steven
Jagler, John, Assembly District 37
Jakubczak, Margaret
Jandl, Lynette
Janisch, Henry
Janz, David
Jaskiewicz, Susan
Jensen, Aaron
Jensen, David
Jensen, Jo
Jensen, Matt
Jeppson, Eric
Jepsen, Alicia
Joe, Mynda & Dan
Johns, Michael
Johnson, Adam
Johnson, Christopher
Johnson, Erin
Johnson, Gary
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Johnson, Jeremiah
Johnson, Kirsten
Johnson, Russ
Johnson, Sadie
Johnson, The Honorable Ron, U.S. Senate
Johnson, Thomas
Johnson, Zach
Jokela, Jill
Jonen, Grant
Jones, Danielle
Jones, Rocky
Jones, Sunshine
Jorgensen, Robert
Jugenheimer, Gary
Jushchyshyn, Alex
Justin, Whitney
Kaderavek, Diane
Kahler, Pamela
Kaiser, Nancy
Kaiser, Rae
Kaiser, Rileey
Kalashian, Nicholas
Kalberer, Jon
Kalberer, Kellie
Kallenbach, Danielle
Kalmbach, Bonnie
Kalmbach, Chris
Kannenberg, Benjamin
Kaplan, Daniel
Kaplan, Robert, Acting Administrator, U.S. Environmental Protection Agency
Kaplan, Wendy
Karcher, Kim
Karger, Brad, Administrator, Marathon County
Karns, Denis
Kasprzak, Madeline
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Kasuboske, Todd
Kaufman, Ariel
Kay , Anna
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Kaye, Susan
Kaye, Susan
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Keitt-Pride, Rosalie
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Kelly, Bradley
Kelly, Kathleen
Kemble, Alder Rebecca
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Kemp, Mason
Kendall, Alissa
Kendl, Jeremy
Kensick, Stephen & Eric,
Keough, Jamie
Keough, Kristin
Kerr, Wendy
Kersick, Steve
Kervin, Sarah

Kester, Dolores
Ketcham, Linda
Kettleson, Craig
Kidwell, Amanda
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Kietzer, Linda
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Kilmark, Constance
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Kind, The Honorable Ron, U.S. House of Representatives
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Kingsbury, Judith
Kingsbury, William
Kinney, Robin
Kirkman, Matt, Director, Green Lake County
Klafka, Steven
Klawitter, Wendy
Klebesadel, Debra
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Knief, Alaina
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Kobs, Keith
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Koch, Bruce
Koch, Lewis
Koenig, Robin
Koga, John
Kohlberg, Leslie
Kolstad, Douglas
Konkel, Brenda
Konkol, Aaron
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Kotnik, Barrett
Krasno, Anita
Krauskopf, Sara
Krenke, Robert
Krezinski, Allison
Krisher, Cherie
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Kruchten, Brittney
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Krueger, Michele
Kubly, Russ
Kuckuk, Robert
Kuether, Mark
Kuhl, Kitty
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Kunkle, Jeffrey
Kurtz, Abbie
Kutzler, Joe
Kwaterski, Steve
Kwawer, Rek
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Lambert, Laurie
Lambert, RJ
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Carberry, Kati
Carpel, Margert
Carter, Scott
Carty, Martha
Casler, Carol
Chaloupka, Susan
Chew, The Honorable Susan B., Idaho House of Representatives
Christensen, Sonya
Ciarlo, Fran
City of Boise Planning and Zoning Commission
Clare, D.
Clark, Marc
Clayton, RJ
Clegg, Elaine, Boise City Council
Clow, The Honorable Lance, Idaho House of Representatives
Cochrane, Barbara
Coe, Kimberly
Coffman, Carolyn
Compton, Bradley, Idaho Department of Fish and Game
Conner, Judith
Connick, Robin
Connors, Bill, Boise Chamber
Cooke, Kerry
Cooper, Todd
Cooper, Tom
Corr, Mary
Cortez Masto, The Honorable Catherine, U.S. Senate
Cortez, Sarah, Boise Chamber of Commerce
Cory, Thomas
Costello
Cox, Kevin
Coy, Victor
Crapo, The Honorable Mike, Senator, United States Senate
Crawforth, Dave
Crockett, Alice
Crowe, John & Diane
Crowe, John & Diane
Crowell, Gary
Crump, Samuel
Cunfer, Barry
Cunningham, Heather
Curran, Christine, State Historic Preservation Office
Daly, David
Damm, Myrna
Danley, Karen
daSilva, Joseph
Davidson, Bruce
Davis, Warren
Davis, Wayne
DeGrange, Hal
Demer, Brent
Derohan, Terry
DeSedhurst, Susan
Desmond, Jim
Devinaspre, Molly
DeWolf, Christon
Dodd, Joan
Dodge, Darrell
Donald, Robert
Donnelly, Jack
Donovan, Judith
Dorfman, Richard
Douglas, Lara, District Manager, Bureau of Land Management Boise District
DuBois, Lorinda, Administrative Officer, Malheur County
Dwyer, Ken
Earnest, David
Edmondson, Eldon
Elder, William
Elgethun, Paul
Elke, Curtis, State Conservationist, USDA, Natural Resources Conservation Service
Elko County Commissioners
Ellis , The Honorable Jake, Idaho House of Representatives
Ellison, The Honorable John, Nevada State Assembly
Ellsworth, The Honorable Julie, State Treasurer, State of Idaho
Elmore County Commissioners
Elsberry, Brent
Ely, Patricia
Enlow, Angela & George
Ennis, Kimberly
Erpelding, The Honorable Mathew, Idaho House of Representatives
Fauci, Joanie
Feast
Federal Emergency Management Agency
Fender, Jeremy

Fereday, Jeff
Fereday, Meg
Fischer, Sandi, United States Fish and Wildlife Service, Eastern Idaho Field Office
Fite, Katie
Fitzgerald, Katy, United States Fish and Wildlife Service, Northern Idaho Field Office
Fleischmann, Angela
Floyd, Tiffany, Idaho Department of Environmental Quality
Fluke, Daren, Comprehensive Planning Manager, City of Boise Planning and Development
Flynn, Jessica
Forsch, Eric
Foster, Cheryl
Fowkes, William
Fox, Tim
Fraser, Donald
Frazier, Marilyn
Frazier, Melissa, CLB
Freeman, Denise
Freund, Andrew
Fritz, Cindy
Fugal, Janesara
Fulcher, The Honorable Russ, U.S. House of Representatives
Fuller, Dustin
Gailbreth, Katherine
Gannon, The Honorable John, Idaho House of Representatives
Garber, Sid & Alana
Gingerich, Craig
Glerum, John & Vickie
Goicoechea, The Honorable Pete, Nevada Senate
Goulding, William
Graeff, William
Grane, Linda
Gray, Lorri, Regional Director, Bureau of Reclamation
Green, The Honorable Brooke, Idaho House of Representatives
Greene, Austin, Chairperson, Confederated Tribes of the Warm Springs Reservation of Oregon
Greenough, Irene
Griff, Brad
Haberman, Ron & Althea
Hailey, Sean
Hall, Barb
Hallyburton, Jimmy
Hanes, Gary
Hannah, David
Hansen, The Honorable Alexis, Nevada State Assembly
Hansen, The Honorable Ira, Nevada Senate
Hardey, Bonita
Harney County Commissioners
Harris, The Honorable Steven, Idaho House of Representatives
Hartgen, The Honorable Linda, Idaho House of Representatives
Hastins, Tim
Hausrath, Anne
Hawkins, Ralph
Hawley, Eric, Chairman, Burns Paiute Tribe
Hay, Anne
Heberger, Roy
Henry, David
Herndon, John
Herren, Nathan
Herrington, Ann
Herz, Marian
Higgins, Mike
Hill, Ryan
Hilliard, Mark
Hillman, V. Michael
Hinrichs, Earl & Karen
Hofstetter, Jennifer
Holley & Doug Brown, Jennifer
Holmes, Michael
Holtz, Eric & Renata
Honts, Charles
Hopingardner, Caralea
Hoppie, Robert & Kim
Hormaechea, John
Horton, Cami
Howard, Ted, Chairman, Shoshone-Paiute Tribes Duck Valley Reservation
Hrubec, Eva
Huff, Mary, Administrator, Community Development
Hughes, Jeff
Huhn, Jeff
Hulvey, Julie
Humboldt County Commissioners
Hunsaker, Brent
Hupp, Jennifer
Hupp, Joseph
Hupp, Rebecca, City of Boise, Boise Airport
Hurd, Leonard

Ianson, Bob
Jablonski, Edenn
Jacob, Buddy
Jensen, Greg
Jester, Shirley
Johnson, Dana
Johnson, Heidi
Johnson, Zeke & AnnMarie
Jones, Darrell
Jones, Julie
Jordan, The Honorable Maryanne, Idaho Senate
Jorgenson, Cheri
Joss, Laura, Regional Director, National Park Service - Pacific West
Kangas, Dave
Kaylor, Richard
Keirnes, Linda & Forrest
Kemp, Barbara
Kennedy, Tara
Kibler, Robert
King, Scott
Kingwell, John, Director, Planning and Zoning
Kinney, Mary Lou & Richard
Kinzer, Cameron
Koltonski, Michael
Kreamer, William
Krichbaum, Phil
Kroon, Michael
Labrum, Andy
Landin, Juan
Larkin, Bill
Lauterbach, Margaret
Laux, Jon, Director, Community Development
Lawrence, Betty, Planning and Zoning Department
Lawson, Cynthie
Leatherman, Meg, Director, Ada County Development Services
Lee, Jeremy
Lewandowski, Jesse
Liddil, Bruce
Liles, Dian
Lindenberg, Mike
Linehan, Solara
Little, Troy
Lliteras, Mark
Lockhart, Lynn
Loftus, Kathleen
Lombard-Bloom, Debbie
Loop, Stephen L.
Louis, David & Jennifer
Lowman Thomas, Susan
Lucchesi, Robert
Ludwig, Scott, Boise City Council
Maguire, Kaitlin
Mahaffey, Barbara
Malheur County Commissioners
Mann, Royce & Geraldine
Marconi, Linda
Marler, Dan
Marler, Tracy
Martin, Dustin
Martin, The Honorable Fred, Idaho Senate
Maslac, Alan & Catherine
Mason, Tammi
Mason, The Honorable Rob, Idaho House of Representatives
Mattefs, Matthew
Mattise, Sam
McAndrew, Robert
McCarthy, Mike
McElhinney, Gwynne
McGeachin, The Honorable Janice, Lt. Governor, State of Idaho
McKee, Carol
McLean, Lauren, Boise City Council
McMullen, Brandon, Director, Planning and Development
Mendiola, Dave, County Manager, Humboldt County
Menges, Carol
Mericle, Monty
Merkley, The Honorable Jeff, U.S. Senate
Messley, Connie
Mikkelsen, Alan, Acting Commissioner, Bureau of Reclamation
Miller, Bill
Miller, Joseph
Miller, Toni
Mondive, Dirk
Monks, The Honorable Jason, Idaho House of Representatives
Moore, Susan
Moore, Virgil, Director, Idaho Fish and Game
Morales, Jordan
Morris, Jeffrey
Morse, William
Mount, Phil
Mullins, Colleen
Murphy, Neal
Murphy, Tim, State Director, Bureau of Land Management State Office

Nakashima, Skip & Theresa
Nedd, Mike, Acting Director, Bureau of Land Management
Nelson, John
NEPA Reviewer, United States Army Corps of Engineers - Boise Office
Newell, Blake
Newton, Charles
Newton, Karen
Ng, Sharon
Nielson, Logan
Norberg, Patty
North, Claude
Novotny, Richard
OFarrell, Rob
Ogden, David & Karen
OSullivan, Greg
Owyhee County Commissioners
Palmer, Emmily
Palmer, Rebecca, State Historic Preservation Officer, State Historic Preservation Office
Pape, Mike, Idaho Transportation Department
Paporello, Lin
Paradis, Peter
Parry, Darren B., Chairman, Northwestern Band of Shoshone Nation
Patrick, Inna
Patterson, Michael
Paulson, Marta
Payton, Charles
Perronedube, Norma
Petaja, Matt, Boise Airport
Peterson, Ann
Phipps, Wes
Pidjeon, Kenneth
Piepmeyer, Tom
Piepmeyer, Zach
Pirzadeh, Michelle, United States Environmental Protection Agency Region 10 (ETPA-088)
Pitkin, Travis, Curations and Compliance Officer, State Historic Preservation Office
Pori, Robert
Porter, Richard
Post, Joshua
Potter, Andrew
Potter, Andrew
Potter, Daniel
Powers, Trevor
Priest, Barbara & Lester
Pruett, Joseph
Pruitt, Scott, United States Environmental Protection Agency
Prusha-Parlor, Elizabeth
Puett, Dixie
Purdy, Steven
Purin, George & Kathy
Quinn, Jill
Ransom, Joe
Redfield, Jim
Reece, Dean
Regional Forester, U.S. Department of Agriculture Forest Service
Rendler, Cheri
Reynolds, Dale
Reynolds, Kathryn
Reynolds, Kayla
Reynolds, Michael, Acting Director, National Park Service
Richardson, Connor
Richardson, Gary
Ricker, Bryan
Ricker, Jerry
Risch, The Honorable James, Senator, United States Senate
Roeder, Gary
Rogers, Richard & Judy
Rogers, Richard & Judy
Ronayne, Diane
Rosen, The Honorable Jacky, U.S. Senate
Rosenthal, Jay
Rourke, Jerry
Rourke, Sue
Rubel, The Honorable Ilana, Idaho House of Representatives
Rudd, Christiane
Rudd, Gerald
Rynearson, Tim
Saenz, Jose
Sanchez, Lisa, Boise City Council
Sayler, Gary
Scanlan, Helen
Schaefer, Jeanine
Schenk, Barbara
Schmidt, Fred & Yvonne
Schneider, Greg
Schulman, Eric
Scott, Alvin, Director of Planning, Malheur County
Seamans, Ken
Shawver, Bill
Shue, Max

Silvers, Matthew
Simmons, Hal, Planning Director, City of Boise Planning and Zoning
Simnitt, LeAnn
Simpson, The Honorable Mike, U.S. House of Representatives
Sisolak, The Honorable Steve, Governor of Nevada
Skattebo-Rhoades, James
Skidmore, Shawn
Skinner, Sheryl & Mike
Small, Nathan, Chairman, Shoshone-Bannock Tribes of the Fort Hall Reservation
Smalley, Debbie
Smart, Tildon, Chairman, Paiute and Shoshone Tribes of the Fort McDermitt Indian Reservation
Smith, Kent
Smith, Laurie
Smith, Levi
Smith, Rachel
Smith, Rod
Sobieski, Janet
Soelberg, Scott
Speaks, Stanley M., Regional Director, Bureau of Indian Affairs - Northwest Regional Office
Spillard, Claudia
Stambulis, Michael
Stettler, Bruce
Stevens, Craig
Stires, Craig
Stivison, Ernestine
Stokes, Robert, County Manager, Elko County
Strickland, Craig
Strite, James
Strite, Zoe & Jim
Struthers, Anne
Sucorowski, Lynette
Sullivan, Herschel
Sullivan, Stacey
Sullivan, Sue, Idaho Transportation Department
Swogger-Reaves, Emily
Tagg, Scott
Talley, Micheal
Tate, Kimberly
Taylor, Gary
Taylor, Sherri
Terlisner, Jerry
Terrazas-Montamat, Rosie
Thompson, Chad
Thomson, T.J., Boise City Council
Tippetts, Christine
Tozan, Lyn
Tripp, Molly
Troje, Suzanne
Truman, Patricia
Twin Falls County Commissioners
United States Army Corps of Engineers
United States Fish and Wildlife Service, Bend Field Office
United States Fish and Wildlife Service, La Grande Field Office
United States Fish and Wildlife Service, Northern Nevada Field Office
Vader, Susie
Vander Woude, The Honorable John, Idaho House of Representatives
VanDoren, Lois
Verma, Tushar
Vetter, David
Vidinha, Mark
Vliet, Spencer
Walden, The Honorable Greg, U.S. House of Representatives
Walker, Alisha
Wallace, Jane
Wanders, Carol
Ward-Engelking, The Honorable Janie, Idaho Senate
Warren, Jonathan
Wasden, The Honorable Lawrence, Attorney General, State of Idaho
Werk, Elliot
Weston, Betty
Wiedenmann, Kurt
Williams, James
Wilson, Jeanne
Wilson, Kevin
Wilson, Nathan
Wilson, Ryan
Wilson, Terry
Wimber, Ronald
Winchester, L. Gene
Winder, The Honorable Chuck, Idaho Senate
Wintrow, The Honorable Melissa, Idaho House of Representatives
Wolfrum, George & Rhonda
Woodings, Holli, Boise City Council
Woods, Greg
Woolf, The Honorable Brandon, State Controller, State of Idaho
Wyden, The Honorable Ron, U.S. Senate

Young, Kristin
Zarkos, Andy
Zinke, The Honorable Ryan, Secretary, United States Department of the Interior
Zito, The Honorable Christy, Idaho House of Representatives

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Anderson, Greg, Office of the City Council
Anoatubby, Bill, Governor, Chickasaw Nation of Oklahoma
Baker, Bill John, Principal Chief, Cherokee Nation of Oklahoma
Barnes, Joe
Barth, Michelle
Bass, Ryan
Batton, Gary, Chief, Choctaw Nation of Oklahoma
Bean, The Honorable Aaron, State Senator, District 4
Becton, Danny, Office of the City Council
Board of Commissioners, Appling County
Board of Commissioners, Brantley County
Board of Commissioners, Bryan County
Board of Commissioners, Bulloch County
Booth, Ed
Bowman, Aaron, Office of the City Council
Boyer, Lori, Office of the City Council
Brown, Joseph, Administrator, Liberty County
Bryan, Stephanie, Chairwoman, Poarch Band of Creek Indians
Bunch, Joe, Chief, United Keetoowah Band of Cherokee Indians
Burkhalter, Casey, Administrator, Evans County
Byrd, The Honorable Cord, Florida House of Representatives
Camden County Commissioners
City of Jacksonville
City of Jacksonville Planning Commission
Corbett, The Honorable John, Georgia House of Representatives
Couch, Thomas, County Manager, Bulloch County
County Administrator, Wayne County
Crass, David, Deputy State Historic Preservation Officer, Historic Preservation Division
Crescimbeni, John, Office of the City Council
Curry, The Honorable Lenny, Mayor of Jacksonville
Cypress, Billy, Chairman, Miccosukee Tribe of Indians
Daniels, The Honorable Kimberly, Florida House of Representatives
Davis, The Honorable Tracie, Florida House of Representatives
Dennis, Garrett, Office of the City Council
DeSantis, The Honorable Ron, Governor of the State of Florida
District Manager, Bureau of Land Management
Duggan, The Honorable Wyman, Florida House of Representatives
Evans County Commissioners
Evans, Greg, Secretary, Florida Department of Transportation
Ferraro, Al, Office of the City Council
Fetterhoff, The Honorable Elizabeth, Florida House of Representatives
Fine, The Honorable Randy, Florida House of Representatives
Fischer, The Honorable Jason, Florida House of Representatives
Freeman, Terrance, Office of the City Council
Gaffney, Reggie, Office of the City Council
Garrison, Rusty, Director, Georgia Department of Natural Resources
Geiger, H.L.
Gibson, The Honorable Audrey, Florida Senate
Gilliard, The Honorable Carl, Georgia House of Representatives
Glynn County Commissioners
Gooden, Eric
Gordon, The Honorable J. Craig, Georgia House of Representatives
Gulliford, Bill, Office of the City Council
Hazouri, Tommy, Office of the City Council
Herrington, Jay, Field Supervisor, U.S. Fish and Wildlife Service
Hetzel, Andy, City of Jacksonville
Hill, The Honorable Jack, Georgia Senate
Hitchens, The Honorable Bill, Georgia House of Representatives
Hogan, The Honorable Don, Georgia House of Representatives
Howard, Steve, Administrator, Camden County
Huxford, Folks, Chief, City of Jacksonville
Imm, Don, Field Supervisor, U.S. Fish and Wildlife Service
Isakson, The Honorable Johnny, U.S. Senate
Johnson, Lewis, Assistant Chief, Seminole Nation of Oklahoma

Jones, John, Manager, Toombs County Commissioners
Jones, The Honorable Jeff, Georgia House of Representatives
Kemp, The Honorable Brian, State of Georgia
Killingsworth, William, Director, City of Jacksonville
Kirk, Jason, District Commander, U.S. Army Corps of Engineers
Landon, Eric, Director, Planning and Development
Lawson, The Honorable Al, United States Representative
Leek, The Honorable Tom, Florida House of Representatives
Leif, Stefanie, Manager, Planning and Zoning, Glynn County
Lewis, Lee, County Manager, Appling County
Liberty County Commissioners
Ligon, Jr., The Honorable William, Georgia Senate
Long County Commissioners
Long County Planning and Zoning
Long, Melissa, Chief, City of Jacksonville
Lopez Brosche, Anna, Office of the City Council
Love, Jim, Office of the City Council
McIntosh County Commissioners
Morgan, Joyce, Office of the City Council
Morgan, Russell, State Conservationist, USDA, Natural Resources Conservation Service
Murphy, Frank, Tattnall County
Newby, Samuel, Office of the City Council
North Florida Transportation Planning
Osceola, Jr., Marcellus, Chairman, The Seminole Tribe of Florida
Pappas, John, Director, City of Jacksonville Public Works Department
Parsons, Timothy, State Historic Preservation Officer, Florida Division of Historical Resources
Perdue, The Honorable David, U.S. Senate
Petrea, The Honorable Jesse, Georgia House of Representatives
Pittman, Ju'Coby, Office of the City Council
Planning and Zoning Department, Tatnall County
Plasencia, The Honorable Rene, Florida House of Representatives
Reed, James, GIS Section Head, City of Jacksonville
Reed, Kristen, Chief, City of Jacksonville
Regional Director, Bureau of Indian Affairs
Regional Director, National Park Service
Regional Forester, USDA, Forest Service
Rice, Kenneth, Center Director, U.S. Geological Survey
Rubio, The Honorable Marco, United States Senate
Rutherford, The Honorable John, United States Representative
Santiago, The Honorable David, Florida House of Representatives
Schellenberg, Matt, Office of the City Council
Scott, The Honorable Rick, United States Senate
Silverman, Noah, NEPA Coordinator, National Marine Fisheries Service
Sirois, The Honorable Tyler, Florida House of Representatives
Sneed, Richard, Principal Chief, Eastern Band of Cherokee Indians
Spencer, The Honorable John, Georgia House of Representatives
Stahl, Chris, Clearinghouse Coordinator, Office of Intergovernmental Programs
Stephens, The Honorable Mickey, Georgia House of Representatives
Stephens, The Honorable Ron, Georgia House of Representatives
Stevenson, The Honorable Cyndi, Florida House of Representatives
Strong, Greg, Director, Florida Department of Environmental Protection
Tattnall County Commissioners
Taylor, Ben, Administrator, Bryan County
Taylor, Tom
Tillery, The Honorable Blake, Georgia Senate
Toombs County Commissioners
United States Environmental Protection Agency
Watford, Ernestina
Watson, The Honorable Ben, Georgia Senate
Watts, Jason, Office Manager, Florida Department of Transportation
Wayne County Commissioners
White, Randy, Office of the City Council
Wiley, Nick, Executive Director, Florida Fish and Wildlife Conservation Commission
Williams, The Honorable Al, Georgia House of Representatives
Wilson, Scott, Office of the City Council
Wuellner, Edward, Executive Director, Northeast Florida Regional Airport

Yarborough, The Honorable Clay, Florida House of Representatives
Zoucks, Patrick, Manager, McIntosh County

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Accettola, Dominic
Acciavatti, Daniel
Alcona County Building Department
Alcona County Commissioners
Alexander, Gordon
Allen, Jason
Allen, Jason, State Director, U.S. Department of Agriculture
Alpena County Commissioners
Anderson, Jennifer, NEPA Coordinator, National Marine Fisheries Service
Arenac County Commissioners
Batkins, Brian, Harrison Township Trustee, Harrison Township
Bitonti, Bill, Harrison Township Trustee, Harrison Township
Bolden, The Honorable Kyra, Michigan House of Representatives
Booher, The Honorable Darwin, Michigan State Senate
Bora, Dan
Capoccia, Chris
Carrick, Sr., Levi, President, Bay Mills Chippewa Indian Community
Casco-Bentley, Regina, Chairperson, Little Traverse Bay Bands of Odawa Indians
Chirkun, The Honorable John Paul, Michigan House of Representatives
Cloutier, Frank, Chief, Saginaw Chippewa Indian Tribe
Conway, Brian, State Historic Preservation Office
Crawford County Commissioners
Culcasi, John
Cwikla, John Paul, Public Information Officer, Macomb County
Davis, Pat
DeLalla, Richard
Department of Building and Safety, Crawford County
Dubay, Hilary
Dworzecki, Zygmunt, Chairperson, Planning Commission, Tuscola County
Edoff, Erik
Farrington, The Honorable Diana, Michigan House of Representatives
Forlina, Tony
Franzel, Scott, Chair, Planning Commission, Sanilac County
Frisch, Rachel, Administrator, Otsego County
Gettinger, Dean, District Manager, Bureau of Land Management
Gracie, Cheryl
Grether, Heidi, Director, Michigan Department of Environment, Great Lakes, and Energy
Griffith, Tara, Administrator, Sanilac County
Hackel, Mark, Office of County Executive, Macomb County
Hartley, Victoria
Herd, Jane
Hertel, The Honorable Kevin, Michigan House of Representatives
Hicks, Scott, U.S. Fish and Wildlife Service
Hoagland, Michael, Administrator, Tuscola County
Hrit, Kevin
Hune, The Honorable Joe, Michigan State Senate
Huron County Commissioners
Iosco County Commissioners
Kaplan, Robert, U.S. Environmental Protection Agency, Region 5
Kennedy, Dan, Michigan Department of Natural Resources
Kuhn, Karen
Lee, Garry, State Conservationist
Lucido, The Honorable Pete , Michigan State Senate
MacDonald, The Honorable Michael, Michigan State Senate
Marino, The Honorable Steve, Michigan House of Representatives
McClellan, Thurlow S., Chairperson, Grand Traverse Band of Ottawa and Chippewa Indians
McKernan, John
Meerschaert, Gary
Meshiguad, Kenneth, Chairperson, Hannahville Potawatomi Indian Community
Milano, Tony
Miller, Candice S., Commissioner, Macomb County Public Works Department
Mitchell, The Honorable Paul, United States House of Representatives, 10th District
Montmorency County Commissioners

Ogemaw County Commissioners
Olberle, Jason D., Superintendent, Michigan Agency, BIA
Oscoda County Commissioners
Otsego County Commissioners
Payment, Aaron, Chairperson, The Sault Ste. Marie Tribe of Chippewa Indians
Payne, Timothy, Michigan Department of Natural Resources
Peters, The Honorable Gary, United States Senate
Petts, Jeffrey
Planning and Zoning Department, Ogemaw County
Planning and Zoning Department, Otsego County
Planning Board, Oscoda County
Planning Commissioner, Iosco County
Presque Isle County Commissioners
Quackenbush, Peter, Michigan Department of Environment, Great Lakes, and Energy
Rad, Vicky, Macomb County Department of Planning and Economic Development
Randall, Ellen
Rea, John Paul, Executive Director, Macomb County Department of Planning and Economic Development
Ream, Carolyn
Regional Director, Bureau of Indian Affairs, Eastern Region
Regional Director, National Park Service, Midwest Region
Regional Forester, U.S. Department of Agriculture Forest Service
Rice, Glen, Chairman, Arenac County Planning Commission
Romanelli, Larry, Ogema, The Little River Band of Ottawa Indians
Rosbury, Jenora
Ross, Terry & Angelika
Sanilac County Commissioners
Santoro, Gerard, Macomb County Department of Planning and Economic Development
Sargent, Lori, Michigan Department of Natural Resources
Schave, Dustin
Schuett, Gene
Scollon, Isabel, The Burt Lake Band of Ottawa and Chippewa Indians, Inc.
Servial, Bill, Harrison Township Trustee, Harrison Township
Shannon, The Honorable Nate, Michigan House of Representatives
Silda, Joseph
Smigelski, Steven
Smith, Jeff, Director, Planning, Building, and Zoning Department, Huron County
Sowerby, The Honorable William, Michigan House of Representatives
Sprague, Scott, Chairperson, Match-e-be-nash-she-wish Band of Potawatomi Indians of Michigan
Stabenow, The Honorable Debbie, United States Senate
Steudle, Kirk, Director, Michigan Department of Transportation
Stinson, Anne
Stone, The Honorable Lori, Michigan House of Representatives
Strach, Russel, Center Director, U.S. Geological Survey
Stuck, Jamie, Chairperson, The Nottawaseppi Huron Band of Potawatomi
Stuehmer, Clifford & Rosemary
Swartz, Jr., Warren, President, The Keweenaw Bay Indian Community
Szware, Alex
The Grand River Bands of Ottawa Indians
Thomas, Gary
Thrushman, Lu
Tomenello, Lawrence, Harrison Township Trustee, Harrison Township
Tuscola County Commissioners
U.S. Army Corps of Engineers, Detroit District
Verkest, Kenneth, Supervisor, Harrison Township
Walrath, Dick
Warren, John , Chairperson, The Pokagon Band of Potawatomi Indians
Whitmer, The Honorable Gretchen, Governor, State of Michigan
Willer, Lisa
Williams, Jr., James, Chairperson, Lac Vieux Desert Band of Lake Superior Chippewa Indians
Wilmot, Darlene, Chairperson, Alpena County Planning Commission
Wojno, The Honorable Paul, Michigan State Senate
Wozniak, The Honorable Doug, Michigan House of Representatives
York, Amanda

Zakshesky, James, Building and Zoning, Presque Isle County

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Alabama Department of Environmental Management (ADEM) - Office of Education and Outreach
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Anderson, Phyliss, Chief, Mississippi Band of Choctaw Indians
Anoatubby, Bill, Governor, Chickasaw Nation of Oklahoma
Baker, Bill John, Principal Chief, Cherokee Nation of Oklahoma
Barfoot, The Honorable Will, Senate District 25
Barnett, The Honorable Shane, Mississippi House of Representatives
Bartlett, Mark, Federal Highway Admin., AL Division
Barton, The Honorable Manly, Mississippi House of Representatives
Battise, JoAnn, Chairperson, Alabama-Coushatta Tribe of Texas
Batton, Gary, Chief, Choctaw Nation of Oklahoma
Beeker III, Chris, State Director, U.S. Department of Agriculture
Bell, Fred, City Council
Bell, Robert
Bibb County
Blankenship, Christopher, Alabama Department of Conservation and Natural Resources
Bollinger, Richard, City Council
Boswell, Kenneth, Alabama Department of Community and Economic Affairs (ADECA)
Bracy, The Honorable Napoleon, Alabama House of Representatives
Brazzley, Shenetta
Brown, The Honorable Chip, Alabama House of Representatives
Bryan, Stephanie, Chairwoman, Poarch Band of Creek Indians
Bryant, The Honorable Phil, Governor of Mississippi
Buck, Felicia, Executive Director, Alabama Environmental Council
Buckalew, Anna, President & CEO, Montgomery Area Chamber of Commerce
Bunch, Joe, Chief, United Keetoowah Band of Cherokee Indians
Burkette, The Honorable David, Senate District 26
Burns, Sue
Butler-Wolfe, Edwina, Governor, Absentee-Shawnee Tribe of Indians of Oklahoma
Byrd, The Honorable Larry, Mississippi House of Representatives
Carlisle, Betty, Administrator, Forrest County Planning Department
Carnley, Nancy, Commission Chairman, Alabama Indian Affairs Commission
Casillas, Renee
Chestnut, The Honorable Prince, Alabama House of Representatives
Chief, U.S. Army Corps of Engineers
Chief, U.S. Fish and Wildlife Service
Choctaw County
Clark, Greg , Executive Director, Central Alabama Regional Planning and Development Commission
Clarke County
Clarke, The Honorable Adline, Alabama House of Representatives
Commissioner, AL Department of Agriculture and Industries
Conway, Chris, Director of Public Works, City of Montgomery Public Works Department
Cypress, Billy, Chairman, Miccosukee Tribe of Indians
Dallas County
Daramola, Kandis
Davis, Dwight
Davis, Phillip, Chief, Alabama Department of Environmental Management (ADEM) - Land Division
Dean, Elton N., Montgomery County Commission
Director, Alabama Emergency Management
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Division Director, Alabama Office of Water Resources
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Easterbrook, The Honorable Brett, Alabama House of Representatives
Efferson, Randy
Environmental Coordinator, Alabama Department of Transportation - Design Bureau

Environmental Review Coordinator, USEPA, Region 4
Flanagan, Ken, Director, Community Development
Flores, Cecilia, Chairperson, Alabama-Coushatta Tribe of Texas
Floyd, James, Principal Chief, The Muscogee (Creek) Nation
Forrest County
Gain, W. Scott, U.S. Geological Survey
Gaston, The Honorable Victor, Alabama House of Representatives
George County
Gillespie, Jr., The Honorable Bill, Mayor, City of Prattville
Glynn, Jill
Gore, Ron , Chief, Alabama Department of Environmental Management (ADEM) - Air Division
Graham, Audrey, City Council
Green, Jr., William, City Council
Greene County
Greene County
Greene, Joe , Vice President, Military and Federal Affairs, Montgomery Area of Chamber and Commerce
Griffin, Patricia
Hale County
Harjo, Nelson, Chief, Alabama-Quassarte Tribal Town of the Creek Nation
Harper, Brad
Harrell, Barbara, Administrator, Dallas County
Hartsfield, John
Harvey, Rick, Administrator, Clarke County
Hatcher, The Honorable Kirk, Alabama House of Representatives
Hendrix, Bob, Airport Fire Chief, Interim Executive Director, Montgomery Regional Airport
Hendry, Brian
Hobia, Jeremiah (Tiger), Kialegee Tribal Town of the Creek Nation of Oklahoma
Holley, Joe
Holly, A.B.
Hooper, Conwell
Houston, Kate
Howard, The Honorable Ralph, Alabama House of Representatives
Hyde-Smith, The Honorable Cindy, U.S. Senate
Ingram, The Honorable Reed, Alabama House of Representatives
Ivey, The Honorable Kay, Governor, Governor of Alabama
Jackson, The Honorable Thomas, Alabama House of Representatives
James, Tommy
Jinwright, Charles , President, City Council
Johnson, Lewis, Assistant Chief, Seminole Nation of Oklahoma
Johnson, The Honorable Chris, Mississippi House of Representatives
Jones, The Honorable Doug, U.S. Senate
Jones, The Honorable Sam, Alabama House of Representatives
King, Shanna
Knight Fleming, Tammy, Board Chairwoman, Montgomery Airport Authority
Knights, Andy
Ladner, The Honorable Timmy, Mississippi House of Representatives
Larkin, Tracy, President Pro Tem, City Council
Law , Tony
Lawrence, The Honorable Kelvin, Alabama House of Representatives
Lee, Arch, City Council
LeFleur, Lance, Director, Alabama Department of Environmental Management (ADEM)
Lewis, David
Lewis, Jennifer
Lewis, Jenny
Lyons, Brantley, City Council
Malone, Ben, State Conservationist, USDA, Natural Resources Conservation Service
Marengo County
Marshall, The Honorable Steve , Office of the Attorney General
Martin, Steve
McCampbell, The Honorable Artis, Alabama House of Representatives
McClammy, The Honorable Thad, Alabama House of Representatives
McClendon, Lora
McGee, The Honorable Missy, Mississippi House of Representatives
McLendon, Lora, Director, Military & Federal Strategies
McLeod, Mac, Director, Business and Commercial Development
McLeod, The Honorable Doug, Mississippi House of Representatives
McNeal, The Honorable Roun, Mississippi House of Representatives

Melton, Randy, Planning and Building Department
Mims, Donald L., Montgomery County Administrator
Mobile County
Monroe County
Morris, The Honorable Tashina, Alabama House of Representatives
Morrow, Ryan, Interim Town King, Thlopthlocco Tribal Town of Oklahoma
Osceola Jr., Marcellus, Chairman, Seminole Tribe of Florida
Pafenbach, John, Administrator, Mobile County
Pearson, Bill, U.S. Fish and Wildlife Service
Perry County
Perry County
P'Pool, Ken, Deputy State Historic Preservation Officer, Mississippi Department of Archives and History
Pringle, The Honorable Chris, Alabama House of Representatives
Pruitt, Jr., Glen, City Council
Regional Director, Bureau of Indian Affairs, Eastern Region
Regional Director, National Park Service, Southeast Region
Regional Forester, U.S. Department of Agriculture Forest Service
Ricks, Stephen, Field Supervisor, U.S. Fish and Wildlife Service
Robinson, Russell
Roby, The Honorable Martha, U.S. House of Representatives
Rogers, The Honorable Mike , U.S. House of Representatives
Saladin, Anderson
Sells, The Honorable Chris, Alabama House of Representatives
Sewell, The Honorable Terri, U.S. House of Representatives
Shelby, The Honorable Richard , U.S. Senate
Shiver, The Honorable Harry, Alabama House of Representatives
Sickey, David, Chairman, Coushatta Tribe of Louisiana
Simpson, The Honorable Matt, Alabama House of Representatives
Slay, Andrea, Chief, Alabama Department of Environmental Management (ADEM) - Water Division
Smith, Beverly Cheryl, Principal Chief, Jena Band of Choctaw Indians
Smith, Robert E., Director of Planning and Development, City of Montgomery Planning Department
Sneed, Richard, Principal Chief, Eastern Band of Cherokee Indians
Sodders, Charlene
Sparkman, Ron, Chief, Shawnee Tribe
Speake, PE/LS, George C., Montgomery County Engineer
Stone County
Strange, The Honorable Todd, Mayor, City of Montgomery
Straw, William, Regional Environmental Officer, Federal Emergency Management Agency
Stringfellow, Shelby, Montgomery Chamber of Commerce
Sullivan, The Honorable Rodney, Alabama House of Representatives
Sumter County
Sykes, Charles, Alabama Department of Conservation and Natural Resources
Thrasher, Benjamin
United States Environmental Protection Agency
VanderWal, Patty, President, Prattville Area Chamber of Commerce
Vaughn, Max
Wallace, Glenna J., Chief, Eastern Shawnee Tribe of Oklahoma
Washington County
Watson, The Honorable Percy, Mississippi House of Representatives
Weaver, The Honorable April, Alabama House of Representatives
Webster, Felisa
Wheeler, The Honorable David, Alabama House of Representatives
Wicker, The Honorable Roger, U.S. Senate
Wilcox County
Wilcox, The Honorable Margie, Alabama House of Representatives
Williams, Robert
Wofford, Lee Anne, Deputy State Historic Preservation Officer, Alabama Historical Commission
Wood, Tony

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Appendix A6

Summary of Responses to Public Comments on the Draft EIS

F-35A Environmental Impact Statement (EIS) Ops 5&6
Draft EIS
Public Comment Summary & Responses

The United States (U.S.) Air Force (USAF) would like to extend our appreciation to all who have shown interest in this proposal and have provided comments on the Draft Environmental Impact Statement (EIS). By taking an active part in the environmental impact analysis process, you help to ensure that this document is the best it can possibly be and that all substantive issues have been addressed.

Comments were received via email, the website, U.S. Postal Service, hand-written in person at public meetings, or via the transcript from the public meetings. The comments addressed below are in order of when they were received. The table below shows the comment title and where it can be located. Comments were grouped into similar topics so that, in many cases, a single response was generated for multiple comments, thereby reducing redundancy in responses.

There were over 6,000 comment letters received during the Draft EIS comment period. Not all comments received were considered to be substantive, though all were fully considered and made part of the administrative record. Substantive comments were considered individually and collectively and responded to in the following pages. Some comments were used to make corrections or modifications in the body of the EIS.

As discussed in the EIS (Section 1.6.2), substantive comments are those comments that generally challenge the analysis, methodologies, or information in the EIS as being factually inaccurate or analytically inadequate; that identify impacts not analyzed or developed and evaluate reasonable alternatives or feasible mitigations not considered by the National Guard Bureau (NGB) or USAF; or that offer specific information that may have a bearing on the decision, such as differences in interpretations of significance, scientific, or technical conclusions, or cause changes or revisions in the proposal. Non-substantive comments, which do not require a specific NGB response, are generally considered to be those comments that are non-specific; express a conclusion, an opinion, agree, or disagree with the proposals; vote for or against the proposal itself, or some aspect of it; state a position for or against a particular alternative; or otherwise state a personal preference or opinion. Due to the voluminous number of comment letters received on the Draft EIS and the sensitivity of Personally Identifiable Information, the USAF has summarized the comments. The following table of contents identifies where the reader can find relative comments and responses. However, public comment letters are a part of the official record.

The following table of contents identifies where the reader can find relative comments and responses.

Comment	Page Number
1) Request to be added to the mailing list.	A6-4
2) Comment indicating proponent, opponent, or other non-substantive comment.	A6-4
3) Proposed Action/Purpose and need.	A6-4
a. Questions about the Proposed Action or purpose and need for the action.	A6-4
b. How were the alternatives selected?	A6-4
c. What happens to the legacy aircraft if alternative location is selected?	A6-6
d. What would happen to the Fighter Wing if they don't get the F-35A?	A6-5
4) Noise	A6-5
a. General comments about noise, including complaints, inadequacy of analysis, etc.	A6-5
b. Does "incompatible" mean "uninhabitable"?	A6-6

Comment	Page Number
c. Would any schools be closed?	A6-6
d. Suggestions to include the 55 and 60 decibel (dB) noise contours.	A6-6
e. Why didn't you use Maximum Sound Level (L_{max})?	A6-7
f. Does the noise model account for topographic features and weather conditions?	A6-7
g. The number of home station sorties is not correct.	A6-7
h. Increased noise has a detrimental health effect on humans.	A6-7
i. How can you mitigate impacts to people who spend time outdoors?	A6-8
j. Suggestion to include specific apartments/townhomes in the analysis.	A6-8
k. Questions regarding sonic booms.	A6-8
l. Request for noise contour maps in the Special Use Airspace (SUA).	A6-9
5) Air Quality	A6-9
a. General comments about the air quality analysis.	A6-9
b. The Environmental Impact Statement (EIS) needs to address Wisconsin Natural Resources (NR) 445 "Control of Hazardous Pollutants."	A6-9
6) Environmental Justice	A6-9
a. General questions about impacts to populations of minority, low income, and children.	A6-9
b. Concern that the use of thresholds of 20 percent poverty and 50 percent minority being inappropriate. Also, the City of Madison conducted their own analysis, which demonstrated significant disproportionate impacts.	A6-9
c. Areas outside 65 dB Day-Night Average Sound Level (DNL) contour may not be eligible for sound attenuation assistance.	A6-10
d. U.S. Department of Housing and Urban Development (HUD) as cooperating agency.	A6-10
7) Selection Criteria	A6-10
a. General questions about the selection criteria and alternatives analyzed.	A6-10
b. How did some of the alternatives rise to the top 5 even though they appear to not meet some of the basic selection criteria?	A6-10
c. Why does this aircraft have to be placed at an Air National Guard (ANG) installation at all?	A6-10
d. How were Environmental Justice and children's health impacts considered when identifying the preferred alternatives?	A6-10
8) Concern for domestic animals and/or pets.	A6-11
9) Safety concerns	A6-11
a. Concerns about military aircraft flying at commercial airfields and the potential for mishaps.	A6-11
b. Concern that ANG pilots are student pilots.	A6-11
c. Concern about the stealth coating on the F-35A.	A6-11
10) Socioeconomics – general comments.	A6-11
11) Concern for manufactured homes (mobile homes) within the 65 dB contours.	A6-12
12) Nuclear weapons – concern that the F-35A is "nuclear-capable."	A6-12
13) Why not build the 3rd runway at Boise Airport?	A6-12
14) Wildlife	A6-12
a. General concern for noise impacts to wildlife.	A6-12
b. Why were all species not included in the analysis?	A6-12
15) Irrelevant concerns not related to the F-35A proposal.	A6-13
16) Afterburner use should be modeled differently.	A6-13

Comment	Page Number
17) Decreased property values.	A6-13
18) Housing shortages would leave low-income population without a home.	A6-14
19) Why was the public meeting venue not closer to the impacted area?	A6-14
20) Land use issues.	A6-14
21) Why do flight paths occur over populated areas?	A6-14
22) Noise Mitigation	A6-15
a. Noise mitigation needs to be explained in more detail.	A6-15
b. How will promised mitigation be tracked to ensure it's accomplished?	A6-15
c. Housing near the proposed 65 dB noise contour line is not eligible for sound mitigation funding.	A6-15
23) Bring the F-35A here so we can hear what it will sound like.	A6-15
24) Hazardous Wastes and Materials	A6-16
a. General concerns about hazardous wastes and materials being used.	A6-16
b. Concerns about perfluorooctane sulfonate (PFOS)/perfluorooctanoic acid (PFOA).	A6-16
25) Cumulative impact concerns.	A6-17
26) Flight path concerns and suggestion that ANG fly at different airfields.	A6-17
27) Why wasn't I notified about the public meeting?	A6-17
28) Why is the 2019 EIS different than the 2012 EIS (Boise, Jacksonville)?	A6-17
29) Add other/more points of interest (POIs) in the noise analysis.	A6-17
30) Concerns about special needs persons (Post-traumatic Stress Disorder [PTSD], autism).	A6-18
31) ANG should comply with Federal Aviation Administration (FAA) noise standards for commercial/civilian aircraft.	A6-18
32) L_{max} table should be included to facilitate comparison to 2012 EIS.	A6-19
33) Water quality concerns.	A6-19
34) Concerns/questions about a wide range of impacts.	A6-19
35) When will the alert mission (Madison) be flown by the F-35A?	A6-19
36) Wetlands concerns.	A6-19
a) General concerns about impacts to wetlands.	A6-19
b) EIS should discuss how sequencing established by the Clean Water Act Section 404(b)(1) guidelines was applied.	A6-19
37) Please hold more public meetings.	A6-19
38) Are transient aircraft (non-based) included in the noise analysis?	A6-20
39) Will the F-35A jettison fuel?	A6-20
40) Please extend the comment period.	A6-20
41) The EIS (and/or other associated documents) needs to be translated into Spanish and Hmong.	A6-20
42) Infrastructure general comments.	A6-20
43) Airspace concerns.	A6-20
a. The EIS must include anticipated changes to SUA.	A6-20
b. Increased flight time must result in impacts in the SUA.	A6-21
44) Additional noise concerns.	A6-21
a. Medical professionals should have been consulted.	A6-21
b. Concerns about noise metrics used in the analysis.	A6-22
c. Use of DNL for speech interference is inappropriate.	A6-22
d. Use of SUA in Michigan needs to be updated.	A6-22

Comment	Page Number
e. Will ANG comply with Air Force Instruction (AFI) 48-127 to protect hearing damage?	A6-23
f. Will altitudes and power settings be restricted to prevent >87 dB on the ground?	A6-23
g. Will the EIS address high onset rate of overflights?	A6-23
45) ANG and United States (U.S.) Air Force (USAF) need to respond to elected officials respectfully and promptly.	A6-23
46) Having the F-35A based locally would make the community vulnerable to terrorist attack.	A6-23
47) How is significance determined?	A6-23
48) Please send me files associated with the EIS.	A6-24
49) Errors identified and corrected.	A6-24
50) The EIS lacks adequate scientific information.	A6-24
51) The EIS should be revised to present the alternatives in order of potential impacts.	A6-24
52) Concerns regarding impacts to cultural resources.	A6-24
53) Request to add pollinator habitat.	A6-25
54) Concern that EIS did not include all agency consultation.	A6-25

Comment #1) Commenters asked to be added to the mailing list and to receive documents/information on the Proposed Action.

Response: Commenters were added to the project mailing list, as requested. Please note that the EIS and all documents incorporated by reference were made available throughout the EIS process via the project website at: www.angf35eis.com. Furthermore, the USAF identified the U.S. Postal Service and email addresses as follows: a) F-35A EIS Project Manager, NGB/A4AM, Shepperd Hall, 3501 Fetchet Avenue, Joint Base Andrews MD 20762-5157 and b) usaf.jbanafw.ngb-a4.mbx.a4anepacomments@mail.mil.

Comment #2) The commenter was either a proponent, opponent, or other non-substantive comment.

Response: Thank you for your interest in this process and for taking the time to provide your comment.

Comment #3a) Commenters asked general questions about the details of the Proposed Action and/or Purpose and Need, which can be found in the EIS (e.g., how many aircraft would come? How many operations would be flown?).

Response: EIS Chapter 2 and Chapter 4, Section 2 of the installation-specific sections described the Proposed Action and alternatives, including the No Action Alternative. The USAF proposes to beddown 18 F-35A aircraft at two of five alternative locations. The alternatives included: 115th Fighter Wing (115 FW) at Dane County Regional Airport in Madison, Wisconsin; 124th Fighter Wing (124 FW) at Boise Airport in Boise, Idaho; 125th Fighter Wing (125 FW) at Jacksonville International Airport in Jacksonville, Florida; 127th Wing (127 WG) at Selfridge Air National Guard Base (ANGB) in Harrison Township, Michigan; and 187th Fighter Wing (187 FW) at Montgomery Regional Airport in Montgomery, Alabama. For details on the purpose and need of the Proposed Action, see EIS Chapter 1, Section 1.2.

Comment #3b) Commenters asked how the five alternatives and two preferred alternatives were selected.

Response: As discussed in the EIS (Section 2.3.1) and pursuant to Air Force Instruction 10-503, based on extensive analysis by the NGB and USAF operations communities, a study was conducted to determine the

specific requirements for beddown of the F-35A aircraft and to identify potential military installations where this beddown could occur. Following this study, the Secretary of the Air Force (SECAF) and the Chief of Staff of the Air Force approved selection criteria for the F-35A beddown. The initial screening yielded a defined enterprise of 18 alternative installations to be evaluated for the 5th and 6th Operational Beddowns. NGB presented objective screening criteria to the Strategic Basing Executive Steering Group to be used in the identification of installations for the beddown of the F-35A. The approved criteria were used to screen the enterprise of 18 alternative installations to identify those installations' capacity to successfully support the F-35A mission. The objective criteria included mission, capacity, environmental considerations, and cost.

As discussed in the EIS (Section 2.3.2), the SECAF announced the two preferred alternatives for the 5th and 6th F-35A Operational Beddown as the: 115 FW at Dane County Regional Airport, Madison, Wisconsin; and 187 FW at Montgomery Regional Airport, Montgomery, Alabama. Identification of the preferred alternatives is not the final decision. The USAF will make the final basing decisions after the EIS is complete. The final decision will be reflected in a Record of Decision (ROD), anticipated to be signed in March of 2020.

Public involvement in this process occurred in two ways. First, Congress was notified during key steps in the basing process. Second, the public at large was invited to provide input to and comment on the scope of the EIS and the content of the Draft EIS. In this latter phase, the public could comment on all aspects of the Draft EIS to include alternatives selection and potential mitigation measures.

Comment #3c) Commenters asked what would happen to the legacy aircraft if the F-35A were beddown at any of these locations.

Response: As discussed in the EIS (Sections 1.1 and 1.2), the F-35A would replace existing F-15, F-16, or A-10 aircraft. If an A-10 installation were selected, then the existing A-10s would be kept in the USAF inventory to be redistributed as needed. If an F-16 or F-15 installation were selected, those aircraft would be evaluated for redistribution or removed from the USAF inventory on a case-by-case basis based on aircraft condition.

Comment #3d) Commenters inquired as to what would happen to the Fighter Wing if the F-35A does not come.

Response: As stated in the EIS (Section 2.3.5), under the No Action Alternative, no F-35A operational aircraft would be based, no F-35A personnel changes or construction would be performed, an increase in Active Duty Associate Unit would not occur due to this action, and no training activities by F-35A operational aircraft would be conducted in the airspace. Under the No Action Alternative, the NGB would continue to conduct their current mission using existing, legacy aircraft with multiple configurations. If a future mission conversion were to occur, that conversion would be the subject of subsequent National Environmental Policy Act (NEPA) analysis.

Comment #4a) Commenters raised general comments about noise (e.g., complaints about noise, claims that the analysis was inadequate, etc.).

Response: The EIS was written consistent with USAF policy for evaluating noise impacts. In the EIS, the Air National Guard (ANG) conducted a detailed noise analysis for each of the affected locations and determined that impacts from aircraft noise near the airfield would be considered significant in some locations. The noise analysis is located in Chapter 4, Section 3.1 in the installation-specific sections of the EIS. Other documents related to the noise analysis were located on the project website

http://www.angf35eis.com/DocumentsRef.aspx, and included noise studies for each of the five alternative locations, as well as a noise appendix to the Pacific Operational Beddown EIS, which contained extensive background information on noise analyses (including impacts to structures from vibration, nonauditory human health impacts, wildlife impacts, etc.): http://www.angf35eis.com/Resources/Documents/F-35A_Operational_Beddown-Pacific_Final_EIS_Feb_Appendix_E.pdf. Specifically, noise-induced vibration effects on structures and humans could be found in the Appendix Section E.2.10. This entire Pacific Ops Appendix E (which was previously incorporated by reference in the Draft EIS) has been brought into Appendix B of this EIS for easy access by the reader.

Comment #4b) Commenters were concerned that "incompatible" meant "uninhabitable," and were concerned that they would have to move out of their homes.

Response: The land use compatibility table (Table 3.6-1) used by the Federal Aviation Administration (FAA) and USAF is not meant to determine the acceptability or unacceptability of a land use. Nor is it used to determine if a structure is habitable or uninhabitable. Combined with the land use table, Day-Night Average Sound Level (DNL) provides one factor for local communities to use in predicting the success and cost of new development. Noise from outside noise sources, such as aircraft overflights and other transportation noise, can interfere with day-to-day activities. The activities of some land uses are more noise-tolerant than others, and this is the basis of the compatibility guidance. However, all the factors affecting land use decisions must be assessed based on their cost and technological feasibility and the needs and desires of each particular community. As indicated in the notes for Table 3.6-1, residential areas, except mobile home parks, located in areas below 75 decibels (dB) DNL are conditionally-compatible when an outdoor to indoor noise level reduction of 25-30 dB is provided by the structure. (Mobile homes are excepted because the walls and roof cannot accommodate that much sound insulation.) As summarized in Table 2.4-1, no residential structures are located in areas where the DNL exceeds 75 dB at any of the installations. While not considered compatible, existing mobile home parks at some of the installations are located in areas where the DNL is currently above 65 dB. People continue to reside there; while the noise levels in these areas could increase, the noise would not be expected to make the homes uninhabitable. The noise may impact some activities. For example, momentary speech interference could be expected. This is similar to other environmental conditions. Extreme cold suggests that housing is incompatible above the Arctic Circle, but people live there by adapting their homes to the environment. Text has been added to the EIS (Chapter 3 and land use analysis for all five installations) clarifying this issue.

Comment #4c) Commenters asked if any schools would be closed as a result of the F-35A beddown.

Response: The USAF does not anticipate it would be necessary to close any schools as a result of its basing decision. Interference with classroom speech is expected to remain the same or increase by no more than one event per hour at any school under any of the alternatives (EIS Chapter 4, Section 3.1 of the installation-specific sections). It is important to note also that structures, including school buildings, could be insulated from distracting, exterior noise. Such mitigation may be available from the FAA's noise mitigation programs and other sources (EIS Section 2.6). The EIS (Chapter 4, each installation-specific Section 3.7.1.2) has been modified to explain that the USAF does not plan to close any schools or purchase any homes or businesses as a result of the basing decisions.

Comment #4d) Commenters suggested that the USAF should include the 55 and 60 dB noise contours in the analysis.

Response: The EIS was written consistent with USAF policy for evaluating noise impacts and does not include impacts below the 65 dB DNL contours. Additionally, the federal government considers 65 dB to be an acceptable level of outdoor noise exposure.

Comment #4e) Commenters mentioned that they do not understand why the analysis leans heavily on the DNL metric as opposed to Maximum Sound Level (L_{max}).

Response: The EIS was written consistent with USAF policy for evaluating noise impacts. As discussed in the EIS (Section 3.2.2), DNL was included per Department of Defense (DoD) guidelines. It is also a well-accepted predictor of annoyance used by the FAA and U.S. Environmental Protection Agency (USEPA), along with various other agencies, for impact analysis. DNL is time averaged over a 24-hour period and includes all noise events, so it is a very good metric for comparing the impacts at multiple sites. DNL is the only metric that specifically recognizes the importance of noise that occurs at night and heavily penalizes it. The 24-hour timeframe (based on Annual Average Day operations) makes DNL the best metric for judging chronic exposure such as neighbors in host communities experience. For all these reasons, DNL is considered the most useful, appropriate, and fair general metric.

L_{max} is the greatest sound level measured during a single noise event (typically lasting 1/10 of a second only). It can be very loud, but like a gunshot or a backfiring lawnmower, the sound is typically gone before the observer identifies the source. L_{max}'s usefulness as an impact metric or a predictor of annoyance is therefore limited. Sound Exposure Level (SEL), presented in the EIS, is a better descriptor than L_{max} in this type of analysis. SEL is integrated over a single noise event. It includes the building and then receding of the sound (duration) as well as the peak (L_{max}). This is more appropriate to describe the sound that a vehicle in motion makes. For example, a firecracker's bang for a tenth second at an L_{max} of 100 dB is likely not as impactful as a dump truck accelerating up a hill from a stop sign lasting many minutes at an L_{max} of 90 dB. In addition, the sound from aircraft overflights typically lasts more than 1 second, so the SEL is usually greater than the L_{max}. As described in Sections 3.2.3.2 and 3.2.3.3, SEL events have been provided in addition to DNL at noise-sensitive locations. L_{max} has been included for those locations to determine the potential for Residential and Classroom Speech Interference.

Comment #4f) Commenters asked if the noise model accounts for topographic features (i.e., water, hills) and weather conditions?

Response: Yes, the noise model accounted for local weather and topographic features such as hills and valleys. The model also considered ground cover because vegetation and soft soil tend to absorb sound energy at higher rates than paved surfaces and bodies of water.

Comment #4g) Commenters mentioned that they believe the EIS analyzed too many annual home station sorties (3,061), and if the historical number of sorties had been analyzed, there would be a reduction in the number of people affected by noise. Commenters also questioned whether use of the simulator would reduce actual flying time, and thus the noise footprint.

Response: The 3,061 home station sorties were based on the USAF prescribed Ready Aircrew Program (RAP) requirements. The EIS (Table 2.2-2) reflected the increase in home station air operations for the initial F-35A qualification training required for ANG pilots. After the ANG pilots are qualified in the F-35A, which is expected to take several years, and begin deployments and off-station training, air operations could be expected to be reduced to a level closer to historical home station operations, with a commensurate reduction in noise impacts. Though the flight simulator would be used extensively by the ANG pilots, that training is in addition to the 3,061 sorties that would be expected to be flown annually. This information has been added to Section 2.2.1.2 of the Final EIS.

Comment #4h) Commenters mentioned that they believe that increased noise would have detrimental impacts to human health.

Response: Research continually refines our understanding of the effects of any pollutant or stressor on the human body. The studies to date continue to support the conclusion that permanent, physical harm for most people comes from chronic exposure to extreme noise. As discussed in the EIS (Section 3.2.3.7), the DoD uses National Institute for Occupational Safety and Health (NIOSH) criteria screening for partial hearing loss risk by determining if any residences would be exposed to 80 dB DNL or greater (working lifetime of 40 years with exposure lasting 8 hours per day for 5 days per week). The intermittency of aircraft noise, even during closed pattern training exercises, makes the risk much lower than that expected to harm nearly all people.

Studies have been performed to see whether noise can cause health effects other than hearing loss. The current state of scientific knowledge cannot yet support inference of a causal or consistent relationship between aircraft noise exposure and non-auditory health consequences for exposed residents. It is not yet possible to establish a quantitative cause and effect based on the currently available scientific evidence. Also see: Draft EIS Appendix E, *Noise Modeling, Methodology, and Effects*, of the USAF F-35A Operational Beddown Pacific Final Environmental Impact Statement, which was incorporated by reference (available on the project website http://www.angf35eis.com/) and has since been incorporated into the Final EIS Appendix B for easy access by the reader).

Comment #4i) Commenters asked what protections/mitigation are provided for people who may spend part of the day outdoors or with windows open, and thereby be affected by the increased noise levels. Similarly, what protections are there for people who may be waiting for gate-checked baggage on the tarmac when an F-35A takes off, and/or workers at the airfield?

Response: Permanent, physical harm from noise only occurs with extreme, chronic exposure. As discussed in the EIS (Chapter 3, Section 3.2.3), populations exposed to noise greater than 80 dB DNL are at the greatest risk of permanent hearing loss. Passengers and visitors to the airport will have no ill effects from casual, transient exposure.

There are some concerns for workers. The USEPA's Guidelines for Noise Impact Analysis quantifies hearing loss risk in terms of Noise-Induced Permanent Threshold Shift (NIPTS). NIPTS defines the permanent change in the threshold level below which a sound cannot be heard. NIPTS is stated in terms of the average threshold shift at several frequencies that can be expected from daily exposure to noise over a normal working lifetime of 40 years, with exposure lasting 8 hours per day for 5 days per week. In response, workers in high-noise areas are required to wear hearing protection.

Comment #4j) Commenter indicated that Truax Park and Webb/Rethke Townhomes were located on the border of the 65 dB noise contour and suggested that these residences should be included in the analysis.

Response: These locations are outside the anticipated 65 dB contour and therefore would not have been included in those calculations.

Comment #4k) Commenters raised concerns about impacts from sonic booms and requested information on how large of a land area would be impacted by the sonic boom footprint from an F-35A supersonic flight.

Response: All supersonic flight would occur within existing airspace above existing DoD ranges and at altitudes previously approved for such activities. Communities in proximity to the airport will not experience sonic booms. Chapter 4, Installation-Specific Section 2.2.1 Airspace Use and Chapter 4, Installation-Specific Section 3.1.2.2 includes details on the location and frequency of supersonic flights.

NGB anticipates that time spent in air-to-air combat training would involve supersonic flight for a maximum of 2 to 3 minutes per sortie.

The land area affected by a sonic boom is dependent on the altitude of the flight. The air pressure forms a cone from the nose of the plane and extends to the ground along the flight path.

Comment #4l) The EIS should include noise contour maps for the Special Use Airspace (SUA).

Response: Onset-Rate Adjusted Day-Night Average Sound Level (L_{dnmr}) noise levels in the SUA environment are discussed in Chapter 4, Installation-Specific Section 3.1.2.2 of the EIS. The presentation of noise contours are reserved for the airfield and range environments where the L_{dn} (DNL) reaches 65 dB, the level where land use planning recommendations begin to trigger incompatible land uses and the potential for effects on other resources (such as sleep interference, cognizance, etc.). Although L_{dn} (DNL) at and below 60 dB could trigger an increase in annoyance levels, other effects would not be measurable; therefore, it is more meaningful to use single event metrics such as SEL and L_{max} to describe the potential consequences of changes to the noise environment.

Comment #5a) Commenters raised questions about the Air Quality analysis (e.g., you need to evaluate all emissions associated with the F-35A).

Response: As discussed in the EIS (Chapter 4, installation-specific Section 3.3, and Appendix B), the ANG conducted a detailed analysis of the air quality impacts from the Proposed Action and determined that impacts from the Proposed Action would not exceed regulatory thresholds and therefore would not be significant. The air quality analyses considered all potential emissions from the proposed F-35A operations including construction and aircraft operations.

Comment #5b) Commenters suggested that the EIS is deficient because it did not address Wisconsin Natural Resources (NR) 445 "Control of Hazardous Pollutants."

Response: Wisconsin NR 445, "Control of Hazardous Pollutants" only applies to stationary sources. The Proposed Action involves air emissions primarily from mobile sources. The EIS (Section 3.4.1.2) indicated that "Hazardous Air Pollutants (HAPs) would not create significant or adverse health risks to humans living adjacent to airfields or underneath airspace in which aircraft operate, and are not further evaluated in the analysis." Therefore, the EIS does not address Wisconsin NR 445.

Comment #6a) Commenters raised several general questions about the Environmental Justice analysis (e.g., concerns about minority, low income, and/or children).

Response: The USAF identified and addressed, to extent practicable, disproportionately high and adverse human health or environmental effects of its activities on minority populations and low-income populations based on the Council on Environmental Quality (CEQ) "Environmental Justice Guidance Under NEPA," December 10, 1997. In the EIS (Chapter 4 Sections 3.1 and 3.7 of the installation-specific chapters), the ANG conducted a detailed analysis of the noise impacts from the Proposed Action to low-income and minority populations, and determined that impacts from aircraft noise near the airfield would be considered significant in some locations. The methodology used for the analysis of Environmental Justice and the Protection of Children is located in Chapter 3.8.

Comment #6b) Commenters mentioned the use of thresholds of 20 percent poverty and 50 percent minority being inappropriate. They also mentioned that the City of Madison conducted their own analysis, which demonstrated significant disproportionate impacts.

Response: In the EIS (Chapter 3, Section 3.8.2), the 20 percent and 50 percent methodology used is from the CEQ guidance (Environmental Justice Guidance Under NEPA, December 10, 1997). Furthermore, the analysis in the EIS is consistent with the City of Madison's determination that there are disproportionate impacts. Groupings of sensitive receptors or areas of high concentration of minority population would not change the significance findings of the EIS, which adequately inform the USAF decision maker of potential impacts.

Comment #6c) Commenters also mentioned that poverty and persons of color occur just outside of the 65 dB DNL contour line at CDA Truax housing, CDA Webb-Rethke townhomes, and other housing near Worthington Park, and near the intersection of Packers Avenue and Northport Drive that might be ineligible for sound attenuation assistance.

Response: Eligibility for sound attenuation is determined by FAA guidance. Such determinations are outside of the scope of the proposed USAF action and outside of the USAF's control (see response to comment #22c).

Comment #6d) Were consultations with the U.S. Department of Housing and Urban Development (HUD) performed?

Response: HUD has no jurisdiction by law over the Proposed Action. However, data from HUD on the location of Public Housing Developments and Public Housing Buildings was used to analyze whether any of these locations were within the proposed 65 dB DNL noise contour. According to this data from HUD, none of these public housing locations are located under the proposed 65 dB DNL or greater noise contour for any of the five installations.

Comment #7a) Comments were received about the selection criteria and alternatives analyzed (e.g., how were the alternatives narrowed down to five; why can't these aircraft go to an Air Force base (AFB)?).

Response: The EIS (Section 2.3) described the alternative identification process.

Comment #7b) Commenters asked how the five candidate locations were selected if, as stated in Section 2.3.1 of the EIS, the alternatives should "…have an absence or limited amount of noise-sensitive development located in areas near the airport/installation that are exposed to DNL at and above 65 dB and considered by the FAA and DoD as incompatible land uses."

Response: As discussed in the EIS (Section 2.3.2), the candidate bases were selected by the SECAF based on the location's ability to meet mission, capacity, environmental, and cost criteria. Site surveys were used to assess each candidate base individually using the site survey criteria. The site surveys only identified broad existing environmental constraints. Since that time, the analysis in this EIS has more fully described potential impacts.

Comment #7c) Commenters asked why the F-35A has to be at any ANG installation, particularly given that these installations are located at commercial airfields.

Response: As discussed in the EIS, Section 1.1, the ANG's federal mission is to maintain well-trained, well-equipped units available for prompt mobilization during wartime, and to provide assistance during national emergencies. As such, the ANG must acquire and train with the current USAF aircraft, including the F-35A.

Comment #7d) Commenters suggested that the EIS should explain how Environmental Justice and children's health impacts were considered when identifying the preferred alternatives.

Response: As discussed in Sections 2.3.1 and 2.3.2 of the EIS, application of the screening criteria resulted in an enterprise of 18 alternative installations, which yielded a clear break in scoring with the five alternative installations carried forward for detailed analysis in the EIS. The screening criteria involved considerations of mission, capacity, cost, and environmental factors. The two alternatives that have been initially identified as the preferred alternatives for Operational Beddowns 5 and 6 were identified by the SECAF in December 2017, as best meeting the needs of the USAF based primarily on operational and cost factors. The analysis conducted in the EIS had not yet been accomplished; Environmental Justice and children's health were not and are not required to be considered in the identification of the preferred alternatives.

Comment #8) Commenters expressed a general concern for domestic animals and/or pets (e.g., my dog cowers when a fighter jet flies over; my goats will not reproduce due to aircraft noise).

Response: Potential impacts to domestic animals and/or pets were discussed in the EIS (Chapter 3, Section 3.2.1.3, and Appendix E).

Comment #9a) Commenters expressed a general concern for safety issues related to the F-35A and/or military flights at commercial airfields (e.g., concerns about the safety record of the F-35A; what happens if this jet crashes in my neighborhood?).

Response: As discussed in the EIS (Section 3.3.4 of the installation-specific sections), the ANG conducted a detailed analysis of safety, including fire/crash response, accident potential zones/runway protections zones, explosive safety, and anti-terrorism/force protection.

Comment #9b) Commenters raised concerns that student pilots would be flying F-35A aircraft at the local airfields.

Response: All ANG pilots who fly the F-35A at operational bases are fully qualified in the aircraft and are not students. They all have graduated from an F-35A Formal Training Course (at Luke AFB or Eglin AFB) and have completed a USAF/FAA-compliant flight evaluation in the aircraft. Most ANG pilots are highly experienced aviators who have spent years flying high-performance fighter aircraft. As discussed in the EIS (Chapter 4, Section 3.4.1 of the installation-specific sections), impacts to safety from the proposed beddown of the F-35A aircraft would not be significant.

Comment #9c) Commenters were concerned about the stealth coating on the F-35A. Some were concerned about the material in the event of a crash, and some were concerned with basic maintenance of the material on the planes.

Response: The EIS discussed (Chapter 4, Section 3.4.2.2 of the airspace portion of the installation-specific sections) the stealth coating and concerns regarding its characteristics in a crash event. This discussion has been brought into the installation section of Safety as well. The installations would keep local firefighting departments informed about any new information or firefighting techniques associated with composite materials should an accident occur. The only maintenance of the stealth coating (e.g., low observable material) that would be accomplished at the base would be done using a brush or roller to apply coatings, bonding materials, or applying tape. Depot-level maintenance of the low observable material (including spray capability) would be conducted off-site, and therefore the composite material for major repairs to the low observable material would not be stored on base. This has been added to the EIS.

Comment #10) Commenters raised concerns about socioeconomics (e.g., the ANG does not provide much economic input to the community; the proposed number of additional personnel will not justify the impacts).

Response: The ANG conducted a detailed analysis of socioeconomics, including population, housing, employment, and income in Chapter 4, Section 3.6 in the installation-specific sections of the EIS, which provides specific analysis on potential economic input from temporary construction jobs and salaries from additional personnel.

Comment #11) Commenters were concerned about manufactured home communities located within the 65 dB and greater noise contours. With the current shortage of affordable housing in their areas, they are concerned that this would affect the lives of many disadvantaged people.

Response: The 65 dB DNL metric is used by federal agencies, including the USAF and FAA, to determine compatibility of military aircraft operations with local land use. Residential land use, including mobile home parks, is considered compatible with noise levels of <65 dB DNL, and therefore nobody would be displaced from these mobile home communities. One commenter in particular from Boise was concerned about her mobile home community within the South Eisenman Neighborhood being located in the noise contours. Though this community is located near the airport and underneath aircraft flight tracks, it is located outside the 65 dB DNL noise contours both currently and under the Proposed Action.

Comment #12) Commenters expressed concern that the F-35A is nuclear-capable and the community would not want nuclear weapons at their airfield.

Response: The F-35A Block 3F aircraft is not "nuclear-capable"; therefore, the F-35A aircraft that would be based at any of these five alternative locations would not have the hardware necessary for a nuclear mission. Currently, there are no plans to add the hardware necessary to make these F-35A aircraft nuclear-capable. Only units with a nuclear mission are provided the hardware necessary to carry nuclear weapons; therefore, because none of these five alternatives have a nuclear mission, should any of the aircraft associated with this F-35A beddown ever be fitted with Block 4 upgrades, they still would not be nuclear-capable. This has been added to the EIS Chapter 2.

Comment #13) Commenters raised concern about a third runway at Boise Airport; and wondered why it is not a part of this proposal? That would move the impacts south and away from many of the homes and businesses that could be affected.

Response: Though there has been discussion historically of a third runway at the Boise Airport, and it was listed in the Airport Master Plan as something that could occur, there is no concrete proposal for this runway at the time this EIS was developed (nor since). Should that runway ever be constructed, it is conceivable that the 124 FW could utilize that runway and thereby reduce impacts.

Comment #14a) Commenters expressed a general concern for wildlife (endangered species, birds, etc.) as a result of the F-35A operations.

Response: Reference Chapter 3, Section 3.2.1.3 Wildlife and Domesticated Animals Noise Effects. Also see: Appendix E, Noise Modeling, Methodology, and Effects, of the USAF F-35A Operational Beddown Pacific Final Environmental Impact Statement, which is incorporated by reference (available on the project website http://www.angf35eis.com/) and has also been incorporated into the Final EIS. Studies recommended by commenters were reviewed for applicability.

Comment #14b) Commenters suggested that the EIS is deficient because it did not list all species that could occur in the vicinity of the airfield and/or the Special Use Airspace (SUA) that would be used by the F-35A aircraft.

Response: As discussed in the EIS (Section 3.11 of the installation-specific sections), all federally listed species that have the potential to occur in the area(s) were analyzed in detail. Please note that the non-federally listed species discussed within the installation and/or airspace sections is not an exhaustive list of all species that might be found within the geographic region, but rather a representative list.

Comment #15) Commenters identified concerns with actions that are out of scope for the proposed F-35A beddown for ANG, such as the Mountain Home Airspace EIS, the Mountain Home Urban Close Air Support action, or the Law of War.

Response: Thank you for your interest in this process, and for taking the time to provide your comment. However, this comment is regarding an unrelated issue that is not relevant to the F-35A beddown.

Comment #16) Commenters questioned whether 5 percent afterburner use is reasonable – because F-35A aircraft at other locations are using a far higher percentage; there were requests to model afterburner at 5, 10, 15, 20, etc., percent.

Response: As addressed in the EIS (Section 2.2.1.2), use of afterburner by the F-35A aircraft at all five of these alternative locations has been modeled for 5 percent of take-offs. Due to the immense thrust provided by the F-35A engine, there would be little to no expected requirement for its use. Even though there is no anticipated requirement for afterburner use, it has been included at 5 percent in the noise model to provide a conservative estimate of potential noise impacts. The USAF will not be modeling additional levels of afterburner use for this EIS.

The RAP for the F-35A does not require afterburner use for take-off. As addressed in the EIS (Section 2.2.1.2), use of afterburner, in the take-off phase of flight, is dictated by the F-35A Joint Technical Data (JTD) and Air Force Manual (AFMAN) 11-2F-35A Vol 3. Based on airfield temperature, pressure altitude, winds, aircraft weight/configuration (drag), and runway length, the JTD will give pilots all the parameters for take-off based on the selected power setting, military or afterburner. This is called aircraft Take-off and Landing Data (TOLD). The parameters include take-off distance, abort speed, rotation speed, take-off speed, acceleration check speed, etc. Based on this, the F-35A JTD and associated AFMANs do not require afterburner take-off under normal training loads and atmospheric conditions at the currently proposed Ops 5 and 6 F-35A bases.

Comment # 17) Commenters raised concerns about potential decreases in property values near the airfield; and potential for businesses to leave the area and a resulting decreased tax base.

Response: Property values are a function of many different variables, including noise levels. The issue of the negative effect of airport noise on property values has been widely researched. The property value to noise effects relationship is presented in the form of the Noise Depreciation Index (NDI), which reflects the estimated percent loss of property value per dB DNL. A review of several relevant studies concluded that noise may affect property values and related taxes in a NDI range of 0.2 to 2.0 percent per dB of noise increase, which correlates to an average loss of 0.5 percent of the property value per dB. The value of the property is determined based on many individual variables, which when taken together, form the total price and requires detailed information on local housing markets and actual sales prices. Furthermore, price property value studies model relationships between city level income and population data, and the overall willingness to pay for noise abatement, which enables an estimate of noise impacts in locations where detailed housing data is not available. The cost of noise mitigation is less of a factor in regions that experience extreme temperatures. Many structural elements designed to improve energy conservation also improve the acoustic performance of homes. The way properties are used in hot or cold environs (such as not opening windows for ventilation) can add as much as 15 dB of noise attenuation.

Information regarding potential impacts to property values and taxes has been added to Chapter 4, Section 3.6.1.1 in each installation-specific section of the EIS as well as Appendix B in the Final EIS.

Comment #18) Commenters expressed a concern that some of these communities have affordable housing shortages and there is nowhere for people to go if they move from the noise impacted areas. There were additional concerns that the communities cannot support the new ANG families due to the housing shortages.

Response: Some people may perceive that any increase in noise is unacceptable. That is a personal decision, which may prompt them to relocate their residence. Overall, noise would not impact the availability of housing in the market as noise levels would not be expected to make any houses uninhabitable (see response to Comment 4b). In addition, there would less than or equal to 85 new personnel as a result of the Proposed Action, which would be a negligible impact on the housing market in any of these communities.

Comment #19) Commenters at Madison and Boise were concerned that the public meeting venue was not located near the impacted area; therefore, some impacted communities were unable to attend the meeting.

Response: The USAF made every attempt to find the best possible venue as close to the impacted area as possible. Because it was apparent that there would be a large turnout at both the Madison and Boise meetings, the USAF had to seek fairly large venues that could comfortably accommodate the anticipated crowds. There were no venues closer to the airports that had availability at any time during the public comment period. Venues for both of these meetings were within a 4 to 8 mile drive of the airfield (Boise and Madison, respectively). This information has been added into the public involvement section of the Final EIS.

Comment #20) Commenters expressed concern about general land use issues (e.g., the land use map is incorrect; there are residential areas surrounding the airport).

Response: The ANG conducted a detailed analysis of the potential impacts to land use, including compatibility of various land uses with certain levels of expected noise. This discussion of land use compatibility and methodology can be found in Section 3.6 of the EIS, and the analysis is located in Chapter 4, Section 3.6 (i.e., WI3.6, ID3.6, FL3.6, MI3.6, and AL3.6) in the installation-specific sections of the EIS, as well as Appendix E, Noise Modeling, Methodology, and Effects, of the USAF F-35A Operational Beddown Pacific Final Environmental Impact Statement, which is incorporated by reference (available on the project website http://www.angf35eis.com/) and has also been incorporated into the Final EIS, Appendix B for more convenient access.

Comment #21) Commenters wondered why current and proposed flights need to approach and take off over such a populated area as opposed to northerly approach. Why do flights circle and dip repeatedly over the city?

Response: Each of the five alternative ANG locations for the F-35A beddown currently implement any procedures they can to minimize impacts to noise-sensitive receptors. Aircraft take-offs and landings are largely dictated by the prevailing winds at the time of the operation. Further, local pattern operations (circle and dip, as the commenter mentions) are similarly limited by local operational restrictions, and depending on the location, are infrequent. Depending on the circumstance, it could be in a single case of a pilot not being able to safely land in a particular condition (wind, weather, etc.) and needed to circle for another landing. In other instances, it allows for multiple aircraft to arrive in a short period of time and all safely land (avoiding conflicts between them, nor requiring radar control for safe separation).

Comment #22a) Commenters suggested that noise mitigation needs to be more detailed and specific in the EIS.

Response: As discussed in the EIS (Chapter 4, Section 3.1 of the installation-specific sections), the ANG conducted a detailed analysis of the noise impacts from the Proposed Action and determined that impacts from aircraft noise near the airfield would be considered significant in some locations. Potential mitigation for noise impacts is discussed in Chapter 4, Section 3.1.3 in the installation-specific sections of the EIS. Further, the USAF will prepare a formal mitigation plan for the two selected installations following signature of the ROD. No public outreach to schools within the impacted areas has been accomplished beyond that described in Section 1.6 of the EIS. The USAF and FAA will consider conducting outreach to the impacted schools as a part of the mitigation plan development process. Further, mitigation for pre-existing incompatible land uses associated with noise could be addressed during a FAA Part 150 Study update.

Comment #22b) Commenters asked about how the USAF will track the mitigations that the ANG and FAA sign up to.

Response: When the Mitigation and Monitoring Plan is developed, it will include metrics to track and monitor those activities that are identified to minimize the impacts. These could include afterburner usage, flight tracks, number of operations, etc. Mitigations will be identified in the ROD and the Mitigation and Monitoring Plan will identify who is responsible for implementing specific mitigation procedures, who is responsible for funding them, and who is responsible for tracking these measures to ensure compliance. This information has been added to Chapter 4 of each installation-specific Section 3.1.3 of the Final EIS.

Comment #22c) Commenters noted that there is housing near the proposed 65 dB noise contour line and they will not be eligible for sound mitigation funding through the noise compatibility program. They also noted that these residences would experience virtually the same noise impacts as those located within the 65 dB noise contour.

Response: The USAF does not have authority to expend appropriated funds on facilities that are not under the direct control of the USAF. However, the FAA has a program that addresses noise and compatible land use near airports. Title 14, Code of Federal Regulations (CFR), Part 150 – *Airport Noise Compatibility Planning*, the implementing regulations of the *Aviation Safety and Noise Abatement Act of 1979*, as amended, provides a voluntary process an airport sponsor can use to mitigate significant noise impacts from airport users. It is important to note that the Part 150 program is not a guarantee that sound mitigation or abatement will take place. Airport Improvement Program requires that the impacted property is located within a DNL 65 dB or higher noise contour and meet various other criteria in FAA guide documents used for sound mitigation.

Comment #23) Commenters requested that the USAF bring the F-35A to their location so they can hear what it will sound like.

Response: Transient F-35A aircraft have flown into each of the five alternative locations on multiple occasions already. Further, most installation's airshows have had F-35A aircraft participate over recent years. It was not possible to schedule these aircraft into a local area specifically for civilian interest outside of the airshows due to their ongoing training and mission requirements.

As mentioned by Acting SECAF Matthew P. Donovan in his response to Representative Pocan, "In contrast to the DNL, this would only present a momentary experience of that aircraft's noise, which would serve no evaluative purpose. Scientifically, it would not represent the actual cumulative experience over an extended

period of time, nor would it be repeatable at other bases being evaluated. The primary reason for this is that noise generated from a single event is influenced by many factors, such as wind speed and direction, air temperature, relative humidity, and take-off weight. Therefore, a single event would not reflect the requisite science, attend to the complexity and sensitivity of human hearing, and would inject subjectivity that would undermine the deliberative environmental analysis."

Comment #24a) Commenters expressed a general concern about hazardous materials and wastes.

Response: As discussed in the EIS (Chapter 4 Section 3.13 of the installation-specific sections), the ANG conducted a detailed analysis of the impacts of the Proposed Action associated with hazardous materials and wastes, and determined that there would be no new waste streams (including perfluorooctane sulfonate [PFOS]/perfluorooctanoic acid [PFOA]) associated with the F-35A aircraft). Additionally, existing contamination from previous activities is actively being investigated and in some cases remediation is ongoing. Impacts associated with hazardous materials/wastes from the Proposed Action would not be significant. See Comment #24b for more detailed information related specifically to PFOS/PFOA.

Comment #24b) Commenters suggested that the ANG cannot safely and legally perform the planned construction activities without a complete investigation that defines the extent and nature of PFOS/PFOA contamination in soil and groundwater and subsequent remediation.

Response: As described in the EIS (Section 3.13 of the installation-specific sections), each base implements an active environmental restoration program that addresses contamination at the bases. Additional details regarding PFOS/PFOA have been added to the EIS (Section 3.13 of the installation-specific sections). Existing PFOS/PFOA contamination is related to the former use of aqueous film forming foam (AFFF), a fire suppressing agent. The USAF is transitioning to an alternative firefighting foam and taking steps to reduce the opportunity for this alternative formulation to enter the environment. Transition to use of this alternative foam in the hangar systems is expected to be complete by the end of 2019, and retrofitting of the fire vehicles is 97 percent complete.

To address the potential presence of PFOS/PFOA in the environment, the USAF carefully follows the established, step-wise process set forth in the governing federal cleanup law, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), to protect human health and the environment. The U.S. Environmental Protection Agency (USEPA), which is endowed by Congress with the expertise and authority to regulate environmental contaminants, has not issued regulatory limits on PFOS/PFOA. However, USEPA has issued a 70 parts per trillion Lifetime Health Advisory level for PFOS/PFOA in drinking water. If PFOS/PFOA attributable to USAF actions is found in drinking water at levels that exceed USEPA's Lifetime Health Advisory, the USAF takes immediate action to stop human exposure by providing alternate drinking water sources.

Consistent with the CERCLA cleanup process, each of the five bases has completed a Site Investigation Report on PFOS/PFOA. If necessary, the next step in the CERCLA process would be the Remedial Investigation, which would determine the nature and extent of contamination and assess the potential risk to human health and the environment. If CERCLA's risk assessment process ultimately determines there is a need for cleanup action, federal and state cleanup standards will be evaluated under the CERCLA process to see if they are Applicable or Relevant and Appropriate Requirements at the specific site. If so, they are incorporated into the cleanup levels that must be attained at the site.

The only known potential for existing PFOS/PFOA contamination to be encountered as a result of the proposed F-35A beddown is through construction activities. As described in Section 3.13.1.2 of each of the installation- specific sections, the USAF will comply with Air Force Guidance Memorandum

(AFGM2019-32-01) *AFFF-Related Waste Management Guidance* to manage waste streams containing PFOS/PFOA (USAF 2019). The AFGM will be updated as needed to address changes in regulatory requirements, DoD determinations of risk, or development of new technologies.

Comment #25) Comments were raised relative to cumulative impacts (e.g., aren't you are already doing construction for the F-35A? I saw an Environmental Assessment about it.).

As discussed in the EIS (Chapter 4, Section 4.0 of the installation-specific sections), the ANG conducted a detailed analysis of the cumulative impacts from the Proposed Action and those other reasonably foreseeable projected activities planned for the local areas under each alternative location. These actions include those covered by other NEPA documents. The most recent Environmental Assessment for construction and demolition was for the current mission and not related to the F-35A beddown.

Comment #26) Commenters raised questions about flight path information, and questioning why the aircraft cannot fly differently at the airfield.

Response: Aircraft take-offs and landings are largely dictated by the prevailing winds at the time of the operation. Further, local pattern operations are similarly limited by local airport operational restrictions. Flight path information can be found in the installation-specific noise studies which are located on the project website at www.ANGF35EIS.com, EIS Documents tab, under Documents Incorporated by Reference.

Comment #27) Commenters asked why they were not notified about the public meeting or had other concerns about public outreach and involvement.

Response: The NGB notified the public of the release of the Draft EIS and the public meetings through a variety of means. The Notice of Availability (NOA) for the Draft EIS was published in the Federal Register on August 9, 2019. Newspaper ads were placed 2 weeks prior to each public meeting and the week of the meeting in the local newspapers. Press releases were distributed to local media organizations prior to the public meetings. Flyers were posted at local businesses near each airfield. Fact Sheets were mailed to everyone that signed up to be on the mailing list as well as all properties located within the projected 65 dB noise contours. Updates were also posted on the project website. Appendix A of the EIS provides a list of individuals on the mailing list as well as federal, state, and local agencies that were provided scoping letters and copies of the Draft EIS. This information has been added to Section 1.6.2 of the Final EIS.

Comment #28) Commenters asked why the 2019 EIS have different results than the 2012 EIS (Boise, Jacksonville).

Response: The 2012 Operational 1 EIS evaluated a different number of aircraft (18, 48, 72 for Boise; 18 and 24 for Jacksonville) and the data for that was collected 8 years ago, and therefore current civilian and military operations have changed. Each EIS attempts to use the best currently available data to present the most accurate conditions at the time.

Comment #29) Commenters suggested additional Points of Interest (POIs) to consider.

Response: POIs depicted in the noise analysis represent a cross section of nearby schools, places of worship, residential areas, and daycare centers. It was not intended to be an exhaustive list, but rather present enough geographically dispersed points that readers could locate one close to their homes or places of business, worship, etc.

Comment #30) Commenters expressed concern for special needs children/adults – autism, Post-traumatic Stress Disorder (PTSD), etc. There is a school for special needs children (Richardson School) that would be affected at Madison.

Response: PTSD is a serious, life-altering condition that can be successfully treated. The National Institute of Mental Health (NIMH) offers guidance to understand the symptoms and reactions as well as information to find treatment. NIMH has specific links on their website at https://www.nimh.nih.gov/health/topics/post-traumatic-stress-disorder-ptsd/index.shtml. PTSD affects 6-8 percent of the population. Initiating events are highly varied – from military combat and natural disasters to car accidents and assault. Given the diverse causation and success rate of individual treatment, it is unlikely that basing the F-35A at any of the alternative locations would have a significant effect on persons suffering PTSD.

Vulnerable groups (such as those who suffer autism) regarding environmental noise have been understudied, are generally underrepresented in study populations and evidence of differential effects is still highly anecdotal. As a consequence, clear effects are few and this is partly due to the lack of targeted and well-designed studies making clear comparisons between the general population and the potentially susceptible groups and quantifying these differences in terms of noise levels. Setting specific limit values to protect susceptible groups is not yet possible based on the available evidence, although some suggestions have been made in the literature. To further this field, it is necessary in future studies to present and compare subgroup-specific exposure effect relations. Generic use of the term "vulnerable groups" should be avoided as the mechanisms are quite different and maybe more important: they vary in time, place, and across contexts. Groups at risk or susceptible groups, periods or places would, in most cases, be more appropriate terms to use and are less stigmatizing than the term vulnerability. (van Kamp I, Davies H. Noise and health in vulnerable groups: A review. Noise Health [serial online] 2013 [cited 2019 Nov 14];15:153-9. Available from: http://www.noiseandhealth.org/text.asp?2013/15/64/153/112361). Information regarding impacts to special needs children/adults has been added to Appendix B in the Final EIS.

Comment #31) Commenter suggested that the ANG needs to change policy on which type of aircraft are based at urban municipal airports like Boise. Considering the FAA has maximum noise regulations for commercial and private aircraft using municipal airports, the ANG should only base aircraft that meet FAA regulations like the A-10 currently in Boise. Any military aircraft that exceeds the FAA regulations should only be based at AFBs.

Response: In addition to the financial cost-savings of the ANG utilizing joint-use airports in many cases, the ANG functions as citizen-soldier/airmen in their role of training to meet the needs of national defense. In the balance of Active Duty and Reserve Component units set by Congress, it requires the stationing of assets (to include fighters) in a training environment where ANG Airmen can be recruited. ANG units are located in/near population centers and municipal airports in order to meet recruiting requirements to accomplish the ANG mission, which would not be feasible in sparsely-populated areas.

Additionally, the purpose of this EIS is to analyze the environmental impacts of modernizing the existing weapon systems (i.e., from F-16, F-15, or A-10 to F-35A). Aircraft modernization, as the reasonable alternative for this EIS, had locations selected as part of an USAF Strategic Basing Process decision based on the financial efficiency of utilizing existing ANG fighter bases for the beddown of F-35A aircraft. It is outside the scope of this EIS to discuss other basing options (i.e., removal of fighter aircraft from an existing base, or establishing a new ANG installation).

Comment #32) Commenters suggested that by not including a copy of the L_{max} table used for noise modeling, no means is provided to justify the large difference in amount of land and people inside the 65 dB DNL for the current 18 aircraft scenario of the 2019 EIS and the previous 2012 EIS.

Response: Though L_{max} is discussed in the EIS, SEL and DNL are the primary metrics used in comparison of noise impacts across locations. Please see response #4e.

Comment #33) Commenters raised concerns about water quality, in particular as it relates to PFOS/PFOA contamination.

Response: As addressed in Chapter 4, Section 3.10 in the installation-specific sections of the EIS, the ANG conducted a detailed analysis of water resources. The Proposed Action would be managed in accordance with all applicable federal, state, and local regulations. Please also see comment response #24b.

Comment #34) Comments were raised about a wide range of impacts – indicating that the reader was confused about potential impacts identified (i.e., the EIS understates impacts from noise, does not evaluate impacts to air quality).

Response: The EIS included a summary of potential impacts as a result of the F-35A beddown at each of the five alternative locations can be found in Chapter 2, Section 2.4 of the EIS, or in the Executive Summary.

Comment #35) Commenters raised some questions regarding how long it will be until the alert mission changes to F-35A and operations decrease at the 115 FW.

Response: As stated in the EIS (Section 2.2.1.2), the F-16s will continue to conduct the alert mission until the F-35A aircraft are alert mission-capable, which is currently an undetermined length of time. Also refer to Comment #4g.

Comment #36a) Commenters raised some general concern about wetlands (e.g., the USAF should evaluate impacts to wetlands; Cherokee Marsh is northwest of the airport).

Response: As discussed in Chapter 4, Section 3.10 in the installation-specific sections of the EIS, the ANG conducted a detailed analysis of water resources, including wetlands. The Wisconsin DNR wetland inventory was reviewed and none of the wetlands depicted on the maps would be impacted by the proposed construction activities.

Comment #36b) Commenter stated that the EIS should discuss how sequencing established by the Clean Water Act Section 404(b)(1) guidelines was applied.

Response: The only installation that would have impacts to wetlands would be the 125 FW in Jacksonville, Florida. Mitigation sequencing would be used to mitigate impacts to jurisdictional wetlands impacted by the Proposed Action. Under the Proposed Action for the 125 FW installation, there are no practicable alternatives for the location of the proposed facilities that would impact wetlands as they must be functionally co-located with the nearby facilities, and the ANG parcel has limited property in which to move the co-located facilities. Steps would be taken, if practicable, to minimize adverse impacts to wetlands. Compensatory mitigation and federal permitting and state water quality certification, in accordance with Sections 401 and 404 of the CWA, would be necessary for any future construction activities affecting these wetlands.

Comment #37) Commenters asked if the USAF/ANG would hold another public meeting to discuss the proposal.

Response: There is no plan to have additional public meetings on the Draft EIS or the Final EIS.

Comment #38) Commenters asked whether transient (non-based) aircraft are included in the analysis.

Response: As discussed in the EIS (Chapter 4, Section 3.1.1.1 of the installation-specific sections), the noise analysis was developed based on all other aircraft activity maintaining the status quo and the ANG fighter aircraft changing from the existing fighter to the F-35A aircraft. As such, any other aircraft (i.e., transients) currently flying into each installation were calculated into both the baseline and Proposed Action noise contours.

Comment #39) Commenters asked if the F-35A would jettison fuel.

Response: The F-35A does have the capability to jettison fuel for emergency situations. The FAA set requirements for when and how fuel dumping may occur. This FAA instruction stipulates that fuel can only be dumped above a minimum altitude of 2,000 feet to improve its evaporation, and that a dumping aircraft must be separated from other air traffic by at least 5 miles. Air traffic controllers are also instructed to direct planes dumping fuel away from populated areas and over large bodies of water as much as possible. The same guidelines apply to military aircraft; air bases only permit fuel dumping in a specified area. In 2001, the USEPA National Vehicle and Fuel Emissions Laboratory concluded, "Since fuel dumping is a rare event, and the fuel would likely be dispersed over a very large area, we believe its impact to the environment would not be serious." This information has been added to the EIS in Chapter 4 within the installation-specific Sections 3.4.2 (safety within the airspace).

Comment #40) Commenters requested that the comment period be extended.

Response: The Draft EIS public comment period must be a minimum of 45 days; however, due to the timing of public meetings and the requirement for the comment period to extend at least 15 days after the last public meeting, this comment period was originally 51 days beginning on the NOA publication date on August 9, 2019 through September 27, 2019. The Draft EIS comment period was extended until November 1, 2019.

Comment #41) Commenters suggested that the document be translated into Spanish and Hmong for Madison. Why was outreach in other languages not accomplished?

Response: Within the census block groups that overlap with the 65 dB or higher noise contours, the percentage of those Spanish speakers who speak English "not at all" (approximately 1%) and of Hmong speakers who understand English "less than very well" (approximately 1%), does not justify the time and cost to translate the entire document. Further, during the scoping process, there was no indication that there was a need to translate the document or the public involvement materials into another language.

Comment #42) Commenters had concerns about infrastructure (e.g., ANG needs to develop a stormwater management plan; ANG must adhere to local stormwater management regulations).

Response: As discussed in the EIS, (Chapter 4, Section 3.8 of the installation-specific sections), the ANG conducted a detailed analysis of infrastructure, including potable water, wastewater, stormwater, electrical and natural gas systems, solid waste management, and transportation. The Proposed Action would be managed in accordance with all applicable federal, state, and local regulations.

Comment #43a) Comments about the Draft EIS stating that no SUA airspace changes are planned or anticipated. Section MI4.1 of the EIS shows major airspace changes proposed for the Alpena SUA with Anticipated Year for Implementation as NA. On September 16, 2019, Col. Southworth of the Michigan ANG presented a proposal of this plan, which shows implementation of these major changes as December

2020. This Draft EIS needs updating to reflect the current state of the SUA and the subsequent cumulative effects.

Response: The USAF has determined that no SUA changes are required for beddown of the F-35A at any of the alternative installations. If in the future the NGB chooses to make any F-35A-specific airspace or range modifications, these actions would undergo the appropriate level of environmental analysis prior to implementation. Changes to the SUA proposed by the Michigan ANG are needed to support existing missions and are needed whether or not the USAF selects Selfridge ANGB for basing of the F-35A. The EIS includes information on this proposal in the cumulative impacts section (Chapter 4, Section 4.0 of the installation-specific sections). Because the decision to modify the airspace has not yet been made, it is included in this section as a "reasonably foreseeable action." Timing of the Alpena SUA modification is accurately depicted as NA (and not directly related to the F-35A beddown).

Comment #43b) Commenters asked how the USAF can assert that there would be no significant impacts to airspace use when there would be an approximate expected increase in time spent in the airspace for each SUA complex (except Montgomery)?

Response: As discussed in the EIS (Chapter 4, Section 3.2 of the installation-specific sections), the ANG conducted a detailed analysis of airspace. Additional information on airspace operations can be found in the installation-specific Chapter 2.2. As stated in the EIS (Section 2.2.2.1), there would be no modifications to the physical boundaries of airspace parcels as a result of this proposal. Any ongoing airspace modifications for any of the alternatives are not related to this action. Furthermore, though each airspace complex (except for the 187 FW airspace) would experience an increase in use as a result of the F-35A beddown, close coordination of scheduling and use of the SUA by each user would continue to ensure safe air traffic operations throughout the region. Impacts to civil and commercial aviation traffic in the training airspace would be negligible.

Comment #44a) Commenters noted that "in a review of the list of preparers of this EIS (Chapter 6), the scoping letter distribution list, and the Draft EIS distribution list shows there were no medical professionals or medical organizations consulted or asked for comments during this EIS process. This appears to be a major omission given the well documented extremely high A-weighted decibel (dBA) noise levels of the F-35A and the F-16 with the PW-229 engine upgrade. The F-35A noise levels at military power at 500 feet above ground level (AGL) will clearly violate the Air Force Instruction (AFI) 48-127 115 dBA limit for unprotected hearing exposure. At 500 feet AGL, afterburner take-off for the F-35A and the F-16 PW-229 will create potential hearing loss after 3 to 14 seconds exposure in a 24-hour period. At 1,500 feet AGL in afterburner, the F-35A will still be in violation of AFI 48-127. Given a sortie of two aircraft taking off in close proximity, 3 to 14 seconds exposure in 24 hours seems more than likely. Why isn't this analysis shown in the EIS as well as L_{max} data by aircraft, by altitude, by power settings as has been shown in numerous other Environmental Assessments (EAs) and EISs? Without this data, there is no way to assess the potential hearing damage from the individual take-offs, overflights, landing approaches, closed pattern operations, or low altitude combat jet training with multiple passes over the same location."

Response: While medical professionals or medical organizations were not consulted directly in the preparation of the EIS, the technical guidance and professional references used in the analysis were written or reviewed by medical professional and organizations. See response to Comment #4e with regard to L_{max} analysis.

AFI 48-127, Occupational Noise and Hearing Conservation Program, covers military and civilian personnel and is designed to reduce or eliminate hazardous noise exposure to workers subjected to high noise levels for long periods of time. The AFI includes recommendations to ensure an individual's daily dose of noise

levels above 85 dBA does not exceed 8 hours. While noise levels of the F-16 (115 FW and 187 FW both operate the F-100-GE-100 engines) can exceed these levels in areas outside of the installation, the noise level would not be sustained for any substantial amount of time.

Noise associated with aircraft overflights is not continuous, it peaks when the aircraft is closest to the observer and fades with distance. Aircraft taking off in afterburner (modeled for up to 5 percent of the time) cause L_{max} on the ground at the airport boundary of approximately 100 dB or less, which decreases with distance from the airfield. When afterburner is engaged, it is used to get aircraft up to speed, then power is reduced to military power shortly after liftoff while aircraft are still above the runway at roughly 100 to 200 feet above the ground. When multiple aircraft events are summed, the AFI requires use of the 8-hour Equivalent Noise Level ($L_{eq(8)}$) metric and testing for it to see where it is above 85 dB. At 187 FW, the $L_{eq(8)}$ 85 dB contour is on the airport for all but two small areas, neither of which overlays any residential areas.

The Defense Noise Working Group advises that military airfield impact studies should use the 80 dB DNL noise contour as a screening tool to identify populations at the most risk of PHL and if any are found, then additional analysis should be performed. The EIS found that existing conditions at 187 FW currently expose an estimated 2 acres of land outside of the airport to 80 dB DNL or greater, none of which contain residential structures. The Proposed Action would not cause any appreciable change in acreage nor expose any residential populations to 80 dB DNL or greater.

Comment #44b) Comments identified that "DNL and SEL are time-based energy averages that do not directly represent the sound level at any given time. This gives rise to gross misrepresentations by the military at public meetings and by the media portraying jet overflight noise levels as "comparable to a Hoover" vacuum when it is in fact the same as having a vacuum cleaner, running, with you 24 hours per day, 7 days per week. This comparison, or a similar one, should be mandatory in any document for public review and comment. Otherwise, a non-technical person has no basis to come to an informed decision. DNL and SEL are not appropriate measurements when there is potential for hearing and health effects from modern jet fighter noise levels. L_{max} (unweighted and weighted) should be included in the analysis and compared to modern medical standards for noise levels, vibration effects, exposure times, and overall human health in the EAs and EISs."

Response: DNL was included because it is a well-accepted predictor of annoyance and used by the FAA and USEPA, along with various other agencies, for impact analysis. See response to Comment #4e.

Comment #44c) Comments on the "use of DNL to assess Speech Interference Level (SIL) is inappropriate in addressing everyday life and safety issues (parking lots, job sites, child supervision) in low altitude jet operations areas."

Response: As discussed in the EIS, (Appendix E, Noise Modeling, Methodology, and Effects, of the USAF F-35A Operational Beddown Pacific Final Environmental Impact Statement, which is incorporated by reference [available on the project website http://www.angf35eis.com/] and has also been incorporated into the Final EIS), the Defense Noise Working Group specifies indoor L_{max} of 50 dB as a screening threshold for speech interfering events, which roughly translates to a SIL of 45 dB for aircraft noise. An L_{max} of 50 dB has been shown to provide 90 percent speech intelligibility for students situated throughout a classroom and forms the basis for classroom speech interference and residential speech interference in the EIS.

Comments #44d) A commenter suggested that "this Draft EIS needs updating to reflect the following:

1. On September 16, 2019, Col. Southworth of the Michigan ANG presented a proposal to the Port Austin Township Board Meeting (Huron County) stating that the F-35A has been removed from Steelhead Low Military Operations Area (MOA) in the Alpena SUA airspace.
2. On September 18, 2019, Michigan Governor Gretchen Whitmer stated, in writing to me, "After extensive discussions with the Michigan National Guard" that "an accurate projection of usage of the Steelhead Low Military Operating Area is approximately 46 times per month."
3. Governor Whitmer also stated, 'the F-35 will be excluded from the Steelhead Low Military Operating Area proposal.' "

Response: The EIS presented information based on F-35A pilot training requirements utilizing existing airspace. Under the Proposed Action, the 41 dB L_{dnmr} predicted under the existing Steelhead MOA would be well below that of concern and no mitigation requirements were identified. The proposed "Steelhead Low MOA" is not required to support the F-35A, and the comments regarding Steelhead Low are therefore outside the scope of this EIS.

Comment #44e) Commenters raised concerns that "all aircraft altitudes and power settings (including afterburner usage) be restricted to comply with AFI 48-127 to prevent unprotected hearing damage and physical pain during overflights from a single pass or multiple passes over the same location"?

Response: AFI 48-127 does not restrict aircraft operations. It is in place to ensure that workers in close proximity to aircraft have sufficient protection. The noise levels of aircraft taking off are discussed above in Comment #4a.

Comment #44f) Commenters raised concerns that all aircraft altitudes and power settings (including afterburner usage) be restricted to prevent ground level noise >87 dBA, the level at which speech communication at 3 feet requires shouting, out to the distance on both sides of the flight path where the noise level drops to <87 dBA?

Response: Speech interference was considered as explained above in Comment #4c.

Comment #44g) Commenters raised the concerns that the EIS address, in detail, the human health and safety impacts of the high dBA level/high onset rate of overflights, including extreme startle response, PTSD episodes, cardiovascular and hypertension issues, learning disruption in schools and hearing damage in children outdoors who are exposed to high dBA levels?

Response: See response to Comments #4e and #30.

Comment #45) Commenters suggested that the USAF respond to their elected representatives in a respectful and expedient manner.

Response: Note that Congressional inquiries require extensive coordination. Several Congressional inquiries were responded to as promptly as possible, which can be found in Appendix A.

Comment #46) Commenters suggested that having the F-35A at their locations would make their city more vulnerable to attack by adversaries and/or terrorists.

Response: Each of these five alternative locations have previously had state-of-the-art aircraft; therefore, it is highly unlikely that having the F-35A aircraft based at these locations would increase the risk of such an attack.

Comment #47) Commenters wondered how significance is determined.

Response: Analysis methodology can be found in Chapter 3 of the EIS for each resource described. Per 40 CFR 1508.27, the term "significantly," as used in NEPA, requires consideration of both context and intensity. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant. The intensity of an action refers to the severity of its impacts. It is also important to note that there are not always quantitative "significance thresholds" for each resource, and that some determination of "significance" can be qualitative and/or situational.

Comment #48) Commenters requested files (i.e., noise modeling files) associated with development of the EIS.

Response: Relevant information can be obtained on the project website.

Comment #49) Commenters identified errors in the EIS that did not affect analysis but were corrected (e.g., the land use map shows vacant where residential).

Response: Error corrected, but analysis was not affected. EIS Figure WI3.5-1 and 3.5-2 had the Village of Maple Bluff coded as vacant land. This was corrected to show residential land use. In addition, commenters noted that the land use designations for Cherokee Marsh (which was outlined by hashed blue lines) had agricultural land categorized underneath. Therefore, these land use maps were changed to delete these additional designations underneath the existing Cherokee Marsh boundaries that are shown already.

EIS was updated to state that the slickspot peppergrass location was mapped in 2006 (as opposed to 2002). In addition, the status of the Greater Sage-Grouse was updated to indicate that it is currently not listed, proposed, or a candidate for listing under the Endangered Species Act.

In addition, some suggested edits were made in the EIS with regard to stormwater pollution permit.

Comment #50) Commenters claimed that there was a lack of adequate and comprehensive scientific and baseline information; detailed and thorough analysis was not conducted.

Response: As demonstrated by the more than 1,000 pages of the Draft EIS, a very comprehensive environmental baseline (e.g., Affected Environment) was presented for each resource at a relevant level of detail; further, an analysis of each resource commensurate with the potential environmental impact was conducted.

Comment #51) Commenters questioned if the EIS should be revised to present the alternatives in increasing order of impacts.

Response: There is no requirement per CEQ guidance to rank the alternatives in terms of "levels of impacts." Further, each person perceives impacts differently. The USAF addressed the impacts in comparative form, for example see Table 2.4-1, Summary of Impacts.

Comment #52) Commenters stated that the Draft EIS was issued prior to completion of the Section 106 process and properties within the 65 dB contour were not identified/considered in the study of indirect effects (Area of Potential Effect not properly defined). Commenters also stated that Section 106 mitigation would include the purchase and demolition of properties, which is itself an adverse effect.

Response: As discussed in the EIS (Chapter 4, Section 3.12 of the installation-specific sections), the ANG conducted a detailed analysis of cultural resources. Cultural resources consist of prehistoric and historic districts, sites, structures, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Cultural

resources can be divided into three major categories: archaeological resources (prehistoric and historic), architectural resources, and traditional cultural resources.

NEPA does not require that Section 106 is complete prior to releasing a Draft EIS. At the time the Draft EIS was released, ANG was in the final stages of consultation with the State Historic Preservation Offices and was awaiting concurrence letters on a "no effect" determination. The Area of Potential Effects is defined as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist (36 CFR 800.16[d]). The Area of Potential Effects for this undertaking was determined to be areas under the proposed noise contours at or above 65 dB DNL. The USAF is not authorized to expend federal appropriations on properties not owned by the USAF. There are currently no plans to purchase property to mitigate adverse effects under Section 106.

Comment #53) Commenter requested that pollinator habitat be constructed at selected beddown sites.

Response: Landscaping as part of the construction projects will require use of native plant species. Plant species that attract pollinators will be evaluated; however, since we are on an airfield, we cannot commit to using flowering plants.

Comment #54) Commenter stated that the Draft EIS did not include all interagency consultation.

Response: All agency correspondence was included in Appendix A of the EIS. Sample outgoing letters were included in the appendix along with a mailing list of those that received the letters. In addition, all letters received from agencies were included in the appendix.

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Appendix B - Noise Modeling, Methodology, and Effects

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ACRONYMS AND ABBREVIATIONS

%	Percent
%HA	Percent Highly Annoyed
AFOSH	Air Force Occupational Safety and Health
AGL	Above Ground Level
ANG	Air National Guard
ANSI	American National Standards Institute
CDNL	C-Weighted Day-Night Average Sound Level
CFR	Code of Federal Regulations
CHABA	Committee on Hearing, Bioacoustics, and Biomechanics
CNEL	Community Noise Equivalent Level
CSEL	C-Weighted Sound Exposure Level
dB	Decibel
dB(A)	A-Weighted Decibels
dBA	A-Weighted Decibels
dBC	C-Weighted Decibel
DLR	German Aerospace Center (*Deutsches Zentrum für Luft und Raumfahrt e.V.*)
DNL	Day-Night Average Sound Level
DoD	Department of Defense
FAA	Federal Aviation Administration
FICAN	Federal Interagency Committee on Aviation Noise
FICON	Federal Interagency Committee on Noise
HA	Highly Annoyed
HYENA	Hypertension and Exposure to Noise near Airports
Hz	Hertz
ISO	International Organization for Standardization
L	Sound Level
L_{dn}	Day-Night Average Sound Level
L_{dnmr}	Onset-Rate Adjusted Monthly Day-Night Average Sound Level
L_{eq}	Equivalent Sound Level
$L_{eq(16)}$	Equivalent Sound Level over 16 hours
$L_{eq(24)}$	Equivalent Sound Level over 24 hours
$L_{eq(30min)}$	Equivalent Sound Level over 30 minutes
$L_{eq(8)}$	Equivalent Sound Level over 8 hours
$L_{eq(h)}$	Hourly Equivalent Sound Level
L_{max}	Maximum Sound Level
L_{pk}	Peak Sound Level
mmHg	millimeters of mercury
MTR	Military Training Route
NA	Number of Events At or Above a Selected Threshold
NAL	Number of Events Above combined with the Threshold Level
NATO	North Atlantic Treaty Organization
NDI	Noise Depreciation Index
NIOSH	National Institute for Occupational Safety and Health
NIPTS	Noise-induced Permanent Threshold Shift
OR	Odds Ratio
OSHA	Occupational Safety and Health Administration
POI	Point of Interest
psf	Pound per Square Foot
PTS	Permanent Threshold Shift
PTSD	Post-traumatic Stress Disorder
RANCH	Road Traffic and Aircraft Noise Exposure and Children's Cognition and Health
SEL	Sound Exposure Level

SIL	Speech Interference Level
SUA	Special Use Airspace
TA	Time Above
TAL	Time Above combined with the Threshold Level
TTS	Temporary Threshold Shift
U.S.	United States
UKDfES	United Kingdom Department for Education and Skills
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WHO	World Health Organization

B NOISE MODELING, METHODOLOGY, AND EFFECTS

Section B.1 of this appendix discusses sound and noise and their potential effects on the human and natural environment. The largest section, Section B.2, reviews the potential effects of noise, focusing on effects on humans but also addressing effects on property values, terrain, structures, and animals. Section B.3 contains the list of references cited.

B.1 NOISE AND SONIC BOOM

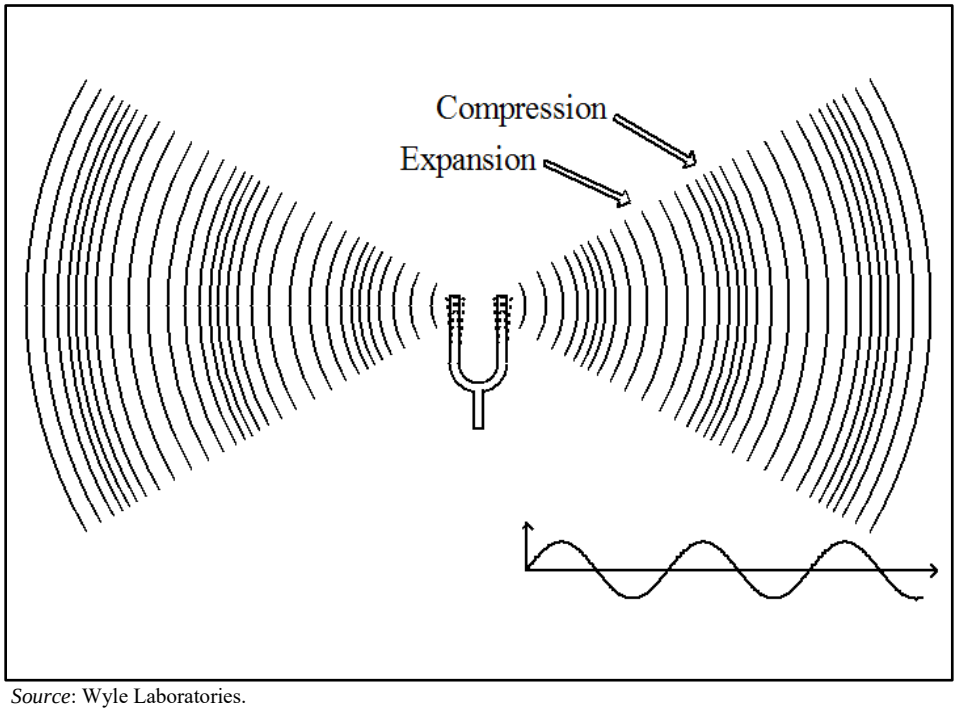
Section B.1.1 provides an overview of the basics of sound and noise. Section B.1.2 defines and describes the different metrics used to describe noise.

B.1.1 Basics of Sound

The following four subsections describe sound waves, sound levels and types of sounds, sonic boom and workplace noise.

B.1.1.1 Sound Waves and Decibels

Sound consists of minute vibrations in the air that travel through the air and are sensed by the human ear. Figure B-1 is a sketch of sound waves from a tuning fork. The waves move outward as a series of crests where the air is compressed and troughs where the air is expanded. The height of the crests and the depth of the troughs are the amplitude or sound pressure of the wave. The pressure determines its energy or intensity. The number of crests or troughs that pass a given point each second is called the frequency of the sound wave.



Source: Wyle Laboratories.

Figure B-1. Sound Waves from a Vibrating Tuning Fork

The measurement and human perception of sound involves three basic physical characteristics: intensity, frequency, and duration.

- *Intensity* is a measure of the acoustic energy of the sound and is related to sound pressure. The greater the sound pressure, the more energy carried by the sound and the louder the perception of that sound.
- *Frequency* determines how the pitch of the sound is perceived. Low frequency sounds are characterized as rumbles or roars, while high frequency sounds are typified by sirens or screeches.
- *Duration* or the length of time the sound can be detected.

As shown in Figure B-1, the sound from a tuning fork spreads out uniformly as it travels from the source. The spreading causes the sound's intensity to decrease with increasing distance from the source. For a source such as an aircraft in flight, the sound level will decrease by about 6 decibels (dB) for every doubling of the distance. For a busy highway, the sound level will decrease by 3 to 4.5 dB for every doubling of distance.

As sound travels from the source, it also gets absorbed by the air. The amount of absorption depends on the frequency composition of the sound, the temperature, and the humidity conditions. Sound with high frequency content gets absorbed by the air more than sound with low frequency content. More sound is absorbed in colder and drier conditions than in hot and wet conditions. Sound is also affected by wind and temperature gradients, terrain (elevation and ground cover), and structures.

The loudest sounds that can be comfortably heard by the human ear have intensities a trillion times higher than those of sounds barely heard. Because of this vast range, it is unwieldy to use a linear scale to represent the intensity of sound. As a result, a logarithmic unit known as the decibel (abbreviated dB) is used to represent the intensity of a sound. Such a representation is called a sound level. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above 120 dB begin to be felt inside the human ear as discomfort. Sound levels between 130 and 140 dB are felt as pain (Berglund and Lindvall 1995).

Because of the logarithmic nature of the decibel unit, sound levels cannot simply be added or subtracted and are somewhat cumbersome to handle mathematically. However, some simple rules are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. For example:

60 dB + 60 dB = 63 dB, and

80 dB + 80 dB = 83 dB.

Second, the total sound level produced by two sounds of different levels is usually only slightly more than the higher of the two. For example:

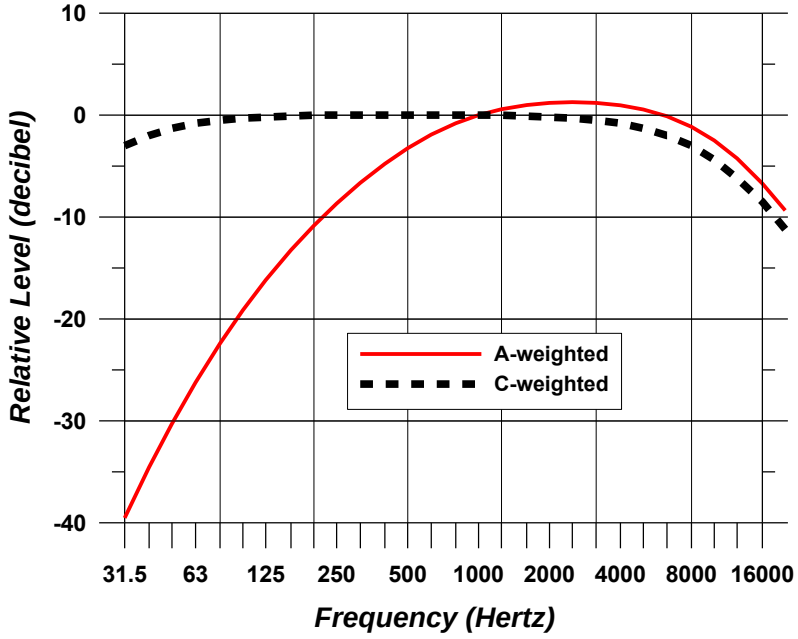
60.0 dB + 70.0 dB = 70.4 dB.

Because the addition of sound levels is different than that of ordinary numbers, this process is often referred to as "decibel addition."

The minimum change in the sound level of individual events that an average human ear can detect is about 3 dB. On average, a person perceives a change in sound level of about 10 dB as a doubling (or halving) of the sound's loudness. This relation holds true for loud and quiet sounds. A decrease in sound level of 10 dB actually represents a 90 percent (%) decrease in sound intensity but only a 50% decrease in perceived loudness because the human ear does not respond linearly.

Sound frequency is measured in terms of cycles per second or hertz (Hz). The normal ear of a young person can detect sounds that range in frequency from about 20 Hz to 20,000 Hz. As we get older, we lose the ability to hear high frequency sounds. Not all sounds in this wide range of frequencies are heard equally. Human hearing is most sensitive to frequencies in the 1,000 to 4,000 Hz range. The notes on a piano range from just over 27 Hz to 4,186 Hz, with middle C equal to 261.6 Hz. Most sounds (including a single note on a piano) are not simple pure tones like the tuning fork in Figure B-1, but contain a mix, or spectrum, of many frequencies.

Sounds with different spectra are perceived differently even if the sound levels are the same. Weighting curves have been developed to correspond to the sensitivity and perception of different types of sound. A-weighting and C-weighting are the two most common weightings. These two curves, shown in Figure B-2, are adequate to quantify most environmental noises. A-weighting puts emphasis on the 1,000 to 4,000 Hz range.



Source: ANSI S1.4A -1985 "Specification of Sound Level Meters."

Figure B-2. Frequency Characteristics of A- and C-Weighting

Very loud or impulsive sounds, such as explosions or sonic booms, can sometimes be felt, and can cause secondary effects, such as shaking of a structure or rattling of windows. These types of sounds can add to annoyance, and are best measured by C-weighted sound levels, denoted dBC. C-weighting is nearly flat throughout the audible frequency range, and includes low frequencies that may not be heard but cause shaking or rattling. C-weighting approximates the human ear's sensitivity to higher intensity sounds.

B.1.1.2 Sound Levels and Types of Sounds

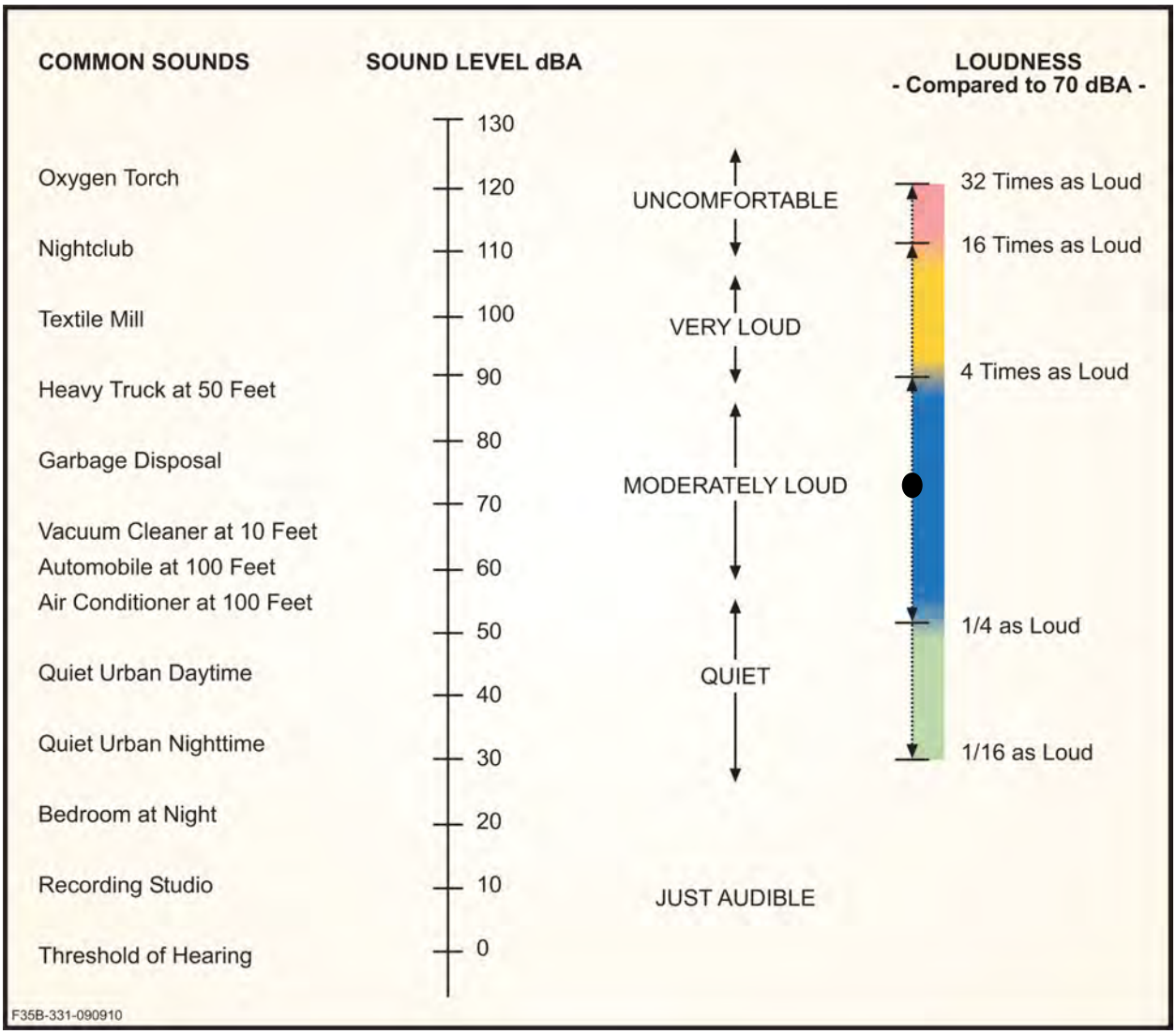
Most environmental sounds are measured using A-weighting. They are called A-weighted sound levels, and sometimes use the unit dBA or dB(A) rather than dB. When the use of A-weighting is understood, the term "A-weighted" is often omitted and the unit dB is used. Unless otherwise stated, dB units refer to A-weighted sound levels.

Sound becomes noise when it is unwelcome and interferes with normal activities, such as sleep or conversation. Noise is unwanted sound. Noise can become an issue when its level exceeds the ambient or background sound level. Ambient noise in urban areas typically varies from 60 to 70 dB, but can be as high as 80 dB in the center of a large city. Quiet suburban neighborhoods experience ambient noise levels around 45-50 dB (U.S. Environmental Protection Agency [USEPA] 1978).

Figure B-3 is a chart of A-weighted sound levels from common sources. Some sources, like the air conditioner and vacuum cleaner, are continuous sounds whose levels are constant for some time. Some sources, like the automobile and heavy truck, are the maximum sound during an intermittent event like a vehicle pass-by. Some sources like "urban daytime" and "urban nighttime" are averages over extended periods. A variety of noise metrics have been developed to describe noise over different time periods. These are discussed in detail in Section B.2.

Aircraft noise consists of two major types of sound events: flight (including takeoffs, landings, and flyovers), and stationary, such as engine maintenance run-ups. The former are intermittent and the latter primarily continuous. Noise from aircraft overflights typically occurs beneath main approach and departure paths, in local air traffic patterns around the airfield, and in areas near aircraft parking ramps and staging areas. As aircraft climb, the noise received on the ground drops to lower levels, eventually fading into the background or ambient levels.

Impulsive noises are generally short, loud events. Their single-event duration is usually less than 1 second. Examples of impulsive noises are small-arms gunfire, hammering, pile driving, metal impacts during rail-yard shunting operations, and riveting. Examples of high-energy impulsive sounds are quarry/mining explosions, sonic booms, demolition, and industrial processes that use high explosives, military ordnance (e.g., armor, artillery and mortar fire, and bombs), explosive ignition of rockets and missiles, and any other explosive source where the equivalent mass of dynamite exceeds 25 grams (American National Standards Institute [ANSI] 1996).



Sources: Harris 1979; Federal Interagency Committee on Aviation Noise (FICAN) 1997.

Figure B-3. Typical A-weighted Sound Levels of Common Sounds

B.1.1.3 Sonic Booms

When an aircraft moves through the air, it pushes the air out of its way. At subsonic speeds, the displaced air forms a pressure wave that disperses rapidly. At supersonic speeds, the aircraft is moving too quickly for the wave to disperse, so it remains as a coherent wave. This wave is a sonic boom. When heard at the ground, a sonic boom consists of two shock waves (one associated with the forward part of the aircraft, the other with the rear part) of approximately equal strength and (for fighter aircraft) separated by 100 to 200 milliseconds. When plotted, this pair of shock waves and the expanding flow between them has the appearance of a capital letter "N," so a sonic boom pressure wave is usually called an "N-wave." An N-wave has a characteristic "bang-bang" sound that can be startling. Figure B-4 shows the generation and evolution of a sonic boom N-wave under the aircraft. Figure B-5 shows the sonic boom pattern for an aircraft in steady supersonic flight. The boom forms a cone that is said to sweep out a "carpet" under the flight track.

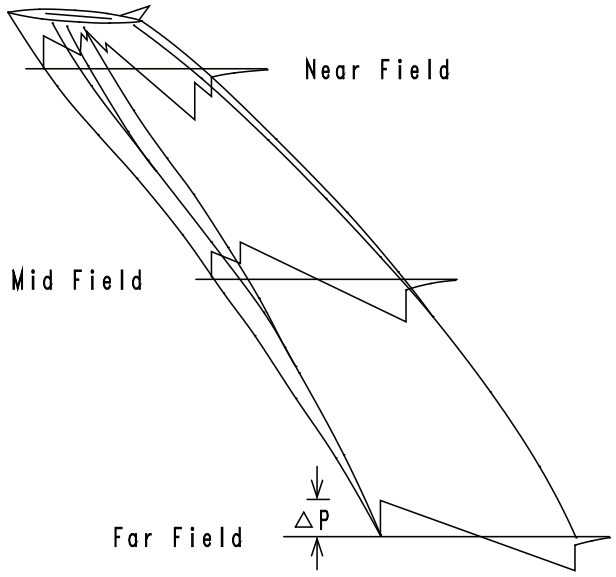


Figure B-4. Sonic Boom Generation and Evolution to N-Wave

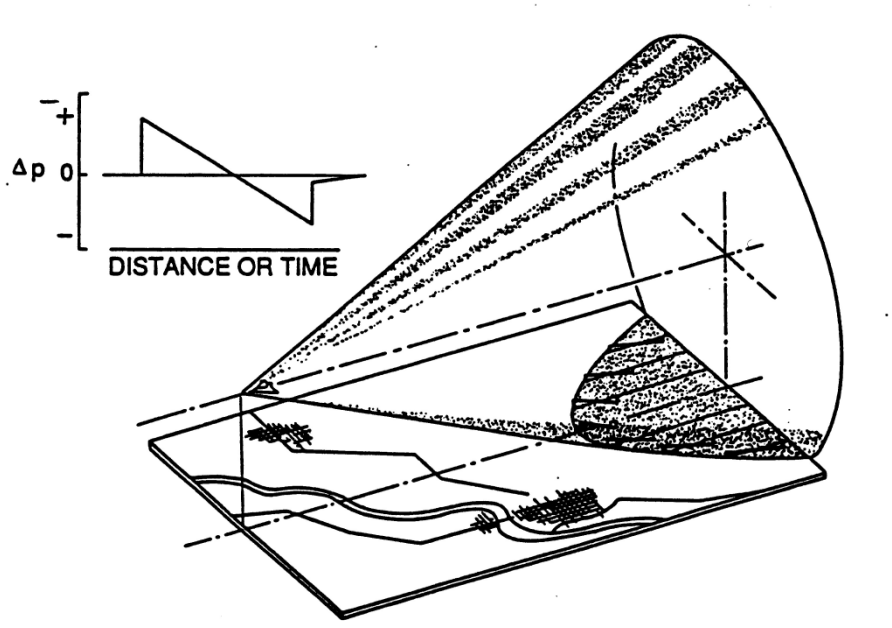


Figure B-5. Sonic Boom Carpet in Steady Flight

The complete ground pattern of a sonic boom depends on the size, shape, speed, and trajectory of the aircraft. Even for a nominally steady mission, the aircraft must accelerate to supersonic speed at the start, decelerate back to subsonic speed at the end, and usually change altitude. Figure B-6 illustrates the complexity of a nominal full mission.

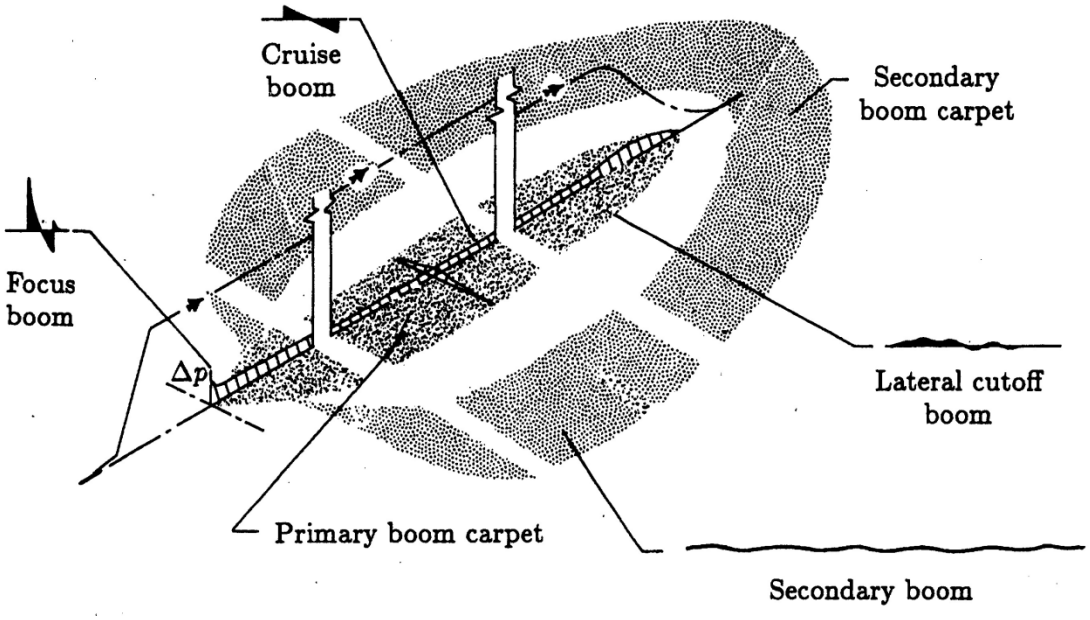


Figure B-6. Complex Sonic Boom Pattern for Full Mission

B.1.1.4 Workplace Noise

In 1972, the National Institute for Occupational Safety and Health (NIOSH) published a criteria document with a recommended exposure limit of 85 dB as an 8-hour time-weighted average. This exposure limit was reevaluated in 1998 when NIOSH made recommendations that went beyond conserving hearing by focusing on the prevention of occupational hearing loss (NIOSH 1998). Following the reevaluation using a new risk assessment technique, NIOSH published another criteria document in 1998 which reaffirmed the 85 dB recommended exposure limit (NIOSH 1998). Active-duty and reserve components of the United States (U.S.) Air Force (including the Air National Guard [ANG]), as well as civilian employees and contracted personnel working on Air Force bases and Air Guard stations must comply with Occupational Safety and Health Administration (OSHA) regulations (29 Code of Federal Regulations [CFR] § 1910.95 Occupational Noise Exposure), Department of Defense (DoD) Instruction 6055.12, Hearing Conservation Program; Air Force Occupational Safety and Health (AFOSH) Standard 48-20 (June 2006), and Occupational Noise and Hearing Conservation Program (including material derived from the International Organization for Standardization [ISO] 1999.2 Acoustics-Determination of Occupational Noise Exposure and Estimation of Noise Induced Impairment). Per AFOSH Standard 48-20, the Hearing Conservation Program is designed to protect workers from the harmful effects of hazardous noise by identifying all areas where workers are exposed to hazardous noise. The following are main components of the program:

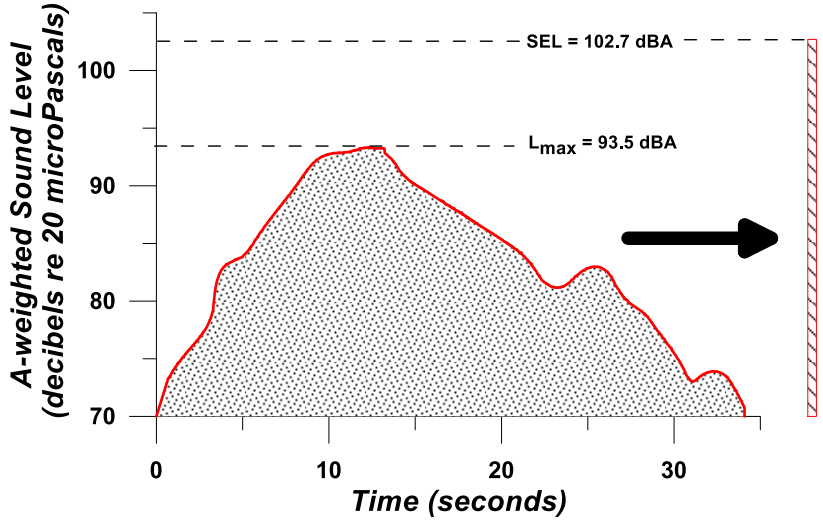
1. Identify noise hazardous areas or sources and ensure these areas are clearly marked.
2. Use engineering controls as the primary means of eliminating personnel exposure to potentially hazardous noise. All practical design approaches to reduce noise levels to below hazardous levels

by engineering principles shall be explored. Priorities for noise control resources shall be assigned based on the applicable risk assessment code. Where engineering controls are undertaken, the design objective shall be to reduce steady-state levels to below 85 dBA, regardless of personnel exposure time, and to reduce impulse noise levels to below 140 dB peak sound pressure level.

3. Ensure workers with an occupational exposure to hazardous noise complete an initial/reference audiogram within 30 days from the date of the workers' initial exposure to hazardous noise.
4. Ensure new equipment being considered for purchase has the lowest sound emission levels that are technologically and economically possible and compatible with performance and environmental requirements. 42 United States Code (USC) § 4914, *Public Health and Welfare, Noise Control, Development of Low-Noise Emission Products*, applies.
5. Education and training regarding potentially noise hazardous areas and sources, use and care of hearing protective devices, the effects of noise on hearing, and the Hearing Conservation Program.

B.1.2 Noise Metrics

Noise metrics quantify sounds so they can be compared with each other, and with their effects, in a standard way. The simplest metric is the A-weighted level, which is appropriate by itself for constant noise such as an air conditioner. Aircraft noise varies with time. During an aircraft overflight, noise starts at the background level, rises to a maximum level as the aircraft flies close to the observer, then returns to the background as the aircraft recedes into the distance. This is sketched in Figure B-7, which also indicates two metrics (Maximum Sound Level [L_{max}] and Sound Exposure Level [SEL]) that are described in Sections B.2.1 and B.2.3 below. Over time there can be a number of events, not all the same.



Source: Wyle Laboratories

Figure B-7. Example Time History of Aircraft Noise Flyover

There are a number of metrics that can be used to describe a range of situations, from a particular individual event to the cumulative effect of all noise events over a long time. This section describes the metrics relevant to environmental noise analysis.

B.1.2.1 Single Events

Maximum Sound Level (L_{max})

The highest A-weighted sound level measured during a single event in which the sound changes with time is called the maximum A-weighted sound level or Maximum Sound Level and is abbreviated L_{max}. The L_{max} is depicted for a sample event in Figure B-7.

L_{max} is the maximum level that occurs over a fraction of a second. For aircraft noise, the "fraction of a second" is one-eighth of a second, denoted as "fast" response on a sound level measuring meter (ANSI 1988). Slowly varying or steady sounds are generally measured over 1 second, denoted "slow" response. L_{max} is important in judging if a noise event will interfere with conversation, TV or radio listening, or other common activities. Although it provides some measure of the event, it does not fully describe the noise, because it does not account for how long the sound is heard.

Table B-1 reflects L_{max} values for typical aircraft associated with this assessment operating at the indicated flight profiles and power settings. On takeoff through 1,000 feet AGL, the F-22 has the highest L_{max} of 112 dB with the F-35A ranked a close second with 111 dB L_{max}. On approach through 1,000 feet AGL, the F-22 has the highest L_{max} of 104 dB with the B-1 and F-15 tied for second with 97 dB L_{max}.

Table B-1. Representative Instantaneous Maximum Sound Levels (L_{max})[1]

Aircraft (engine type)	*Power Setting*	*Power Unit[2]*	*L_{max} (in dBA) At Varying Altitudes (500 feet)*	*L_{max} (in dBA) At Varying Altitudes (1,000 feet)*	*L_{max} (in dBA) At Varying Altitudes (2,000 feet)*	*L_{max} (in dBA) At Varying Altitudes (5,000 feet)*	*L_{max} (in dBA) At Varying Altitudes (10,000 feet)*
Takeoff/Departure Operations							
A-10A	6200	NF	100	92	82	68	58
B-1[3]	97.5%	RPM	113	105	97	84	72
F-15 (PW220)	90%	NC	111	104	97	85	75
F-16 (PW229)	93%	NC	114	106	98	86	76
F-22	100%	ETR	120	112	105	93	83
F-35A[4]	100%	ETR	119	111	103	91	81
Landing/Arrival Operations[5]							
A-10A	5225	NF	97	89	79	60	46
B-1	90%	RPM	104	97	89	76	65
F-15 (PW220)	75%	NC	104	97	89	77	66
F-16 (PW229)	83.5%	NC	93	86	78	66	56
F-22	43%	ETR	111	104	96	84	73
F-35A[4]	40%	ETR	100	93	85	73	62

Source: NOISEMAP OPX file using standard weather conditions of 59 degrees Fahrenheit and 70% relative humidity

1. Power settings indicated may not be comparable across aircraft, that all numbers are rounded, and power settings are typical but not constant for departure/arrival operations.
2. RPM—Revolutions Per Minute; ETR—Engine Thrust Request; NC—Engine Core RPM; and NF—Engine Fan RPM.
3. B-1 Takeoff/Departure modeled with Afterburner; all other departure aircraft modeled without afterburner (if available).
4. Based on 2013 Edwards measurements.
5. All Landing/Arrival aircraft modeled with "parallel-interpolation" power setting for gear down configuration (except if noted).

Peak Sound Pressure Level (L_{pk})

The Peak Sound Pressure Level is the highest instantaneous level measured by a sound level measurement meter. L_{pk} is typically measured every 20 microseconds, and usually based on unweighted or linear response of the meter. A- or C-weighting is not applied. It is used to describe individual impulsive events such as sonic boom and blast noise. Because blast noise varies from shot to shot and varies with meteorological (weather) conditions, the DoD usually characterizes L_{pk} by the metric PK 15(met), which is the L_{pk} exceeded 15% of the time. The "met" notation refers to the metric accounting for varied meteorological or weather conditions.

For sonic booms, this is the peak pressure of the shock wave, as described in Section B.2 of this appendix. This pressure is usually presented in physical units of pounds per square foot (psf). Sometimes it is represented on the decibel level scale, with symbol L_{pk}.

Sound Exposure Level (SEL)

SEL combines both the intensity of a sound and its duration. For an aircraft flyover, SEL includes the maximum and all lower noise levels produced as part of the overflight, together with how long each part lasts. It represents the total sound energy in the event. Figure B-7 indicates the SEL for an example event, representing it as if all the sound energy were contained within 1 second.

Because aircraft noise events last more than a few seconds, the SEL value is larger than L_{max}. It does not directly represent the sound level heard at any given time, but rather the entire event. SEL provides a much better measure of aircraft flyover noise exposure than L_{max} alone.

Table B-2 shows SEL values corresponding to the aircraft and power settings reflected in Table B-1. At 1,000 feet above ground level (AGL) on takeoff, the F-22 has the highest SEL of 121 dB, with the F-35A close behind with 119 dB SEL. At 1,000 feet AGL on approach, the F-22 has the highest SEL of 109 dB, with the B-1 ranked second with 105 dB SEL.

C-weighted SEL can be computed for impulsive sounds, and the results denoted CSEL or LCE. SEL for A-weighted sound is sometimes denoted ASEL. Within this study, SEL is used for A-weighted sounds and CSEL for C-weighted.

B.1.2.2 Cumulative Events

Equivalent Sound Level (L_{eq})

L_{eq} is a "cumulative" metric that combines a series of noise events over a period of time. L_{eq} is the sound level that represents the decibel average SEL of all sounds in the time period. Just as SEL has proven to be a good measure of a single event, L_{eq} has proven to be a good measure of series of events during a given time period.

The time period of an L_{eq} measurement is usually related to some activity, and is given along with the value. The time period is often shown in parenthesis (e.g., $L_{eq(24)}$ for 24 hours). The L_{eq} from 7 a.m. to 3 p.m. may give exposure of noise for a school day.

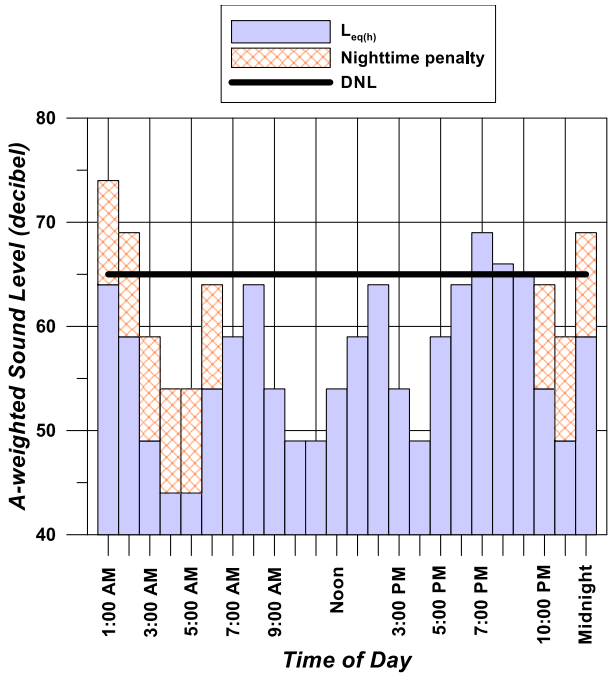
Figure B-8 gives an example of $L_{eq(24)}$ using notional hourly average noise levels ($L_{eq(h)}$) for each hour of the day as an example. The $L_{eq(24)}$ for this example is 61 dB.

Table B-2. Representative Sound Exposure Levels (SEL)[1]

Aircraft (engine type)	*Power Setting*	*Power Unit[2]*	*SEL (in dBA) At Varying Altitudes (500 feet)*	*SEL (in dBA) At Varying Altitudes (1,000 feet)*	*SEL (in dBA) At Varying Altitudes (2,000 feet)*	*SEL (in dBA) At Varying Altitudes (5,000 feet)*	*SEL (in dBA) At Varying Altitudes (10,000 feet)*
Takeoff/Departure Operations[3]							
A-10A	6200	NF	105	99	91	80	71
B-1[4]	97.5%	RPM	119	113	106	96	86
F-15 (PW220)	90%	NC	120	115	109	100	91
F-16 (PW229)	93%	NC	119	114	107	98	89
F-22	100%	ETR	127	121	115	106	98
F-35A	100%	ETR	125	119	113	103	95
Landing/Arrival Operation[5]							
A-10A	5225	NF	98	92	83	67	55
B-1	90%	RPM	111	105	98	88	79
F-15 (PW220)	75%	NC	99	94	88	79	71
F-16 (PW229)	83.5%	NC	97	92	86	77	68
F-22	43%	ETR	115	109	103	94	85
F-35A[6]	40%	ETR	107	102	95	86	76

Source: NOISEMAP OPX file using standard weather conditions of 59 degrees Fahrenheit and 70% relative humidity.

1. Power settings indicated may not be comparable across aircraft, that all numbers are rounded, and power settings are typical but not constant for departure/arrival operations.
2. RPM—Revolutions Per Minute; ETR—Engine Thrust Request; NC—Engine Core RPM; and NF—Engine Fan RPM.
3. Takeoff/Departure modeled at 160 knots airspeed for SEL purposes.
4. B-1 Takeoff/Departure modeled with Afterburner; all other departure aircraft modeled without afterburner (if available).
5. All Landing/Arrival aircraft modeled at 160 knots airspeed for SEL purposes.
6. Based on 2013 Edwards measurements.



Source: Wyle Laboratories.

Figure B-8. Example of $L_{eq}(24)$, DNL Computed from Hourly Equivalent Sound Levels

Day-Night Average Sound Level (DNL or L_{dn})

DNL is a cumulative metric that accounts for all noise events in a 24-hour period. However, unlike $L_{eq(24)}$, DNL contains a nighttime noise penalty. To account for our increased sensitivity to noise at night, DNL applies a 10 dB penalty to events during the nighttime period, defined as 10:00 p.m. to 7:00 a.m. The notations DNL and L_{dn} are both used for Day-Night Average Sound Level and are equivalent.

For airports and military airfields outside of California, DNL represents the average sound level for annual average daily aircraft events. Figure B-8 gives an example of DNL using notional hourly average noise levels ($L_{eq(h)}$) for each hour of the day as an example. Note the $L_{eq(h)}$ for the hours between 10 p.m. and 7 a.m. have a 10 dB penalty assigned. The DNL for this example is 65 dB. Figure B-9 shows the ranges of DNL that occur in various types of communities. Under a flight path at a major airport the DNL may exceed 80 dB, while rural areas may experience DNL less than 45 dB.

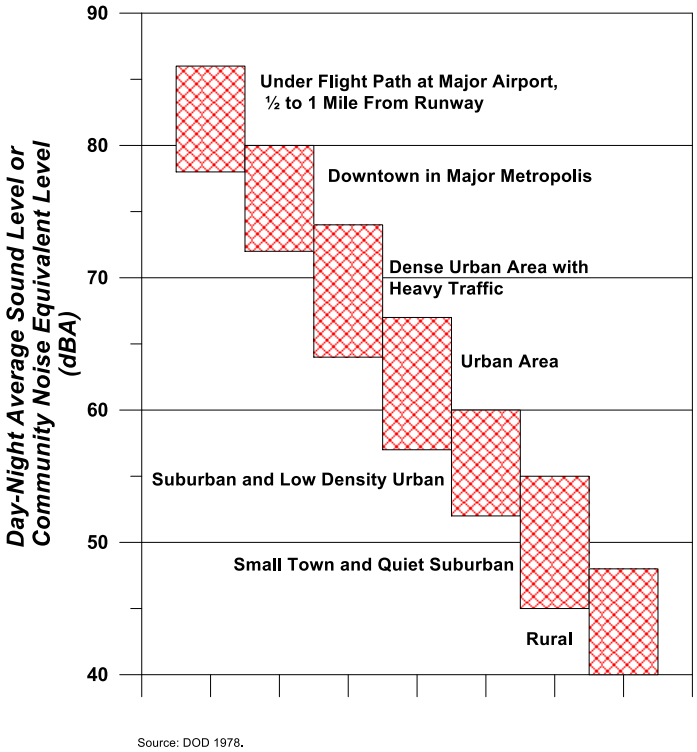


Figure B-9. Typical DNL Ranges in Various Types of Communities

The decibel summation nature of these metrics causes the noise levels of the loudest events to control the 24-hour average. As a simple example, consider a case in which only one aircraft overflight occurs during the daytime over a 24-hour period, creating a sound level of 100 dB for 30 seconds. During the remaining 23 hours, 59 minutes, and 30 seconds of the day, the ambient sound level is 50 dB. The DNL for this 24-hour period is 65.9 dB. Assume, as a second example that 10 such 30-second overflights occur during daytime hours during the next 24-hour period, with the same ambient sound level of 50 dB during the remaining 23 hours and 55 minutes of the day. The DNL for this 24-hour period is 75.5 dB. Clearly, the averaging of noise over a 24-hour period does not ignore the louder single events and tends to emphasize both the sound levels and number of those events.

A feature of the DNL metric is that a given DNL value could result from a very few noisy events or a large number of quieter events. For example, 1 overflight at 90 dB creates the same DNL as 10 overflights at 80 dB.

DNL does not represent a level heard at any given time, but represent long-term exposure. Scientific studies have found good correlation between the percentages of groups of people highly annoyed and the level of average noise exposure measured in DNL (Schultz 1978; USEPA 1978).

Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr})

Military aircraft utilizing Special Use Airspace (SUA) such as Military Training Routes (MTRs), Military Operations Areas, and Restricted Areas/Ranges generate a noise environment that is somewhat different from that around airfields. Rather than regularly occurring operations like at airfields, activity in SUAs is highly sporadic. It is often seasonal, ranging from 10 per hour to less than 1 per week. Individual military overflight events also differ from typical community noise events in that noise from a low-altitude, high-airspeed flyover can have a rather sudden onset, with rates of up to 150 dB per second.

The cumulative daily noise metric devised to account for the "surprise" effect of the sudden onset of aircraft noise events on humans and the sporadic nature of SUA activity is the Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}). Onset rates between 15 and 150 dB per second require an adjustment of 0 to 11 dB to the event's SEL, while onset rates below 15 dB per second require no adjustment to the event's SEL (Stusnick et al. 1992). The term 'monthly' in L_{dnmr} refers to the noise assessment being conducted for the month with the most operations or sorties—the so-called busiest month.

B.1.2.3 Supplemental Metrics

Number of Events Above (NA) a Threshold Level (L)

The Number of Events Above (NA) metric gives the total number of events that exceed a noise level threshold (L) during a specified period of time. Combined with the selected threshold, the metric is denoted NAL. The threshold can be either SEL or L_{max}, and it is important that this selection is shown in the nomenclature. When labeling a contour line or point of interest (POI), NAL is followed by the number of events in parentheses. For example, where 10 events exceed an SEL of 90 dB over a given period of time, the nomenclature would be NA90SEL(10). Similarly, for L_{max} it would be NA90L_{max}(10). The period of time can be an average 24-hour day, daytime, nighttime, school day, or any other time period appropriate to the nature and application of the analysis.

NA is a supplemental metric. It is not supported by the amount of science behind DNL/Community Noise Equivalent Level (CNEL), but it is valuable in helping to describe noise to the community. A threshold level and metric are selected that best meet the need for each situation. An L_{max} threshold is normally selected to analyze speech interference, while an SEL threshold is normally selected for analysis of sleep disturbance.

The NA metric is the only supplemental metric that combines single-event noise levels with the number of aircraft operations. In essence, it answers the question of how many aircraft (or range of aircraft) fly over a given location or area at or above a selected threshold noise level.

Time Above (TA) a Specified Level (L)

The Time Above (TA) metric is the total time, in minutes, that the A-weighted noise level is at or above a threshold. Combined with the threshold level (L), it is denoted TAL. TA can be calculated over a full 24-hour annual average day, the 15-hour daytime and 9-hour nighttime periods, a school day, or any other time period of interest, provided there is operational data for that time.

TA is a supplemental metric, used to help understand noise exposure. It is useful for describing the noise environment in schools, particularly when assessing classroom or other noise sensitive areas for various scenarios. TA can be shown as contours on a map similar to the way DNL contours are drawn.

TA helps describe the noise exposure of an individual event or many events occurring over a given time period. When computed for a full day, the TA can be compared alongside the DNL in order to determine the sound levels and total duration of events that contribute to the DNL. TA analysis is usually conducted along with NA analysis so the results show not only how many events occur, but also the total duration of those events above the threshold.

B.2 NOISE AND SONIC BOOM EFFECTS

Noise is of concern because of potential adverse effects. The following subsections describe how noise can affect communities and the environment, and how those effects are quantified. The specific topics discussed are:

- Annoyance,
- Land Use Compatibility,
- Speech interference,
- Sleep disturbance,
- Noise-induced hearing impairment,
- Non-auditory health effects,
- Performance effects,
- Noise effects on children,
- Property values,
- Noise-induced vibration effects on structures and humans,
- Noise effects on terrain,
- Noise effects on historical and archaeological sites,
- Effects on domestic animals and wildlife, and
- Sonic Boom.

B.2.1 Annoyance

With the introduction of jet aircraft in the 1950s, it became clear that aircraft noise annoyed people and was a significant problem around airports. Early studies, such as those of Rosenblith et al. (1953) and Stevens et al. (1953) showed that effects depended on the quality of the sound, its level, and the number of flights. Over the next 20 years considerable research was performed refining this understanding and setting guidelines for noise exposure. In the early 1970s, the USEPA published its "Levels Document" (USEPA 1974) that reviewed the factors that affected communities. DNL (still known as L_{dn} at the time) was identified as an appropriate noise metric, and threshold criteria were recommended.

Threshold criteria for annoyance were identified from social surveys, where people exposed to noise were asked how noise affects them. Surveys provide direct real world data on how noise affects actual residents.

Surveys in the early years had a range of designs and formats, and needed some interpretation to find common ground. In 1978, Schultz showed that the common ground was the number of people "highly annoyed," defined as the upper 28% range of whatever response scale a survey used (Schultz 1978). With that definition, he was able to show a remarkable consistency among the majority of the surveys for which data were available. Figure B-10 shows the result of his study relating DNL to individual annoyance measured by percent highly annoyed (%HA).

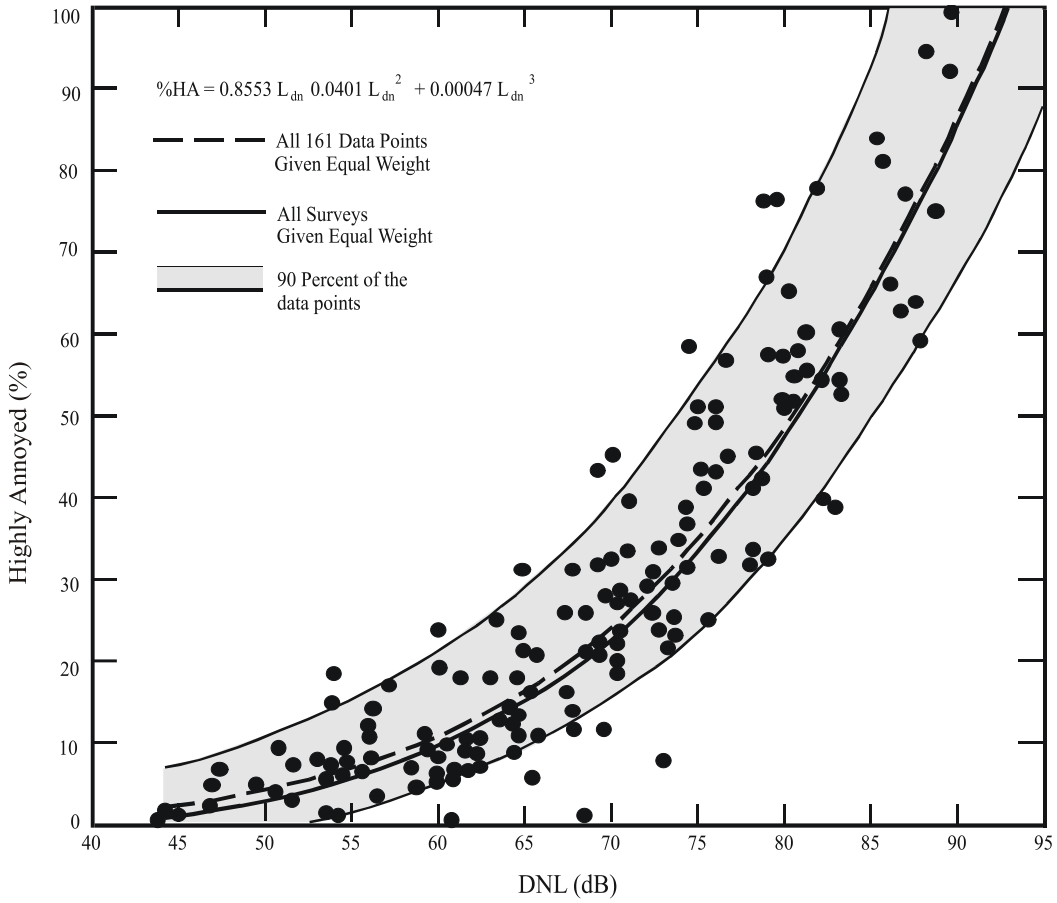


Figure B-10. Schultz Curve Relating Noise Annoyance to DNL (Schultz 1978)

Schultz's original synthesis included 161 data points. Figure B-11 compares revised fits of the Schultz data set with an expanded set of 400 data points collected through 1989 (Finegold et al. 1994). The new form is the preferred form in the U.S., endorsed by the Federal Interagency Committee on Aviation Noise (FICAN) (1997). Other forms have been proposed, such as that of Fidell and Silvati (2004), but have not gained widespread acceptance.

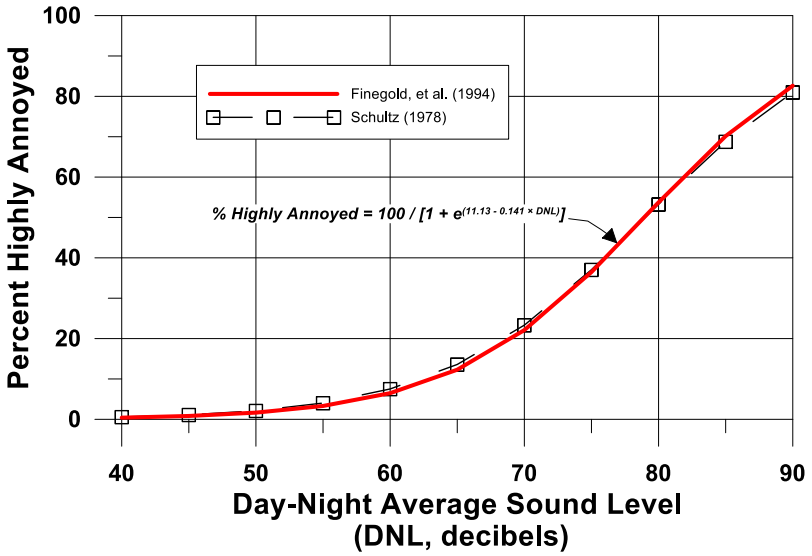


Figure B-11. Response of Communities to Noise; Comparison of Original Schultz (1978) with Finegold et al. (1994)

When the goodness of fit of the Schultz curve is examined, the correlation between groups of people is high, in the range of 85-90%. The correlation between individuals is lower, 50% or less. This is not surprising, given the personal differences between individuals. The surveys underlying the Schultz curve include results that show that annoyance to noise is also affected by non-acoustical factors. Newman and Beattie (1985) divided the non-acoustic factors into the emotional and physical variables shown in Table B-3.

Table B-3. Non-Acoustic Variables Influencing Aircraft Noise Annoyance

Emotional Variables	*Physical Variables*
Feeling about the necessity or preventability of the noise;	Type of neighborhood;
Judgement of the importance and value of the activity that is producing the noise;	Time of day;
Activity at the time an individual hears the noise;	Season;
Attitude about the environment;	Predictability of the noise;
General sensitivity to noise;	Control over the noise source; and
Belief about the effect of noise on health; and	Length of time individual is exposed to a noise.
Feeling of fear associated with the noise.	

Schreckenberg and Schuemer (2010) recently examined the importance of some of these factors on short-term annoyance. Attitudinal factors were identified as having an effect on annoyance. In formal regression analysis, however, sound level (L_{eq}) was found to be more important than attitude.

A recent study by Plotkin et al. (2011) examined updating DNL to account for these factors. It was concluded that the data requirements for a general analysis were much greater than most existing studies. It was noted that the most significant issue with DNL is that it is not readily understood by the public, and that supplemental metrics such as TA and NA were valuable in addressing attitude when communicating noise analysis to communities (DoD 2009a).

A factor that is partially non-acoustical is the source of the noise. Miedema and Vos (1998) presented synthesis curves for the relationship between DNL and percentage "Annoyed" and percentage "Highly

Annoyed" for three transportation noise sources. Different curves were found for aircraft, road traffic, and railway noise. Table B-4 summarizes their results. Comparing the updated Schultz curve suggests that the percentage of people highly annoyed by aircraft noise may be higher than previously thought.

Table B-4. Percent Highly Annoyed for Different Transportation Noise Sources

DNL (dB)	*Percent Highly Annoyed (%HA) Miedema and Vos Air*	*Percent Highly Annoyed (%HA) Miedema and Vos Road*	*Percent Highly Annoyed (%HA) Miedema and Vos Rail*	*Percent Highly Annoyed (%HA) Schultz Combined*
55	12	7	4	3
60	19	12	7	6
65	28	18	11	12
70	37	29	16	22
75	48	40	22	36

Source: Miedema and Vos 1998.

As noted by the World Health Organization (WHO), however, even though aircraft noise seems to produce a stronger annoyance response than road traffic, caution should be exercised when interpreting synthesized data from different studies (WHO 1999).

Consistent with WHO's recommendations, the Federal Interagency Committee on Noise (FICON) (1992) considered the Schultz curve to be the best source of dose information to predict community response to noise, but recommended further research to investigate the differences in perception of noise from different sources.

Sonic boom exposure is assessed cumulatively with C-weighted DNL, denoted CDNL. Correlation between CDNL and annoyance has been established, based on community reaction to impulsive sounds (Committee on Hearing, Bioacoustics and Biomechanics [CHABA] 1981). Values of the C-weighted equivalent to the Schultz curve are different than that of the Schultz curve itself. Table B-5 shows the relation between annoyance, DNL, and CDNL.

Table B-5. Relation Between Annoyance, DNL and CDNL

DNL	*% Highly Annoyed*	*CDNL*
45	0.83	42
50	1.66	46
55	3.31	51
60	6.48	56
65	12.29	60
70	22.10	65

Interpretation of CDNL from impulsive noise is accomplished by using the CDNL versus annoyance values in Table B-3. CDNL can be interpreted in terms of an "equivalent annoyance" DNL. For example, CDNL of 52, 61, and 69 dB are equivalent to DNL of 55, 65, and 75 dB, respectively. If both continuous and impulsive noise occurs in the same area, impacts are assessed separately for each.

B.2.2 Land Use Compatibility

As noted above, the inherent variability between individuals makes it impossible to predict accurately how any individual will react to a given noise event. Nevertheless, when a community is considered as a whole, its overall reaction to noise can be represented with a high degree of confidence. As described above, the best noise exposure metric for this correlation is the DNL or L_{dnmr} for military overflights.

Impulsive noise can be assessed by relating CDNL to an "equivalent annoyance" DNL, as outlined in Section B.2.1.

In June 1980, an ad hoc Federal Interagency Committee on Urban Noise published guidelines (Federal Interagency Committee on Urban Noise 1980) relating DNL to compatible land uses. This committee was composed of representatives from DoD, Transportation, Housing and Urban Development, USEPA, and the Veterans Administration. Since the issuance of these guidelines, federal agencies have generally adopted these guidelines for their noise analyses.

Following the lead of the committee, the DoD adopted the concept of land use compatibility as the accepted measure of aircraft noise effect. Air Force guidelines are presented in Table B-6, along with the explanatory notes included in the regulation. These guidelines are not mandatory (note the footnote "*" in the table), rather they are recommendations to provide the best means for determining noise impact for communities adjacent to bases. Again, these are recommendations only; it is up to the city/county zoning and planning entities to determine what land uses are compatible and how they will deal with incompatibilities (e.g., what type of development is allowed, instituting residential buyouts, or whether noise attenuation efforts will be done in residential units). In general, residential land uses normally are not compatible with outdoor DNL values above 65 dB, and the extent of land areas and populations exposed to DNL of 65 dB and higher provides the best means for assessing the noise impacts of alternative aircraft actions. In some cases a change in noise level, rather than an absolute threshold, may be a more appropriate measure of impact.

Table B-6. Air Force Land Use Compatibility Recommendations

Land Uses SLUCM NO.	*Land Uses Category*	*Suggested Land Use Compatibility DNL 65-69*	*Suggested Land Use Compatibility DNL 70-74*	*Suggested Land Use Compatibility DNL 75-79*	*Suggested Land Use Compatibility DNL 80-84*	*Suggested Land Use Compatibility DNL >85*
10	**Residential**					
11	Household units	N[1]	N[1]	N	N	N
11.11	Single units: detached	N[1]	N[1]	N	N	N
11.12	Single units: semidetached	N[1]	N[1]	N	N	N
11.13	Single units: attached row	N[1]	N[1]	N	N	N
11.21	Two units: side-by-side	N[1]	N[1]	N	N	N
11.22	Two units: one above the other	N[1]	N[1]	N	N	N
11.31	Apartments: walk-up	N[1]	N[1]	N	N	N
11.32	Apartment: elevator	N[1]	N[1]	N	N	N
12	Group quarters	N[1]	N[1]	N	N	N
13	Residential hotels	N[1]	N[1]	N	N	N
14	Mobile home parks or courts	N	N	N	N	N
15	Transient lodgings	N[1]	N[1]	N[1]	N	N
16	Other residential	N[1]	N[1]	N	N	N
20	**Manufacturing**					
21	Food and kindred products; manufacturing	Y	Y[2]	Y[3]	Y[4]	N
22	Textile mill products; manufacturing	Y	Y[2]	Y[3]	Y[4]	N
23	Apparel and other finished products; products made from fabrics, leather, and similar materials; manufacturing	Y	Y[2]	Y[3]	Y[4]	N
24	Lumber and wood products (except furniture); manufacturing	Y	Y[2]	Y[3]	Y[4]	N

Table B-6. Air Force Land Use Compatibility Recommendations

Land Uses SLUCM NO.	*Land Uses Category*	*Suggested Land Use Compatibility DNL 65-69*	*Suggested Land Use Compatibility DNL 70-74*	*Suggested Land Use Compatibility DNL 75-79*	*Suggested Land Use Compatibility DNL 80-84*	*Suggested Land Use Compatibility DNL >85*
25	Furniture and fixtures; manufacturing	Y	Y[2]	Y[3]	Y[4]	N
26	Paper and allied products; manufacturing	Y	Y[2]	Y[3]	Y[4]	N
27	Printing, publishing, and allied industries	Y	Y[2]	Y[3]	Y[4]	N
28	Chemicals and allied products; manufacturing	Y	Y[2]	Y[3]	Y[4]	N
29	Petroleum refining and related industries	Y	Y[2]	Y[3]	Y[4]	N
30	**Manufacturing**					
31	Rubber and misc. plastic products; manufacturing	Y	Y[2]	Y[3]	Y[4]	N
32	Stone, clay and glass products; manufacturing	Y	Y[2]	Y[3]	Y[4]	N
33	Primary metal products; manufacturing	Y	Y[2]	Y[3]	Y[4]	N
34	Fabricated metal products; manufacturing	Y	Y[2]	Y[3]	Y[4]	N
35	Professional scientific, and controlling instruments; photographic and optical goods; watches and clocks	Y	25	30	N	N
39	Miscellaneous manufacturing	Y	Y[2]	Y[3]	Y[4]	N
40	**Transportation, Communication and Utilities**					
41	Railroad, rapid rail transit, and street railway transportation	Y	Y[2]	Y[3]	Y[4]	N
42	Motor vehicle transportation	Y	Y[2]	Y [3]	Y[4]	N
43	Aircraft transportation	Y	Y[2]	Y[3]	Y[4]	N
44	Marine craft transportation	Y	Y[2]	Y[3]	Y[4]	N
45	Highway and street right-of-way	Y	Y	Y	Y	N
46	Automobile parking	Y	Y	Y	Y	N
47	Communication	Y	25[5]	30[5]	N	N
48	Utilities	Y	Y[2]	Y[3]	Y[4]	N
49	Other transportation, communication and utilities	Y	25[5]	30[5]	N	N
50	**Trade**					
51	Wholesale trade	Y	Y[2]	Y[3]	Y[4]	N
52	Retail trade – building materials, hardware and farm equipment	Y	25	30	Y[4]	N
53	Retail trade – including shopping centers, discount clubs, home improvement stores, electronics superstores, etc.	Y	25	30	N	N
54	Retail trade – food	Y	25	30	N	N
55	Retail trade – automotive, marine craft, aircraft and accessories	Y	25	30	N	N
56	Retail trade – apparel and accessories	Y	25	30	N	N

Table B-6. Air Force Land Use Compatibility Recommendations

Land Uses SLUCM NO.	*Land Uses Category*	*Suggested Land Use Compatibility DNL 65-69*	*Suggested Land Use Compatibility DNL 70-74*	*Suggested Land Use Compatibility DNL 75-79*	*Suggested Land Use Compatibility DNL 80-84*	*Suggested Land Use Compatibility DNL >85*
57	Retail trade – furniture, home, furnishings and equipment	Y	25	30	N	N
58	Retail trade – eating and drinking establishments	Y	25	30	N	N
59	Other retail trade	Y	25	30	N	N
60	**Services**					
61	Finance, insurance and real estate services	Y	25	30	N	N
62	Personal services	Y	25	30	N	N
62.4	Cemeteries	Y	Y[2]	Y[3]	Y[4,11]	Y[6,11]
63	Business services	Y	25	30	N	N
63.7	Warehousing and storage	Y	Y[2]	Y[3]	Y[4]	N
64	Repair services	Y	Y[2]	Y[3]	Y[4]	N
65	Professional services	Y	25	30	N	N
65.1	Hospitals, other medical facilities	25	30	N	N	N
65.16	Nursing homes	N[1]	N[1]	N	N	N
66	Contract construction services	Y	25	30	N	N
67	Government services	Y[1]	25	30	N	N
68	Educational services	25	30	N	N	N
68.1	Child care services, child development centers, and nurseries	25	30	N	N	N
69	Miscellaneous Services	Y	25	30	N	N
69.1	Religious activities (including places of worship)	Y	25	30	N	N
70	**Cultural, Entertainment and Recreational**					
71	Cultural activities	25	30	N	N	N
71.2	Nature exhibits	Y[1]	N	N	N	N
72	Public assembly	Y	N	N	N	N
72.1	Auditoriums, concert halls	25	30	N	N	N
72.11	Outdoor music shells, amphitheaters	N	N	N	N	N
72.2	Outdoor sports arenas, spectator sports	Y[7]	Y[7]	N	N	N
73	Amusements	Y	Y	N	N	N
74	Recreational activities (including golf courses, riding stables, water recreation)	Y	25	30	N	N
75	Resorts and group camps	Y	25	N	N	N
76	Parks	Y	25	N	N	N
79	Other cultural, entertainment and recreation	Y	25	N	N	N
80	**Resource Production and Extraction**					
81	Agriculture (except live- stock)	Y[8]	Y[9]	Y[10]	Y[10,11]	Y[10,11]
81.5-81.7	Agriculture-Livestock farming including grazing and feedlots	Y[8]	Y[9]	N	N	N
82	Agriculture related activities	Y[8]	Y[9]	Y[10]	Y[10,11]	Y[10,11]
83	Forestry activities	Y[8]	Y[9]	Y[10]	Y[10,11]	Y[10,11]
84	Fishing activities	Y	Y	Y	Y	Y

Table B-6. Air Force Land Use Compatibility Recommendations

Land Uses SLUCM NO.	*Land Uses Category*	*Suggested Land Use Compatibility DNL 65-69*	*Suggested Land Use Compatibility DNL 70-74*	*Suggested Land Use Compatibility DNL 75-79*	*Suggested Land Use Compatibility DNL 80-84*	*Suggested Land Use Compatibility DNL >85*
85	Mining activities	Y	Y	Y	Y	Y
89	Other resource production or extraction	Y	Y	Y	Y	Y

Legend:
SLUCM – Standard Land Use Coding Manual, U.S. Department of Transportation
Y (Yes) – Land use and related structures compatible without restrictions.
N (No) – Land use and related structures are not compatible and should be prohibited.
Y^x – Yes with restrictions. The land use and related structures generally are compatible. However, see note(s) indicated by the superscript.
N^x – No with exceptions. The land use and related structures are generally incompatible. However, see note(s) indicated by the superscript.
25, 30, or 35 – The numbers refer to noise level reduction (NLR) levels. NLR (outdoor to indoor) is achieved through the incorporation of noise attenuation into the design and construction of a structure. Land use and related structures are generally compatible; however, measures to achieve NLR of 25, 30, or 35 must be incorporated into design and construction of structures. However, measures to achieve an overall noise reduction do not necessarily solve noise difficulties outside the structure and additional evaluation is warranted. Also, see notes indicated by superscripts where they appear with one of these numbers.
DNL – Day-Night Average Sound Level.
CNEL – Community Noise Equivalent Level (normally within a very small decibel difference of DNL)
Ldn – Mathematical symbol for DNL.

Notes:
1. General
a. Although local conditions regarding the need for housing may require residential use in these zones, residential use is discouraged in DNL 65-69 and strongly discouraged in DNL 70-74. The absence of viable alternative development options should be determined and an evaluation should be conducted locally prior to local approvals indicating that a demonstrated community need for the residential use would not be met if development were prohibited in these zones. Existing residential development is considered as pre-existing, non-conforming land uses.
b. Where the community determines that these uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 decibels (dB) in DNL 65-69 and 30 dB in DNL 70-74 should be incorporated into building codes and be considered in individual approvals; for transient housing, an NLR of at least 35 dB should be incorporated in DNL 75-79.
c. Normal permanent construction can be expected to provide an NLR of 20 dB, thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation, upgraded sound transmission class ratings in windows and doors, and closed windows year round. Additional consideration should be given to modifying NLR levels based on peak noise levels or vibrations.
d. NLR criteria will not eliminate outdoor noise problems. However, building location, site planning, design, and use of berms and barriers can help mitigate outdoor noise exposure particularly from ground level sources. Measures that reduce noise at a site should be used wherever practical in preference to measures that only protect interior spaces.
2. Measures to achieve NLR of 25 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
3. Measures to achieve NLR of 30 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
4. Measures to achieve NLR of 35 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
5. If project or proposed development is noise sensitive, use indicated NLR; if not, land use is compatible without NLR.
6. Buildings are not permitted.
7. Land use is compatible provided special sound reinforcement systems are installed.
8. Residential buildings require an NLR of 25
9. Residential buildings require an NLR of 30.
10. Residential buildings are not permitted.
11. Land use that involves outdoor activities is not recommended, but if the community allows such activities, hearing protection devices should be worn when noise sources are present. Long-term exposure (multiple hours per day over many years) to high noise levels can cause hearing loss in some unprotected individuals.

B.2.3 Speech Interference

Speech interference from noise is a primary cause of annoyance for communities. Disruption of routine activities such as radio or television listening, telephone use, or conversation leads to frustration and annoyance. The quality of speech communication is important in classrooms and offices. In the workplace, speech interference from noise can cause fatigue and vocal strain in those who attempt to talk over the noise. In schools it can impair learning.

There are two measures of speech comprehension:

1. *Word Intelligibility* – the percent of words spoken and understood. This might be important for students in the lower grades who are learning the English language, and particularly for students who have English as a Second Language.
2. *Sentence Intelligibility* – the percent of sentences spoken and understood. This might be important for high school students and adults who are familiar with the language, and who do not necessarily have to understand each word in order to understand sentences.

U.S. Federal Criteria for Interior Noise

In 1974, the USEPA identified a goal of an indoor $L_{eq(24)}$ of 45 dB to minimize speech interference based on sentence intelligibility and the presence of steady noise (USEPA 1974). Figure B-12 shows the effect of steady indoor background sound levels on sentence intelligibility. For an average adult with normal hearing and fluency in the language, steady background indoor sound levels of less than 45 dB L_{eq} are expected to allow 100% sentence intelligibility.

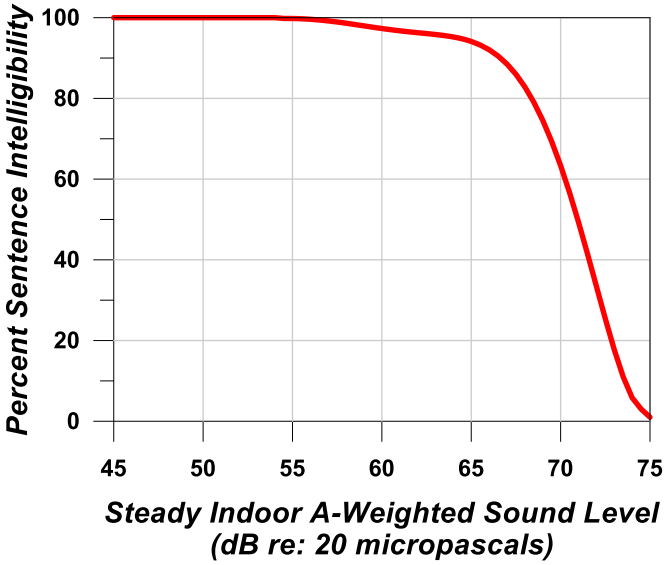


Figure B-12. Speech Intelligibility Curve (digitized from USEPA 1974)

The curve in Figure B-12 shows 99% intelligibility at L_{eq} below 54 dB, and less than 10% above 73 dB. Recalling that L_{eq} is dominated by louder noise events, the USEPA $L_{eq(24)}$ goal of 45 dB generally ensures that sentence intelligibility will be high most of the time.

Classroom Criteria

For teachers to be understood, their regular voice must be clear and uninterrupted. Background noise has to be below the teacher's voice level. Intermittent noise events that momentarily drown out the teacher's

voice need to be kept to a minimum. It is therefore important to evaluate the steady background level, the level of voice communication, and the single-event level due to aircraft overflights that might interfere with speech.

Lazarus (1990) found that for listeners with normal hearing and fluency in the language, complete sentence intelligibility can be achieved when the signal-to-noise ratio (i.e., a comparison of the level of the sound to the level of background noise) is in the range of 15 to 18 dB. The initial ANSI classroom noise standard (ANSI 2002) and American Speech-Language-Hearing Association (1995) guidelines concur, recommending at least a 15 dB signal-to-noise ratio in classrooms. If the teacher's voice level is at least 50 dB, the background noise level must not exceed an average of 35 dB. The National Research Council of Canada (Bradley 1993) and WHO (1999) agree with this criterion for background noise.

For eligibility for noise insulation funding, the Federal Aviation Administration (FAA) guidelines state that the design objective for a classroom environment is 45 dB L_{eq} during normal school hours (FAA 1985).

Most aircraft noise is not continuous. It consists of individual events like the one sketched in Figure B-7. Since speech interference in the presence of aircraft noise is caused by individual aircraft flyover events, a time-averaged metric alone, such as L_{eq}, is not necessarily appropriate. In addition to the background level criteria described above, single-event criteria that account for those noisy events are also needed.

A 1984 study by Wyle for the Port Authority of New York and New Jersey recommended using Speech Interference Level (SIL) for classroom noise criteria (Sharp and Plotkin 1984). SIL is based on the maximum sound levels in the frequency range that most affects speech communication (500-2,000 Hz). The study identified an SIL of 45 dB as the goal. This would provide 90% word intelligibility for the short time periods during aircraft overflights. While SIL is technically the best metric for speech interference, it can be approximated by an L_{max} value. A SIL of 45 dB is equivalent to an A-weighted L_{max} of 50 dB for aircraft noise (Wesler 1986).

Lind et al. (1998) also concluded that an L_{max} criterion of 50 dB would result in 90% word intelligibility. Bradley (1985) recommends SEL as a better indicator. His work indicates that 95% word intelligibility would be achieved when indoor SEL did not exceed 60 dB. For typical flyover noise this corresponds to an L_{max} of 50 dB. While WHO (1999) only specifies a background L_{max} criterion, they also note the SIL frequencies and that interference can begin at around 50 dB.

The United Kingdom Department for Education and Skills (UKDfES) established in its classroom acoustics guide a 30-minute time-averaged metric of $L_{eq(30min)}$ for background levels and the metric of $L_{A1,30min}$ for intermittent noises, at thresholds of 30-35 dB and 55 dB, respectively. $L_{A1,30min}$ represents the A-weighted sound level that is exceeded 1% of the time (in this case, during a 30-minute teaching session) and is generally equivalent to the L_{max} metric (UKDfES 2003).

Table B-7 summarizes the criteria discussed. Other than the FAA (1985) 45 dB L_{max} criterion, they are consistent with a limit on indoor background noise of 35-40 dB L_{eq} and a single event limit of 50 dB L_{max}. It should be noted that these limits were set based on students with normal hearing and no special needs. At-risk students may be adversely affected at lower sound levels.

Table B-7. Indoor Noise Level Criteria Based on Speech Intelligibility

Source	*Metric/Level (dB)*	*Effects and Notes*
U.S. FAA (1985)	$L_{eq(during\ school\ hours)}$ = 45 dB	Federal assistance criteria for school sound insulation; supplemental single-event criteria may be used.
Lind et al. (1998), Sharp and Plotkin (1984), Wesler (1986)	L_{max} = 50 dB / SIL 45	Single event level permissible in the classroom.
WHO (1999)	L_{eq} = 35 dB L_{max} = 50 dB	Assumes average speech level of 50 dB and recommends signal-to-noise ratio of 15 dB.
U.S. ANSI (2010)	L_{eq} = 35 dB, based on Room Volume (e.g., cubic feet)	Acceptable background level for continuous and intermittent noise.
U.K. DFES (2003)	$L_{eq(30min)}$ = 30-35 dB L_{max} = 55 dB	Minimum acceptable in classroom and most other learning environs.

B.2.4 Sleep Disturbance

Sleep disturbance is a major concern for communities exposed to aircraft noise at night. A number of studies have attempted to quantify the effects of noise on sleep. This section provides an overview of the major noise-induced sleep disturbance studies. Emphasis is on studies that have influenced U.S. federal noise policy. The studies have been separated into two groups:

1. Initial studies performed in the 1960s and 1970s, where the research was focused on sleep observations performed under laboratory conditions.
2. Later studies performed in the 1990s up to the present, where the research was focused on field observations.

Initial Studies

The relation between noise and sleep disturbance is complex and not fully understood. The disturbance depends not only on the depth of sleep and the noise level, but also on the non-acoustic factors cited for annoyance. The easiest effect to measure is the number of arousals or awakenings from noise events. Much of the literature has therefore focused on predicting the percentage of the population that will be awakened at various noise levels.

FICON's 1992 review of airport noise issues (FICON 1992) included an overview of relevant research conducted through the 1970s. Literature reviews and analyses were conducted from 1978 through 1989 using existing data (Griefahn 1978; Lukas 1978; Pearsons et al. 1989). Because of large variability in the data, FICON did not endorse the reliability of those results.

FICON did recommend, however, an interim dose-response curve, awaiting future research. That curve predicted the percent of the population expected to be awakened as a function of the exposure to SEL. This curve was based on research conducted for the U.S. Air Force (Finegold 1994). The data included most of the research performed up to that point, and predicted a 10% probability of awakening when exposed to an interior SEL of 58 dB. The data used to derive this curve were primarily from controlled laboratory studies.

Recent Sleep Disturbance Research – Field and Laboratory Studies

It was noted that early sleep laboratory studies did not account for some important factors. These included habituation to the laboratory, previous exposure to noise, and awakenings from noise other than aircraft. In the early 1990s, field studies in people's homes were conducted to validate the earlier laboratory work conducted in the 1960s and 1970s. The field studies of the 1990s found that 80-90% of sleep disturbances were not related to outdoor noise events, but rather to indoor noises and non-noise factors. The results showed that, in real life conditions, there was less of an effect of noise on sleep than had been previously reported from laboratory studies. Laboratory sleep studies tend to show more sleep disturbance than field studies because people who sleep in their own homes are used to their environment and, therefore, do not wake up as easily (FICAN 1997).

Federal Interagency Committee on Aviation Noise

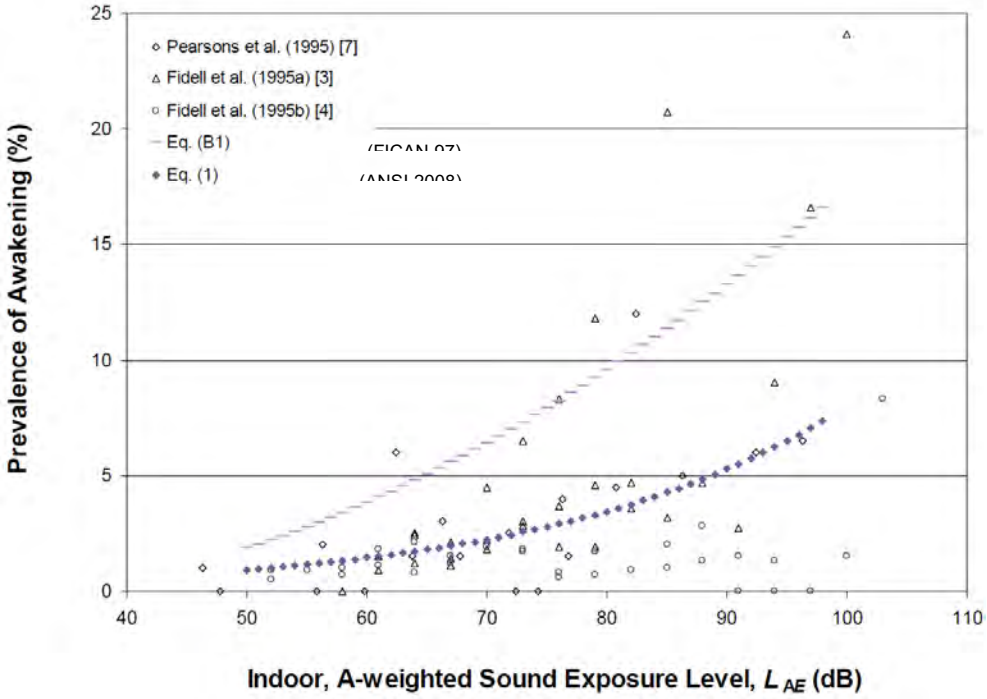
Based on this new information, in 1997 FICAN recommended a dose-response curve to use instead of the earlier 1992 FICON curve (FICAN 1997). Figure B-13 shows FICAN's curve, the red dashed line, which is based on the results of three field studies shown in the figure (Ollerhead et al. 1992; Fidell et al. 1994; Fidell et al. 1995a, 1995b), along with the data from six previous field studies.

The 1997 FICAN curve represents the upper envelope of the latest field data. It predicts the maximum percent awakened for a given residential population. According to this curve, a maximum of 3% of people would be awakened at an indoor SEL of 58 dB. An indoor SEL of 58 dB is equivalent to an outdoor SEL of 83 dB, with the windows closed (73 dB with windows open).

Number of Events and Awakenings

It is reasonable to expect that sleep disturbance is affected by the number of events. The German Aerospace Center (DLR Laboratory) conducted an extensive study focused on the effects of nighttime aircraft noise on sleep and related factors (Basner et al. 2004). The DLR study was one of the largest studies to examine the link between aircraft noise and sleep disturbance. It involved both laboratory and in-home field research phases. The DLR investigators developed a dose-response curve that predicts the number of aircraft events at various values of L_{max} expected to produce one additional awakening over the course of a night. The dose-effect curve was based on the relationships found in the field studies.

A different approach was taken by an ANSI standards committee (ANSI 2008). The committee used the average of the data shown in Figure B-13 (i.e., the blue dashed line) rather than the upper envelope, to predict average awakening from one event. Probability theory is then used to project the awakening from multiple noise events.



Source: DoD 2009b.

Figure B-13. Sleep Disturbance Dose-Response Relationship

Currently, there are no established criteria for evaluating sleep disturbance from aircraft noise, although recent studies have suggested a benchmark of an outdoor SEL of 90 dB as an appropriate tentative criterion when comparing the effects of different operational alternatives. The corresponding indoor SEL would be approximately 25 dB lower (at 65 dB) with doors and windows closed, and approximately 15 dB lower (at 75 dB) with doors or windows open. According to the ANSI (2008) standard, the probability of awakening from a single aircraft event at this level is between 1 and 2% for people habituated to the noise sleeping in bedrooms with windows closed, and 2-3% with windows open. The probability of the exposed population awakening at least once from multiple aircraft events at noise levels of 90 dB SEL is shown in Table B-8.

Table B-8. Probability of Awakening from NA90SEL

Number of Aircraft Events at 90 dB SEL for Average 9-Hour Night	*Minimum Probability of Awakening at Least Once Windows Closed*	*Minimum Probability of Awakening at Least Once Windows Open*
1	1%	2%
3	4%	6%
5	7%	10%
9 (1 per hour)	12%	18%
18 (2 per hour	22%	33%
27 (3 per hour)	32%	45%

Source: DoD 2009b.

In December 2008, FICAN recommended the use of this new standard. FICAN also recognized that more research is underway by various organizations, and that work may result in changes to FICAN's position. Until that time, FICAN recommends the use of the ANSI (2008) standard (FICAN 2008).

Summary

Sleep disturbance research still lacks the details to accurately estimate the population awakened for a given noise exposure. The procedure described in the ANSI (2008) Standard and endorsed by FICAN is based on probability calculations that have not yet been scientifically validated. While this procedure certainly provides a much better method for evaluating sleep awakenings from multiple aircraft noise events, the estimated probability of awakenings can only be considered approximate.

B.2.5 Noise-Induced Hearing Impairment

Residents in surrounding communities express concerns regarding the effects of aircraft noise on hearing. This section provides a brief overview of hearing loss caused by noise exposure. The goal is to provide a sense of perspective as to how aircraft noise (as experienced on the ground) compares to other activities that are often linked with hearing loss.

Hearing Threshold Shifts

Hearing loss is generally interpreted as a decrease in the ear's sensitivity or acuity to perceive sound (i.e., a shift in the hearing threshold to a higher level). This change can either be a Temporary Threshold Shift (TTS) or a Permanent Threshold Shift (PTS) (Berger et al. 1995).

TTS can result from exposure to loud noise over a given amount of time. An example of TTS might be a person attending a loud music concert. After the concert is over, there can be a threshold shift that may last several hours. While experiencing TTS, the person becomes less sensitive to low-level sounds, particularly at certain frequencies in the speech range (typically near 4,000 Hz). Normal hearing eventually returns, as long as the person has enough time to recover within a relatively quiet environment.

PTS usually results from repeated exposure to high noise levels, where the ears are not given adequate time to recover. A common example of PTS is the result of regularly working in a loud factory. A TTS can eventually become a PTS over time with repeated exposure to high noise levels. Even if the ear is given time to recover from TTS, repeated occurrence of TTS may eventually lead to permanent hearing loss. The point at which a TTS results in a PTS is difficult to identify and varies with a person's sensitivity.

Criteria for Permanent Hearing Loss

It has been well established that continuous exposure to high noise levels will damage human hearing (USEPA 1978). A large amount of data on hearing loss have been collected, largely for workers in manufacturing industries, and analyzed by the scientific/medical community. The OSHA regulation of 1971 places the limit on workplace noise exposure at an average level of 90 dB over an 8-hour work period or 85 dB over a 16-hour period (U.S. Department of Labor 1971). Some hearing loss is still expected at those levels. The most protective criterion, with no measurable hearing loss after 40 years of exposure, is an average sound level of 70 dB over a 24-hour period.

The USEPA established 75 dB $L_{eq(8)}$ and 70 dB $L_{eq(24)}$ as the average noise level standard needed to protect 96% of the population from greater than a 5 dB PTS (USEPA 1978). The National Academy of Sciences CHABA identified 75 dB as the lowest level at which hearing loss may occur (CHABA 1977). WHO concluded that environmental and leisure-time noise below an $L_{eq(24)}$ value of 70 dB "will not cause hearing loss in the large majority of the population, even after a lifetime of exposure" (WHO 1999).

Hearing Loss and Aircraft Noise

The 1982 USEPA Guidelines report (USEPA 1982) addresses noise-induced hearing loss in terms of the "Noise-Induced Permanent Threshold Shift" (NIPTS). This defines the permanent change in hearing caused by exposure to noise. Numerically, the NIPTS is the change in threshold that can be expected from daily exposure to noise over a normal working lifetime of 40 years. A grand average of the NIPTS over time and hearing sensitivity is termed the Average NIPTS, or Ave. NIPTS for short. The Ave. NIPTS that can be expected for noise measured by the $L_{eq(24)}$ metric is given in Table B-9 and assumes exposure to the full outdoor noise throughout the 24 hours. When inside a building, the exposure will be less (Eldred and von Gierke 1993).

Table B-9. Average NIPTS and 10th Percentile NIPTS as a Function of DNL

DNL	*Ave. NIPTS dB**	*10^{th} Percentile NIPTS dB**
75-76	1.0	4.0
76-77	1.0	4.5
77-78	1.6	5.0
78-79	2.0	5.5
79-80	2.5	6.0
80-81	3.0	7.0
81-82	3.5	8.0
82-83	4.0	9.0
83-84	4.5	10.0
84-85	5.5	11.0
85-86	6.0	12.0
86-87	7.0	13.5
87-88	7.5	15.0
88-89	8.5	16.5
89-90	9.5	18.0

Source: DoD 2012.
Note: *Rounded to the nearest 0.5 dB.

The average NIPTS is estimated as an average over all people exposed to the noise. The actual value of NIPTS for any given person will depend on their physical sensitivity to noise – some will experience more hearing loss than others. The USEPA Guidelines provide information on this variation in sensitivity in the form of the NIPTS exceeded by 10% of the population, which is included in the Table B-9 in the "10^{th} Percentile NIPTS" column (USEPA 1982). For individuals exposed to $L_{eq(24)}$ of 80 dB, the most sensitive of the population would be expected to show degradation to their hearing of 7 dB over time.

To put these numbers in perspective, changes in hearing level of less than 5 dB are generally not considered noticeable or significant. Furthermore, there is no known evidence that a NIPTS of 5 dB is perceptible or has any practical significance for the individual. Lastly, the variability in audiometric testing is generally assumed to be ±5 dB (USEPA 1974).

The scientific community has concluded that noise exposure from civil airports has little chance of causing permanent hearing loss (Newman and Beattie 1985). For military airbases, DoD policy requires that hearing risk loss be estimated for population exposed to $L_{eq(24)}$ of 80 dB or higher (DoD 2012), including residents of on-base housing. Exposure of workers inside the base boundary is assessed using DoD regulations for occupational noise exposure.

Noise in low-altitude military airspace, especially along MTRs where L_{max} can exceed 115 dB, is of concern. That is the upper limit used for occupational noise exposure (e.g., U.S. Department of Labor

1971). One laboratory study (Ising et al. 1999) concluded that events with L_{max} above 114 dB have the potential to cause hearing loss. Another laboratory study of participants exposed to levels between 115 and 130 dB (Nixon et al. 1993), however, showed conflicting results. For an exposure to four events across that range, half the subjects showed no change in hearing, a quarter showed a temporary 5 dB decrease in sensitivity, and a quarter showed a temporary 5 dB increase in sensitivity. For exposure to eight events of 130 dB, subjects showed an increase in sensitivity of up to 10 dB (Nixon et al. 1993).

Summary

Aviation noise levels are not comparable to the occupational noise levels associated with hearing loss of workers in manufacturing industries. There is little chance of hearing loss at levels less than 75 dB DNL. Noise levels equal to or greater than 75 dB DNL can occur near military airbases, and DoD policy specifies that NIPTS be evaluated when exposure exceeds 80 dB $L_{eq(24)}$ (DoD 2009c). There is some concern about L_{max} exceeding 115 dB in low-altitude military airspace, but no research results to date have definitely related permanent hearing impairment to aviation noise.

B.2.6 Non-Auditory Health Effects

Studies have been performed to see whether noise can cause health effects other than hearing loss. The premise is that annoyance causes stress. Prolonged stress is known to be a contributor to a number of health disorders. Cantrell (1974) confirmed that noise can provoke stress, but noted that results on cardiovascular health have been contradictory. Some studies have found a connection between aircraft noise and blood pressure (e.g., Michalak et al. 1990; Rosenlund et al. 2001), while others have not (e.g., Pulles et al. 1990).

Kryter and Poza (1980) noted, "It is more likely that noise related general ill-health effects are due to the psychological annoyance from the noise interfering with normal everyday behavior, than it is from the noise eliciting, because of its intensity, reflexive response in the autonomic or other physiological systems of the body."

The connection from annoyance to stress to health issues requires careful experimental design. Some highly publicized reports on health effects have, in fact, been rooted in poorly done science. Meecham and Shaw (1979) apparently found a relation between noise levels and mortality rates in neighborhoods under the approach path to Los Angeles International Airport. When the same data were analyzed by others (Frerichs et al. 1980) no relationship was found. Jones and Tauscher (1978) found a high rate of birth defects for the same neighborhood. But when the Centers for Disease Control performed a more thorough study near Atlanta's Hartsfield International Airport, no relationships were found for levels above 65 dB (Edmonds et al. 1979).

A carefully designed study, Hypertension and Exposure to Noise near Airports (HYENA), was conducted around six European airports from 2002 through 2006 (Jarup et al. 2005, 2008). There were 4,861 subjects, aged between 45 and 70. Blood pressure was measured, and questionnaires administered for health, socioeconomic and lifestyle factors, including diet and physical exercise. Hypertension was defined by WHO blood pressure thresholds (WHO 2003). Noise from aircraft and highways was predicted from models.

The HYENA results were presented as an odds ratio (OR). An OR of 1 means there is no added risk, while an OR of 2 would mean risk doubles. An OR of 1.14 was found for nighttime aircraft noise,

measured by L_{night}, the L_{eq} for nighttime hours. For daytime aircraft noise, measured by $L_{eq(16)}$, the OR was 0.93. For road traffic noise, measured by the full day $L_{eq(24)}$, the OR was 1.1.

Note that OR is a statistical measure of change, not the actual risk. Risk itself and the measured effects were small, and not necessarily distinct from other events. Haralabidis et al. (2008) reported an increase in systolic blood pressure of 6.2 millimeters of mercury (mmHg) for aircraft noise, and an increase of 7.4 mmHg for other indoor noises such as snoring.

It is interesting that aircraft noise was a factor only at night, while traffic noise is a factor for the full day. Aircraft noise results varied among the six countries so that result is pooled across all data. Traffic noise results were consistent across the six countries.

One interesting conclusion from a 2013 study of the HYENA data (Babisch et al. 2013) states there is some indication that noise level is a stronger predictor of hypertension than annoyance. That is not consistent with the idea that annoyance is a link in the connection between noise and stress. Babisch et al. (2012) present interesting insights on the relationship of the results to various modifiers.

Two recent studies examined the correlation of aircraft noise with hospital admissions for cardiovascular disease. Hansell et al. (2013) examined neighborhoods around London's Heathrow airport. Correia et al. (2013) examined neighborhoods around 89 airports in the U.S. Both studies included areas of various noise levels. They found associations that were consistent with the HYENA results. The authors of these studies noted that further research is needed to refine the associations and the causal interpretation with noise or possible alternative explanations.

> "Impacts from environmental noise on vulnerable groups (such as those who suffer from post-traumatic stress disorder [PTSD] and autism) have been understudied and are generally underrepresented in study populations, and evidence of differential effects is still highly anecdotal. As a consequence, clear effects are few and this is partly due to the lack of targeted and well-designed studies making clear comparisons between the general population and the potentially susceptible groups and quantifying these differences in terms of noise levels. Setting specific limit values to protect susceptible groups is not yet possible based on the available evidence, although some suggestions have been made in the literature. To further this field, it is necessary in future studies to present and compare subgroup-specific exposure effect relations. Generic use of the term 'vulnerable groups' should be avoided as the mechanisms are quite different and maybe more important, they vary in time, place, and across contexts. Groups at risk or susceptible groups, periods or places would, in most cases, be more appropriate terms to use and are less stigmatizing than the term vulnerability" (van Kamp and Davies 2013).

Summary

The current state of scientific knowledge cannot yet support inference of a causal or consistent relationship between aircraft noise exposure and non-auditory health consequences for exposed residents. The large scale HYENA study, and the recent studies by Hansell et al. (2013) and Correia et al. (2013) offer indications, but it is not yet possible to establish a quantitative cause and effect based on the currently available scientific evidence.

B.2.7 Performance Effects

The effect of noise on the performance of activities or tasks has been the subject of many studies. Some of these studies have found links between continuous high noise levels and performance loss. Noise-induced performance losses are most frequently reported in studies where noise levels are above 85 dB. Little change has been found in low-noise cases. Moderate noise levels appear to act as a stressor for more sensitive individuals performing a difficult psychomotor task.

While the results of research on the general effect of periodic aircraft noise on performance have yet to yield definitive criteria, several general trends have been noted including:

- A periodic intermittent noise is more likely to disrupt performance than a steady-state continuous noise of the same level. Flyover noise, due to its intermittent nature, might be more likely to disrupt performance than a steady-state noise of equal level.
- Noise is more inclined to affect the quality than the quantity of work.
- Noise is more likely to impair the performance of tasks that place extreme demands on workers.

B.2.8 Noise Effects on Children

Recent studies on school children indicate a potential link between aircraft noise and both reading comprehension and learning motivation. The effects may be small but may be of particular concern for children who are already scholastically challenged.

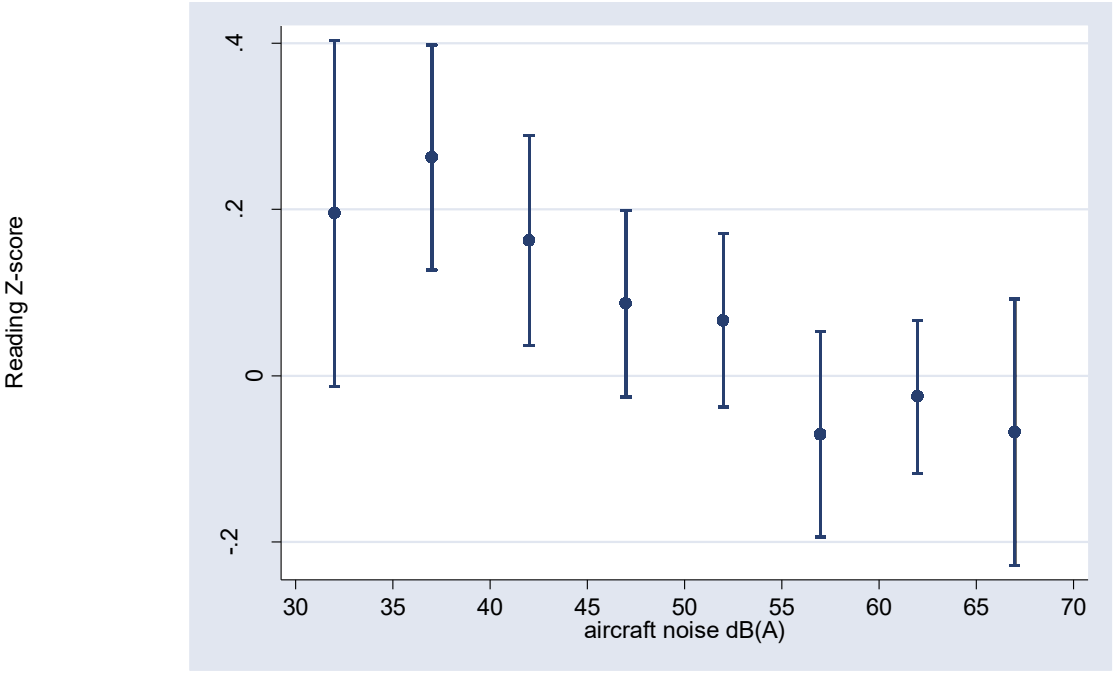
B.2.8.1 Effects on Learning and Cognitive Abilities

Early studies in several countries (Cohen et al. 1973, 1980, 1981; Bronzaft and McCarthy 1975; Green et al. 1982; Evans et al. 1998; Haines et al. 2002; Lercher et al. 2003) showed lower reading scores for children living or attending school in noisy areas than for children away from those areas. In some studies noise exposed children were less likely to solve difficult puzzles or more likely to give up.

More recently, the Road Traffic and Aircraft Noise Exposure and Children's Cognition and Health (RANCH) study (Stansfeld et al. 2005; Clark et al. 2005) compared the effect of aircraft and road traffic noise on over 2.000 children in three countries. This was the first study to derive exposure effect associations for a range of cognitive and health effects, and was the first to compare effects across countries.

The study found a linear relation between chronic aircraft noise exposure and impaired reading comprehension and recognition memory. No associations were found between chronic road traffic noise exposure and cognition. Conceptual recall and information recall surprisingly showed better performance in high road traffic noise areas. Neither aircraft noise nor road traffic noise affected attention or working memory (Stansfeld et al. 2005; Clark et al. 2005).

Figure B-14 shows RANCH's result relating noise to reading comprehension. It shows that reading falls below average (a z-score of 0) at L_{eq} greater than 55 dB. Because the relationship is linear, reducing exposure at any level should lead to improvements in reading comprehension.



Sources: Stansfeld et al. 2005; Clark et al. 2005.

Figure B-14. RANCH Study Reading Scores Varying with L_{eq}

An observation of the RANCH study was that children may be exposed to aircraft noise for many of their childhood years and the consequences of long-term noise exposure were unknown. A follow-up study of the children in the RANCH project is being analyzed to examine the long-term effects on children's reading comprehension (Clark et al. 2009). Preliminary analysis indicated a trend for reading comprehension to be poorer at 15-16 years of age for children who attended noise exposed primary schools. There was also a trend for reading comprehension to be poorer in aircraft noise exposed secondary schools. Further analysis adjusting for confounding factors is ongoing, and is needed to confirm these initial conclusions.

FICAN funded a pilot study to assess the relationship between aircraft noise reduction and standardized test scores (Eagan et al. 2004; FICAN 2007). The study evaluated whether abrupt aircraft noise reduction within classrooms, from either airport closure or sound insulation, was associated with improvements in test scores. Data were collected in 35 public schools near three airports in Illinois and Texas. The study used several noise metrics. These were, however, all computed indoor levels, which makes it hard to compare with the outdoor levels used in most other studies.

The FICAN study found a significant association between noise reduction and a decrease in failure rates for high school students, but not middle or elementary school students. There were some weaker associations between noise reduction and an increase in failure rates for middle and elementary schools. Overall the study found that the associations observed were similar for children with or without learning difficulties, and between verbal and math/science tests. As a pilot study, it was not expected to obtain final answers, but provided useful indications (FICAN 2007).

While there are many factors that can contribute to learning deficits in school-aged children, there is increasing awareness that chronic exposure to high aircraft noise levels may impair learning. This awareness has led WHO and a North Atlantic Treaty Organization (NATO) working group to conclude

that daycare centers and schools should not be located near major sources of noise, such as highways, airports, and industrial sites (NATO 2000; WHO 1999). The awareness has also led to the classroom noise standard discussed earlier (ANSI 2002).

B.2.8.2 Health Effects

A number of studies, including some of the cognitive studies discussed above, have examined the potential for effects on children's health. Health effects include annoyance, psychological health, coronary risk, stress hormones, sleep disturbance and hearing loss.

Annoyance. Chronic noise exposure causes annoyance in children (Bronzaft and McCarthy 1975; Evans et al. 1995). Annoyance among children tends to be higher than for adults, and there is little habituation (Haines et al. 2001a). The RANCH study found annoyance may play a role in how noise affects reading comprehension (Clark et al. 2005).

Psychological Health. Lercher et al. (2002) found an association between noise and teacher ratings of psychological health, but only for children with biological risk defined by low birth weight and/or premature birth. Haines et al. (2001b) found that children exposed to aircraft noise had higher levels of psychological distress and hyperactivity. Stansfeld et al. (2009) replicated the hyperactivity result, but not distress.

As with studies of adults, the evidence suggests that chronic noise exposure is probably not associated with serious psychological illness, but there may be effects on well-being and quality of life. Further research is needed, particularly on whether hyperactive children are more susceptible to stressors such as aircraft noise.

Coronary Risk. The HYENA study discussed earlier indicated a possible relation between noise and hypertension in older adults. Cohen et al. (1980, 1981) found some increase in blood pressure among school children, but within the normal range and not indicating hypertension. Hygge et al. (2002) found mixed effects. The RANCH study found some effect for children at home and at night, but not at school. Overall the evidence for noise effects on children's blood pressure is mixed, and less certain than for older adults.

Stress Hormones. Some studies investigated hormonal levels between groups of children exposed to aircraft noise compared to those in a control group. Two studies analyzed cortisol and urinary catecholamine levels in school children as measurements of stress response to aircraft noise (Haines et al. 2001a, 2001b). In both instances, there were no differences between the aircraft noise exposed children and the control groups.

Sleep Disturbance. A sub-study of RANCH in a Swedish sample used sleep logs and the monitoring of rest/activity cycles to compare the effect of road traffic noise on child and parent sleep (Öhrström et al. 2006). An exposure-response relationship was found for sleep quality and daytime sleepiness for children. While this suggests effects of noise on children's sleep disturbance, it is difficult to generalize from one study.

Hearing loss. A few studies have examined hearing loss from exposure to aircraft noise. Noise-induced hearing loss for children who attended a school located under a flight path near a Taiwan airport was greater than for children at another school far away (Chen et al. 1997). Another study reported that hearing ability was reduced significantly in individuals who lived near an airport and were frequently

exposed to aircraft noise (Chen and Chen 1993). In that study, noise exposure near the airport was greater than 75 dB DNL and L_{max} were about 87 dB during overflights. Conversely, several other studies reported no difference in hearing ability between children exposed to high levels of airport noise and children located in quieter areas (Andrus et al. 1975; Fisch 1977; Wu et al. 1995). It is not clear from those results whether children are at higher risk than adults, but the levels involved are higher than those desirable for learning and quality of life.

Ludlow and Sixsmith (1999) conducted a cross-sectional pilot study to examine the hypothesis that military jet noise exposure early in life is associated with raised hearing thresholds. The authors concluded that there were no significant differences in audiometric test results between military personnel who as children had lived in or near stations where fast jet operations were based, and a similar group who had no such exposure as children.

B.2.9 Property Values

Noise can affect the value of homes. Economic studies of property values based on selling prices and noise have been conducted to find a direct relation.

The value-noise relation is usually presented as the Noise Depreciation Index (NDI) or Noise Sensitivity Depreciation Index, the percent loss of value per dB (measured by the DNL metric). An early study by Nelson (1978) at three airports found an NDI of 1.8-2.3% per dB. Nelson also noted a decline in NDI over time which he theorized could be due to either a change in population or the increase in commercial value of the property near airports. Crowley (1978) reached a similar conclusion. A larger study by Nelson (1980) looking at 18 airports found an NDI from 0.5 to 0.6% per dB.

In a review of property value studies, Newman and Beattie (1985) found a range of NDI from 0.2 to 2% per dB. They noted that many factors other than noise affected values.

Fidell et al. (1996) studied the influence of aircraft noise on actual sale prices of residential properties in the vicinity of a military base in Virginia and one in Arizona. They found no meaningful effect on home values. Their results may have been due to non-noise factors, especially the wide differences in homes between the two study areas.

Recent studies of noise effects on property values have recognized the need to account for non-noise factors. Nelson (2004) analyzed data from 33 airports, and discussed the need to account for those factors and the need for careful statistics. His analysis showed NDI from 0.3 to 1.5% per dB, with an average of about 0.65% per dB. Nelson (2007) and Andersson et al. (2013) discuss statistical modeling in more detail.

Another recent literature review was conducted by Aliyu et al. (2016) and found similar ranges of impacts. The most common approach used in assessing impacts is the hedonic pricing method where the value of the property is modeled to reflect the contribution of many individual variables (e.g. scenic views, house appearance, and neighborhood demand) which, when taken together, form the total price. The hedonic pricing method requires detailed information on local housing markets and sales prices.

He et al. (2014) used a meta-analysis of more than 60 hedonic price property value studies to model the relationship between city level income and population data and the overall willingness to pay for noise abatement. This approach enables an estimate of noise impacts in locations where detailed housing data is not available. The mean NDI of the hedonic price studies used was 0.75 percent and the median was

0.67 percent. Results of the model are comparable with hedonic price models and the previous studies discussed. Wolfe et al. (2014) use the approach described by He et al. (2014) to compare the impacts related to noise with impacts related to climate and air quality. They show the spatial relationship of noise impacts in areas in the immediate vicinity of the airport and also caution that some hedonic pricing models that are measuring impacts from noise may be capturing impacts associated with air quality as well if this variable is not accounted for.

Similar price impacts were found by Jud and Winkler (2006) and Mense and Kholodilin (2012); however, these studies also showed that the impacts occurred as a result of the announcement of an airport expansion. The anticipation of the noise level rise impacts property values before the noise increases.

Enough data are available to conclude that aircraft noise has a real effect on property values. This effect falls in the range of 0.2 to 2.0% per dB, with the average on the order of 0.5% per dB. The actual value varies from location to location, and is very often small compared to non-noise factors.

B.2.10 Noise-Induced Vibration Effects on Structures and Humans

High noise levels can cause buildings to vibrate. If high enough, building components can be damaged. The most sensitive components of a building are the windows, followed by plaster walls and ceilings. Possibility of damage depends on the peak sound pressures and the resonances of the building. In general, damage is possible only for sounds lasting more than one second above an unweighted sound level of 130 dB (CHABA 1977). That is higher than expected from normal aircraft operations. Even low-altitude flyovers of heavy aircraft do not reach the potential for damage (Sutherland 1990a).

Noise-induced structural vibration may cause annoyance to dwelling occupants because of induced secondary vibrations, or "rattle," of objects within the dwelling – hanging pictures, dishes, plaques, and bric-a-brac. Loose window panes may also vibrate noticeably when exposed to high levels of airborne noise, causing homeowners to fear breakage. In general, rattling occurs at peak unweighted sound levels that last for several seconds at levels above 110 dB, which is well above that considered normally compatible with residential land use. Thus, assessments of noise exposure levels for compatible land use will also be protective of noise-induced rattle.

The sound from an aircraft overflight travels from the exterior to the interior of the house in one of two ways: through the solid structural elements and directly through the air. Figure B-15 illustrates the sound transmission through a wall constructed with a brick exterior, stud framing, interior finish wall, and absorbent material in the cavity. The sound transmission starts with noise impinging on the wall exterior. Some of this sound energy will be reflected away and some will make the wall vibrate. The vibrating wall radiates sound into the airspace, which in turn sets the interior finish surface vibrating, with some energy lost in the airspace. This surface then radiates sound into the dwelling interior. As the figure shows, vibrational energy also bypasses the air cavity by traveling through the studs and edge connections.

Normally, the most sensitive components of a structure to airborne noise are the windows, followed by plastered walls and ceilings. An evaluation of the peak sound pressures impinging on the structure is normally sufficient to determine the possibility of damage. In general, at unweighted sound levels above 130 dB, there is the possibility of structural damage. While certain frequencies (such as 30 Hertz for window breakage) may be of more concern than other frequencies, conservatively, only sounds lasting

more than one second above an unweighted sound level of 130 dB are potentially damaging to structural components (von Gierke and Ward 1991).

In the assessment of vibration on humans, the following factors determine if a person will perceive and possibly react to building vibrations:

1. Type of excitation: steady-state, intermittent, or impulsive vibration.
2. Frequency of the excitation. International Organization for Standardization (ISO) standard 2631-2 (ISO 1989) recommends a frequency range of 1 to 80 Hz for the assessment of vibration on humans.
3. Orientation of the body with respect to the vibration.
4. The use of the occupied space (i.e., residential, workshop, hospital).
5. Time of day.

Table B-10 lists the whole-body vibration criteria from ISO 2631-2 for one-third octave frequency bands from 1 to 80 Hz.

Table B-10. Vibration Criteria for the Evaluation of Human Exposure to Whole-Body Vibration

Frequency (Hz)	*RMS Acceleration (m/s/s) Combined Criteria Base Curve*	*RMS Acceleration (m/s/s) Residential Night*	*RMS Acceleration (m/s/s) Residential Day*
1.00	0.0036	0.0050	0.0072
1.25	0.0036	0.0050	0.0072
1.60	0.0036	0.0050	0.0072
2.0	0.0036	0.0050	0.0072
2.50	0.0037	0.0052	0.0074
3.15	0.0039	0.0054	0.0077
4.00	0.0041	0.0057	0.0081
5.00	0.0043	0.0060	0.0086
6.30	0.0046	0.0064	0.0092
8.00	0.0050	0.0070	0.0100
10.00	0.0063	0.0088	0.0126
12.50	0.0078	0.0109	0.0156
16.00	0.0100	0.0140	0.0200
20.00	0.0125	0.0175	0.0250
25.00	0.0156	0.0218	0.0312
31.50	0.0197	0.0276	0.0394
40.00	0.0250	0.0350	0.0500
50.00	0.0313	0.0438	0.0626
63.00	0.0394	0.0552	0.0788
80.00	0.0500	0.0700	0.1000

Source: ISO 1989.

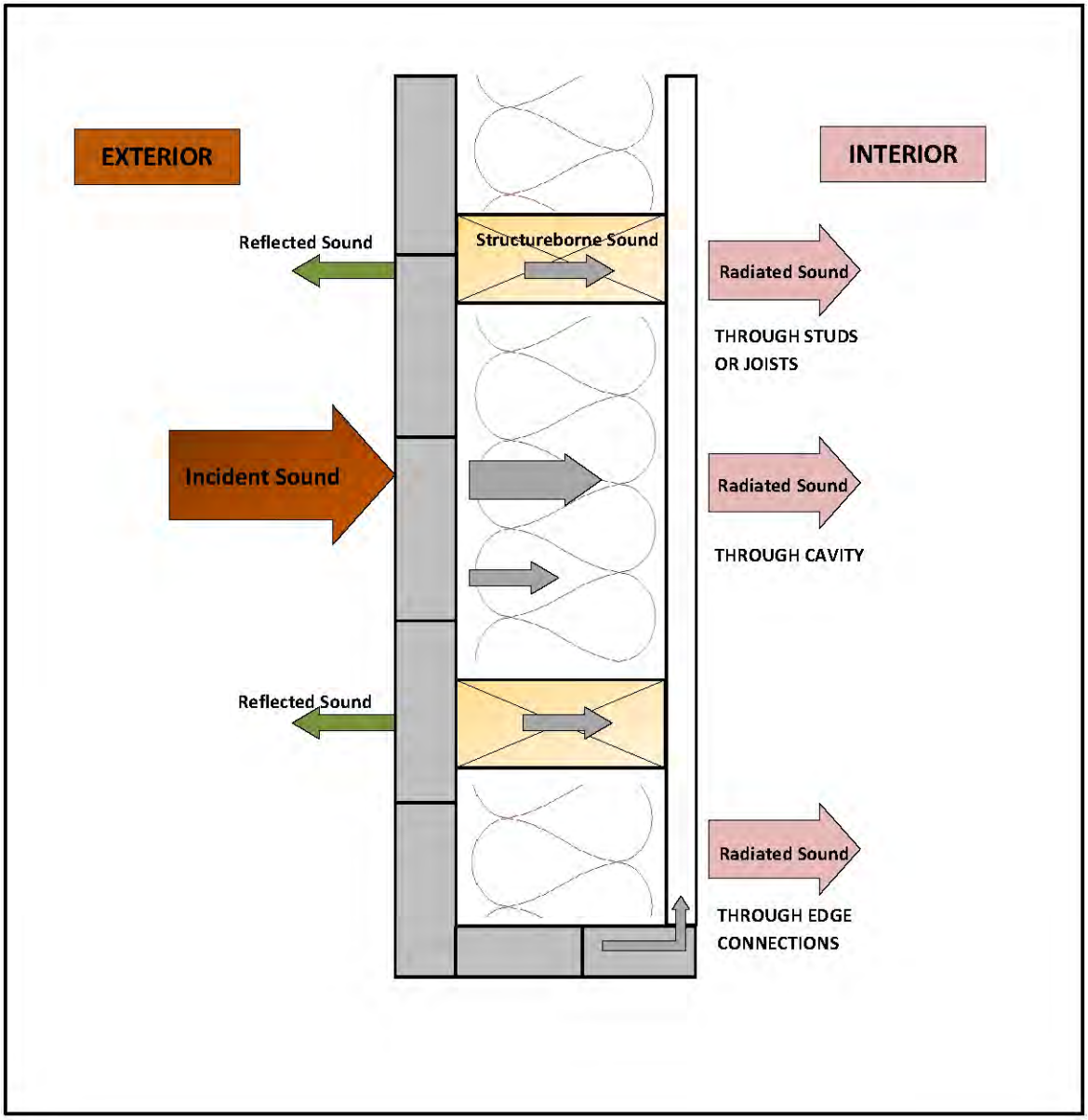


Figure B-15. Depiction of Sound Transmission through Built Construction

B.2.11 Sonic Booms

Sonic booms are commonly associated with structural damage. Most damage claims are for brittle objects, such as glass and plaster. Table B-11 summarizes the threshold of damage that might be expected at various overpressures. There is a large degree of variability in damage experience, and much damage depends on the pre-existing condition of a structure. Breakage data for glass, for example, spans a range of two to three orders of magnitude at a given overpressure. At 1 psf, the probability of a window breaking ranges from one in a billion (Sutherland 1990b) to one in a million (Hershey and Higgins 1976). These damage rates are associated with a combination of boom load and glass condition. At 10 psf, the probability of breakage is between one in a hundred and one in a thousand. Laboratory tests of glass (White 1972) have shown that properly installed window glass will not break at overpressures below 10 psf, even when subjected to repeated booms, but in the real world glass is not in pristine condition.

Table B-11. Possible Damage to Structures From Sonic Booms

Sonic Boom Overpressure Nominal (psf)	*Type of Damage*	*Item Affected*
0.5 - 2	Plaster	Fine cracks; extension of existing cracks; more in ceilings; over door frames; between some plaster boards.
0.5 - 2	Glass	Rarely shattered; either partial or extension of existing.
0.5 - 2	Roof	Slippage of existing loose tiles/slates; sometimes new cracking of old slates at nail hole.
0.5 - 2	Damage to outside walls	Existing cracks in stucco extended.
0.5 - 2	Bric-a-brac	Those carefully balanced or on edges can fall; fine glass, such as large goblets, can fall and break.
0.5 - 2	Other	Dust falls in chimneys.
2 - 4	Glass, plaster, roofs, ceilings	Failures show that would have been difficult to forecast in terms of their existing localized condition. Nominally in good condition.
4 - 10	Glass	Regular failures within a population of well-installed glass; industrial as well as domestic greenhouses.
4 - 10	Plaster	Partial ceiling collapse of good plaster; complete collapse of very new, incompletely cured, or very old plaster.
4 - 10	Roofs	High probability rate of failure in nominally good state, slurry-wash; some chance of failures in tiles on modern roofs; light roofs (bungalow) or large area can move bodily.
4 - 10	Walls (out)	Old, free standing, in fairly good condition can collapse.
4 - 10	Walls (in)	Inside (“party”) walls known to move at 10 psf.
Greater than 10	Glass	Some good glass will fail regularly to sonic booms from the same direction. Glass with existing faults could shatter and fly. Large window frames move.
Greater than 10	Plaster	Most plaster affected.
Greater than 10	Ceilings	Plaster boards displaced by nail popping.
Greater than 10	Roofs	Most slate/slurry roofs affected, some badly; large roofs having good tile can be affected; some roofs bodily displaced causing gale-end and will-plate cracks; domestic chimneys dislodged if not in good condition.
Greater than 10	Walls	Internal party walls can move even if carrying fittings such as hand basins or taps; secondary damage due to water leakage.
Greater than 10	Bric-a-brac	Some nominally secure items can fall; e.g., large pictures, especially if fixed to party walls.

Source: Haber and Nakaki 1989.

Damage to plaster occurs at similar ranges to glass damage. Plaster has a compounding issue in that it will often crack due to shrinkage while curing, or from stresses as a structure settles, even in the absence of outside loads. Sonic boom damage to plaster often occurs when internal stresses are high from these factors.

Some degree of damage to glass and plaster should thus be expected whenever there are sonic booms, but usually at the low rates noted above. In general, structural damage from sonic booms should be expected only for overpressures above 10 psf.

B.2.12 Noise and Sonic Boom Effects on Terrain

It has been suggested that noise levels associated with low-flying aircraft may affect the terrain under the flight path by disturbing fragile soil or snow, especially in mountainous areas, causing landslides or avalanches. There are no known instances of such events. It is improbable that such effects would result from routine subsonic aircraft operations.

In contrast to subsonic noise, sonic booms are considered to be a potential trigger for snow avalanches. Avalanches are highly dependent on the physical status of the snow, and do occur spontaneously. They can be triggered by minor disturbances, and there are documented accounts of sonic booms triggering avalanches. Switzerland routinely restricts supersonic flight during avalanche season. Landslides are not an issue for sonic booms. There was one anecdotal report of a minor landslide from a sonic boom generated by the Space Shuttle during landing, but there is no credible mechanism or consistent pattern of reports.

B.2.13 Noise Effects on Historical and Archaeological Sites

Historical buildings and sites can have elements that are more fragile than conventional structures. Aircraft noise may affect such sites more severely than newer, modern structures. In older structures, seemingly insignificant surface cracks caused by vibrations from aircraft noise may lead to greater damage from natural forces (Hanson et al. 1991). There are few scientific studies of such effects to provide guidance for their assessment.

For example, one study involved measurements of noise and vibration in a restored plantation house, originally built in 1795. It is located 1,500 feet from the centerline at the departure end of Runway 19L at Washington Dulles International Airport. The aircraft measured was the Concorde. There was special concern for the building's windows, since roughly half of the 324 panes were original. No instances of structural damage were found. Interestingly, despite the high levels of noise during Concorde takeoffs, the induced structural vibration levels were actually less than those induced by touring groups and vacuum cleaning (Wesler 1977).

As for conventional structures, noise exposure levels for normally compatible land uses should also be protective of historic and archaeological sites. Unique sites should, of course, be analyzed for specific exposure.

B.2.14 Effects on Domestic Animals and Wildlife

Domestic animals and wildlife have different hearing thresholds, frequency response, and tolerance characteristics than do humans. There is a large difference in response even among different animal species. Evaluation of noise impacts on wildlife using metrics primarily intended for human impact should be done with caution and makes evaluation of impacts on wildlife even more difficult. As such,

evaluations in this appendix have been based primarily on historical response to sounds rather than to absolute sound levels.

Hearing is critical to an animal's ability to react, compete, reproduce, hunt, forage, and survive in its environment. While the existing literature does include studies on possible effects of jet aircraft noise and sonic booms on wildlife, there appears to have been little concerted effort in developing quantitative comparisons of aircraft noise effects on normal auditory characteristics. Behavioral effects have been relatively well described, but the larger ecological context issues, and the potential for drawing conclusions regarding effects on populations, has not been well developed.

The relationships between potential auditory/physiological effects and species interactions with their environments are not well understood. Manci et al. (1988), assert that the consequences that physiological effects may have on behavioral patterns are vital to understanding the long-term effects of noise on wildlife. Questions regarding the effects (if any) on predator-prey interactions, reproductive success, and intra-inter specific behavior patterns remain.

The following discussion provides an overview of the existing literature on noise effects (particularly jet aircraft noise) on animal species. The literature reviewed here involves those studies that have focused on the observations of the behavioral effects that jet aircraft and sonic booms have on animals.

A great deal of research was conducted in the 1960s and 1970s on the effects of aircraft noise on the public and the potential for adverse ecological impacts. These studies were largely completed in response to the increase in air travel and as a result of the introduction of supersonic jet aircraft. According to Manci et al. (1988), the foundation of information created from that focus does not necessarily correlate or provide information specific to the impacts to wildlife in areas overflown by aircraft at supersonic speed or at low altitudes.

The abilities to hear sounds and noise and to communicate assist wildlife in maintaining group cohesiveness and survivorship. Social species communicate by transmitting calls of warning, introduction, and other types that are subsequently related to an individual's or group's responsiveness.

Animal species differ greatly in their responses to noise. Noise effects on domestic animals and wildlife are classified as primary, secondary, and tertiary. Primary effects are direct, physiological changes to the auditory system, and most likely include the masking of auditory signals. Masking is defined as the inability of an individual to hear important environmental signals that may arise from mates, predators, or prey. There is some potential that noise could disrupt a species' ability to communicate or could interfere with behavioral patterns (Manci et al. 1988). Although the effects are likely temporal, aircraft noise may cause masking of auditory signals within exposed faunal communities. Animals rely on hearing to avoid predators, obtain food, and communicate with, and attract, other members of their species. Aircraft noise may mask or interfere with these functions. Other primary effects, such as ear drum rupture or temporary and permanent hearing threshold shifts, are not as likely given the subsonic noise levels produced by aircraft overflights.

Secondary effects may include non-auditory effects such as stress and hypertension; behavioral modifications; interference with mating or reproduction; and impaired ability to obtain adequate food, cover, or water. Tertiary effects are the direct result of primary and secondary effects, and include population decline and habitat loss. Most of the effects of noise are mild enough that they may never be detectable as variables of change in population size or population growth against the background of

normal variation (Bowles 1995). Other environmental variables (e.g., predators, weather, changing prey base, ground-based disturbance) also influence secondary and tertiary effects, and confound the ability to identify the ultimate factor in limiting productivity of a certain nest, area, or region (Smith et al. 1988). Overall, the literature suggests that species differ in their response to various types, durations, and sources of noise (Manci et al. 1988).

Many scientific studies have investigated the effects of aircraft noise on wildlife, and some have focused on wildlife "flight" due to noise. Animal responses to aircraft are influenced by many variables, including size, speed, proximity (both height above the ground and lateral distance), engine noise, color, flight profile, and radiated noise. The type of aircraft (e.g., fixed wing versus rotor-wing [helicopter]) and type of flight mission may also produce different levels of disturbance, with varying animal responses (Smith et al. 1988). Consequently, it is difficult to generalize animal responses to noise disturbances across species.

One result of the Manci et al. (1988) literature review was the conclusion that, while behavioral observation studies were relatively limited, a general behavioral reaction in animals from exposure to aircraft noise is the startle response. The intensity and duration of the startle response appears to be dependent on which species is exposed, whether there is a group or an individual, and whether there have been some previous exposures. Responses range from flight, trampling, stampeding, jumping, or running, to movement of the head in the apparent direction of the noise source. Manci et al. (1988) reported that the literature indicated that avian species may be more sensitive to aircraft noise than mammals.

B.2.14.1 Domestic Animals

Although some studies report that the effects of aircraft noise on domestic animals is inconclusive, a majority of the literature reviewed indicates that domestic animals exhibit some behavioral responses to military overflights but generally seem to habituate to the disturbances over a period of time. Mammals in particular appear to react to noise at sound levels higher than 90 dB, with responses including the startle response, freezing (i.e., becoming temporarily stationary), and fleeing from the sound source. Many studies on domestic animals suggest that some species appear to acclimate to some forms of sound disturbance (Manci et al. 1988). Some studies have reported such primary and secondary effects as reduced milk production and rate of milk release, increased glucose concentrations, decreased levels of hemoglobin, increased heart rate, and a reduction in thyroid activity. These latter effects appear to represent a small percentage of the findings occurring in the existing literature.

Some reviewers have indicated that earlier studies, and claims by farmers linking adverse effects of aircraft noise on livestock, did not necessarily provide clear-cut evidence of cause and effect (Cottereau 1978). In contrast, many studies conclude that there is no evidence that aircraft overflights affect feed intake, growth, or production rates in domestic animals.

Cattle

In response to concerns about overflight effects on pregnant cattle, milk production, and cattle safety, the U.S. Air Force prepared a handbook for environmental protection that summarized the literature on the impacts of low-altitude flights on livestock (and poultry) and includes specific case studies conducted in numerous airspaces across the country. Adverse effects have been found in a few studies but have not been reproduced in other similar studies. One such study, conducted in 1983, suggested that 2 of 10 cows in late pregnancy aborted after showing rising estrogen and falling progesterone levels. These increased

hormonal levels were reported as being linked to 59 aircraft overflights. The remaining eight cows showed no changes in their blood concentrations and calved normally. A similar study reported abortions occurred in three out of five pregnant cattle after exposing them to flyovers by six different aircraft. Another study suggested that feedlot cattle could stampede and injure themselves when exposed to low-level overflights (U.S. Air Force 1994a).

A majority of the studies reviewed suggests that there is little or no effect of aircraft noise on cattle. Studies presenting adverse effects to domestic animals have been limited. A number of studies (Parker and Bayley 1960; Casady and Lehmann 1967; Kovalcik and Sottnik 1971) investigated the effects of jet aircraft noise and sonic booms on the milk production of dairy cows. Through the compilation and examination of milk production data from areas exposed to jet aircraft noise and sonic boom events, it was determined that milk yields were not affected. This was particularly evident in those cows that had been previously exposed to jet aircraft noise.

A study examined the causes of 1,763 abortions in Wisconsin dairy cattle over a 1-year time period and none were associated with aircraft disturbances (U.S. Air Force 1993). In 1987, researchers contacted seven livestock operators for production data, and no effects of low-altitude and supersonic flights were noted. Of the 43 cattle previously exposed to low-altitude flights, 3 showed a startle response to an F/A-18 aircraft flying overhead at 500 feet AGL and 400 knots by running less than 10 meters. They resumed normal activity within 1 minute (U.S. Air Force 1994a). Beyer (1983) found that helicopters caused more reaction than other low-aircraft overflights, and that the helicopters at 30-60 feet overhead did not affect milk production and pregnancies of 44 cows in a 1964 study (U.S. Air Force 1994a).

Additionally, Beyer (1983) reported that five pregnant dairy cows in a pasture did not exhibit fright-flight tendencies or disturb their pregnancies after being overflown by 79 low-altitude helicopter flights and 4 low-altitude, subsonic jet aircraft flights. A 1956 study found that the reactions of dairy and beef cattle to noise from low-altitude, subsonic aircraft were similar to those caused by paper blowing about, strange persons, or other moving objects (U.S. Air Force 1994a).

In a report to Congress, the U.S. Forest Service concluded that "evidence both from field studies of wild ungulates and laboratory studies of domestic stock indicate that the risks of damage are small (from aircraft approaches of 50-100 meters), as animals take care not to damage themselves (U.S. Forest Service 1992). If animals are overflown by aircraft at altitudes of 50-100 meters, there is no evidence that mothers and young are separated, that animals collide with obstructions (unless confined) or that they traverse dangerous ground at too high a rate." These varied study results suggest that, although the confining of cattle could magnify animal response to aircraft overflight, there is no proven cause and effect link between startling cattle from aircraft overflights and abortion rates or lower milk production.

Horses

Horses have also been observed to react to overflights of jet aircraft. Several of the studies reviewed reported a varied response of horses to low-altitude aircraft overflights. Observations made in 1966 and 1968 noted that horses galloped in response to jet flyovers (U.S. Air Force 1993). Bowles (1995) cites Kruger and Erath as observing horses exhibiting intensive flight reactions, random movements, and biting/kicking behavior. However, no injuries or abortions occurred, and there was evidence that the mares adapted somewhat to the flyovers over the course of a month (U.S. Air Force 1994a). Although horses were observed noticing the overflights, it did not appear to affect either survivability or

reproductive success. There was also some indication that habituation to these types of disturbances was occurring.

LeBlanc et al. (1991), studied the effects of F-14 jet aircraft noise on pregnant mares. They specifically focused on any changes in pregnancy success, behavior, cardiac function, hormonal production, and rate of habituation. Their findings reported observations of "flight-fright" reactions, which caused increases in heart rates and serum cortisol concentrations. The mares, however, did habituate to the noise. Levels of anxiety and mass body movements were the highest after initial exposure, with intensities of responses decreasing thereafter. There were no differences in pregnancy success when compared to a control group.

Swine

Generally, the literature findings for swine appear to be similar to those reported for cows and horses. While there are some effects from aircraft noise reported in the literature, these effects are minor. Studies of continuous noise exposure (i.e., 6 hours, 72 hours of constant exposure) reported influences on short-term hormonal production and release. Additional constant exposure studies indicated the observation of stress reactions, hypertension, and electrolyte imbalances (Dufour 1980). A study by Bond et al. (1963), demonstrated no adverse effects on the feeding efficiency, weight gain, ear physiology, or thyroid and adrenal gland condition of pigs subjected to observed aircraft noise. Observations of heart rate increase were recorded; noting that cessation of the noise resulted in the return to normal heart rates. Conception rates and offspring survivorship did not appear to be influenced by exposure to aircraft noise.

Similarly, simulated aircraft noise at levels of 100-135 dB had only minor effects on the rate of feed utilization, weight gain, food intake, or reproduction rates of boars and sows exposed, and there were no injuries or inner ear changes observed (Gladwin et al. 1988; Manci et al. 1988).

Domestic Fowl

According to a 1994 position paper by the U.S. Air Force on effects of low-altitude overflights (below 1,000 feet) on domestic fowl, overflight activity has negligible effects (U.S. Air Force 1994b). The paper did recognize that given certain circumstances, adverse effects can be serious. Some of the effects can be panic reactions, reduced productivity, and effects on marketability (e.g., bruising of the meat caused during "pile-up" situations).

The typical reaction of domestic fowl after exposure to sudden, intense noise is a short-term startle response. The reaction ceases as soon as the stimulus is ended, and within a few minutes all activity returns to normal. More severe responses are possible depending on the number of birds, the frequency of exposure, and environmental conditions. Large crowds of birds, and birds not previously exposed, are more likely to pile up in response to a noise stimulus (U.S. Air Force 1994b). According to studies and interviews with growers, it is typically the previously unexposed birds that incite panic crowding, and the tendency to do so is markedly reduced within five exposures to the stimulus (U.S. Air Force 1994b). This suggests that the birds habituate relatively quickly. Egg productivity was not adversely affected by infrequent noise bursts, even at exposure levels as high as 120-130 dB.

Between 1956 and 1988, there were 100 recorded claims against the Navy for alleged damage to domestic fowl. The number of claims averaged three per year, with peak numbers of claims following publications of studies on the topic in the early 1960s. Many of the claims were disproved or did not have sufficient supporting evidence. The claims were filed for the following alleged damages: 55% for panic reactions,

31% for decreased production, 6% for reduced hatchability, 6% for weight loss, and less than 1% for reduced fertility (U.S. Air Force 1994b).

B2.14.2 Wildlife

Studies on the effects of overflights and sonic booms on wildlife have been focused mostly on avian species and ungulates such as caribou and bighorn sheep. Few studies have been conducted on marine mammals, small terrestrial mammals, reptiles, amphibians, and carnivorous mammals. Generally, species that live entirely below the surface of the water have also been ignored due to the fact they do not experience the same level of sound as terrestrial species (National Park Service 1994). Wild ungulates appear to be much more sensitive to noise disturbance than domestic livestock. This may be due to previous exposure to disturbances. One common factor appears to be that low-altitude flyovers seem to be more disruptive in terrain where there is little cover (Manci et al. 1988).

Mammals

TERRESTRIAL MAMMALS

Studies of terrestrial mammals have shown that noise levels of 120 dB can damage mammals' ears, and levels at 95 dB can cause temporary loss of hearing acuity. Noise from aircraft has affected other large carnivores by causing changes in home ranges, foraging patterns, and breeding behavior. One study recommended that aircraft not be allowed to fly at altitudes below 2,000 feet AGL over important grizzly and polar bear habitat. Wolves have been frightened by low-altitude flights that were 25-1,000 feet AGL. However, wolves have been found to adapt to aircraft overflights and noise as long as they were not being hunted from aircraft (Dufour 1980).

Wild ungulates (American bison, caribou, bighorn sheep) appear to be much more sensitive to noise disturbance than domestic livestock (Weisenberger et al. 1996). Behavioral reactions may be related to the past history of disturbances by such things as humans and aircraft. Common reactions of reindeer kept in an enclosure exposed to aircraft noise disturbance were a slight startle response, rising of the head, pricking ears, and scenting of the air. Panic reactions and extensive changes in behavior of individual animals were not observed. Observations of caribou in Alaska exposed to fixed-wing aircraft and helicopters showed running and panic reactions occurred when overflights were at an altitude of 200 feet or less. The reactions decreased with increased altitude of overflights, and, with more than 500 feet in altitude, the panic reactions stopped. Also, smaller groups reacted less strongly than larger groups. One negative effect of the running and avoidance behavior is increased expenditure of energy. For a 90-kilogram animal, the calculated expenditure due to aircraft harassment is 64 kilocalories per minute when running and 20 kilocalories per minute when walking. When conditions are favorable, this expenditure can be counteracted with increased feeding; however, during harsh winter conditions, this may not be possible. Incidental observations of wolves and bears exposed to fixed-wing aircraft and helicopters in the northern regions suggested that wolves are less disturbed than wild ungulates, while grizzly bears showed the greatest response of any animal species observed (Weisenberger et al. 1996).

It has been proven that low-altitude overflights do induce stress in animals. Increased heart rates, an indicator of excitement or stress, have been found in pronghorn antelope, elk, and bighorn sheep. As such reactions occur naturally as a response to predation, infrequent overflights may not, in and of themselves, be detrimental. However, flights at high frequencies over a long period of time may cause harmful effects. The consequences of this disturbance, while cumulative, are not additive. It may be that aircraft

disturbance may not cause obvious and serious health effects, but coupled with a harsh winter, it may have an adverse impact. Research has shown that stress induced by other types of disturbances produces long-term decreases in metabolism and hormone balances in wild ungulates.

Behavioral responses can range from mild to severe. Mild responses include head raising, body shifting, or turning to orient toward the aircraft. Moderate disturbance may be nervous behaviors, such as trotting a short distance. Escape is the typical severe response.

BIRDS

Auditory research conducted on birds indicates that they fall between the reptiles and the mammals relative to hearing sensitivity. According to Dooling (1978), within the range of 1,000 to 5,000 Hz, birds show a level of hearing sensitivity similar to that of the more sensitive mammals. In contrast to mammals, bird sensitivity falls off at a greater rate to increasing and decreasing frequencies. Passive observations and studies examining aircraft bird strikes indicate that birds nest and forage near airports. Aircraft noise in the vicinity of commercial airports apparently does not inhibit bird presence and use.

High noise events (like a low-altitude aircraft overflight) may cause birds to engage in escape or avoidance behaviors, such as flushing from perches or nests (Ellis et al. 1991). These activities impose an energy cost on the birds that, over the long term, may affect survival or growth. In addition, the birds may spend less time engaged in necessary activities like feeding, preening, or caring for their young because they spend time in noise-avoidance activity. However, the long-term significance of noise-related impacts is less clear. Several studies on nesting raptors have indicated that birds become habituated to aircraft overflights and that long-term reproductive success is not affected (Ellis et al. 1991; Grubb and King 1991). Threshold noise levels for significant responses range from 62 dB for Pacific black brant to 85 dB for crested tern (Brown 1990; Ward and Stehn 1990).

Songbirds were observed to become silent prior to the onset of a sonic boom event (F-111 jets), followed by "raucous discordant cries." There was a return to normal singing within 10 seconds after the boom (Higgins 1974 in Manci et al. 1988). Ravens responded by emitting protestation calls, flapping their wings, and soaring.

Manci et al. (1988), reported a reduction in reproductive success in some small territorial passerines (i.e., perching birds or songbirds) after exposure to low-altitude overflights. However, it has been observed that passerines are not driven any great distance from a favored food source by a nonspecific disturbance, such as aircraft overflights (U.S. Forest Service 1992). Further study may be warranted.

A cooperative study between the DoD and the U.S. Fish and Wildlife Service (USFWS), assessed the response of the red-cockaded woodpecker to a range of military training noise events, including artillery, small arms, helicopter, and maneuver noise (Pater et al. 1999). The project findings show that the red-cockaded woodpecker successfully acclimates to military noise events. Depending on the noise level that ranged from innocuous to very loud, the birds responded by flushing from their nest cavities. When the noise source was closer and the noise level was higher, the number of flushes increased proportionately. In all cases, however, the birds returned to their nests within a relatively short period of time (usually within 12 minutes). Additionally, the noise exposure did not result in any mortality or statistically detectable changes in reproductive success (Pater et al. 1999). Red-cockaded woodpeckers did not flush when artillery simulators were more than 122 meters away and SELs were 70 dB.

Lynch and Speake (1978) studied the effects of both real and simulated sonic booms on the nesting and brooding eastern wild turkey in Alabama. Hens at four nest sites were subjected to between 8 and 11 combined real and simulated sonic booms. All tests elicited similar responses, including quick lifting of the head and apparent alertness for 10-20 seconds. No apparent nest failure occurred as a result of the sonic booms. Twenty-one brood groups were also subjected to simulated sonic booms. Reactions varied slightly between groups, but the largest percentage of groups reacted by standing motionless after the initial blast. Upon the sound of the boom, the hens and poults fled until reaching the edge of the woods (approximately 4-8 meters). Afterward, the poults resumed feeding activities while the hens remained alert for a short period of time (approximately 15-20 seconds). In no instances were poults abandoned, nor did they scatter and become lost. Every observation group returned to normal activities within a maximum of 30 seconds after a blast.

RAPTORS

In a literature review of raptor responses to aircraft noise, Manci et al. (1988) found that most raptors did not show a negative response to overflights. When negative responses were observed they were predominantly associated with rotor-winged aircraft or jet aircraft that were repeatedly passing within 0.5 mile of a nest.

Ellis et al. (1991), performed a study to estimate the effects of low-level military jet aircraft and mid- to high-altitude sonic booms (both actual and simulated) on nesting peregrine falcons and seven other raptors (common black-hawk, Harris' hawk, zone-tailed hawk, red-tailed hawk, golden eagle, prairie falcon, bald eagle). They observed responses to test stimuli, determined nest success for the year of the testing, and evaluated site occupancy the following year. Both long- and short-term effects were noted in the study. The results reported the successful fledging of young in 34 of 38 nest sites (all eight species) subjected to low-level flight and/or simulated sonic booms. Twenty-two of the test sites were revisited in the following year, and observations of pairs or lone birds were made at all but one nest. Nesting attempts were underway at 19 of 20 sites that were observed long enough to be certain of breeding activity. Reoccupancy and productivity rates were within or above expected values for self-sustaining populations.

Short-term behavior responses were also noted. Overflights at a distance of 150 meters or less produced few significant responses and no severe responses. Typical responses consisted of crouching or, very rarely, flushing from the perch site. Significant responses were most evident before egg laying and after young were "well grown." Incubating or brooding adults never burst from the nest, thus preventing egg breaking or knocking chicks out of the nest. Jet passes and sonic booms often caused noticeable alarm; however, significant negative responses were rare and did not appear to limit productivity or reoccupancy. Due to the locations of some of the nests, some birds may have been habituated to aircraft noise. There were some test sites located at distances far from zones of frequent military aircraft usage, and the test stimuli were often closer, louder, and more frequent than would be likely for a normal training situation (Ellis et al. 1991).

Manci et al. (1988), noted that a female northern harrier was observed hunting on a bombing range in Mississippi during bombing exercises. The harrier was apparently unfazed by the exercises, even when a bomb exploded within 200 feet. In a similar case of habituation/non-disturbance, a study on the Florida snail-kite stated the greatest reaction to overflights (approximately 98 dB) was "watching the aircraft fly by." No detrimental impacts to distribution, breeding success, or behavior were noted.

Bald Eagle. A study by Grubb and King (1991) on the reactions of the bald eagle to human disturbances showed that terrestrial disturbances elicited the greatest response, followed by aquatic (i.e., boats) and aerial disturbances. The disturbance regime of the area where the study occurred was predominantly characterized by aircraft noise. The study found that pedestrians consistently caused responses that were greater in both frequency and duration. Helicopters elicited the highest level of aircraft-related responses. Aircraft disturbances, although the most common form of disturbance, resulted in the lowest levels of response. This low response level may have been due to habituation; however, flights less than 170 meters away caused reactions similar to other disturbance types. Ellis et al. (1991) showed that eagles typically respond to the proximity of a disturbance, such as a pedestrian or aircraft within 100 meters, rather than the noise level. Fleischner and Weisberg (1986) stated that reactions of bald eagles to commercial jet flights, although minor (e.g., looking), were twice as likely to occur when the jets passed at a distance of 0.5 mile or less. They also noted that helicopters were four times more likely to cause a reaction than a commercial jet and 20 times more likely to cause a reaction than a propeller plane.

The USFWS advised Cannon Air Force Base that flights at or below 2,000 feet AGL from October 1 through March 1 could result in adverse impacts to wintering bald eagles (USFWS 1998). However, Fraser et al. (1985), suggested that raptors habituate to overflights rapidly, sometimes tolerating aircraft approaches of 65 feet or less.

Golden Eagle. In their guidelines for aerial surveys, USFWS (Pagel et al. 2010) summarized past studies by stating that most golden eagles respond to survey aircraft (fixed- and rotary-wing) by remaining on their nests, and continuing to incubate or roost. Surveys take place generally as close as 10 to 20 meters from cliffs (including hovering less than 30 seconds, if necessary, to count eggs) and no farther than 200 meters from cliffs depending on safety (Pagel et al. 2010).

Grubb et al. (2007) experimented with multiple exposure to two helicopter types and concluded that flights with a variety of approach distances (800, 400, 200, and 100 meters) had no effect on golden eagle nesting success or productivity rates within the same year or on rates of renewed nesting activity the following year when compared to the corresponding figures for the larger population of non-manipulated nest sites (Grubb et al. 2007). They found no significant, detrimental, or disruptive responses in 303 helicopter passes near eagles. In 227 AH-64 Apache helicopter experimental passes (considered twice as loud as a civilian helicopter also tested) at test distances of 0–800 meters from nesting golden eagles, 96% resulted in no more response than watching the helicopter pass. No greater reactions occurred until after hatching when individual golden eagles exhibited five flatten and three fly behaviors at three nest sites. The flight responses occurred at approach distances of 200 meters or less. No evidence was found of an effect on subsequent nesting activity or success, despite many of the helicopter flights occurring during early courtship and nest repair. None of these responding pairs failed to successfully fledge young, except for one nest that fell later in the season. Excited, startled, avoidance reactions were never observed. Non-attending eagles or those perched away from the nests were more likely to fly than attending eagles, but also with less potential consequence to nesting success (Grubb et al. 2007). Golden eagles appeared to become less responsive with successive exposures. Much of helicopter sound energy may be at a lower frequency than golden eagles can hear, thus reducing expected impacts. Grubb et al. (2007) found no relationship between helicopter sound levels and corresponding eagle ambient behaviors or limited responses, which occurred throughout recorded test levels (76.7–108.8 dB, unweighted). The authors thought that the lower than expected behavioral responses may be partially due to the fact that the golden eagles in the area appear acclimated to the current high levels of outdoor recreational, including

aviation, activities. Based on the results of this study, the authors recommended reduction of existing buffers around nest sites to 100 meters (325 feet) for helicopter activity.

Richardson and Miller (1997) reviewed buffers as protection for raptors against disturbance from ground-based human activities. No consideration of aircraft activity was included. They stressed a clear line of sight as an important factor in a raptor's response to a particular disturbance, with visual screening allowing a closer approach of humans without disturbing a raptor. A Geographic Information System-assisted viewshed approach combined with a designated buffer zone distance was found to be an effective tool for reducing potential disturbance to golden eagles from ground-based activities (Richardson and Miller 1997). They summarized recommendations that included a median 0.5-mile (800-meter) buffer (range = 200-1,600 meters, n = 3) to reduce human disturbances (from ground-based activities such as rock climbing, shooting, vehicular activity) around active golden eagle nests from February 1 to August 1 based on an extensive review of other studies (Richardson and Miller 1997). Physical characteristics (i.e., screening by topography or vegetation) are important variables to consider when establishing buffer zones based on raptors' visual- and auditory-detection distances (Richardson and Miller 1997).

Osprey. A study by Trimper et al. (1998), in Goose Bay, Labrador, Canada, focused on the reactions of nesting osprey to military overflights by CF-18 Hornets. Reactions varied from increased alertness and focused observation of planes to adjustments in incubation posture. No overt reactions (e.g., startle response, rapid nest departure) were observed as a result of an overflight. Young nestlings crouched as a result of any disturbance until 1 to 2 weeks prior to fledging. Helicopters, human presence, float planes, and other ospreys elicited the strongest reactions from nesting ospreys. These responses included flushing, agitation, and aggressive displays. Adult osprey showed high nest occupancy rates during incubation regardless of external influences. The osprey observed occasionally stared in the direction of the flight before it was audible to the observers. The birds may have been habituated to the noise of the flights; however, overflights were strictly controlled during the experimental period. Strong reactions to float planes and helicopter may have been due to the slower flight and therefore longer duration of visual stimuli rather than noise-related stimuli.

Red-tailed Hawk. Andersen et al. (1989), conducted a study that investigated the effects of low-level helicopter overflights on 35 red-tailed hawk nests. Some of the nests had not been flown over prior to the study. The hawks that were naïve (i.e., not previously exposed) to helicopter flights exhibited stronger avoidance behavior (9 of 17 birds flushed from their nests) than those that had experienced prior overflights. The overflights did not appear to affect nesting success in either study group. These findings were consistent with the belief that red-tailed hawks habituate to low-level air traffic, even during the nesting period.

UPLAND GAME BIRDS

Greater Sage-grouse. The greater sage-grouse was recently designated as a candidate species for protection under the Endangered Species Act after many years of scrutiny and research (USFWS 2010). This species is a widespread and characteristic species of the sagebrush ecosystems in the Intermountain West. Greater sage-grouse, like most bird species, rely on auditory signals as part of mating. Sage-grouse are known to select their leks based on acoustic properties and depend on auditory communication for mating behavior (Braun 2006). Although little specific research has been completed to determine what, if any, effects aircraft overflight and sonic booms would have on the breeding behavior of this

species, factors that may be important include season and time of day, altitude, frequency, and duration of overflights, and frequency and loudness of sonic booms.

Booth in 2009 found, while attempting to count sage-grouse at leks (breeding grounds) using light sport aircraft at 150 meters (492 feet) to 200 meters (650 feet) AGL, that sage-grouse flushed from leks on 12 of 14 approaches when the airplane was within 656 to 984 feet (200–300 meters) of the lek (Booth et al. 2009). In the other two instances, male grouse stopped exhibiting breeding behavior and crouched but stayed on the lek. The time to resumption of normal behavior after disturbance was not provided in this study. Strutting ceased around the time when observers on the ground heard the aircraft. The light sport aircraft could be safely operated at very low speed (68 kilometers/hour or 37 nautical miles/hour) and was powered by either a two-stroke or a four-stroke engine. It is unclear how the response to the slow-flying light sport aircraft used in the study would compare to overflight by military jets, operating at speeds 10 to 12 times as great as the aircraft used in the study. It is possible that response of the birds was related to the slow speed of the light sport aircraft causing it to resemble an aerial predator.

Other studies have found disturbance from energy operations and other nearby development have adversely affected breeding behavior of greater sage-grouse (Holloran 2005; Doherty 2008; Walker et al. 2007; Harju et al. 2010). These studies do not specifically address overflight and do not isolate noise disturbance from other types (e.g., visual, human presence) nor do they generally provide noise levels or qualification of the noise source (e.g., continuous or intermittent, frequency, duration).

Because so few studies have been done on greater sage-grouse response to overflights or sonic booms, research on related species may be applicable. Observations on other upland game bird species include those on the behavior of four wild turkey (*Meleagris gallapavo*) hens on their nests during real and simulated sonic booms (Manci et al. 1988). Simulated sonic booms were produced by firing 5-centimeter mortar shells, 300 to 500 feet from the nest of each hen. Recordings of pressure for both types of booms measured 0.4 to 1.0 psf at the observer's location.

Turkey hens exhibited only a few seconds of head alert behavior at the sound of the sonic boom. No hens were flushed off the nests, and productivity estimates revealed no effect from the booms. Twenty brood groups were also subjected to simulated sonic booms. In no instance did the hens desert any poults (young birds), nor did the poults scatter or desert the rest of the brood group. In every observation, the brood group returned to normal activity within 30 seconds after a simulated sonic boom. Similarly, researchers cited in Manci et al. (1988) observed no difference in hatching success of bobwhite quail (*Colinus virginianus*) exposed to simulated sonic booms of 100 to 250 micronewtons per square meter.

MIGRATORY WATERFOWL

Fleming et al. (1996) conducted a study of caged American black ducks found that noise had negligible energetic and physiologic effects on adult waterfowl. Measurements included body weight, behavior, heart rate, and enzymatic activity. Experiments also showed that adult ducks exposed to high noise events acclimated rapidly and showed no effects.

The study also investigated the reproductive success of captive ducks, which indicated that duckling growth and survival rates at Piney Island, North Carolina, were lower than those at a background location. In contrast, observations of several other reproductive indices (i.e., pair formation, nesting, egg production, and hatching success) showed no difference between Piney Island and the background location. Potential effects on wild duck populations may vary, as wild ducks at Piney Island have

presumably acclimated to aircraft overflights. It was not demonstrated that noise was the cause of adverse impacts. A variety of other factors, such as weather conditions, drinking water and food availability and variability, disease, and natural variability in reproduction, could explain the observed effects. Fleming noted that drinking water conditions (particularly at Piney Island) deteriorated during the study, which could have affected the growth of young ducks. Further research would be necessary to determine the cause of any reproductive effects (Fleming et al. 1996).

Another study by Conomy et al. (1998) exposed previously unexposed ducks to 71 noise events per day that equaled or exceeded 80 dB. It was determined that the proportion of time black ducks reacted to aircraft activity and noise decreased from 38% to 6% in 17 days and remained stable at 5.8% thereafter. In the same study, the wood duck did not appear to habituate to aircraft disturbance. This supports the notion that animal response to aircraft noise is species-specific. Because a startle response to aircraft noise can result in flushing from nests, migrants and animals living in areas with high concentrations of predators would be the most vulnerable to experiencing effects of lowered birth rates and recruitment over time. Species that are subjected to infrequent overflights do not appear to habituate to overflight disturbance as readily.

Black brant studied in the Alaska Peninsula were exposed to jets and propeller aircraft, helicopters, gunshots, people, boats, and various raptors. Jets accounted for 65% of all the disturbances. Humans, eagles, and boats caused a greater percentage of brant to take flight. There was markedly greater reaction to Bell-206-B helicopter flights than fixed-wing, single-engine aircraft (Ward et al. 1986).

The presence of humans and low-flying helicopters in the Mackenzie Valley North Slope area did not appear to affect the population density of Lapland longspurs, but the experimental group was shown to have reduced hatching and fledging success and higher nest abandonment. Human presence appeared to have a greater impact on the incubating behavior of the black brant, common eider, and Arctic tern than fixed-wing aircraft (Gunn and Livingston 1974).

Gunn and Livingston (1974) found that waterfowl and seabirds in the Mackenzie Valley and North Slope of Alaska and Canada became acclimated to float plane disturbance over the course of 3 days. Additionally, it was observed that potential predators (bald eagle) caused a number of birds to leave their nests. Non-breeding birds were observed to be more reactive than breeding birds. Waterfowl were affected by helicopter flights, while snow geese were disturbed by Cessna 185 flights. The geese flushed when the planes were less than 1,000 feet, compared to higher flight elevations. An overall reduction in flock sizes was observed. It was recommended that aircraft flights be reduced in the vicinity of premigratory staging areas.

Manci et al. 1988, reported that waterfowl were particularly disturbed by aircraft noise. The most sensitive appeared to be snow geese. Canada geese and snow geese were thought to be more sensitive than other animals such as turkey vultures, coyotes, and raptors (Edwards et al. 1979).

WADING AND SHOREBIRDS

Black et al. (1984), studied the effects of low-altitude (less than 500 feet AGL) military training flights with sound levels from 55 to 100 dB on wading bird colonies (i.e., great egret, snowy egret, tricolored heron, and little blue heron). The training flights involved three or four aircraft, which occurred once or twice per day. This study concluded that the reproductive activity—including nest success, nestling survival, and nestling chronology—was independent of F-16 overflights. Dependent variables were more

strongly related to ecological factors, including location and physical characteristics of the colony and climatology.

Another study on the effects of circling fixed-wing aircraft and helicopter overflights on wading bird colonies found that at altitudes of 195 to 390 feet, there was no reaction in nearly 75% of the 220 observations. Approximately 90% displayed no reaction or merely looked toward the direction of the noise source. Another 6% stood up, 3% walked from the nest, and 2% flushed (but were without active nests) and returned within 5 minutes (Kushlan 1979). Apparently, non-nesting wading birds had a slightly higher incidence of reacting to overflights than nesting birds. Seagulls observed roosting near a colony of wading birds in another study remained at their roosts when subsonic aircraft flew overhead (Burger 1981). Colony distribution appeared to be most directly correlated to available wetland community types and was found to be distributed randomly with respect to MTRs. These results suggest that wading bird species presence was most closely linked to habitat availability and that they were not affected by low-level military overflights (U.S. Air Force 2000).

Burger (1986) studied the response of migrating shorebirds to human disturbance and found that shorebirds did not fly in response to aircraft overflights, but did flush in response to more localized intrusions (i.e., humans and dogs on the beach). Burger (1981) studied the effects of noise from JFK Airport in New York on herring gulls that nested less than 1 kilometer from the airport. Noise levels over the nesting colony were 85-100 dB on approach and 94-105 dB on takeoff. Generally, there did not appear to be any prominent adverse effects of subsonic aircraft on nesting, although some birds flushed when the Concorde flew overhead and, when they returned, engaged in aggressive behavior. Groups of gulls tended to loaf in the area of the nesting colony, and these birds remained at the roost when the Concorde flew overhead. Up to 208 of the loafing gulls flew when supersonic aircraft flew overhead. These birds would circle around and immediately land in the loafing flock (U.S. Air Force 2000).

In 1970, sonic booms were potentially linked to a mass hatch failure of sooty terns on the Dry Tortugas (Austin et al. 1970). The cause of the failure was not certain, but it was conjectured that sonic booms from military aircraft or an overgrowth of vegetation were factors. In the previous season, sooty terns were observed to react to sonic booms by rising in a "panic flight," circling over the island, then usually settling down on their eggs again. Hatching that year was normal. Following the 1969 hatch failure, excess vegetation was cleared and measures were taken to reduce supersonic activity. The 1970 hatch appeared to proceed normally. A colony of noddies on the same island hatched successfully in 1969, the year of the sooty tern hatch failure.

Subsequent laboratory tests of exposure of eggs to sonic booms and other impulsive noises (Cottereau 1972; Cogger and Zegarra 1980; Bowles et al. 1991, 1994) failed to show adverse effects on hatching of eggs. A structural analysis by Ting et al. (2002) showed that, even under extraordinary circumstances, sonic booms would not damage an avian egg.

Burger (1981) observed no effects of subsonic aircraft on herring gulls in the vicinity of JFK International Airport. The Concorde aircraft did cause more nesting gulls to leave their nests (especially in areas of higher density of nests), causing the breakage of eggs and the scavenging of eggs by intruder prey. Clutch sizes were observed to be smaller in areas of higher-density nesting (presumably due to the greater tendency for panic flight) than in areas where there were fewer nests.

Fish and Amphibians

The effects of overflight noise on fish and amphibians have not been well studied, but conclusions regarding their expected responses have involved speculation based upon known physiologies and behavioral traits of these taxa (Gladwin et al. 1988). Although fish do startle in response to low-flying aircraft noise, and probably to the shadows of aircraft, they have been found to habituate to the sound and overflights. Amphibians that respond to low frequencies and those that respond to ground vibration, such as spadefoot toads, may be affected by noise.

Summary

Some physiological/behavioral responses such as increased hormonal production, increased heart rate, and reduction in milk production have been described in a small percentage of studies. A majority of the studies focusing on these types of effects have reported short-term or no effects.

The relationships between physiological effects and how species interact with their environments have not been thoroughly studied. Therefore, the larger ecological context issues regarding physiological effects of jet aircraft noise (if any) and resulting behavioral pattern changes are not well understood.

Animal species exhibit a wide variety of responses to noise. It is therefore difficult to generalize animal responses to noise disturbances or to draw inferences across species, as reactions to jet aircraft noise appear to be species-specific. Consequently, some animal species may be more sensitive than other species and/or may exhibit different forms or intensities of behavioral responses. For instance, wood ducks appear to be more sensitive and more resistant to acclimation to jet aircraft noise than Canada geese in one study. Similarly, wild ungulates seem to be more easily disturbed than domestic animals.

The literature does suggest that common responses include the "startle" or "fright" response and, ultimately, habituation. It has been reported that the intensities and durations of the startle response decrease with the numbers and frequencies of exposures, suggesting no long-term adverse effects. The majority of the literature suggests that domestic animal species (cows, horses, chickens) and wildlife species exhibit adaptation, acclimation, and habituation after repeated exposure to jet aircraft noise and sonic booms.

Animal responses to aircraft noise appear to be somewhat dependent on, or influenced by, the size, shape, speed, proximity (vertical and horizontal), engine noise, color, and flight profile of planes. Helicopters also appear to induce greater intensities and durations of disturbance behavior as compared to fixed-wing aircraft. Some studies showed that animals that had been previously exposed to jet aircraft noise exhibited greater degrees of alarm and disturbance to other objects creating noise, such as boats, people, and objects blowing across the landscape. Other factors influencing response to jet aircraft noise may include wind direction, speed, and local air turbulence; landscape structures (i.e., amount and type of vegetative cover); and, in the case of bird species, whether the animals are in the incubation/nesting phase.

B.3 REFERENCES

Aliyu, A., I. Abdu, M. Ibrahim, S. Maryam, and M. Habu. 2016. Influence of aircraft noise on residential property values: Evidence from current literature. In Proceedings of the Academic Conference of Nightingale Publications & Research International on Sustainable Development (Vol. 2, No. 3).

Almer, C., S. Boes, and S. Nüesch. 2017. Adjustments in the housing market after an environmental shock: evidence from a large-scale change in aircraft noise exposure. Oxford Economic Papers, 69(4), 918-938.

American National Standards Institute (ANSI). 1985. *Specification for Sound Level Meters*, ANSI S1.4A-1985 Amendment to ANSI S1.4-1983.

_____. 1988. *Quantities and Procedures for Description and Measurement of Environmental Sound: Part 1*, ANSI S12.9-1988.

_____. 1996. *Quantities and Procedures for Description and Measurement of Environmental Sound: Part 4*, ANSI S12.9-1996.

_____. 2002. *Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools,* ANSI S12.60-2002.

_____. 2008. *Methods for Estimation of Awakenings with Outdoor Noise Events Heard in Homes*, ANSI S12.9-2008/Part6.

_____. 2010. Acoustical performance criteria, design requirements, and guidelines for schools, Part 1: permanent schools, ANSI S12.60-2010/Part 1.

American Speech-Language-Hearing Association. 1995. *Guidelines for Acoustics in Educational Environments*, V.37, Suppl. 14, pgs. 15-19.

Andersen, D.E., O.J. Rongstad, and W.R. Mytton. 1989. *Responses of Nesting Red-tailed Hawks to Helicopter Overflights*, The Condor, Vol. 91, pp. 296-299.

Andersson, H., L. Jonsson, and M. Ogren. 2013. "Benefit measures for noise abatement: calculations for road and rail traffic noise," *Eur. Transp. Res. Rev.* 5:135–148.

Andrus, W.S., M.E. Kerrigan, and K.T. Bird. 1975. *Hearing in Para-Airport Children*. Aviation, Space, and Environmental Medicine, Vol. 46, pp. 740-742.

Austin, Jr., O.L., W.B. Robertson, Jr., and G.E. Wolfenden. 1970. "Mass Hatching Failure in Dry Tortugas Sooty Terns (*Sterna fuscata*)," *Proceedings of the XVth International Ornithological Congress*, The Hague, The Netherlands, August 30 through September 5.

Babisch, W., W. Swart, D. Houthuijs, J. Selander, G. Bluhm, G. Pershagen, K. Dimakopoulou, A.S. Haralabidis, K. Katsouyanni, E. Davou, P. Sourtzi, E. Cadum, F. Vigna-Taglianti, S. Floud, and A.L. Hansell. 2012. "Exposure modifiers of the relationships of transportation noise with high blood pressure and noise annoyance," *J. Acoust. Soc. Am.*, Vol. 132, No. 6, pp. 3788-3808, December.

Babisch, W., G. Pershagen, J. Selander, D. Houthuijs, O. Breugelmans, E. Cadum, F. Vigna-Taglianti, K. Katsouyanni, A.S. Haralabidis, K. Dimakopoulou, P. Sourtzi, S. Floud, and A.L. Hansell. 2013. Noise annoyance – A modifier of the association between noise level and cardiovascular health? *Science of the Total Environment*, Volumes 452-453, pp. 50-57, May.

Basner, M., H. Buess, U. Miller, G. Platt, and A. Samuel. 2004. "Aircraft Noise Effects on Sleep: Final Results of DLR Laboratory and Field Studies of 2240 Polysomnographically Recorded Subject Nights", *Internoise 2004, The 33rd International Congress and Exposition on Noise Control Engineering*, August 22-25.

Berger, E.H., W.D. Ward, J.C. Morrill, and L.H. Royster. 1995. *Noise And Hearing Conservation Manual, Fourth Edition*, American Industrial Hygiene Association, Fairfax, Virginia.

Berglund, B., and T. Lindvall, eds. 1995. *Community Noise*, Jannes Snabbtryck, Stockholm, Sweden.

Beyer, D. 1983. "Studies of the Effects of Low-Flying Aircraft on Endocrinological and Physiological Parameters in Pregnant Cows," Veterinary College of Hannover, München, Germany.

Black, B., M. Collopy, H. Percivial, A. Tiller, and P. Bohall. 1984. "Effects of Low-Altitude Military Training Flights on Wading Bird Colonies in Florida," Florida Cooperative Fish and Wildlife Research Unit, Technical Report No. 7.

Bond, J., C.F. Winchester, L.E. Campbell, and J.C. Webb. 1963. "The Effects of Loud Sounds on the Physiology and Behavior of Swine," U.S. Department of Agriculture Agricultural Research Service Technical Bulletin 1280.

Booth, D.T., S.E. Cox, G.E. Simonds, and B. Elmore. 2009. *Efficacy of Two Variations on an Aerial Lek-Count Method for Greater Sage-Grouse*. In the Western North American Naturalist. Volume 69(3). Pgs. 413-416.

Bowles, A.E. 1995. *Responses of Wildlife to Noise*. In R.L. Knight and K.J. Gutzwiller, eds., "Wildlife and Recreationists: Coexistence through Management and Research," Island Press, Covelo, California, pp. 109-156.

Bowles, A.E., F.T. Awbrey, and J.R. Jehl. 1991. "The Effects of High-Amplitude Impulsive Noise On Hatching Success: A Reanalysis of the Sooty Tern Incident," HSD-TP-91-0006.

Bowles, A.E., M. Knobler, M.D. Sneddon, and B.A. Kugler. 1994. "Effects of Simulated Sonic Booms on the Hatchability of White Leghorn Chicken Eggs," AL/OE-TR-1994-0179.

Bradley J.S. 1985. "Uniform Derivation of Optimum Conditions for Speech in Rooms," National Research Council, Building Research Note, BRN 239, Ottawa, Canada.

_____. 1993. "NRC-CNRC NEF Validation Study: Review of Aircraft Noise and its Effects," National Research Council Canada and Transport Canada, Contract Report A-1505.5.

Braun, C.E. 2006. A Blueprint for Sage-grouse Conservation and Recovery. Unpublished report. Grouse Inc. Tucson, Arizona.

Bronzaft, A.L. and D.P. McCarthy. 1975. "The effects of elevated train noise on reading ability" *J. Environment and Behavior*, 7, 517-527.

Brown, A.L. 1990. *Measuring the Effect of Aircraft Noise on Sea Birds*, Environment International, Vol. 16, pp. 587-592.

Burger, J. 1981. *Behavioral Responses of Herring Gulls (Larus argentatus) to Aircraft Noise*. Environmental Pollution (Series A), Vol. 24, pp. 177-184.

_____. 1986. *The Effect of Human Activity on Shorebirds in Two Coastal Bays in Northeastern United States*, Environmental Conservation, Vol. 13, No. 2, pp. 123-130.

Cantrell, R.W. 1974. *Prolonged Exposure to Intermittent Noise: Audiometric, Biochemical, Motor, Psychological, and Sleep Effects*, Laryngoscope, Supplement I, Vol. 84, No. 10, p. 2.

Casady, R.B. and R.P. Lehmann. 1967. "Response of Farm Animals to Sonic Booms", Studies at Edwards Air Force Base, June 6-30, 1966. Interim Report, U.S. Department of Agriculture, Beltsville, Maryland, p. 8.

Chen, T. and S. Chen. 1993. *Effects of Aircraft Noise on Hearing and Auditory Pathway Function of School-Age Children*, International Archives of Occupational and Environmental Health, Vol. 65, No. 2, pp. 107-111.

Chen, T., S. Chen, P. Hsieh, and H. Chiang. 1997. *Auditory Effects of Aircraft Noise on People Living Near an Airport*, Archives of Environmental Health, Vol. 52, No. 1, pp. 45-50.

Clark, C., R. Martin, E. van Kempen, T. Alfred, J. Head, H.W. Davies, M.M. Haines, I.L. Barrio, M. Matheson, and S.A. Stansfeld. 2005. "Exposure-effect relations between aircraft and road traffic noise exposure at school and reading comprehension: the RANCH project," *American Journal of Epidemiology*, 163, 27-37.

Clark, C., S.A. Stansfeld, and J. Head. 2009. "The long-term effects of aircraft noise exposure on children's cognition: findings from the UK RANCH follow-up study." In *Proceedings of the Euronoise Conference*. Edinburgh, Scotland, October.

Cogger, E.A. and E.G. Zegarra. 1980. "Sonic Booms and Reproductive Performance of Marine Birds: Studies on Domestic Fowl as Analogues," In Jehl, J.R., and C.F. Cogger, eds., "Potential Effects of Space Shuttle Sonic Booms on the Biota and Geology of the California Channel Islands: Research Reports," San Diego State University Center for Marine Studies Technical Report No. 80-1.

Cohen, S., Glass, D.C. & Singer, J.E. 1973. "Apartment noise, auditory discrimination, and reading ability in children." *Journal of Experimental Social Psychology*, 9, 407-422.

Cohen, S., Evans, G.W., Krantz, D.S., et al. 1980. *Physiological, Motivational, and Cognitive Effects of Aircraft Noise on Children: Moving from Laboratory to Field*, American Psychologist, Vol. 35, pp. 231-243.

Cohen, S., Evans, G.W., Krantz, D.S., et al. 1981. "Aircraft noise and children: longitudinal and cross-sectional evidence on adaptation to noise and the effectiveness of noise abatement," *Journal of Personality and Social Psychology*, 40, 331-345.

Committee on Hearing, Bioacoustics, and Biomechanics (CHABA). 1977. "Guidelines for Preparing Environmental Impact Statements on Noise," The National Research Council, National Academy of Sciences.

_____. 1981. Assessment of Community Response to High-Energy Impulsive Sounds, Report of Working Group 84.

Conomy, J.T., J.A. Dubovsky, J.A. Collazo, and W.J. Fleming. 1998. "Do black ducks and wood ducks habituate to aircraft disturbance?," *Journal of Wildlife Management*, Vol. 62, No. 3, pp. 1135-1142.

Correia, A.W., J.L. Peters, J.I. Levy, S. Melly, and F. Dominici. 2013. "Residential exposure to aircraft noise and hospital admissions for cardiovascular diseases: multi-airport retrospective study," *British Medical Journal*, 2013;347:f5561 doi: 10.1136/bmj.f5561, 8 October.

Cottereau, P. 1972. *Les Incidences Du 'Bang' Des Avions Supersoniques Sur Les Productions Et La Vie Animals*, Revue Medicine Veterinaire, Vol. 123, No. 11, pp. 1367-1409.

_____. 1978. *The Effect of Sonic Boom from Aircraft on Wildlife and Animal Husbandry*, In "Effects of Noise on Wildlife," Academic Press, New York, New York, pp. 63-79.

Crowley, R.W. 1978. "A case study of the effects of an airport on land values," *Journal of Transportation Economics and Policy*, Vol. 7, May.

Department of Defense (DoD). 1978. "Environmental Protection, Planning in the Noise Environment," Air Force Manual AFM 19-10, Technical Manual TM 5-803-2, NAVFAC P-870, Departments of the Air Force, the Army, and the Navy, June 15.

_____. 2009a. "Improving Aviation Noise Planning, Analysis, and Public Communication with Supplemental Metrics," Defense Noise Working Group Technical Bulletin, December.

_____. 2009b. "Sleep Disturbance From Aviation Noise," Defense Noise Working Group Technical Bulletin, November.

_____. 2009c. Memorandum from the Under Secretary of Defense, Ashton B. Carter, re: "Methodology for Assessing Hearing Loss Risk and Impacts in DoD Environmental Impact Analysis," 16 June.

_____. 2012. "Noise–Induced Hearing Impairment Sleep," Defense Noise Working Group Technical Bulletin, July.

Doherty, K.E. 2008. Sage-grouse and energy development: integrating science with conservation planning to reduce impacts. Presented as a dissertation to the University of Montana, Missoula, Montana. Autumn.

Dooling, R.J. 1978. "Behavior and psychophysics of hearing in birds," *J. Acoust. Soc. Am.*, Supplement 1, Vol. 65, p. S4.

Dufour, P.A. 1980. "Effects of Noise on Wildlife and Other Animals: Review of Research Since 1971," U.S. Environmental Protection Agency.

Eagan, M.E., G. Anderson, B. Nicholas, R. Horonjeff, and T. Tivnan. 2004. "Relation Between Aircraft Noise Reduction in Schools and Standardized Test Scores," Washington, DC, FICAN.

Edmonds, L.D., P.M. Layde, and J.D. Erickson. 1979. *Airport Noise and Teratogenesis*, Archives of Environmental Health, Vol. 34, No. 4, pp. 243-247.

Edwards, R.G., A.B. Broderson, R.W. Harbour, D.F. McCoy, and C.W. Johnson. 1979. "Assessment of the Environmental Compatibility of Differing Helicopter Noise Certification Standards," U.S. Dept. of Transportation, Washington, D.C. 58 pp.

Eldred, K, and H. von Gierke. 1993. "Effects of Noise on People," Noise News International, 1(2), 67-89, June.

Ellis, D.H., C.H. Ellis, and D.P. Mindell. 1991. *Raptor Responses to Low-Level Jet Aircraft and Sonic Booms*, Environmental Pollution, Vol. 74, pp. 53-83.

Evans, G.W., S. Hygge, and M. Bullinger. 1995. "Chronic noise and psychological stress," *J. Psychological Science*, 6, 333-338.

Evans, G.W., M. Bullinger, and S. Hygge. 1998. *Chronic Noise Exposure and Physiological Response: A Prospective Study of Children Living under Environmental Stress*, Psychological Science, Vol. 9, pp. 75-77.

Federal Aviation Administration (FAA). 1985. *Airport Improvement Program (AIP) Handbook*, Order No. 100.38.

Federal Interagency Committee on Aviation Noise (FICAN). 1997. "Effects of Aviation Noise on Awakenings from Sleep," June.

_____. 2007. "Findings of the FICAN Pilot Study on the Relationship Between Aircraft Noise Reduction and Changes in Standardized Test Scores," Washington, DC, FICAN.

_____. 2008. "FICAN Recommendation for use of ANSI Standard to Predict Awakenings from Aircraft Noise," December.

Federal Interagency Committee on Noise (FICON). 1992. "Federal Agency Review of Selected Airport Noise Analysis Issues," August.

Federal Interagency Committee on Urban Noise. 1980. Guidelines for Considering Noise in Land Use Planning and Control. June.

Fidell, S., and Silvati, L. 2004. "Parsimonious alternatives to regression analysis for characterizing prevalence rates of aircraft noise annoyance," *Noise Control Eng. J*. 52, 56–68.

Fidell, S., K. Pearsons, R. Howe, B. Tabachnick, L. Silvati, and D.S. Barber. 1994. "Noise-Induced Sleep Disturbance in Residential Settings," AL/OE-TR-1994-0131, Wright Patterson AFB, OH, Armstrong Laboratory, Occupational & Environmental Health Division.

Fidell, S., K. Pearsons, B. Tabachnick, R. Howe, L. Silvati, and D.S. Barber. 1995a. "Field study of noise-induced sleep disturbance," *Journal of the Acoustical Society of America*, Vol. 98, No. 2, pp. 1025-1033.

Fidell, S., R. Howe, B. Tabachnick, K. Pearsons, and M. Sneddon. 1995b. "Noise-induced Sleep Disturbance in Residences near Two Civil Airports," NASA Contractor Report 198252.

Fidell, S., B. Tabachnick, and L. Silvati. 1996. "Effects of Military Aircraft Noise on Residential Property Values," BBN Systems and Technologies, BBN Report No. 8102.

Finegold, L.S., C.S. Harris, and H.E. von Gierke. 1994. "Community annoyance and sleep disturbance: updated criteria for assessing the impact of general transportation noise on people," *Noise Control Engineering Journal*, Vol. 42, No. 1, pp. 25-30.

Fisch, L. 1977. "Research Into Effects of Aircraft Noise on Hearing of Children in Exposed Residential Areas Around an Airport," Acoustics Letters, Vol. 1, pp. 42-43.

Fleischner, T.L. and S. Weisberg. 1986. "Effects of Jet Aircraft Activity on Bald Eagles in the Vicinity of Bellingham International Airport," Unpublished Report, DEVCO Aviation Consultants, Bellingham, WA.

Fleming, W.J., J. Dubovsky, and J. Collazo. 1996. "An Assessment of the Effects of Aircraft Activities on Waterfowl at Piney Island, North Carolina," Final Report by the North Carolina Cooperative Fish and Wildlife Research Unit, North Carolina State University, prepared for the Marine Corps Air Station, Cherry Point.

Fraser, J.D., L.D. Franzel, and J.G. Mathiesen. 1985. "The impact of human activities on breeding bald eagles in north-central Minnesota," *Journal of Wildlife Management*, Vol. 49, pp. 585-592.

Frerichs, R.R., B.L. Beeman, and A.H. Coulson. 1980. "Los Angeles Airport noise and mortality: faulty analysis and public policy," *Am. J. Public Health*, Vol. 70, No. 4, pp. 357-362, April.

Gladwin, D.N., K.M. Manci, and R. Villella. 1988. "Effects of Aircraft Noise and Sonic Booms on Domestic Animals and Wildlife," Bibliographic Abstracts, NERC-88/32. U.S. Fish and Wildlife Service National Ecology Research Center, Ft. Collins, Colorado.

Green, K.B., B.S. Pasternack, and R.E. Shore. 1982. *Effects of Aircraft Noise on Reading Ability of School-Age Children*, Archives of Environmental Health, Vol. 37, No. 1, pp. 24-31.

Griefahn, B. 1978. Research on Noise Disturbed Sleep Since 1973, *Proceedings of Third Int. Cong. On Noise as a Public Health Problem*, pp. 377-390 (as appears in NRC-CNRC NEF Validation Study: (2) *Review of Aircraft Noise and Its Effects*, A-1505.1, p. 31).

Grubb, T.G. D.K. Delaney, and W.W. Bowerman. 2007. *Investigating potential effects of heli-skiing on golden eagles in the Wasatch Mountains*, Utah. Final report to the Wasatch-Cache National Forest. 10 November.

Grubb, T.G., and R.M. King. 1991. "Assessing human disturbance of breeding bald eagles with classification tree models," Journal of Wildlife Management, Vol. 55, No. 3, pp. 500-511.

Gunn, W.W.H., and J.A. Livingston. 1974. "Disturbance to Birds by Gas Compressor Noise Simulators, Aircraft, and Human Activity in the MacKenzie Valley and the North Slope," Chapters VI-VIII, Arctic Gas Biological Report, Series Vol. 14.

Haber, J., and Nakaki, D. 1989. *Sonic Boom Damage to Conventional Structures*. Report by BBN, Systems and Technologies Corporation for the Noise and Sonic Boom Impact Technology Program, Wright-Patterson Air Force Base, Technical Report No. HSD-TR-89-001.

Haines, M.M., S.A. Stansfeld, R.F. Job, B. Berglund, and J. Head. 2001a. *Chronic Aircraft Noise Exposure, Stress Responses, Mental Health and Cognitive Performance in School Children*, Psychological Medicine, Vol. 31, pp. 265 277, February.

Haines, M.M., S.A. Stansfeld, S. Brentnall, J. Head, B. Berry, M. Jiggins, and S. Hygge. 2001b. *The West London Schools Study: the Effects of Chronic Aircraft Noise Exposure on Child Health*, Psychological Medicine, Vol. 31, pp. 1385-1396. November.

Haines, M.M., S.A. Stansfeld, J. Head, and R.F.S. Job. 2002. "Multilevel modelling of aircraft noise on performance tests in schools around Heathrow Airport London," *Journal of Epidemiology and Community Health*, 56, 139-144.

Hansell, A.L., M. Blangiardo, L. Fortunato, S. Floud, K. de Hoogh, D. Fecht, R.E. Ghosh, H.E. Laszlo, C. Pearson, L. Beale, S. Beevers, J. Gulliver, N. Best, S. Richardson, and P. Elliott. 2013. "Aircraft noise and cardiovascular disease near Heathrow airport in London: small area study," *British Medical Journal*, 2013;347:f5432 doi: 10.1136/bmj.f5432, 8 October.

Hanson, C.E., K.W. King, M.E. Eagan, and R.D. Horonjeff. 1991. "Aircraft Noise Effects on Cultural Resources: Review of Technical Literature," Report No. HMMH-290940.04-1, available as PB93-205300, sponsored by National Park Service, Denver CO.

Haralabidis, A.S., K. Dimakopoulou, F. Vigna-Taglianti, M. Giampaolo, A. Borgini, M.L. Dudley, G. Pershagen, G. Bluhm, D. Houthuijs, W. Babisch, M. Velonakis, K. Katsouyanni, and L. Jarup, for the HYENA Consortium. 2008. "Acute effects of night-time noise exposure on blood pressure in populations living near airports," *European Heart Journal*, doi:10.1093/eurheartj/ehn013.

Harju, S.M., M.R. Dzialak, R.C. Taylor, L.D. Hayden-Wing, and J.B. Winstead. 2010. Thresholds and time lags in effects of energy development on greater sage-grouse populations. Journal of Wildlife Management. Volume 74, Number 3: 437–448.

Harris, C.M. 1979. *Handbook of Noise Control*, McGraw-Hill Book Co.

He, Q., C. Wollersheim, M. Locke, and I. Waitz. 2014. Estimation of the global impacts of aviation-related noise using an income-based approach. Transport Policy, 34, 85-101.

Hershey, R.L. and T.H. Higgins. 1976. Statistical Model of Sonic Boom Structural Damage. FAA-RD-76-87. July.

Higgins, T.H. 1974. The response of songbirds to the seismic compression waves preceding sonic booms. Natl. Tech. Inf. Serv., Springfield, VA, FAA-RD-74-78. 28 pp.

Holloran, M.J. 2005. Greater Sage-Grouse (*Centrocercus urophasianus)* Population Response to Natural Gas Field Development in Western Wyoming. A dissertation submitted to the Department of Zoology and Physiology and the Graduate School of the University of Wyoming, Laramie, Wyoming. December.

Hygge, S., G.W. Evans, and M. Bullinger. 2002. *A Prospective Study of Some Effects of Aircraft Noise on Cognitive Performance in School Children*, Psychological Science Vol. 13, pp. 469-474.

International Organization for Standardization (ISO). 1989. "Evaluation of Human Exposure to Whole-Body Vibration – Part 2: Continuous and Shock-Induced Vibration in Buildings (1 to 80 Hz)," International Organization for Standardization, Standard 2631-2, February.

Ising, H., Z. Joachims, W. Babisch, and E. Rebentisch. 1999. *Effects of Military Low-Altitude Flight Noise I Temporary Threshold Shift in Humans*, Zeitschrift fur Audiologie (Germany), Vol. 38, No. 4, pp. 118-127.

Jarup L., M.L. Dudley, W. Babisch, D. Houthuijs, W. Swart, G. Pershagen, G. Bluhm, K. Katsouyanni, M. Velonakis, E. Cadum, and F. Vigna-Taglianti for the HYENA Consortium. 2005. "Hypertension and Exposure to Noise near Airports (HYENA): Study Design and Noise Exposure Assessment," Environ Health Perspect 2005, 113: 1473–1478.

Jarup L., W. Babisch, D. Houthuijs, G. Pershagen, K. Katsouyanni, E. Cadum, M-L. Dudley, P. Savigny, I. Seiffert, W. Swart, O. Breugelmans, G. Bluhm, J. Selander, A. Haralabidis, K. Dimakopoulou, P. Sourtzi, M. Velonakis, and F. VignaTaglianti, on behalf of the HYENA study team. 2008. "Hypertension and Exposure to Noise near Airports - the HYENA study," Environ Health Perspect 2008, 116:329-33.

Jones, F.N. and J. Tauscher. 1978. "Residence Under an Airport Landing Pattern as a Factor in Teratism," Archives of Environmental Health, pp. 10-12, January/February.

Jud, G.D. and D.T. Winkler. 2006. The Announcement Effect of an Airport Expansion on Housing Prices. Journal of Real Estate Finance and Economics, vol. 33, no. 2, 2006, pp. 91-103.

Kovalcik, K. and J. Sottnik. 1971. *Vplyv Hluku Na Mliekovú Úzitkovost Krár* [*The Effect of Noise on the Milk Efficiency of Cows*], Zivocisná Vyroba, Vol. 16, Nos. 10-11, pp. 795-804.

Kryter, K.D. and F. Poza. 1980. "Effects of noise on some autonomic system activities," *Journal of Acoustical Society of America*, Vol. 67, No. 6, pp. 2036-2044.

Kushlan, J.A. 1979. "Effects of helicopter censuses on wading bird colonies," *Journal of Wildlife Management*, Vol. 43, No. 3, pp. 756-760.

Lazarus, H. 1990. "New Methods for Describing and Assessing Direct Speech Communication Under Disturbing Conditions," Environment International, 16: 373-392.

LeBlanc, M.M., C. Lombard, S. Lieb, E. Klapstein, and R. Massey. 1991. "Physiological Responses of Horses to Simulated Aircraft Noise," U.S. Air Force, NSBIT Program for University of Florida.

Lercher, P., G.W. Evans, M. Meis, and K. Kofler. 2002. "Ambient neighbourhood noise and children's mental health," *Journal of Occupational and Environmental Medicine*, 59, 380-386.

Lercher, P., G.W. Evans, and M. Meis. 2003. "Ambient noise and cognitive processes among primary school children," *Journal of Environment and Behavior*, 35, 725-735.

Lind, S.J., K. Pearsons, and S. Fidell. 1998. "Sound Insulation Requirements for Mitigation of Aircraft Noise Impact on Highline School District Facilities," Volume I, BBN Systems and Technologies, BBN Report No. 8240.

Ludlow, B. and K. Sixsmith. 1999. Long-term Effects of Military Jet Aircraft Noise Exposure during Childhood on Hearing Threshold Levels. Noise and Health 5:33-39.

Lukas, J.S. 1978. *Noise and Sleep: A Literature Review and a Proposed Criterion for Assessing Effect*, In Daryl N. May, ed., *Handbook of Noise Assessment*, Van Nostrand Reinhold Company: New York, pp. 313-334.

Lynch, T.E. and D.W. Speake. 1978. *Eastern Wild Turkey Behavioral Responses Induced by Sonic Boom*, In "Effects of Noise on Wildlife," Academic Press, New York, New York, pp. 47-61.

Manci, K.M., D.N. Gladwin, R. Villella, and M.G Cavendish. 1988. "Effects of Aircraft Noise and Sonic Booms on Domestic Animals and Wildlife: A Literature Synthesis," U.S. Fish and Wildlife Service National Ecology Research Center, Fort Collins, CO, NERC-88/29. 88 pp.

Meecham, W.C., and Shaw, N. 1979. "Effects of Jet Noise on Mortality Rates," *British Journal of Audiology*, 77-80. August.

Mense, Andreas and Konstantin A. Kholodilin. 2012. Noise Expectation and House Prices. DIW Berlin Discussion Paper No. 1244. Available at SSRN: https://ssrn.com/abstract=2152209 or http://dx.doi.org/10.2139/ssrn.2152209.

Michalak, R., H. Ising, and E. Rebentisch. 1990. "Acute Circulatory Effects of Military Low-Altitude Flight Noise," *International Archives of Occupational and Environmental Health*, Vol. 62, No. 5, pp. 365-372.

Miedema, H.M. and H. Vos. 1998. "Exposure-response relationships for transportation noise," *Journal of the Acoustical Society of America*, pp. 104(6): 3432–3445, December.

National Institute for Occupational Safety and Health (NIOSH). 1998. Criteria for a Recommended Standard: Occupational Noise Exposure, Chapter 1. Accessed at: http://www.cdc.gov/niosh/docs/98-126/. 14 July 2010.

National Park Service. 1994. "Report to Congress: Report on Effects of Aircraft Overflights on the National Park System," Prepared Pursuant to Public Law 100-91, The National Parks Overflights Act of 1987. 12 September.

Nelson, J.P. 1978. *Economic Analysis of Transportation Noise Abatement*, Ballenger Publishing Company, Cambridge, MA.

_____. 1980. "Airports and property values: a survey of recent evidence," *Journal of Transport Economics and Policy*, 14, 37-52.

_____. 2004. "Meta-analysis of airport noise and hedonic property values - problems and prospects," *Journal of Transport Economics and Policy*, Volume 38, Part 1, pp. 1-28, January.

_____. 2007. "Hedonic Property Values Studies of Transportation Noise: Aircraft and Road Traffic," in "Hedonic Methods on Housing Markets," Andrea Barazini, Jose Ramerez, Caroline Schaerer and Philippe Thalman, eds., pp. 57-82, Springer.

Newman, J.S., and K.R. Beattie. 1985. "Aviation Noise Effects," U.S. Department of Transportation, Federal Aviation Administration Report No. FAA-EE-85-2.

Nixon, C.W., D.W. West, and N.K. Allen. 1993. *Human Auditory Responses to Aircraft Flyover Noise*, In Vallets, M., ed., Proceedings of the 6th International Congress on Noise as a Public Problem, Vol. 2, Arcueil, France: INRETS.

North Atlantic Treaty Organization (NATO). 2000. "The Effects of Noise from Weapons and Sonic Booms, and the Impact on Humans, Wildlife, Domestic Animals and Structures," Final Report of the Working Group Study Follow-up Program to the Pilot Study on Aircraft Noise, Report No. 241, June.

Öhrström, E., Hadzibajramovic, E., Holmes, and M., H. Svensson. 2006. "Effects of road traffic noise on sleep: studies on children and adults," *Journal of Environmental Psychology*, 26, 116-126.

Ollerhead, J.B., C.J. Jones, R.E. Cadoux, A. Woodley, B.J. Atkinson, J.A. Horne, F. Pankhurst, L. Reyner, K.I. Hume, F. Van, A. Watson, I.D. Diamond, P. Egger, D. Holmes, and J. McKean. 1992. "Report of a Field Study of Aircraft Noise and Sleep Disturbance," Commissioned by the UK Department of Transport for the 36 UK Department of Safety, Environment and Engineering, London, England: Civil Aviation Authority, December.

Pagel, J.E., D.M. Whittington, and G.T. Allen. 2010. Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations. Division of Migratory Bird Management, U.S. Fish and Wildlife Service. February.

Parker, J.B. and N.D. Bayley. 1960. "Investigations on Effects of Aircraft Sound on Milk Production of Dairy Cattle, 1957-58," U.S. Agricultural Research Services, U.S. Department of Agriculture, Technical Report Number ARS 44 60.

Pater, L.D., D.K. Delaney, T.J. Hayden, B. Lohr, and R. Dooling. 1999. "Assessment of Training Noise Impacts on the Red-cockaded Woodpecker: Preliminary Results – Final Report," Technical Report 99/51, U.S. Army, Corps of Engineers, CERL, Champaign, IL.

Pearsons, K.S., D.S. Barber, and B.G. Tabachnick. 1989. "Analyses of the Predictability of Noise-Induced Sleep Disturbance," USAF Report HSD-TR-89-029, October.

Plotkin, K.J., B.H. Sharp, T. Connor, R. Bassarab, I. Flindell, and D. Schreckenberg. 2011. "Updating and Supplementing the Day-Night Average Sound Level (DNL)," Wyle Report 11-04, DOT/FAA/AEE/2011-03, June.

Pulles, M.P.J., W. Biesiot, and R. Stewart. 1990. *Adverse Effects of Environmental Noise on Health: An Interdisciplinary Approach*, Environment International, Vol. 16, pp. 437-445.

Richardson, C.T. and C.K. Miller. 1997. Recommendations for protecting raptors from human disturbance: a review. Wildlife Society Bulletin. Volume 25, Number 3: 634-638.

Rosenblith, W.A., K.N. Stevens, and Staff of Bolt, Beranek, and Newman. 1953. "Handbook of Acoustic Noise Control, Vol. 2, Noise and Man," USAF Report WADC TR-52-204.

Rosenlund, M., N. Berglind, G. Bluhm, L. Jarup, and G. Pershagen. 2001. "Increased Prevalence of Hypertension in a Population Exposed to Aircraft Noise," *Occupational and Environmental Medicine*, Vol. 58, No. 12, pp. 769 773. December.

Schreckenberg, D. and R. Schuemer. 2010. "The Impact of Acoustical, Operational and Non-Auditory Factors on Short-Term Annoyance Due to Aircraft Noise," Inter-Noise 2010, June.

Schultz, T.J. 1978. "Synthesis of social surveys on noise annoyance," *Journal of Acoustical Society of America*, Vol. 64, No. 2, pp. 377-405, August.

Sharp, B.H., and K.J. Plotkin. 1984. "Selection of Noise Criteria for School Classrooms," Wyle Research Technical Note TN 84-2 for the Port Authority of New York and New Jersey, October.

Smith, D.G., D.H. Ellis, and T.H. Johnston. 1988. *Raptors and Aircraft*, In R.L Glinski, B. Gron-Pendelton, M.B. Moss, M.N. LeFranc, Jr., B.A. Millsap, and S.W. Hoffman, eds., Proceedings of the Southwest Raptor Management Symposium, National Wildlife Federation, Washington, D.C., pp. 360-367.

Stansfeld, S.A., B. Berglund, and C. Clark, I. Lopez-Barrio, P. Fischer, E. Öhrström, M.M. Haines, J. Head, S. Hygge, and I. van Kamp, B.F. Berry, on behalf of the RANCH study team. 2005. "Aircraft and road traffic noise and children's cognition and health: a cross-national study," *Lancet*, 365, 1942-1949.

Stansfeld, SA., C. Clark, R.M. Cameron, T. Alfred, J. Head, M.M. Haines, I. van Kamp, E. van Kampen, and I. Lopez-Barrio. 2009. "Aircraft and road traffic noise exposure and children's mental health," *Journal of Environmental Psychology*, 29, 203-207.

Stevens, K.N., W.A. Rosenblith, and R.H. Bolt. 1953. "Neighborhood Reaction to Noise: A Survey and Correlation of Case Histories (A)," *Journal of Acoustical Society of America*, Vol. 25, 833.

Stusnick, E., D.A. Bradley, J.A. Molino, and G. DeMiranda. 1992. "The Effect of Onset Rate on Aircraft Noise Annoyance, Volume 2: Rented Home Experiment," Wyle Laboratories Research Report WR 92-3, March.

Sutherland, L.C. 1990a. "Assessment of Potential Structural Damage from Low Altitude Subsonic Aircraft," Wyle Research Report 89-16 (R).

Sutherland, L.C. 1990b. "Effects of Sonic Boom on Structures," Lecture 3 of Sonic Boom: Prediction and Effects, AIAA Short Course, October 1990.

Ting, C., J. Garrelick, and A. Bowles. 2002. "An analysis of the response of sooty tern eggs to sonic boom overpressures," *Journal of Acoustical Society of America*, Vol. 111, No. 1, Pt. 2, pp. 562-568.

Trimper, P.G., N.M. Standen, L.M. Lye, D. Lemon, T.E. Chubbs, and G.W. Humphries. 1998. "Effects of low-level jet aircraft noise on the behavior of nesting osprey," *Journal of Applied Ecology*, Vol. 35, pp. 122-130.

United Kingdom Department for Education and Skills (UKDfES). 2003. "Building Bulletin 93, Acoustic Design of Schools - A Design Guide," London: The Stationary Office.

U.S. Air Force. 1993. *The Impact of Low Altitude Flights on Livestock and Poultry*, Air Force Handbook. Volume 8, Environmental Protection, 28 January.

_____. 1994a. "Air Force Position Paper on the Effects of Aircraft Overflights on Large Domestic Stock," Approved by HQ USAF/CEVP, 3 October.

_____. 1994b. "Air Force Position Paper on the Effects of Aircraft Overflights on Domestic Fowl," Approved by HQ USAF/CEVP, 3 October.

_____. 2000. "Preliminary Final Supplemental Environmental Impact Statement for Homestead Air Force Base Closure and Reuse," Prepared by SAIC, 20 July.

U.S. Department of Labor. 1971. "Occupational Safety & Health Administration, Occupational Noise Exposure," Standard No. 1910.95.

U.S. Environmental Protection Agency (USEPA). 1974. "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With an Adequate Margin of Safety," U.S. Environmental Protection Agency Report 550/9-74-004, March.

_____. 1978. "Protective Noise Levels," Office of Noise Abatement and Control, Washington, D.C. U.S. Environmental Protection Agency Report 550/9-79-100, November.

_____. 1982. "Guidelines for Noise Impact Analysis," U.S. Environmental Protection Agency Report 550/9-82-105, April.

U.S. Fish and Wildlife Service (USFWS). 2010. 12-Month Findings for Petitions to List the Greater Sage-Grouse (Centrocercus urophasianus) as Threatened or Endangered. Federal Register, Volume 75, Number 55: 13910-14014. 23 March.

_____. 1998. "Consultation Letter #2-22-98-I-224 Explaining Restrictions on Endangered Species Required for the Proposed Force Structure and Foreign Military Sales Actions at Cannon AFB, NM," To Alton Chavis HQ ACC/CEVP at Langley AFB from Jennifer Fowler-Propst, USFWS Field Supervisor, Albuquerque, NM, 14 December.

U.S. Forest Service. 1992. "Report to Congress: Potential Impacts of Aircraft Overflights of National Forest System Wilderness," U.S. Government Printing Office 1992-0-685-234/61004, Washington, D.C.

van Kamp, I. and H. Davies. 2013. Noise and health in vulnerable groups: A review. *Noise & Health,* Vol. 15, Issue 64, pp. 153-159.

von Gierke, H.E. and W.D. Ward. 1991. "Criteria for Noise and Vibration Exposure", *Handbook of Acoustical Measurements and Noise Control*, C.M. Harris, editor, Third Edition.

Walker, B.L., D.E. Naugle, and K.E. Doherty. 2007. Greater sage-grouse population response to energy development and habitat loss (pre-print version). Wildlife Biology Program, College of Forestry and Conservation, University of Montana. Missoula, Montana. June.

Ward, D.H. and R.A. Stehn. 1990. "Response of Brant and Other Geese to Aircraft Disturbances at Izembek Lagoon, Alaska," Final Technical Report, Number MMS900046. Performing Org.: Alaska Fish and Wildlife Research Center, Anchorage, AK, Sponsoring Org.: Minerals Management Service, Anchorage, AK, Alaska Outer Continental Shelf Office.

Ward, D.H., E.J. Taylor, M.A. Wotawa, R.A. Stehn, D.V. Derksen, and C.J. Lensink. 1986. "Behavior of Pacific Black Brant and Other Geese in Response to Aircraft Overflights and Other Disturbances at Izembek Lagoon, Alaska," 1986 Annual Report, p. 68.

Weisenberger, M.E., P.R. Krausman, M.C. Wallace, D.W. De Young, and O.E. Maughan. 1996. "Effects of simulated jet aircraft noise on heart rate and behavior of desert ungulates," *Journal of Wildlife Management*, Vol. 60, No. 1, pp. 52-61.

Wesler, J.E. 1977. "Concorde Operations at Dulles International Airport," NOISEXPO '77, Chicago, IL, March.

_____. 1986. "Priority Selection of Schools for Soundproofing," Wyle Research Technical Note TN 96-8 for the Port Authority of New York and New Jersey, October.

White, R. 1972. Effects of Repetitive Sonic Booms on Glass Breakage. FAA Report FAA-RD-72-43. April.

Wolfe, P. J., S.H. Yim, G. Lee, A. Ashok, S.R. Barrett, and I.A. Waitz. 2014. Near-airport distribution of the environmental costs of aviation. Transport Policy, 34, 102-108.

World Health Organization (WHO). 1999. "Guidelines for Community Noise," Berglund, B., T. Lindvall, and D. Schwela, eds.

_____. 2003. "International Society of Hypertension (ISH) statement of management of hypertension," *Journal of Hypertens* 21: 1983–1992.

Wu, T., J.S. Lai, C.Y. Shen, T.S Yu, and P.Y. Chang. 1995. *Aircraft Noise, Hearing Ability, and Annoyance*, Archives of Environmental Health, Vol. 50, No. 6, pp. 452-456, November-December.

Wyle Laboratories. 1970. "Supporting Information for the Adopted Noise Regulations for California Airports," Wyle Report WCR 70-3(R).

Appendix C - Air Quality

LEGACY AIRCRAFT EMISSIONS SUMMARY

Location	Activity	Emissions in Tons Per Year						
		VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
Dannelly	Flight Ops	0.52	47.02	24.98	2.61	4.71	2.44	7,842.49
	Engine Maintenance	0.17	16.94	7.42	1.03	1.87	0.87	3092.58
	Total	**0.69**	**63.96**	**32.40**	**3.64**	**6.58**	**3.31**	**10,935.06**
Boise	Flight Ops	36.19	99.92	4.69	1.32	8.80	3.97	3,975.60
	Engine Maintenance	34.41	93.10	1.85	0.94	7.11	3.15	2811.90
	Total	**70.60**	**193.02**	**6.54**	**2.26**	**15.90**	**7.12**	**6,787.50**
Jacksonville	Flight Ops	45.36	198.55	46.99	7.34	4.42	3.97	22,038.99
	Engine Maintenance	1.00	9.66	6.78	0.85	0.66	0.60	2539.50
	Total	**46.36**	**208.21**	**53.77**	**8.18**	**5.08**	**4.57**	**24,578.49**
Truax	Flight Ops	0.59	47.81	15.11	2.02	4.36	2.41	6,079.52
	Engine Maintenance	1.00	9.66	6.78	0.85	0.66	0.60	2539.50
	Total	**1.59**	**57.46**	**21.89**	**2.87**	**5.03**	**3.01**	**8,619.02**
Selfridge	Flight Ops	30.49	84.34	4.56	1.19	7.64	3.40	3,560.97
	Engine Maintenance	36.53	98.93	1.96	0.99	7.56	3.38	2988.19
	Total	**67.02**	**183.27**	**6.52**	**2.18**	**15.20**	**6.77**	**6,549.16**

TAB A. AIRCRAFT EMISSIONS SUMMARY

Location	Activity	Emissions in Tons Per Year						
		VOC	CO	NOx	SO2	PM	PM2.5	CO2*e*
Dannelly	Flight Ops	0.63	24.34	29.29	6.35	0.40	0.40	9,593
	Engine Maintenance	0.33	8.03	36.01	10.77	0.56	0.51	16,270
	Total	**1.09**	**32.37**	**65.30**	**17.11**	**0.96**	**0.91**	**25,863**
Boise	Flight Ops	0.06	2.65	24.45	3.85	0.26	0.26	5,816
	Engine Maintenance	0.28	6.91	30.97	9.26	0.48	0.44	13,995
	Total	**0.39**	**9.55**	**55.43**	**13.11**	**0.75**	**0.70**	**19,811**
Jacksonville	Flight Ops	0.03	1.46	19.82	2.40	0.17	0.17	3,623
	Engine Maintenance	0.33	8.03	36.02	10.77	0.56	0.51	16,276
	Total	**0.41**	**9.49**	**55.85**	**13.17**	**0.73**	**0.67**	**19,899**
Truax	Flight Ops	0.05	2.85	19.32	2.98	0.26	0.26	4,507
	Engine Maintenance	0.33	8.03	36.02	10.77	0.56	0.51	16,275
	Total	**0.43**	**10.89**	**55.34**	**13.75**	**0.82**	**0.76**	**20,782**
Selfridge	Flight Ops	0.05	2.40	24.00	3.44	0.25	0.25	5,204
	Engine Maintenance	0.33	8.03	36.01	10.77	0.56	0.51	16,270
	Total	**0.43**	**10.43**	**60.01**	**14.21**	**0.81**	**0.75**	**21,474**

115 FW

RECORD OF AIR ANALYSIS (ROAA)

1. General Information: An air analysis was performed to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, Air Quality Compliance And Resource Management; the Environmental Impact Analysis Process (EIAP, 32 Code of Federal Regulations [CFR] 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the analysis.

a. Action Location:

Base: 115th Fighter Wing Installation
State: Wisconsin
County(s): Dane
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: USAF F-35A Operational Beddown - Air National Guard

c. Project Number/s (if applicable):

d. Projected Action Start Date: 2020

e. Action Description:

The United States Air Force (USAF) is proposing to beddown F-35A aircraft at two of five alternative Air National Guard (ANG) locations. The F-35A would replace the existing F-15, F-16, or A-10 fighter attack aircraft at the two selected installations. This action would involve the beddown of one F-35A squadron consisting of 18 Primary Aircraft Authorized (PAA) with 2 Backup Aircraft Inventory at each of the two selected locations, thereby establishing two F-35A operational locations. Five alternative ANG locations (Figure 1.1-1) are being considered for this beddown:

- 115th Fighter Wing (115 FW) at Dane County Regional Airport, Madison, Wisconsin

- 125th Fighter Wing (125 FW) at Jacksonville International Airport (IAP), Jacksonville, Florida

- 124th Fighter Wing (124 FW) at Boise Air Terminal (Boise Airport), Boise, Idaho

- 127th Wing (127 WG) at Selfridge Air National Guard Base (ANGB), Michigan

- 187th Fighter Wing (187 FW) at Montgomery Regional Airport, Montgomery, Alabama

f. Point of Contact:

Name: Lesley Hamilton
Title: Sr Associate
Organization: Cardno
Email:
Phone Number:

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total combined direct and indirect emissions associated with the action were estimated manually with installation-specific input on flight operations data and flight profiles and through Air Conformity Applicability Model (ACAM) for construction, aerospace ground equipment, and personnel on a calendar-year basis for the “worst-case” and “steady state” (net gain/loss upon action fully implemented) emissions.

RECORD OF AIR ANALYSIS (ROAA)

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. Potential impacts to air quality are evaluated with respect to the extent, context, and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. The Council on Environmental Quality (CEQ) defines significance in terms of context and intensity in 40 CFR 1508.27. This requires that the significance of an action be analyzed in respect to the setting of the action and based relative to the severity of the impact. For attainment area criteria pollutants, the project air quality analysis uses the United States Environmental Protection Agency's Prevention of Significant Deterioration (PSD) permitting threshold of 250 tons per year as an initial indicator of the local significance of potential impacts to air quality. It is important to note that these indicators only provide a clue to the potential impacts to air quality. In the context of criteria pollutants for which the proposed project region is in attainment of a National Ambient Air Quality Standards (NAAQS), the analysis compares the annual net increase in emissions estimated for each project alternative to the 250 ton per year PSD permitting threshold. The PSD permitting threshold represents the level of potential new emissions below which a new or existing minor non-listed stationary source may acceptably emit without triggering the requirement to obtain a permit. Thus, if the intensity of any net emissions increase for a project alternative is below 250 tons per year in the context of an attainment criteria pollutant, the indication is the air quality impacts will be insignificant for that pollutant. Therefore, the worst-case year emissions were compared against the 250 ton per year Indicators and are summarized below.

Analysis Summary:

Construction emissions are based on equipment operations for demolition, grading, building construction, application of architectural coatings, and materials transport.

2020 - Construction

Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.66	250	No
NOx	3.54	250	No
CO	3.20	250	No
SOx	0.01	250	No
PM 10	1.46	250	No
PM 2.5	0.17	250	No
CO2e	731	N/A	N/A

F-16 annual operations table represents the landings and take offs of the F-16C, along with closed patterns. Annual engine runups are also included.

2017 F-16 Baseline Operations

Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.84	250	No
NOx	34.12	250	No
CO	64.92	250	No
SOx	3.72	250	No
PM 10	6.29	250	No
PM 2.5	4.23	250	No
CO2e	9,263	N/A	N/A

RECORD OF AIR ANALYSIS (ROAA)

F-35A steady state operations table represents the landings and take offs of the F-35A, along with closed patterns. Annual engine runups and additional commuting personnel are also included.

2025 F-35A Steady State Operations

Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	6.00	250	No
NOx	71.07	250	No
CO	22.03	250	No
SOx	14.85	250	No
PM 10	2.43	250	No
PM 2.5	2.33	250	No
CO2e	21,741	N/A	N/A

The net change is the difference in emissions resulting from the proposed action to homebase the F-35A as compared to not introducing the action.

2025 Net Change

Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.16	250	No
NOx	36.95	250	No
CO	-42.89	250	No
SOx	11.12	250	No
PM 10	-3.85	250	No
PM 2.5	-1.90	250	No
CO2e	12,478	N/A	N/A

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

Lesley Hamilton

7/2/19

Lesley Hamilton, Sr Associate — DATE

TAB E. F-16 EMISSION CALCULATIONS - TRUAX FIELD

Table 1. F-16C Individual Profile Emission Calculations

[1,2,3]Inputs to Emissions Calculations Elevation at Truax = 886 ft MSL

F110-GE-100 Engines

3000 FT AGL Mixing Height

1 kilometer (km) 3,280.84 ft
1 knot = 1.852 km/h
1 knot = 101.2686 ft/min

F-16C Afterburner Departure 1

Point	Distance	Height	Speed, kts	Power % N2	
a	0	0	0	104	Max AB
b	3000	0	160	105	AB
c	9000	800	325	105	AB
CD	14762	3000	337.5	98.7	MIL
d	20000	5000	350	92.3	MIL

									Emission Indices, lb/1000 lb							Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM**	**PM2.5**	**CO2e**
a-a	0	0	0	0	104	0.36667	18088	110.54	1.21	67.41	14.26	1.07	3.35	2.98	3214.59	0.134	7.451	1.576	0.118	0.370	0.329	355.334
a-b	3000	0	80	8101	105	0.3703024	18088	111.63	1.21	67.41	14.26	1.07	3.35	2.98	3214.59	0.135	7.525	1.592	0.119	0.374	0.333	358.857
b-c	6000	400	242.5	24558	105	0.2443232	18088	73.66	1.21	67.41	14.26	1.07	3.35	2.98	3214.59	0.089	4.965	1.050	0.079	0.247	0.219	236.772
c-CD	5762	1900	325	32912	101.8	0.1750685	11358	33.14	0.04	3.38	29	1.07	0.14	0.0003	3214.59	0.001	0.112	0.961	0.035	0.005	0.000	106.533
															Emissions in lb for A/B Departure:	**0.36**	**20.05**	**5.18**	**0.35**	**1.00**	**0.88**	**1057.50**

F-16C Afterburner Departure 2

Point	Distance	Height	Speed, kts	Power % N2	
a	0	0	0	104	Max AB
b	3000	0	160	92.3	MIL
c	9000	400	300	92.3	MIL
CD	15217	3000	325	92.3	MIL
d	20000	5000	350	92.3	MIL

									Emission Indices, lb/1000 lb							Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
a-a	0	0	0	0	104	0.36667	18088	110.54	1.21	67.41	14.26	1.07	3.35	2.98	3214.59	0.134	7.451	1.576	0.118	0.370	0.329	355.334
a-b	3000	0	80	8101	92.3	0.3703024	11358	70.10	0.04	3.38	29	1.07	0.14	0.0003	3214.59	0.003	0.237	2.033	0.075	0.010	0.000	225.337
b-c	6000	200	160	16203	92.3	0.3703024	11358	70.10	0.04	3.38	29	1.07	0.14	0.0003	3214.59	0.003	0.237	2.033	0.075	0.010	0.000	225.337
c-CD	6217.4	1700	300	30381	92.3	0.2046502	11358	38.74	0.04	3.38	29	1.07	0.14	0.0003	3214.59	0.002	0.131	1.123	0.041	0.005	0.000	124.534
															Emissions in lb for A/B Departure 2:	**0.14**	**8.06**	**6.77**	**0.31**	**0.40**	**0.33**	**930.54**

F-16C OH Break Arrival 1

Point	Distance	Height	Speed, kts	Power % N2	
a	200000	8000	300	83	Approach
AB	84162	3000	300	83	Approach
b	75358	2620	300	83	Approach
c	42331	2620	300	83	Approach
d	28006	1620	200	83	Approach
e	23500	1620	200	83	Approach
f	18886	1620	200	83	Approach
g	10000	600	200	83	Approach
h	5000	300	140	83	Approach
i	0	50	140	83	Approach

									Emission Indices, lb/1000 lb							Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
AB-b	8804	2810	300	30381	83	0.2897809	5080	24.53	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.142	0.240	0.026	0.034	0.022	78.869
b-c	33027	2620	300	30381	83	1.087109	5080	92.04	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.003	0.531	0.900	0.098	0.126	0.084	295.877
c-d	14325	2120	250	25317	83	0.565822	5080	47.91	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.276	0.469	0.051	0.066	0.044	153.999
d-e	4506	1620	200	20254	83	0.2224777	5080	18.84	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.109	0.184	0.020	0.026	0.017	60.551
e-f	4614	1620	200	20254	83	0.22781	5080	19.29	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.111	0.189	0.021	0.026	0.018	62.003
f-g	8886	1110	200	20254	83	0.4387343	5080	37.15	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.214	0.363	0.040	0.051	0.034	119.410
g-h	5000	450	170	17216	83	0.2904332	5080	24.59	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.142	0.240	0.026	0.034	0.022	79.047
h-i	5000	175	140	14178	83	0.3526689	5080	29.86	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.172	0.292	0.032	0.041	0.027	95.985
															Emissions in lb for OH Break Arrival 1:	**0.01**	**1.70**	**2.88**	**0.31**	**0.40**	**0.27**	**945.74**

F-16C OH Break Arrival 2

Point	Distance	Height	Speed, kts	Power % N2	
a	200000	8000	300	83	Approach
AB	83662	3000	300	83	Approach
b	74820	2620	300	83	Approach
c	46880	2620	300	83	Approach
d	32551	1620	200	83	Approach
e	28225	1620	200	83	Approach
f	23440	1620	200	83	Approach
g	10000	600	200	83	Approach
h	5000	300	140	83	Approach
i	0	50	140	83	Approach

									Emission Indices, lb/1000 lb							Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power % N2	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
AB-b	8842	2810	300	30381	83	0.2910317	5080	24.64	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.142	0.241	0.026	0.034	0.022	79.210
b-c	27940	2620	300	30381	83	0.9196665	5080	77.87	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.002	0.449	0.762	0.083	0.107	0.071	250.304
c-d	14329	2120	250	25317	83	0.56598	5080	47.92	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.276	0.469	0.051	0.066	0.044	154.042
d-e	4326	1620	200	20254	83	0.2135904	5080	18.08	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.104	0.177	0.019	0.025	0.016	58.133
e-f	4785	1620	200	20254	83	0.2362529	5080	20.00	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.115	0.196	0.021	0.027	0.018	64.301
f-g	13440	1110	200	20254	83	0.6635819	5080	56.18	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.002	0.324	0.549	0.060	0.077	0.051	180.606
g-h	5000	450	170	17216	83	0.2904332	5080	24.59	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.142	0.240	0.026	0.034	0.022	79.047
h-i	5000	175	140	14178	83	0.3526689	5080	29.86	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.172	0.292	0.032	0.041	0.027	95.985
															Emissions in lb for OH Break Arrival 2:	**0.01**	**1.73**	**2.93**	**0.32**	**0.41**	**0.27**	**961.63**

F-16C Straight In Arrival

Point	Distance	Height	Speed, kts	Power % N2	
a	200000	9000	250	83	Approach
AB	75000	3000	240	83	Approach
b	50000	1800	230	83	Approach
c	10000	600	140	83	Approach
d	5000	300	140	83	Approach
e	0	50	140	83	Approach

									Emission Indices, lb/1000 lb							Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
AB-b	25000	2400	235	23798	83	1.0505032	5080	88.94	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.003	0.513	0.870	0.095	0.122	0.081	285.914
b-c	40000	1200	185	18735	83	2.1350768	5080	180.77	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.005	1.043	1.768	0.193	0.248	0.165	581.101
c-d	5000	450	140	14178	83	0.3526689	5080	29.86	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.172	0.292	0.032	0.041	0.027	95.985
d-e	5000	175	140	14178	83	0.3526689	5080	29.86	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.172	0.292	0.032	0.041	0.027	95.985
															Emissions in lb for Straight In Arrival:	**0.01**	**1.90**	**3.22**	**0.35**	**0.45**	**0.30**	**1058.99**

F-16C Closed Pattern

Point	Distance	Height	Speed, kts	Power % N2	
a	0	0	110	90	Intermed
b	3000	0	135	92.3	Intermed
c	9000	400	280	92.3	Intermed
d	20000	1000	300	92.3	Intermed
e	30000	1600	250	92.3	Intermed
f	41440	1600	200	83	Approach
g	51440	300	140	83	Approach
h	58514	50	140	83	Approach

									Emission Indices, lb/1000 lb							Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power % N2	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM	EIPM2.5	EICO2	**HC**	**CO**	**NOx**	**SO2**	**PM**	**PM2.5**	**CO2**
a-a	0	0	110	0	90	0.25000	7332	30.55	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.002	0.106	0.517	0.033	0.018	0.013	98.206
a-b	3000	0	122.5	12405	91.2	0.2418301	7332	29.55	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.001	0.103	0.500	0.032	0.017	0.012	94.996
b-c	6000	200	207.5	21013	92.3	0.2855344	7332	34.89	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.002	0.121	0.590	0.037	0.020	0.014	112.164
c-d	11000	700	290	29368	92.3	0.3745587	7332	45.77	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.002	0.159	0.774	0.049	0.027	0.019	147.135
d-e	10000	1300	275	27849	92.3	0.3590811	7332	43.88	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.002	0.152	0.742	0.047	0.025	0.018	141.055
e-f	11440	1600	225	22785	87.7	0.5020752	7332	61.35	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.003	0.213	1.038	0.066	0.036	0.025	197.227
f-g	10000	950	170	17216	83	0.5808665	5080	49.18	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.284	0.481	0.053	0.067	0.045	158.094
g-h	7074	175	140	14178	83	0.498956	5080	42.24	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.244	0.413	0.045	0.058	0.038	135.800
															Emissions in lb for Closed Pattern:	**0.02**	**1.38**	**5.06**	**0.36**	**0.27**	**0.18**	**1084.68**

Start/Taxi/Idle

					Emission Indices, lb/1000 lb							Emissions (lbs)						
segment	Power (%)	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
[4]Start/Taxi Out	3	35	1111	648.08	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	0.143	15.625	2.443	0.693	1.685	0.726	2083.322

Taxi In/Shut Off

					Emission Indices, lb/1000 lb							Emissions (lbs)						
segment	Power (%)	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
[4]Taxi to Shut Off	3	15	1111	277.75	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	0.061	6.697	1.047	0.297	0.722	0.311	892.852
	Power (%)				EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
[4]Hot Refueling	3	960	1111	17776.00	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	3.911	428.579	67.016	19.020	46.218	19.909	57142.552

[1]F-16 Flight Profile Maps, Dannelly Field, Cardno 2019

[2]*Dannelly_20190329_MASTER_PHK - Flight OperationsOPSCHECK.xlsx*

[3]Air Emissions

[4]Data from installation, May 2019

Table 2. Current F-16C Operations

Type of	Total	Emissions in lbs/op	Annual Emissions

Operation	Number of Operations	HC	CO	NOx	SO2	PM10	PM2.5	CO2e	HC tons/year	CO tons/year	NOx tons/year	SO2 tons/year	PM10 tons/year	PM2.5 tons/year	CO2e tons/year
Taxi/Idle Out	2,400	0.143	15.625	2.443	0.693	1.685	0.726	2083.322	0.17	18.75	2.93	0.83	2.02	0.87	2,500
A/B Departure 1	1,482	0.359	20.054	5.180	0.352	0.996	0.882	1057.495	0.27	14.86	3.84	0.26	0.74	0.65	784
A/B Departure 2	918	0.141	8.056	6.765	0.310	0.395	0.329	930.542	0.06	3.70	3.11	0.14	0.18	0.15	427
Overhead Break Arrival 1	530	0.009	1.698	2.877	0.315	0.403	0.268	945.741	0.00	0.45	0.76	0.08	0.11	0.07	251
Overhead Break Arrival 2	538	0.009	1.726	2.926	0.320	0.410	0.272	961.628	0.00	0.46	0.79	0.09	0.11	0.07	259
Straight In Arrival	1,332	0.010	1.901	3.222	0.352	0.451	0.300	1058.986	0.01	1.27	2.15	0.23	0.30	0.20	705
Closed Pattern	100	0.015	1.381	5.056	0.361	0.268	0.184	1084.678	0.00	0.07	0.25	0.02	0.01	0.01	54
Taxi/Idle In	2,400	0.061	6.697	1.047	0.297	0.722	0.311	892.852	0.07	8.04	1.26	0.36	0.87	0.37	1,071
Hot Refuel	1	3.911	428.579	67.016	19.020	46.218	19.909	57142.552	0.00	0.21	0.03	0.01	0.02	0.01	29
								Total in Tons/Year	**0.59**	**47.81**	**15.11**	**2.02**	**4.36**	**2.41**	**6,079.52**

Table 3. F-16C Aircraft Engine Maintenance Runups

Aircraft	Location Name	Single Engine Operations: Annual	Power Setting Reported	Duration (hr)	FFR, lb/hr	Fuel Use lb	Emissions in lbs/1000 lbs fuel: EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2	Emissions (lbs): HC	CO	NOx	SO2	PM10	PM2.5	CO2
F-16C	Alert Pad-Prior to Taxi	433.00	Idle	0.05	1111	24053.32	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	5.29	579.93	90.68	25.74	62.54	26.94	77,322
			Intermediate	0.0083333	7332	26456.49	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	1.32	91.80	447.64	28.31	15.34	10.85	85,047
	Alert Pad-Hot Cock on Return	433.00	Idle	0.3333333	1111	160355.50	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	35.28	3866.17	604.54	171.58	416.92	179.60	515,477
			Intermediate	0.0083333	7332	26456.49	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	1.32	91.80	447.64	28.31	15.34	10.85	85,047
	Flight Line-Interface Run 1	2.78	Idle	0.0833333	1111	257.00	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	0.06	6.20	0.97	0.27	0.67	0.29	826
	Flight Line-Interface Run 2	5.55	Idle	0.0833333	1111	513.96	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	0.11	12.39	1.94	0.55	1.34	0.58	1,652
			Intermediate	0.0166667	7332	678.37	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.03	2.35	11.48	0.73	0.39	0.28	2,181
			Idle	0.0833333	1111	513.96	0.22	24.11	3.77	1.07	2.60	1.12	3214.59	0.11	12.39	1.94	0.55	1.34	0.58	1,652
	Trim Pad - Interface Run 1	6.94	Idle	0.0833333	1111	642.44	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	0.14	15.49	2.42	0.69	1.67	0.72	2,065
	Trim Pad - Interface Run 2	13.88	Idle	0.1666667	1111	2569.82	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	0.57	61.96	9.69	2.75	6.68	2.88	8,261
													Total Emissions in Tons/Year	**0.02**	**2.37**	**0.81**	**0.13**	**0.26**	**0.12**	**390**

Table 4. Aircraft Summary

Emissions in Tons Per Year						
VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
0.61	50.18	15.92	4.49	4.62	2.53	6469.29

TAB E. F-35 EMISSION CALCULATIONS - Truax Field

Table 1. F-35 Individual Profile Emission Calculations[1,2,3]

3000 Mixing Ht | 1 kilometer 3,280.84 ft | 1 knot= 1.852 km/h | 1 knot = 101.268591 ft/min | Elevation: 887 ft MSL

SOx % EFSOx = 20 * S where EFSOx = SOX emission factor [pounds SOX emitted per thousand
20 = Factor which is derived by converting "weight percent" into units of "lb/1000 lb" and then
molecular weight of sulfur
S = Weight percent sulfur conte

SOx% 0.107% Sulfur oxides calculated based on weight percent sulfur content of JP-8 in 2018 USAF Mobile Sources Guide

SOx Emission Factor EF = 2.14

SOx equation from Air Emissions Inventory Guidance Document for Mobile Sources at Air force Installations (revised August 2018)

JP-8 density = 6.885 lb/gal (based on analyzed value listed in Summary Table for JP-8, Petroleum Quality Infromation System 2013 Annual Report

JP-8 HHV= 0.135 MMBtu/gal default HHV from Table 2 of Federal GHG Accounting and Reporting Guidance, CEQ (2012)

75.2 kg CO2/MMBtu emission factor from Table 2 of Federal GHG Accounting and Reporting Guidance, CEQ (2012)

3.251 lb CO2/lb fuel burned

A/B Departure

Point	Distance	Height	Speed, kts	Power % ETR	
a	0	0	0	50	
b	3000	0	170	150	AB
c	8000	200	300	100	
CD	17714	3000	325	100	
d	42000	10000	350	100	

Emissions in lb for AB Departure:	**2790.65**	**11.88**	**8.60**	**0.1326**	**1.85**	**0.86**	**0.78**

MIL Departure

Point	Distance	Height	Speed, kts	Power % ETR
a	0	0	0	50
b	3500	0	155	100
c	8000	200	220	100
d	12820	700	300	100
DE	20969	3000	300	70
e	44000	9500	300	40

Emissions in lb for MIL Departure1:	**1175.95**	**0.17**	**7.72**	**0.002**	**0.78**	**0.05**	**0.04**

Straight In Arrival 1

Point	Distance	Height	Speed, kts	Power % ETR
c	72375	3000	300	30
d	45880	1800	240	30
e	30783	1800	180	40
f	6076	300	180	40
g	0	50	175	40

Emissions in lb for Straight In Arrival1:	**1479.33**	**0.51**	**4.42**	**0.01**	**0.98**	**0.05**	**0.05**

Warrior Arrival

Point	Distance	Height	Speed, kts	Power % ETR
c	72375	5000	300	30
CD	56521	3000	275	30
d	53509	2620	250	30
e	30783	1620	180	40
f	20715	1620	180	40
g	6076	300	180	40
h	0	50	175	40

Emissions in lb for Warrior Arrival:	**1125.93**	**0.41**	**3.09**	**0.01**	**0.75**	**0.04**	**0.04**

Pitch Out Arrival 1

Point	Distance	Height	Speed, kts	Power % ETR
b	115091	3000	300	35
c	83541	2620	300	35
d	40355	2620	300	35
e	30811	1620	300	35
f	23000	1620	210	35
g	15620	1620	200	40
h	6076	420	180	40
i	0	50	165	40

Emissions in lb for Pitch Out Arrival1:	**1908.77**	**0.63**	**5.67**	**0.02**	**1.26**	**0.07**	**0.06**

Pitch Out Arrival 2

Point	Distance	Height	Speed, kts	Power % ETR
b	115091	3000	300	35
c	68144	2620	300	35
d	35798	2620	300	35
e	26254	1620	300	35
f	21000	1620	210	35
g	15620	1620	200	40
h	6076	420	180	40
i	0	50	165	40

Emissions in lb for Pitch Out Arrival2:	**1843.91**	**0.62**	**5.45**	**0.02**	**1.22**	**0.06**	**0.06**

Pitch Out Arrival 3

Point	Distance	Height	Speed, kts	Power % ETR

b	115091	3000	300	35
c	59983	2620	300	35
d	31241	2620	300	35
e	21697	1620	300	35
f	18500	1620	210	35
g	15620	1620	200	40
h	6076	420	180	40
i	0	50	165	40

Emissions in lb for Pitch Out Arrival2: **1808.85** **0.61** **5.33** **0.02** **1.20** **0.06** **0.06**

VFR Closed Touch and Go

Point	Distance	Height	Speed, kts	Power % ETR
a	0	50	175	40
b	2880	10	170	100
c	8000	140	260	35
d	9127	220	300	35
e	10235	350	300	35
f	13534	1100	215	55
g	17017	1620	210	55
h	23257	1620	210	40
i	30000	1620	210	40
j	38777	1620	210	40
k	52514	350	190	40
l	58514	0	175	40

Emissions in lb for VFR Closed Touch and Go: **700.13** **0.17** **2.99** **0.00** **0.46** **0.03** **0.02**

Table 2. Operations for F-35A

[1]Type of Operation	[2]Total Number of Operations	Emissions in lb per operation							Annual Emissions						
		[5]HC	[5]CO	[5]NOx	[5,6]SO2	[5]PM10	[5]PM2.5	[4]CO2	HC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO2 lb
[3]Idle/Taxi Out	3,061	0.00	0.14	0.35	0.08	0.00	0.00	121.81	11.25	433.68	1,060.32	246.74	13.02	13.02	372,858
A/B Departure	242	0.13	11.88	8.60	1.85	0.86	0.86	2,791	32.08	2,872.85	2,080.98	446.63	208.60	208.60	674,920
MIL Departure	2,819	0.00	0.17	7.72	0.78	0.05	0.05	1,176	4.50	486.08	21,761.93	2,193.81	132.11	132.11	3,315,180
Straight In Arrival	1653	0.01	0.51	4.42	0.98	0.05	0.05	1,479	24.76	835.23	7,303.81	1,618.13	84.92	84.92	2,445,248
Warrior Arrival	46	0.01	0.41	3.09	0.75	0.04	0.04	1,126	0.61	19.00	141.67	34.21	1.80	1.80	51,697
Pitch Out Arrival 1	454	0.02	0.63	5.67	1.26	0.07	0.06	1,909	8.25	288.04	2,576.45	573.52	30.06	30.06	866,674
Pitch Out Arrival 2	454	0.02	0.62	5.45	1.22	0.06	0.06	1,844	8.12	280.54	2,472.53	554.03	29.04	29.04	837,225
Pitch Out Arrival 3	454	0.00	0.05	0.55	0.11	0.01	0.01	167	0.54	22.42	250.96	50.25	2.64	2.64	75,939
VFR Closed Touch and Gos	100	0.00	0.17	2.99	0.46	0.03	0.03	700	0.29	16.69	299.36	46.33	2.52	2.52	70,013
[3]Idle/Taxi In	3061	0.00	0.15	0.23	0.07	0.00	0.00	99	12.86	450.81	700.09	201.46	10.56	10.56	304,439
Hot Refuel	1	0.00	0.04	0.00	0.00	0.00	0.00	7	0.00	0.04	0.00	0.00	0.00	0.00	7
								Total in Tons/Year	**0.05**	**2.85**	**19.32**	**2.98**	**0.26**	**0.26**	**4,507**

Table 3. F-35A Aircraft Engine Maintenance Runs

	HC	CO	NOx	SO2	PM	PM2.5	CO2e
Total in Tons/Year	**0.326**	**8.032**	**36.020**	**10.770**	**0.562**	**0.506**	**16,275**

Table 4. Aircraft Summary

Emissions in Tons Per Year						
VOC	CO	NOx	SO2	PM	PM2.5	CO2e
0.43	10.89	55.34	13.75	0.82	0.76	20,782

124 FW

Final

Conformity Evaluation Report for 124 FW, Boise Airport, Idaho

May 2019

ACRONYMS AND ABBREVIATIONS

124 WG	124th Fighter Wing
ACAM	Air Conformity Applicability Model
AFI	Air Force Instruction
AGE	Aerospace Ground Equipment
AGL	Above Ground Level
AQCR	Air Quality Control Region
CAA	Clean Air Act
CAF	Combat Air Forces
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGB	National Guard Bureau
NO_2	nitrogen dioxide
O_3	ozone
Pb	lead
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
PM_{10}	particulate matter less than or equal to 10 microns in diameter
PSD	Prevention of Significant Deterioration
ROCA	Record of Conformity Applicability
ROI	Region of Influence
SIP	State Implementation Plan
SO_2	sulfur dioxide
U.S.	United States
USAF	United States Air Force
USC	United States Code
USEPA	United States Environmental Protection Agency

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1.0 INTRODUCTION

The National Guard Bureau (NGB) proposes to implement an aircraft conversion for the 124th Fighter Wing (124 FW) at Boise Airport, also known as Gowen Field. Boise Airport is a joint civil-military airport 3 miles south of Boise in Ada County, Idaho. The 124 FW currently flies and maintains 18 A-10 Thunderbolt II aircraft. The proposal is to convert the unit from the A-10 aircraft and operations to the F-35A Strikefighter aircraft and operations at Boise Airport. The 124 FW is an integral component of the Combat Air Forces (CAF). The CAF defends the homeland of the United States (U.S.) as well as deploys forces worldwide to meet threats to ensure the security of the U.S. To fulfill this role, the A-10 pilots of the 124 FW must train as they would fight.

In accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] 4321-4347), Council on Environmental Quality (CEQ) *Regulations for Implementing the Procedural Provisions of NEPA* (40 Code of Federal Regulations [CFR] Parts 1500-1508), and Air Force Instruction (AFI) 32-7061 as promulgated at 32 CFR Part 989 *et seq.*, *Environmental Impact Analysis Process*, the NGB has prepared an Environmental Impact Statement (EIS), which considers the potential consequences to the human and natural environment that may result from implementation of this action. This Conformity Evaluation Report has been prepared in accordance with Section 176(c)(1) of the Clean Air Act (CAA) and as specified in requirements found in 40 CFR 93 Subpart B, and is included in Appendix B of the EIS.

This document addresses the U.S. Environmental Protection Agency's (USEPA's) General Conformity Rule requirements and how they relate to the actions associated with the implementation of the Proposed Action. The CAA requires any federal agency, such as the NGB, to assess whether their proposed action would contribute to further degradation of air quality or prevent the attainment of air quality standards. The NGB proposes to implement a major federal action that would contribute to regional air emissions at Boise Airport and associated environs in Ada County, Idaho. Therefore, the Region of Influence (ROI) includes Boise Airport as well as all of Ada County. This is an area that does not meet air quality standards for several air pollutants (refer to Section 3.3, *Existing Air Quality Attainment Status*).

2.0 AIR QUALITY STANDARDS

Individual states are delegated the responsibility to regulate air quality in order to achieve or maintain air quality in attainment with these standards. The Idaho Department of Environmental Quality, Air Quality Division enforces air pollution regulations and sets guidelines to attain and maintain the National Ambient Air Quality Standards (NAAQS). These guidelines are found in the Idaho State Implementation Plan (SIP). Table 1 summarizes the NAAQS.

Table 1. National Ambient Air Quality Standards

Pollutant		*Primary/ Secondary*	*Averaging Time*	*Level*	*Form*
Carbon Monoxide (CO)		Primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		Primary and secondary	Rolling month average[3]	0.15 µg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)		Primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Primary and secondary	1 year	53 ppb (2)	Annual
Ozone (O_3)		Primary and secondary	8 hours	0.070 ppm(3)	Annual 4th-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	$PM_{2.5}$	Primary	1 year	12.0 µg/m^3	Annual mean, averaged over 3 years
		Secondary	1 year	15.0 µg/m^3	Annual mean, averaged over 3 years
		Primary and secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	Primary and secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		Primary	1 hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Notes: µg/m^3 = microgram per cubic meter; ppb = parts per billion; ppm = parts per million
(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m3 as a calendar quarter average) also remain in effect.
(2) The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O_3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.
(4) The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is a USEPA action requiring a state to resubmit all or part of its SIP to demonstrate attainment of the required NAAQS.
Source: USEPA 2016.

The CAA also established a national goal of preventing degradation or impairment in federally designated Class I areas. Class I areas are defined as those areas where any appreciable degradation in air quality or associated visibility impairment is considered significant. As part of the Prevention of Significant Deterioration (PSD) Program, Congress assigned mandatory Class I status to all national parks, national wilderness areas (excluding wilderness study areas or wild and scenic rivers), and memorial parks greater than 5,000 acres. In Class I areas, visibility impairment

is defined as atmospheric discoloration (such as from an industrial smokestack), and a reduction in regional visual range. Visibility impairment or haze results from smoke, dust, moisture, and vapor suspended in the air. Very small particles are either formed from gases (sulfates, nitrates) or are emitted directly into the atmosphere from sources like electric utilities, industrial processes, and vehicle emissions. Stationary sources are regulated under the PSD Program, and the PSD permitting process requires a review of impacts to all Class I areas within 62 miles (100 kilometers) of any proposed major stationary source. Mobile sources, including aircraft and associated operations such as those occurring at Air National Guard installations, are not subject to the requirements of PSD.

2.1 AIR QUALITY DESIGNATIONS

As part of the CAA, the USEPA has established criteria for major pollutants of concern, called "criteria pollutants." These criteria pollutants include carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), particulate matter less than or equal to 10 microns in diameter (PM_{10}), particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead (Pb). Emissions of Pb are not addressed because the affected areas contain no significant sources of this criteria pollutant, and 124 FW operations would not result in substantial emissions of Pb. The criteria set for these pollutants, the NAAQS, represent maximum levels of background pollution that are considered safe, with an adequate margin of safety to protect the public health and welfare. Based on measured ambient criteria pollutant data, the USEPA designates areas in the U.S. as having air quality better than (attainment) or worse than (nonattainment) the NAAQS. Areas that lack monitoring data to demonstrate attainment or nonattainment status are designated as unclassified and are treated as attainment areas for regulatory purposes. Varying levels of attainment have been established for O_3, CO, and PM_{10} to indicate the severity of the air quality problem (i.e., the classification runs from moderate to serious for CO and PM_{10} and from marginal to extreme for O_3).

2.2 FEDERAL REQUIREMENTS

The CAA (42 USC §§ 7401-7671q, as amended) provided the authority for the USEPA to establish nationwide air quality standards to protect public health and welfare. Federal standards, known as the NAAQS, were developed for the criteria pollutants: O_3, NO_2, CO, SO_2, both coarse and fine inhalable particulate matter PM_{10} and $PM_{2.5}$, and Pb (refer to Table 1). The Act also requires that each state prepare a SIP for maintaining and improving air quality and eliminating violations of the NAAQS. The CAA requires federal agencies to determine whether their proposed actions in nonattainment and maintenance areas conform with the applicable SIP, and demonstrate that their actions will not (1) cause or contribute to a new violation of the NAAQS; (2) increase the frequency or severity of any existing violation; or (3) delay timely attainment of any standard, emission reduction, or milestone contained in the SIP.

2.3 STATE REQUIREMENTS

The CAA requires each state to develop, adopt, and implement a SIP to achieve, maintain, and enforce federal air quality standards throughout the state. States develop SIPs on a pollutant-by-pollutant basis whenever there is a violation of one or more air quality standards. Idaho has adopted the federal ambient air quality standards and does not maintain any additional standards.

2.4 GENERAL CONFORMITY REGULATIONS

The General Conformity Rule was promulgated by the USEPA on November 30, 1993 at 40 CFR Part 93 Subpart B "*Determining Conformity of General Federal Actions to State or Federal Implementation Plans"* for all federal activities except those covered under transportation conformity (USEPA 1993). The General Conformity Regulations were revised by the USEPA on April 5, 2010 (75 *Federal Register* 17253-17279) and changed the existing regulations found in 40 CFR Part 51, Subpart W, and Part 93, Subpart B (USEPA 2010). The USEPA's modifications to 40 CFR Part 51, Subpart W, changed state or Tribal adoption and submittal of general conformity SIPs from a requirement to a voluntary measure in 40 CFR § 51.851(a). In addition, the USEPA provided in 40 CFR § 51.851(b) that until such time as USEPA approves a state's or Tribe's revision to the conformity implementation plan permitted under this section, that federal agencies must meet the requirements of 40 CFR Part 93, Subpart B.

The General Conformity Rule requires any federal agency responsible for an action in a nonattainment or maintenance area to determine that the action conforms to the applicable SIP. Emissions of attainment pollutants are exempt from conformity analysis. Actions would conform to a SIP if their annual direct and indirect emissions would remain less than the applicable *de minimis* thresholds. Formal conformity determinations are required for any actions that would equal or exceed these thresholds. The conformity determination process is intended to demonstrate that a proposed federal action would not: (1) cause or contribute to a new violation of the NAAQS; (2) increase the frequency or severity of any existing violation; or (3) delay timely attainment of any standard, emission reduction, or milestone contained in the SIP.

Analyses required by the General Conformity Regulations focus on the net increase in air emissions from a Proposed Action compared to ongoing historical conditions. Existing SIPs are presumed to have accounted for routine, ongoing federal agency activities. Conformity analyses are further limited to those direct and indirect emissions over which the federal agency has continuing program responsibility and control over. General conformity analyses are not required to analyze emission sources beyond the responsibility and control of the federal agency. Conformity determinations are also not required to address emissions that are not reasonably foreseeable or reasonably quantifiable.

2.5 GENERAL CONFORMITY ANALYSIS PROCEDURES

The USEPA General Conformity Regulations incorporate a stepwise process, beginning with an applicability analysis (USEPA 1993, 2010). According to USEPA guidance, before any approval is given for a federal action to go forward, the regulating federal agency must apply the applicability requirements found at 40 CFR § 93.153(b) to the federal action to evaluate whether, on a pollutant-by-pollutant basis, a determination of general conformity is required. If the regulating federal agency determines that the General Conformity Regulations do not apply to the federal action, no further analysis or documentation is required. However, if the General Conformity Regulations do apply to a federal action, the action proponent must make its own conformity determination in accordance with the criteria and procedures outlined in the implementing regulations, publish a draft determination of general conformity for public review, consider comments from interested parties, and then publish the final determination of general conformity.

3.0 ELEMENTS OF THE PROPOSED ACTION

The Proposed Action involves both construction of new facilities to accommodate the F-35A aircraft, and operational emissions associated with the F-35A aircraft.

3.1 CONSTRUCTION EMISSIONS

The Proposed Action would include construction activities at the 124 FW to provide for additional infrastructure and facilities needed to support the proposed F-35A operations. Air quality impacts from construction would occur from (1) combustion emissions due to the use of fossil fuel-powered equipment; and (2) fugitive dust emissions ($PM_{2.5}$ and PM_{10}) during demolition activities, earth-moving activities, and the operation of equipment on bare soil.

The construction at the 124 FW associated with the Proposed Action would occur between calendar years 2020 and 2023. In order to assess the most conservative scenario, all construction was assumed to occur in a single year, 2020.

3.2 OPERATIONAL EMISSIONS

Operational emissions associated with the Proposed Action include emissions associated with aircraft operations and associated equipment. Mobile source emissions include emissions from aircraft operations (take-offs and landings), aerospace ground equipment (AGE), personal vehicle operations, and maintenance aircraft operations performed with the engines still mounted on the aircraft (engine run-ups and trim checks). The Proposed Action would include an increase of 85 personnel required to support the F-35A operations.

Under the Proposed Action, the 124 FW would convert from 18 A-10 aircraft to 18 F-35A aircraft and with each F-35A arrival, an A-10 would be removed from operation at the Boise Airport. The first F-35A could arrive as early as 2023 and all are anticipated to be located at the Boise Airport at some point in 2024. Baseline operations for the A-10 aircraft at the Boise Airport total 2,500 landings and take-offs and 1,152 closed patterns annually. The number of annual operations would increase by 561 additional landings and take-offs, and 0 additional closed patterns under the Proposed Action.

3.3 EXISTING AIR QUALITY ATTAINMENT STATUS

Ada County, Idaho is part of the Metropolitan Boise Intrastate Air Quality Control Region (AQCR) (40 CFR 81.87). Currently, Ada County is a designated maintenance area for CO and PM_{10}. The applicable *de minimis* thresholds for the area are listed in Table 2.

Table 2. Applicable Criteria Pollutant *de minimis* Thresholds (tpy)

Affected Area	*CO*	*PM_{10}*
Ada County, ID	100	100

Legend: CO = carbon monoxide; PM10 = particulate matter less than or equal to 10 microns in diameter; tpy = tons per year.
Source: 40 CFR 93.153(1).

4.0 GENERAL CONFORMITY EVALUATION

4.1 APPLICABILITY ANALYSIS

The first step in a general conformity evaluation is an analysis of whether the requirements apply to the federal action that is proposed in a nonattainment or a maintenance area. Unless exempted by the regulations or otherwise presumed to conform, a federal action requires a general conformity determination for each pollutant where the total of direct and indirect emissions caused by the federal action would equal or exceed an annual *de minimis* emission rate for any given maintenance or nonattainment pollutant (or precursor). If a proposed action would result in emission increases less than the identified applicable *de minimis* thresholds, then no conformity determination is required.

4.2 EXEMPTIONS FROM GENERAL CONFORMITY REQUIREMENTS

The general conformity requirements apply to a federal action if the net project emissions equal or exceed certain *de minimis* emission rates established in the General Conformity Regulations. The *de minimis* thresholds differ based on the severity of the nonattainment status. The only exceptions to this applicability criterion include certain federal actions that are presumed to conform because of the thorough air quality analysis required to comply with other statutory requirements. Examples of these actions include those subject to the New Source Review program and remedial activities under the Comprehensive Environmental Response, Compensation, and Liability Act.

Other federal actions exempt from the conformity process include those actions that would result in no increase in emissions, or an increase in emissions that is clearly *de minimis*. Examples include continuing or recurring activities, routine maintenance and repair, and administrative and planning actions; however, the emissions that would result from this federal action do not meet any of these exempt categories. For this reason, a Level II Quantitative Assessment, as described in the *Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide – Fundamentals, Volume 1 of 2* (U.S. Air Force [USAF] 2017) was performed. This analysis is used to prepare an estimate of the worst-case annual net change (the total direct and indirect emissions associated with the Proposed Action) and these emissions were compared against *de minimis* thresholds for the pollutants of concern – CO and PM_{10}. Emissions were estimated using flight operations data and flight profiles for the installation, and aircraft model-specific emission factors, along with emission estimates generated in the Air Conformity Applicability Model (ACAM) for construction, AGE, and personal vehicle operations. The results were used to quantify the Proposed Action emissions.

4.3 EMISSION ESTIMATES

Existing emissions quantified include emissions from the A-10 aircraft, which would be replaced under the Proposed Action by the F-35A aircraft. The annual operations as they occur today are anticipated to be the same as when the F-35A has completely replaced the A-10 in 2024.

To evaluate emissions from ongoing historical conditions for evaluating the net emissions increases/decreases associated with the Proposed Action, emissions from the A-10 aircraft operations, A-10 engine testing, and A-10-related AGE were evaluated. Emissions from the A-10 aircraft operations were calculated based on number of operations identified in the noise analysis in Section ID2.1 in the EIS to calculate aircraft operations below a default mixing height of 3,000 feet above ground level (AGL). Appendix B of the EIS provides a discussion of the methodology for quantifying emissions. Table 3 presents the emissions associated with operations of the A-10 aircraft.

Table 3. 124 FW A-10 Emissions at the Boise Airport (tons/year)

Emission Source	*CO*	*PM_{10}*
A-10 Aircraft Operations	99.92	8.80
Engine Testing	93.10	7.11
Aerospace Ground Equipment	45.29	8.80
Total A-10 Operations Emissions	**238.31**	**24.70**

Note: Slight variations due to rounding.
Legend: CO = carbon monoxide; PM10 = particulate matter less than or equal to 10 microns in diameter.

Construction activities at the 124 FW include demolition or renovation of existing structures, construction of new structures, and infrastructure upgrades. Table 4 provides information on the construction projects anticipated ahead of the F-35A arrival to the 124 FW.

Table 4. Construction Projects for 124 FW

Project	*SF to demolish (D), build (B), or renovate (R)*	*Truck Trips*
Flight Simulator	19,000 (B)	572
A/C Shelters	44,000 (B)	340
Wash Rack	24,000 (B)	
BAK-12 system	120,000 (B)	3,131
West Ramp Pavement	18,000 (B)	563
Weapons Loading Training	11,500 (B)	264
Distributed Spares	6,000 (B)	154
Interior renovations for 8 locations & exterior renovations for 1 location	(R)	240
Total material brought in		**23,929 cubic yards**
Total material removed		**21,046 cubic yards**

Table 5 summarizes the annual and total construction emissions associated with the Proposed Action. The data in Table 5 show that the annual emissions for proposed construction activities would not exceed the General Conformity Rule *de minimis* thresholds as set forth in the CAA.

Table 5. 124 FW Construction Emissions in 2020 (tons/year)

Emission Source	*CO*	*PM_{10}*
124 FW Construction Projects	3.06	1.95

Legend: CO = carbon monoxide; PM10 = particulate matter less than or equal to 10 microns in diameter.

Based on the phasing schedule, the A-10 aircraft would be completely departed from the Boise Airport in 2024 and the F-35A aircraft would be at the full complement of 18 aircraft. Operational emissions associated with the Proposed Action are summarized in Table 6 along with a comparison with the baseline emissions for the A-10.

Table 6. 124 FW Projected Emissions, Boise Airport, 2025 and Beyond (tons/year)

Emission Source	*CO*	*PM_{10}*
F-35 Aircraft Operations	2.65	0.26
Engine Testing	6.91	0.48
Aerospace Ground Equipment	9.51	1.61
Additional Staff Vehicles	2.16	0.01
Total Operational Emissions	21.22	2.36
A-10 Operational Emissions	*238.31*	*24.70*
Net Emissions Increase	**-217.08**	**-22.34**
De minimis Threshold	100	100
Equals or Exceeds Threshold?	No	No

Note: Slight variations due to rounding.
Legend: CO = carbon monoxide; PM10 = particulate matter less than or equal to 10 microns in diameter.

As shown in Table 6, emissions associated with the Proposed Action at the Boise Airport would be below the General Conformity Rule *de minimis* thresholds for all pollutants.

4.4 APPLICABILITY OF GENERAL CONFORMITY TO THIS FEDERAL ACTION

The applicability of the General Conformity requirements to the Proposed Action was determined by comparing the federal action emissions to the conformity *de minimis* thresholds for all

nonattainment and maintenance pollutants in the ROI. As shown in Table 6, the emissions of all pollutants are lower than their applicable *de minimis* thresholds.

5.0 FINDING OF CONFORMITY

In accordance with 40 CFR Part 93, Subpart B, 40 CFR Part 51, Subpart W and the 2017 *Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide – Fundamentals, Volume 1 of 2* (USAF 2017), the emissions due to the Proposed Action were evaluated, including reasonable foreseeable direct and indirect emissions. The applicability analysis has found that:

- General Conformity is not applicable to this proposed federal action,
- a Conformity Determination is not required, and
- the General Conformity Evaluation is complete with a completed Record of Conformity Applicability (ROCA) to document the conclusion (included in Appendix 1 to this document).

6.0 REFERENCES

United States Air Force (USAF). 2017. Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide – Fundamentals, Volume 1 of 2.

United States Environmental Protection Agency (USEPA). 1993. Determining Conformity of General Federal Actions to State or Federal Implementation Plans; Final Rule. 40 CFR Parts 6, 51, and 93. 30 November.

_____. 2010. Revisions to the General Conformity Rule Regulations; Final Rule. 40 CFR Parts 51 and 93. 5 April.

_____. 2016. National Ambient Air Quality Standards. Accessed at https://www.epa.gov/criteria-air-pollutants/naaqs-table

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APPENDIX 1
RECORD OF CONFORMITY ANALYSIS

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AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: Emissions were derived manually using installation-specific data and through the Air Force's Air Conformity Applicability Model (ACAM) to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, Air Quality Compliance And Resource Management; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the analysis.

a. Action Location:

Base: 124th Fighter Wing Installation at Boise Airport
State: Idaho
County(s): Ada
Regulatory Area(s): Boise-Northern Ada County, ID; NOT IN A REGULATORY AREA

b. Action Title: USAF F-35A Operational Beddown - Air National Guard

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2020

e. Action Description:

The United States Air Force is proposing to beddown F-35A aircraft at two of five alternative Air National Guard locations. The F-35A would replace the existing F-15, F-16, or A-10 fighter attack aircraft at the two selected installations. This action would involve the beddown of one F-35A squadron consisting of 18 Primary Aircraft Authorized with 2 Backup Aircraft Inventory at each of the two selected locations, thereby establishing two F-35A operational locations. Five alternative Air National Guard locations are being considered for this beddown:

- 124th Fighter Wing (124 FW) at Boise Air Terminal (Boise Airport), Boise, Idaho

- 125th Fighter Wing (125 FW) at Jacksonville International Airport (IAP), Jacksonville, Florida

- 115th Fighter Wing (115 FW) at Dane County Regional Airport, Madison, Wisconsin

- 127th Wing (127 WG) at Selfridge Air National Guard Base (ANGB), Michigan

- 187th Fighter Wing (187 FW) at Montgomery Regional Airport, Montgomery, Alabama

f. Point of Contact:

Name: Lesley Hamilton
Title: Sr. Associate
Organization: Cardno
Email:
Phone Number:

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated manually with installation-specific input on flight operations data and flight profiles, and through ACAM for construction, aerospace ground equipment, and personnel on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

Conformity Analysis Summary:

Construction emissions are based on equipment operations for demolition, grading, building construction, application of architectural coatings, and materials transport.

2020 - Construction

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY Threshold (ton/yr)	GENERAL CONFORMITY Exceedance (Yes or No)
Boise-Northern Ada County, ID			
CO	3.06	100	No
PM 10	1.96	100	No

A-10 annual operations table represents the landings and take offs of the A-10, along with closed patterns (represented as touch and goes). Annual engine runups are also included.

2017 - A-10 Baseline Operations

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY Threshold (ton/yr)	GENERAL CONFORMITY Exceedance (Yes or No)
Boise-Northern Ada County, ID			
CO	238.31	100	Yes
PM 10	24.70	100	No

F-35 steady state operations table represents the landings and take offs of the F-35, along with closed patterns (represented as touch and goes). Annual engine runups and additional commuting personnel are also included.

2025 - F-35 Steady State Operations

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY Threshold (ton/yr)	GENERAL CONFORMITY Exceedance (Yes or No)
Boise-Northern Ada County, ID			
CO	21.22	100	No
PM 10	2.36	100	No

The net change is the difference in emissions resulting from instituting the proposed action to homebase the F-35A as compared to not introducing the action.

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2025 Net Change

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR Threshold (ton/yr)	AIR QUALITY INDICATOR Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
CO	-217.08	100	No
PM 10	-22.34	100	No

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Lesley Hamilton

Lesley Hamilton, Sr. Associate

6/3/19

DATE

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RECORD OF AIR ANALYSIS (ROAA)

1. General Information: Emissions were derived manually using installation-specific data and through the Air Force's Air Conformity Applicability Model (ACAM) to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, Air Quality Compliance And Resource Management; the Environmental Impact Analysis Process (EIAP, 32 Code of Federal Regulations [CFR] 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the analysis.

a. Action Location:

Base: 124th Fighter Wing Installation
State: Idaho
County(s): Ada
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: USAF F-35A Operational Beddown - Air National Guard

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2020

e. Action Description:

The United States Air Force (USAF) is proposing to beddown F-35A aircraft at two of five alternative Air National Guard (ANG) locations. The F-35A would replace the existing F-15, F-16, or A-10 fighter attack aircraft at the two selected installations. This action would involve the beddown of one F-35A squadron consisting of 18 Primary Aircraft Authorized (PAA) with 2 Backup Aircraft Inventory at each of the two selected locations, thereby establishing two F-35A operational locations. Five alternative ANG locations (Figure 1.1-1) are being considered for this beddown:

- 187th Fighter Wing (187 FW) at Montgomery Regional Airport, Montgomery, Alabama

- 125th Fighter Wing (125 FW) at Jacksonville International Airport (IAP), Jacksonville, Florida

- 115th Fighter Wing (115 FW) at Dane County Regional Airport, Madison, Wisconsin

- 124th Fighter Wing (124 FW) at Boise Air Terminal (Boise Airport), Boise, Idaho

- 127th Wing (127 WG) at Selfridge Air National Guard Base (ANGB), Michigan

f. Point of Contact:

Name: Lesley Hamilton
Title: Sr Associate
Organization: Cardno
Email:
Phone Number:

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total combined direct and indirect emissions associated with the action were estimated manually with installation-specific input on flight operations data and flight profiles and through ACAM for construction, aerospace ground

equipment, and personnel on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. Potential impacts to air quality are evaluated with respect to the extent, context, and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. The Council on Environmental Quality (CEQ) defines significance in terms of context and intensity in 40 CFR 1508.27. This requires that the significance of an action be analyzed in respect to the setting of the action and based relative to the severity of the impact. For attainment area criteria pollutants, the project air quality analysis uses the United States Environmental Protection Agency's Prevention of Significant Deterioration (PSD) permitting threshold of 250 tons per year as an initial indicator of the local significance of potential impacts to air quality. It is important to note that these indicators only provide a clue to the potential impacts to air quality. In the context of criteria pollutants for which the proposed project region is in attainment of a National Ambient Air Quality Standards (NAAQS), the analysis compares the annual net increase in emissions estimated for each project alternative to the 250 ton per year PSD permitting threshold. The PSD permitting threshold represents the level of potential new emissions below which a new or existing minor non-listed stationary source may acceptably emit without triggering the requirement to obtain a permit. Thus, if the intensity of any net emissions increase for a project alternative is below 250 tons per year in the context of an attainment criteria pollutant the indication is the air quality impacts will be insignificant for that pollutant. Therefore, the worst-case year emissions were compared against the 250 ton per year Indicator and are summarized below.

Analysis Summary:

Construction emissions are based on equipment operations for demolition, grading, building construction, application of architectural coatings, and materials transport.

2020 - Construction

Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.65	250	No
NOx	3.56	250	No
SOx	0.01	250	No
PM 2.5	0.16	250	No
CO2e	742	N/A	N/A

A-10 annual operations table represents the landings and take offs, along with closed patterns. Annual engine runups are also included.

2017 - A-10 Annual Operations

Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	103.12	100250	No
NOx	75.59	250	No
SOx	5.64	250	No
PM 2.5	15.65	250	No
CO2e	9,229	N/A	N/A

RECORD OF AIR ANALYSIS (ROAA)

F-35A steady state operations table represents the landings and take offs of the F-35A, along with closed patterns. Annual engine runups and additional commuting personnel are also included.

2025 - F-35A Steady State Operations

Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	6.00	250	No
NOx	71.20	250	No
SOx	14.20	250	No
PM 2.5	2.26	250	No
CO2e	20,816	N/A	N/A

The net change is the difference in emissions resulting from the proposed action to homebase the F-35A as compared to not introducing the action.

2025 Net Change

Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	-97.12	250	No
NOx	-4.39	250	No
SOx	8.56	250	No
PM 2.5	-13.38	250	No
CO2e	11,587	N/A	N/A

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

Lesley Hamilton

7/2/19

Lesley Hamilton, Sr Associate — DATE

TAB C. A-10 EMISSION CALCULATIONS - GOWEN FIELD

Table 1. A-10A Individual Profile Emission Calculations

[1,2,3] **Inputs to Emissions Calculations** Elevation at Gowen = 2871 ft MSL

TF34-GE-100 Engines

3000 FT AGL Mixing Height

1	kilometer (km)	3,280.84	ft
1	knot =	1.852	km/h
1	knot =	101.2686	ft/min

A1-10A Standard Departure with Holddown

Point	Distance	Height	Speed, kts	Power % N2	
a	0	0	0	5970	Intermed
b	2700	0	135	6700	MIL
c	9600	400	160	6700	MIL
d	17000	629	200	6700	MIL
e	35000	1629	200	6700	MIL
EF	39222	3000	200	5962.5	Intermed
f	50000	6500	200	5225	Intermed

										Emission Indices, lb/1000 lb					Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM**	**PM2.5**	**CO2e**
a-a	0	0	0	0	5970	0.40000	920	6.13	23.35	78.00	2.6	1.07	8.93	6.95	3214.59	0.143	0.478	0.016	0.007	0.055	0.043	19.716
a-b	2700	0	67.5	6836	6335	0.3949892	5420	35.68	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.004	0.078	0.382	0.038	0.095	0.060	114.699
b-c	6900	200	147.5	14937	6700	0.4619365	5420	41.73	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.005	0.092	0.446	0.045	0.111	0.070	134.139
c-d	7400	515	180	18228	6700	0.4059611	5420	36.67	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.004	0.081	0.392	0.039	0.098	0.062	117.885
d-e	18000	1129	200	20254	6700	0.8887257	5420	80.28	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.010	0.177	0.859	0.086	0.214	0.135	258.072
e-EF	4222	2315	200	20254	6331.25	0.2084519	5420	18.83	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.002	0.041	0.201	0.020	0.050	0.032	60.531
															Emissions in lb for Standard Departure with Holddown:	**0.17**	**0.95**	**2.30**	**0.23**	**0.62**	**0.40**	**705.04**

A1-10A Standard Departure

Point	Distance	Height	Speed, kts	Power % N2	
a	0	0	0	5970	Intermed
b	2700	0	135	6700	MIL
c	9600	200	200	6700	MIL
CD	17682	3000	200	6700	MIL
d	35000	9000	200	6700	MIL

										Emission Indices, lb/1000 lb					Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM**	**PM2.5**	**CO2e**
a-a	0	0	0	0	5970	0.40000	920	6.13	23.35	78.00	2.6	1.07	8.93	6.95	3214.59	0.143	0.478	0.016	0.007	0.055	0.043	19.716
a-b	2700	0	67.5	6836	6335	0.3949892	5420	35.68	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.004	0.078	0.382	0.038	0.095	0.060	114.699
b-c	6900	100	167.5	16962	6700	0.4067799	5420	36.75	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.004	0.081	0.393	0.039	0.098	0.062	118.123
c-CD	8082	1600	200	20254	6700	0.3990289	5420	36.05	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.004	0.079	0.386	0.039	0.096	0.061	115.872
															Emissions in lb for Standard Departure:	**0.16**	**0.72**	**1.18**	**0.12**	**0.34**	**0.22**	**368.41**

A-10A Straight In Arrival

Point	Distance	Height	Speed, kts	Power % N2	
b	90000	5000	250	5325	Approach
BC	54964	3000	195	5275	Approach
c	30000	1575	140	5225	Approach
d	6000	300	140	5000	Approach
e	0	50	140	5000	Approach

										Emission Indices, lb/1000 lb					Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
BC-c	24964	2287.5	222.5	22532	5300	1.1079005	1840	33.98	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.074	0.554	0.194	0.036	0.211	0.072	109.218
c-d	24000	937.5	167.5	16962	5250	1.4148867	1840	43.39	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.095	0.707	0.247	0.046	0.269	0.092	139.481
d-e	6000	175	140	14178	5112.5	0.4232027	1840	12.98	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.028	0.212	0.074	0.014	0.081	0.028	41.720
															Emissions in lb for Straight In Arrival:	**0.20**	**1.47**	**0.51**	**0.10**	**0.56**	**0.19**	**290.42**

A-10A Pitchout Profile Series 1

Point	Distance	Height	Speed, kts	Power % N2	
c	60274	3000	250	5225	Approach
d	41024	2130	250	5225	Approach
e	20092	2130	225	5225	Approach
f	18012	2130	170	5225	Approach
g	6080	300	140	5225	Approach
h	0	50	140		

										Emission Indices, lb/1000 lb					Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
c-d	19250	2565	250	25317	5225	0.7603542	1840	23.32	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.051	0.380	0.133	0.025	0.145	0.049	74.956
d-e	20932	2130	237.5	24051	5225	0.8703067	1840	26.69	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.058	0.435	0.152	0.029	0.166	0.057	85.795
e-f	2080	2130	197.5	20001	5225	0.1039972	1840	3.19	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.007	0.052	0.018	0.003	0.020	0.007	10.252
f-g	11932	1215	155	15697	5225	0.7601631	1840	23.31	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.051	0.380	0.133	0.025	0.145	0.049	74.937
g-h	6080	175	140	14178	2612.5	0.4288454	1840	13.15	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.029	0.214	0.075	0.014	0.082	0.028	42.276
															Emissions in lb for Pitchout Profile Series 1:	**0.20**	**1.46**	**0.51**	**0.10**	**0.56**	**0.19**	**288.22**

A-10A Pitchout Profile Series 2a

Point	Distance	Height	Speed, kts	Power % N2	
c	55274	3000	250	5225	Approach
d	36024	2130	250	5225	Approach
e	25092	2130	225	5225	Approach
f	17012	2130	170	5225	Approach
g	6080	300	140	5225	Approach
h	0	50	140	5225	Approach

									Emission Indices, lb/1000 lb						Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
c-d	19250	2565	250	25317	5225	0.7603542	1840	23.32	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.051	0.380	0.133	0.025	0.145	0.049	74.956
d-e	10932	2130	237.5	24051	5225	0.4545286	1840	13.94	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.031	0.227	0.079	0.015	0.087	0.030	44.808
e-f	8080	2130	197.5	20001	5225	0.403989	1840	12.39	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.027	0.202	0.071	0.013	0.077	0.026	39.826
f-g	10932	1215	155	15697	5225	0.6964552	1840	21.36	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.047	0.348	0.122	0.023	0.133	0.045	68.657
g-h	6080	175	140	14178	5225	0.4288454	1840	13.15	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.029	0.214	0.075	0.014	0.082	0.028	42.276
															Emissions in lb for Pitchout Profile Series 2a:	**0.18**	**1.37**	**0.48**	**0.09**	**0.52**	**0.18**	**270.52**

A-10A Pitchout Profile Series 2b

Point	Distance	Height	Speed, kts	Power % N2	
c	55274	3000	250	5225	Approach
d	41024	2130	250	5225	Approach
e	24092	2130	225	5225	Approach
f	17012	2130	170	5225	Approach
g	6080	300	140	5225	Approach
h	0	50	140	5225	Approach

									Emission Indices, lb/1000 lb						Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
c-d	14250	2565	250	25317	5225	0.5628596	1840	17.26	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.038	0.281	0.098	0.018	0.107	0.037	55.487
d-e	16932	2130	237.5	24051	5225	0.7039955	1840	21.59	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.047	0.352	0.123	0.023	0.134	0.046	69.400
e-f	7080	2130	197.5	20001	5225	0.3539903	1840	10.86	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.024	0.177	0.062	0.012	0.067	0.023	34.897
f-g	10932	1215	155	15697	5225	0.6964552	1840	21.36	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.047	0.348	0.122	0.023	0.133	0.045	68.657
g-h	6080	175	140	14178	5225	0.4288454	1840	13.15	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.029	0.214	0.075	0.014	0.082	0.028	42.276
															Emissions in lb for Pitchout Profile Series 2b:	**0.18**	**1.37**	**0.48**	**0.09**	**0.52**	**0.18**	**270.72**

A-10A Pitchout Profile Series 2c

Point	Distance	Height	Speed, kts	Power % N2	
c	55274	3000	250	5225	Approach
d	36024	2130	250	5225	Approach
e	24092	2130	225	5225	Approach
f	17012	2130	170	5225	Approach
g	6080	300	140	5225	Approach
h	0	50	140	5225	Approach

									Emission Indices, lb/1000 lb						Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
c-d	19250	2565	250	25317	5225	0.7603542	1840	23.32	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.051	0.380	0.133	0.025	0.145	0.049	74.956
d-e	11932	2130	237.5	24051	5225	0.4961064	1840	15.21	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.033	0.248	0.087	0.016	0.094	0.032	48.907
e-f	7080	2130	197.5	20001	5225	0.3539903	1840	10.86	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.024	0.177	0.062	0.012	0.067	0.023	34.897
f-g	10932	1215	155	15697	5225	0.6964552	1840	21.36	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.047	0.348	0.122	0.023	0.133	0.045	68.657
g-h	6080	175	140	14178	5225	0.4288454	1840	13.15	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.029	0.214	0.075	0.014	0.082	0.028	42.276
															Emissions in lb for Pitchout Profile Series 2c:	**0.18**	**1.37**	**0.48**	**0.09**	**0.52**	**0.18**	**269.69**

A-10A Pitchout Profile Series 3

Point	Distance	Height	Speed, kts	Power % N2	
c	70274	3000	250	5225	Approach
d	46024	2130	250	5225	Approach
e	34092	2130	225	5225	Approach
f	18012	2130	170	5225	Approach
g	6080	300	140	5225	Approach
h	0	50	140	5225	Approach

									Emission Indices, lb/1000 lb						Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
c-d	24250	2565	250	25317	5225	0.9578488	1840	29.37	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.064	0.479	0.167	0.031	0.182	0.062	94.425
d-e	11932	2130	237.5	24051	5225	0.4961064	1840	15.21	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.033	0.248	0.087	0.016	0.094	0.032	48.907
e-f	16080	2130	197.5	20001	5225	0.803978	1840	24.66	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.054	0.402	0.141	0.026	0.153	0.052	79.257
f-g	11932	1215	155	15697	5225	0.7601631	1840	23.31	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.051	0.380	0.133	0.025	0.145	0.049	74.937
g-h	6080	175	140	14178	5225	0.4288454	1840	13.15	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.029	0.214	0.075	0.014	0.082	0.028	42.276
															Emissions in lb for Pitchout Profile Series 3:	**0.23**	**1.72**	**0.60**	**0.11**	**0.66**	**0.22**	**339.80**

A-10A Touch and Go Pattern

Point	Distance	Height	Speed, kts	Power % N2	
a	0	50	250	6200	MIL
b	3000	50	250	6200	MIL

c	10000	500	250	6200	MIL
d	20996	2130	250	5325	Intermed
e	36996	2130	200	5225	Approach
f	47992	300	180	5225	Approach
g	53991	50	150	5225	Approach

									Emission Indices, lb/1000 lb							Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power % N2	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
a-b	3000	50	250	25317	6200	0.1184968	5420	10.70	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.001	0.024	0.115	0.011	0.028	0.018	34.410
b-c	7000	275	250	25317	6200	0.2764924	5420	24.98	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.003	0.055	0.267	0.027	0.066	0.042	80.289
c-d	10996	1315	250	25317	5762.5	0.4343301	920	6.66	23.35	78.00	2.6	1.07	8.93	6.95	3214.59	0.156	0.519	0.017	0.007	0.059	0.046	21.408
d-e	16000	2130	225	22785	5275	0.702203	920	10.77	23.35	78.00	2.6	1.07	8.93	6.95	3214.59	0.251	0.840	0.028	0.012	0.096	0.075	34.612
e-f	10996	1215	190	19241	5225	0.571487	1840	17.53	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.038	0.286	0.100	0.019	0.109	0.037	56.338
f-g	5999	175	165	16709	5225	0.3590212	1840	11.01	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.024	0.179	0.063	0.012	0.068	0.023	35.393
															Emissions in lb for Touch and Go Pattern:	**0.47**	**1.90**	**0.59**	**0.09**	**0.43**	**0.24**	**262.45**

A-10A Radar Pattern

Point	Distance	Height	Speed, kts	Power % N2	
a	0	50	140	6200	MIL
b	3000	50	225	6200	MIL
c	10000	500	225	6200	MIL
d	20000	2130	225	5325	Intermed
e	182699	2130	225	5225	Approach
f	210265	2130	150	5225	Approach
g	233000	2000	150	5225	Approach
h	270265	50	140	5225	Approach

									Emission Indices, lb/1000 lb							Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power % N2	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM	EIPM2.5	EICO2	**HC**	**CO**	**NOx**	**SO2**	**PM**	**PM2.5**	**CO2**
a-b	3000	50	182.5	18482	6200	0.1623243	5420	14.66	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.002	0.032	0.157	0.016	0.039	0.025	47.136
b-c	7000	275	225	22785	6200	0.3072138	5420	27.75	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.003	0.061	0.297	0.030	0.074	0.047	89.210
c-d	10000	1315	225	22785	5762.5	0.4388769	920	6.73	23.35	78.00	2.6	1.07	8.93	6.95	3214.59	0.157	0.525	0.017	0.007	0.060	0.047	21.632
d-e	162699	2130	225	22785	5275	7.1404831	920	109.49	23.35	78.00	2.6	1.07	8.93	6.95	3214.59	2.557	8.540	0.285	0.117	0.978	0.761	351.957
e-f	27566	2130	187.5	18988	5225	1.4517696	1840	44.52	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.098	0.726	0.254	0.048	0.276	0.094	143.117
f-g	22735	2065	150	15190	5225	1.4966799	1840	45.90	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.101	0.748	0.262	0.049	0.285	0.097	147.544
g-h	37265	1025	145	14684	5225	2.5378056	1840	77.83	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.170	1.269	0.444	0.083	0.483	0.165	250.179
															Emissions in lb for Radar Pattern:	**3.09**	**11.90**	**1.72**	**0.35**	**2.20**	**1.24**	**1050.78**

Start/Taxi/Idle

					Emission Indices, lb/1000 lb						Emissions (lbs)							
segment	Power (%)	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
[a]Start/Taxi Out	3	40	780	520.00	39.45	106.7	2.1	1.07	8.13	3.6	3214.59	20.514	55.484	1.092	0.556	4.228	1.872	1671.587

Taxi In/Shut Off

					Emission Indices, lb/1000 lb							Emissions (lbs)						
segment	Power (%)	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
[a]Taxi to Shut Off	3	15	780	195.00	39.45	106.7	2.1	1.07	8.13	3.6	3214.59	7.693	20.807	0.410	0.209	1.585	0.702	626.845
	Power (%)				EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
[a]Hot Refueling	3	540	780	7020.00	39.45	106.7	2.1	1.07	8.13	3.6	3214.59	276.939	749.034	14.742	7.511	57.073	25.272	22566.422

[1]F-16 Flight Profile Maps, Dannelly Field, Cardno 2019

[2]*Dannelly_20190329_MASTER_PHK - Flight OperationsOPSCHECK.xlsx*

Guide for Air

[4]Data from installation, May 2019

Table 2. Current A-10 Operations

Type of Operation	Total Number of Operations	Emissions in lbs/op							Annual Emissions						
		HC	CO	NOx	SO2	PM10	PM2.5	CO2e	HC tons/year	CO tons/year	NOx tons/year	SO2 tons/year	PM10 tons/year	PM2.5 tons/year	CO2e tons/year
Taxi/Idle Out	2,498	20.514	55.484	1.092	0.556	4.228	1.872	1671.587	25.62	69.30	1.36	0.69	5.28	2.34	2,088
Standard Dep w\Holddown	599	0.169	0.947	2.297	0.235	0.622	0.401	705.043	0.05	0.28	0.69	0.07	0.19	0.12	211
Standard Dep	1,899	0.156	0.717	1.177	0.123	0.343	0.225	368.409	0.15	0.68	1.12	0.12	0.33	0.21	350
Straight In Arrival	250	0.198	1.473	0.515	0.097	0.561	0.192	290.418	0.02	0.18	0.06	0.01	0.07	0.02	36
Pitchout Profile Series 1	157	0.196	1.461	0.511	0.096	0.557	0.190	288.217	0.02	0.11	0.04	0.01	0.04	0.01	23
Pitchout Profile Series 2a	883	0.184	1.372	0.480	0.090	0.523	0.178	270.523	0.08	0.61	0.21	0.04	0.23	0.08	119
Pitchout Profile Series 2b	879	0.184	1.373	0.480	0.090	0.523	0.179	270.717	0.08	0.60	0.21	0.04	0.23	0.08	119
Pitchout Profile Series 2c	206	0.184	1.368	0.478	0.090	0.521	0.178	269.692	0.02	0.14	0.05	0.01	0.05	0.02	28
Pitchout Profile Series 3	125	0.231	1.723	0.603	0.113	0.656	0.224	339.802	0.01	0.11	0.04	0.01	0.04	0.01	21
Touch and Go Pattern	1,063	0.474	1.903	0.590	0.087	0.428	0.242	262.449	0.25	1.01	0.31	0.05	0.23	0.13	139
Radar Pattern	89	3.087	11.901	1.715	0.350	2.195	1.236	1050.775	0.14	0.53	0.08	0.02	0.10	0.05	47
Taxi/Idle In	2,498	7.693	20.807	0.410	0.209	1.585	0.702	626.845	9.61	25.99	0.51	0.26	1.98	0.88	783
Hot Refuel	1	276.939	749.034	14.742	7.511	57.073	25.272	22566.422	0.14	0.37	0.01	0.00	0.03	0.01	11
								Total in Tons/Year	**36.19**	**99.92**	**4.69**	**1.32**	**8.80**	**3.97**	**3,975.60**

Table 3. A-10 Aircraft Engine Maintenance Runups

Aircraft	Location Name	Dual Engine Operations					Emissions in lbs/1000 lbs fuel							Emissions (lbs)						
		Annual	Power Setting Reported	Duration (hr)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	HC	CO	NOx	SO2	PM10	PM2.5	CO2e
A-10A	A10-HP	46.36	Idle	0.3333333	780	12052.30	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	475.46	1285.98	25.31	12.90	97.99	43.39	38743.20
			Approach	0.1166667	920	4975.44	2.19	16.30	5.70	1.07	6.21	2.12	3214.59	10.90	81.10	28.36	5.32	30.90	10.55	15993.99
			Intermediate	0.05	390	903.92	23.35	78.00	2.60	1.07	8.93	6.95	3214.59	21.11	70.51	2.35	0.97	8.07	6.28	2905.74
	A10-Mx7	123.99	Idle	0.1666667	780	16118.77	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	635.89	1719.87	33.85	17.25	131.05	58.03	51815.22
	A10-Mx8	123.99	Idle	0.1666667	780	16118.77	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	635.89	1719.87	33.85	17.25	131.05	58.03	51815.22
	A10-Mx9	123.99	Idle	0.1666667	780	16118.77	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	635.89	1719.87	33.85	17.25	131.05	58.03	51815.22
	A10-PostF6	739.86	Idle	0.1666667	780	96181.15	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	3794.35	10262.53	201.98	102.91	781.95	346.25	309182.96
	A10-Pre6	739.86	Idle	0.4166667	780	240452.88	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	9485.87	25656.32	504.95	257.28	1954.88	865.63	772957.41
	A10-PostF7	739.86	Idle	0.1666667	780	96181.15	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	3794.35	10262.53	201.98	102.91	781.95	346.25	309182.96
	A10-Pre7	739.86	Idle	0.4166667	780	240452.88	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	9485.87	25656.32	504.95	257.28	1954.88	865.63	772957.41
	A10-PostF8	739.86	Idle	0.1666667	780	96181.15	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	3794.35	10262.53	201.98	102.91	781.95	346.25	309182.96
	A10-Pre8	739.86	Idle	0.4166667	780	240452.88	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	9485.87	25656.32	504.95	257.28	1954.88	865.63	772957.41
	A10-PostF9	739.86	Idle	0.1666667	780	96181.15	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	3794.35	10262.53	201.98	102.91	781.95	346.25	309182.96
	A10-Pre9	739.86	Idle	0.4166667	780	240452.88	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	9485.87	25656.32	504.95	257.28	1954.88	865.63	772957.41
	A10-PostF10	739.86	Idle	0.1666667	780	96181.15	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	3794.35	10262.53	201.98	102.91	781.95	346.25	309182.96
	A10-Pre10	739.86	Idle	0.4166667	780	240452.88	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	9485.87	25656.32	504.95	257.28	1954.88	865.63	772957.41
													Total Emissions in Tons/Year	**34.41**	**93.10**	**1.85**	**0.94**	**7.11**	**3.15**	**2811.90**

Table 4. Aircraft Summary

Emissions in Tons Per Year						
VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
70.60	193.02	6.54	2.26	15.90	7.12	6787.50

TAB C. F-35 EMISSION CALCULATIONS - Gowen Field

Table 1. F-35 Individual Profile Emission Calculations[1,2,3]

3000 Mixing Ht

1 kilometer 3,280.84 ft
1 knot= 1.852 km/h
1 knot = 101.268591 ft/min

Elevation: 2871 ft MSL

SOx % EFSOx = 20 * S where EFSOx = SOX emission factor [pounds SOX emitted per thousand
20 = Factor which is derived by converting "weight percent" into units of "lb/1000 lb" and ther
molecular weight of sulfur
S = Weight percent sulfur conte

SOx% 0.107% Sulfur oxides calculated based on weight percent sulfur content of JP-8 in 2018 USAF Mobile Sources Guide
SOx Emission Factor EF = 2.14

SOx equation from Air Emissions Inventory Guidance Document for Mobile Sources at Air force Installations (revised August 2018)

JP-8 density = 6.885 lb/gal (based on analyzed value listed in Summary Table for JP-8, Petroleum Quality Infromation System 2013 Annual Report
JP-8 HHV= 0.135 MMBtu/gal default HHV from Table 2 of Federal GHG Accounting and Reporting Guidance, CEQ (2012)
75.2 kg CO2/MMBtu emission factor from Table 2 of Federal GHG Accounting and Reporting Guidance, CEQ (2012)
3.251 lb CO2/lb fuel burned

A/B Departure

Point	Distance	Height	Speed, kts	Power % ETR	
a	0	0	0	50	
b	3000	0	170	150	AB
c	8000	200	300	65	
d	12446	629	300	50	
DE	42126	3000	300	58	
e	50000	3629	300	40	

	CO2	CO	NOx	HC	SO2	PM	PM2.5
Emissions in lb for AB Departure:	**3010.53**	**10.56**	**9.13**	**0.1184**	**1.99**	**0.77**	**0.70**

MIL Departure 1

Point	Distance	Height	Speed, kts	Power % ETR
a	0	0	0	50
b	3500	0	155	100
c	8000	200	220	65
d	13500	629	300	65
DE	32731	3000	300	65
e	50000	5129	300	65

Emissions in lb for MIL Departure1:	**1456.44**	**0.24**	**8.86**	**0.003**	**0.96**	**0.06**	**0.05**

MIL Departure 2

Point	Distance	Height	Speed, kts	Power % ETR
a	0	0	0	50
b	3500	0	155	100
c	13500	629	300	65
d	18352	1629	300	50
DE	40047	3000	300	45
e	50000	3629	300	40

Emissions in lb for MIL Departure2:	**1598.92**	**0.27**	**9.88**	**0.004**	**1.06**	**0.06**	**0.06**

Straight In Arrival 1

Point	Distance	Height	Speed, kts	Power % ETR
e	62457	4629	300	30
EF	39403	3000	250	35
f	20000	1629	200	40
g	6076	300	180	40
h	0	50	175	40

Emissions in lb for Straight In Arrival1:	**880.31**	**0.28**	**2.74**	**0.01**	**0.58**	**0.03**	**0.03**

Straight In Arrival 2

Point	Distance	Height	Speed, kts	Power % ETR
c	91142	5000	300	15
CD	50271	3000	275	15
d	45571	2770	250	40
e	30381	1575	180	30
f	0	50	175	30

Emissions in lb for Straight In Arrival2:	**995.99**	**0.37**	**2.69**	**0.01**	**0.66**	**0.03**	**0.03**

Pitch Out Arrival 1

Point	Distance	Height	Speed, kts	Power % ETR
c	69875	3000	300	35
d	45844	2130	300	35
e	33912	2130	210	35
f	25825	2130	200	40
g	18012	2130	200	40
h	6080	300	180	40
i	0	50	165	40

Emissions in lb for Pitch Out Arrival1:	**1352.22**	**0.43**	**4.14**	**0.01**	**0.89**	**0.05**	**0.04**

Pitch Out Arrival 2

Point	Distance	Height	Speed, kts	Power % ETR
d	57500	3000	300	35
e	36024	2130	300	35
f	24092	2130	210	35

g	21210	2130	200	40
h	18012	2130	200	40
i	6080	300	180	40
j	0	50	165	40

Emissions in lb for Pitch Out Arrival2: 1118.45 0.36 3.42 0.01 0.74 0.04 0.03

Pitch Out Arrival 3

Point	Distance	Height	Speed, kts	Power % ETR
c	57500	3000	300	35
d	41024	2130	300	35
e	29092	2130	210	35
f	22750	2130	200	40
g	18012	2130	200	40
h	6080	300	180	40
i	0	50	165	40

Emissions in lb for Pitch Out Arrival3: 1161.08 0.37 3.57 0.01 0.77 0.04 0.04

Touch and Go

Point	Distance	Height	Speed, kts	Power % ETR
a	0	50	165	40
b	763	10	145	100
c	10850	1800	210	55
d	16003	2130	225	35
e	20854	2130	225	35
f	27226	2130	200	40
g	38462	300	180	40
h	44538	50	165	40

Emissions in lb for Touch and Go: 1347.48 0.35 5.50 0.01 0.89 0.05 0.04

Radar Pattern

Point	Distance	Height	Speed, kts	Power % ETR
a	0	50	165	40
b	6562	300	225	100
c	8020	1050	250	25
d	17760	2130	250	25
e	20000	2130	250	30
f	197699	2130	250	30
g	232103	2130	250	40
h	264189	300	175	40
i	270265	50	165	40

Emissions in lb for Radar Pattern: 4389.69 1.78 11.96 0.06 2.90 0.15 0.14

Table 2. Operations for F-35A

[1]Type of Operation	[2]Total Number of Operations	Emissions in lb per operation							Annual Emissions						
		[5]HC	[5]CO	[5]NOx	[5,6]SO2	[5]PM10	[5]PM2.5	[4]CO2	HC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO2 lb
[3]Idle/Taxi Out	3,061	0.00	0.14	0.35	0.08	0.00	0.00	121.81	11.25	433.67	1,060.31	246.73	13.02	13.02	372,852
A/B Departure	153	0.12	10.56	9.13	1.99	0.77	0.77	3,011	18.12	1,615.25	1,397.61	304.81	118.39	118.39	460,611
MIL Departure 1	2,137	0.00	0.24	8.86	0.96	0.06	0.06	1,456	5.51	510.17	18,937.46	2,059.96	122.39	122.39	3,112,918
MIL Departure 2	771	0.00	0.27	9.88	1.06	0.06	0.06	1,599	2.73	204.41	7,616.02	815.36	48.80	48.80	1,232,137
Straight In Arrival 1	61	0.01	0.28	2.74	0.58	0.03	0.03	880	0.46	17.09	167.65	35.66	1.87	1.87	53,891
Straight In Arrival 2	300	0.01	0.37	2.69	0.66	0.03	0.03	996	3.70	112.38	806.73	197.72	10.32	10.32	298,785
Pitch Out Arrival 1	150	0.01	0.43	4.14	0.89	0.05	0.04	1,352	1.79	65.21	621.41	134.20	7.04	7.04	202,804
Pitch Out Arrival 2	2400	0.01	0.36	3.42	0.74	0.04	0.03	1,118	23.96	867.79	8,208.19	1,776.19	93.19	93.19	2,684,091
Pitch Out Arrival 3	150.0	0.01	0.37	3.57	0.77	0.04	0.04	1,161	1.53	55.86	536.08	115.23	6.05	6.05	174,137
Touch and Gos	763	0.01	0.35	5.50	0.89	0.05	0.05	1,347	5.85	267.46	4,199.67	680.45	37.07	37.07	1,028,267
Radar Pattern	389	0.06	1.78	11.96	2.90	0.15	0.15	4,390	24.71	693.76	4,649.37	1,129.68	59.67	59.67	1,707,127
[3]Idle/Taxi In	3061	0.00	0.15	0.23	0.07	0.00	0.00	99	12.86	450.81	700.09	201.46	10.56	10.56	304,439
Hot Refuel	1	0.00	0.04	0.00	0.00	0.00	0.00	7	0.00	0.04	0.00	0.00	0.00	0.00	7
								Total in Tons/Year	0.06	2.65	24.45	3.85	0.26	0.26	5,816

Table 3. F-35A Aircraft Engine Maintenance Runs

	HC	CO	NOx	SO2	PM	PM2.5	CO2e
Total in Tons/Year	0.280	6.907	30.975	9.261	0.484	0.435	13,995

Table 4. Aircraft Summary

Emissions in Tons Per Year						
VOC	CO	NOx	SO2	PM	PM2.5	CO2e
0.39	9.55	55.43	13.11	0.75	0.70	19,811

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125 FW

RECORD OF AIR ANALYSIS (ROAA)

1. General Information: Emissions were derived manually using installation-specific data and through the Air Force's Air Conformity Applicability Model (ACAM) to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, Air Quality Compliance And Resource Management; the Environmental Impact Analysis Process (EIAP, 32 Code of Federal Regulations [CFR] 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the analysis.

a. Action Location:

Base: 125th Fighter Wing Installation
State: Florida
County(s): Duval
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: USAF F-35A Operational Beddown - Air National Guard

c. Project Number/s (if applicable):

d. Projected Action Start Date: 2020

e. Action Description:

The United States Air Force (USAF) is proposing to beddown F-35A aircraft at two of five alternative Air National Guard (ANG) locations. The F-35A would replace the existing F-15, F-16, or A-10 fighter attack aircraft at the two selected installations. This action would involve the beddown of one F-35A squadron consisting of 18 Primary Aircraft Authorized (PAA) with 2 Backup Aircraft Inventory at each of the two selected locations, thereby establishing two F-35A operational locations. Five alternative ANG locations (Figure 1.1-1) are being considered for this beddown:

- 125th Fighter Wing (125 FW) at Jacksonville International Airport (IAP), Jacksonville, Florida

- 115th Fighter Wing (115 FW) at Dane County Regional Airport, Madison, Wisconsin

- 124th Fighter Wing (124 FW) at Boise Air Terminal (Boise Airport), Boise, Idaho

- 127th Wing (127 WG) at Selfridge Air National Guard Base (ANGB), Michigan

- 187th Fighter Wing (187 FW) at Montgomery Regional Airport, Montgomery, Alabama

f. Point of Contact:

Name: Lesley Hamilton
Title: Sr Associate
Organization: Cardno
Email:
Phone Number:

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total combined direct and indirect emissions associated with the action were estimated manually with installation-specific input on flight operations data and flight profiles, and through ACAM for construction, aerospace ground

equipment, and personnel on a calendar-year basis for the “worst-case” and “steady state” (net gain/loss upon action fully implemented) emissions.

“Air Quality Indicators” were used to provide an indication of the significance of potential impacts to air quality. Potential impacts to air quality are evaluated with respect to the extent, context, and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. The Council on Environmental Quality (CEQ) defines significance in terms of context and intensity in 40 CFR 1508.27. This requires that the significance of an action be analyzed in respect to the setting of the action and based relative to the severity of the impact. For attainment area criteria pollutants, the project air quality analysis uses the United States Environmental Protection Agency’s Prevention of Significant Deterioration (PSD) permitting threshold of 250 tons per year as an initial indicator of the local significance of potential impacts to air quality. It is important to note that these indicators only provide a clue to the potential impacts to air quality. In the context of criteria pollutants for which the proposed project region is in attainment of a National Ambient Air Quality Standards (NAAQS), the analysis compares the annual net increase in emissions estimated for each project alternative to the 250 ton per year PSD permitting threshold. The PSD permitting threshold represents the level of potential new emissions below which a new or existing minor non-listed stationary source may acceptably emit without triggering the requirement to obtain a permit. Thus, if the intensity of any net emissions increase for a project alternative is below 250 tons per year in the context of an attainment criteria pollutant the indication is the air quality impacts will be insignificant for that pollutant. Therefore, the worst-case year emissions were compared against the 250 ton per year Indicator and are summarized below.

Analysis Summary:

Construction emissions are based on equipment operations for demolition, grading, building construction, application of architectural coatings, and materials transport.

2020 - Construction

Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.60	250	No
NOx	4.84	250	No
CO	4.48	250	No
SOx	0.01	250	No
PM 10	15.66	250	No
PM 2.5	0.23	250	No
CO2e	1,003	N/A	N/A

F-15 annual operations table represents the landings and take offs of the F-15, along with closed patterns. Annual engine runups are also included.

2017 - F-15 Annual Operations

Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	50.61	250	No
NOx	66.00	250	No
CO	215.66	250	No
SOx	9.04	250	No
PM 10	6.34	250	No
PM 2.5	5.79	250	No
CO2e	25,222	N/A	N/A

RECORD OF AIR ANALYSIS (ROAA)

F-35A steady state operations table represents the landings and take offs of the F-35A, along with closed patterns. Annual engine runups and additional commuting personnel are also included.

2025 - F-35A Steady State Operations

Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	6.02	250	No
NOx	71.60	250	No
CO	21.19	250	No
SOx	14.26	250	No
PM 10	2.34	250	No
PM 2.5	2.24	250	No
CO2e	20,916	N/A	N/A

The net change is the difference in emissions resulting from the proposed action to homebase the F-35A as compared to not introducing the action.

2025 Net Change

Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	-44.60	250	No
NOx	5.60	250	No
CO	-194.48	250	No
SOx	5.22	250	No
PM 10	-4.00	250	No
PM 2.5	-3.55	250	No
CO2e	-4	N/A	N/A

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

Lesley Hamilton

7/2/19

Lesley Hamilton, Sr Associate — DATE

TAB D. F-15 EMISSION CALCULATIONS - JAX IAP

Table 1. F-15C Individual Profile Emission Calculations

[1,2,3] **Inputs to Emissions Calculations** Elevation at JAX IAP = 29 ft MSL

F100-PW-220 Engines

3000 FT AGL Mixing Height

1	kilometer (km)	3,280.84	ft
1	knot =	1.852	km/h
1	knot =	101.2686	ft/min

F-15C Afterburner Departure

Point	Distance	Height	Speed, kts	Power % N2	
a	0	0	0	90	Afterburner-5
b	1823	0	150	91	Afterburner-5
c	9722	500	300	91	Afterburner-5
d	17013	1000	300	90	MIL
e	23089	2000	350	90	MIL
f	32811	3000	350	90	MIL

									Emission Indices, lb/1000 lb						Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM**	**PM2.5**	**CO2e**
a-a	0	0	0	0	90	0.23333	83364	324.19	1.6	11.87	8.2	1.07	0.38	0.35	3214.59	0.519	3.848	2.658	0.347	0.123	0.113	1042.149
a-b	1823	0	75	7595	90.5	0.2400218	83364	333.49	1.6	11.87	8.2	1.07	0.38	0.35	3214.59	0.534	3.958	2.735	0.357	0.127	0.117	1072.022
b-c	7899	250	225	22785	91	0.3466689	83364	481.66	1.6	11.87	8.2	1.07	0.38	0.35	3214.59	0.771	5.717	3.950	0.515	0.183	0.169	1548.345
c-d	7291	750	300	30381	90.5	0.2399889	19358	77.43	2.08	0.86	29.6	1.07	0.91	0.82	3214.59	0.161	0.067	2.292	0.083	0.070	0.063	248.901
d-e	6076	1500	325	32912	90	0.1846119	19358	59.56	2.08	0.86	29.6	1.07	0.91	0.82	3214.59	0.124	0.051	1.763	0.064	0.054	0.049	191.467
e-f	9722	2500	350	35444	90	0.2742918	19358	88.50	2.08	0.86	29.6	1.07	0.91	0.82	3214.59	0.184	0.076	2.619	0.095	0.081	0.073	284.477
													Emissions in lb for A/B Departure:			**2.29**	**13.72**	**16.02**	**1.46**	**0.64**	**0.58**	**4387.36**

F-15C MIL Departure

Point	Distance	Height	Speed, kts	Power % N2	
a	0	0	0	90	MIL
b	3038	0	150	90	MIL
c	9722	500	250	90	MIL
d	17013	1000	275	90	MIL
e	23089	2000	350	90	MIL
f	32811	3000	350	90	MIL

									Emission Indices, lb/1000 lb						Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
a-a	0	0	0	0	90	0.40000	19358	129.05	2.08	0.86	29.6	1.07	0.91	0.82	3214.59	0.268	0.111	3.820	0.138	0.117	0.106	414.854
a-b	3038	250	75	7595	90	0.3999924	19358	129.05	2.08	0.86	29.6	1.07	0.91	0.82	3214.59	0.268	0.111	3.820	0.138	0.117	0.106	414.846
b-c	6684	750	200	20254	90	0.3300135	19358	106.47	2.08	0.86	29.6	1.07	0.91	0.82	3214.59	0.221	0.092	3.152	0.114	0.097	0.087	342.268
c-d	7291	1500	262.5	26583	90	0.274273	19358	88.49	2.08	0.86	29.6	1.07	0.91	0.82	3214.59	0.184	0.076	2.619	0.095	0.081	0.073	284.458
d-e	6076	2500	312.5	31646	90	0.1919964	19358	61.94	2.08	0.86	29.6	1.07	0.91	0.82	3214.59	0.129	0.053	1.834	0.066	0.056	0.051	199.126
e-f	9722	1500	350	35444	90	0.2742918	19358	88.50	2.08	0.86	29.6	1.07	0.91	0.82	3214.59	0.184	0.076	2.619	0.095	0.081	0.073	284.477
													Emissions in lb for MIL Departure:			**1.26**	**0.52**	**17.86**	**0.65**	**0.55**	**0.49**	**1940.03**

F-15C Overhead Arrival 1

Point	Distance	Height	Speed, kts	Power % N2	
c	30838	3500	350	82	Approach
CD	27824	3000	350	76	Approach
d	21797	2000	350	70	Idle
e	18566	2620	180	70	Idle
f	15159	1620	150	82	Approach
g	6076	1620	150	82	Approach
h	0	1620	145	70	Idle

									Emission Indices, lb/1000 lb						Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
CD-d	6027	2500	350	35444	73	0.1700523	4168	11.81	7.94	35.32	4.61	1.07	0.67	0.6	3214.59	0.094	0.417	0.054	0.013	0.008	0.007	37.974
d-e	3231	2310	265	26836	70	0.1203972	4168	8.36	7.94	35.32	4.61	1.07	0.67	0.6	3214.59	0.066	0.295	0.039	0.009	0.006	0.005	26.886
e-f	3407	2120	165	16709	76	0.2038982	7674	26.08	5.12	1.92	12.5	1.07	0.7	0.63	3214.59	0.134	0.050	0.326	0.028	0.018	0.016	83.832
f-g	9083	1620	150	15190	82	0.5979478	7674	76.48	5.12	1.92	12.5	1.07	0.7	0.63	3214.59	0.392	0.147	0.956	0.082	0.054	0.048	245.844
g-h	6076	1620	147.5	14937	76	0.4067719	7674	52.03	5.12	1.92	12.5	1.07	0.7	0.63	3214.59	0.266	0.100	0.650	0.056	0.036	0.033	167.243
													Emissions in lb for Overhead Arrival 1:			**0.95**	**1.01**	**2.03**	**0.19**	**0.12**	**0.11**	**561.78**

F-15C Overhead Arrival 2

Point	Distance	Height	Speed, kts	Power % N2	
c	35168	3500	350	82	Approach
CD	32223	3000	350	70	Idle
d	26333	2000	350	70	Idle
e	20992	2000	180	70	Idle
f	15395	2000	150	82	Approach
g	6076	300	150	82	Approach
h	0	50	145	70	Idle

									Emission Indices, lb/1000 lb						Emissions (lbs)						

segment	Distance	Height	Speed, kts	speed, ft/min	Power % N2	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	HC	CO	NOx	SO2	PM10	PM2.5	CO2e
CD-d	5890	2500	350	35444	70	0.1661776	4168	11.54	7.94	35.32	4.61	1.07	0.67	0.6	3214.59	0.092	0.408	0.053	0.012	0.008	0.007	37.109
d-e	5341	2000	265	26836	70	0.1990224	4168	13.83	7.94	35.32	4.61	1.07	0.67	0.6	3214.59	0.110	0.488	0.064	0.015	0.009	0.008	44.443
e-f	5597	2000	165	16709	76	0.3349628	7674	42.84	5.12	1.92	12.5	1.07	0.7	0.63	3214.59	0.219	0.082	0.536	0.046	0.030	0.027	137.719
f-g	9319	1150	150	15190	82	0.6134841	7674	78.46	5.12	1.92	12.5	1.07	0.7	0.63	3214.59	0.402	0.151	0.981	0.084	0.055	0.049	252.232
g-h	6076	175	147.5	14937	76	0.4067719	7674	52.03	5.12	1.92	12.5	1.07	0.7	0.63	3214.59	0.266	0.100	0.650	0.056	0.036	0.033	167.243
															Emissions in lb for Overhead Arrival 2:	**1.09**	**1.23**	**2.28**	**0.21**	**0.14**	**0.12**	**638.74**

F-15C SI Arrival

Point	Distance	Height	Speed, kts	Power % N2	
a	60761	3500	300	82	Approach
AB	50634	3000	300	82	Approach
b	30381	2000	300	82	Approach
c	17013	1000	180	82	Approach
d	3038	100	150	80	Approach
e	0	50	140	72.4	Idle

									Emission Indices, lb/1000 lb							Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	HC	CO	NOx	SO2	PM10	PM2.5	CO2e
AB-b	20253	2500	300	30381	82	0.666654	7674	85.27	5.12	1.92	12.5	1.07	0.7	0.63	3214.59	0.437	0.164	1.066	0.091	0.060	0.054	274.092
b-c	13368	1500	240	24304	82	0.5500225	7674	70.35	5.12	1.92	12.5	1.07	0.7	0.63	3214.59	0.360	0.135	0.879	0.075	0.049	0.044	226.140
c-d	13975	550	165	16709	81	0.8363597	7674	106.97	5.12	1.92	12.5	1.07	0.7	0.63	3214.59	0.548	0.205	1.337	0.114	0.075	0.067	343.866
d-e	3038	75	145	14684	76.2	0.2068926	4168	14.37	7.94	35.32	4.61	1.07	0.67	0.6	3214.59	0.114	0.508	0.066	0.015	0.010	0.009	46.201
															Emissions in lb for SI Arrival:	**1.46**	**1.01**	**3.35**	**0.30**	**0.19**	**0.17**	**890.30**

F-15C Pattern 1

Point	Distance	Height	Speed, kts	Power % N2	
a	0	50	210	90	MIL
b	5000	150	250	90	MIL
c	10000	500	300	90	MIL
d	19550	2000	180	82	Intermed
e	32248	2000	180	82	Intermed
f	35678	2000	150	82	Approach
g	42571	300	150	70	Approach
h	50536	50	150	70	Approach

									Emission Indices, lb/1000 lb							Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power % N2	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM	EIPM2.5	EICO2	HC	CO	NOx	SO2	PM	PM2.5	CO2
a-b	5000	100	230	23292	90	0.214668	19358	69.26	2.08	0.86	29.6	1.07	0.91	0.82	3214.59	0.144	0.060	2.050	0.074	0.063	0.057	222.640
b-c	5000	325	275	27849	90	0.1795405	19358	57.93	2.08	0.86	29.6	1.07	0.91	0.82	3214.59	0.120	0.050	1.715	0.062	0.053	0.047	186.208
c-d	9550	1250	240	24304	86	0.392932	11540	75.57	2.89	0.86	22.2	1.07	0.7	0.63	3214.59	0.218	0.065	1.678	0.081	0.053	0.048	242.939
d-e	12698	2000	180	18228	82	0.6966073	11540	133.98	2.89	0.86	22.2	1.07	0.7	0.63	3214.59	0.387	0.115	2.974	0.143	0.094	0.084	430.693
e-f	3430	2000	165	16709	82	0.2052747	7674	26.25	5.12	1.92	12.5	1.07	0.7	0.63	3214.59	0.134	0.050	0.328	0.028	0.018	0.017	84.398
f-g	6893	1150	150	15190	76	0.4537768	7674	58.04	5.12	1.92	12.5	1.07	0.7	0.63	3214.59	0.297	0.111	0.725	0.062	0.041	0.037	186.569
g-h	7965	175	150	15190	70	0.5243482	7674	67.06	5.12	1.92	12.5	1.07	0.7	0.63	3214.59	0.343	0.129	0.838	0.072	0.047	0.042	215.584
															Emissions in lb for Pattern 1:	**1.65**	**0.58**	**10.31**	**0.52**	**0.37**	**0.33**	**1569.03**

F-15C Pattern 2

Point	Distance	Height	Speed, kts	Power % N2	
a	0	50	210	90	MIL
b	5000	150	250	90	MIL
c	7779	500	300	90	MIL
d	17393	2000	180	82	Intermed
e	27210.5	2000	180	82	Intermed
f	31014.5	2000	150	82	Approach
g	40443	300	150	70	Approach
h	46946	50	150	70	Approach

									Emission Indices, lb/1000 lb							Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power % N2	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM	EIPM2.5	EICO2	HC	CO	NOx	SO2	PM	PM2.5	CO2
a-b	5000	100	230	23292	90	0.214668	19358	69.26	2.08	0.86	29.6	1.07	0.91	0.82	3214.59	0.144	0.060	2.050	0.074	0.063	0.057	222.640
b-c	2779	325	275	27849	90	0.0997886	19358	32.20	2.08	0.86	29.6	1.07	0.91	0.82	3214.59	0.067	0.028	0.953	0.034	0.029	0.026	103.494
c-d	9614	1250	240	24304	86	0.3955652	11540	76.08	2.89	0.86	22.2	1.07	0.7	0.63	3214.59	0.220	0.065	1.689	0.081	0.053	0.048	244.567
d-e	9818	2000	180	18228	82	0.5385842	11540	103.59	2.89	0.86	22.2	1.07	0.7	0.63	3214.59	0.299	0.089	2.300	0.111	0.073	0.065	332.992
e-f	3804	2000	165	16709	82	0.2276574	7674	29.12	5.12	1.92	12.5	1.07	0.7	0.63	3214.59	0.149	0.056	0.364	0.031	0.020	0.018	93.600
f-g	9429	1150	150	15190	76	0.6206926	7674	79.39	5.12	1.92	12.5	1.07	0.7	0.63	3214.59	0.406	0.152	0.992	0.085	0.056	0.050	255.195
g-h	6503	175	150	15190	70	0.4281025	7674	54.75	5.12	1.92	12.5	1.07	0.7	0.63	3214.59	0.280	0.105	0.684	0.059	0.038	0.034	176.013
															Emissions in lb for Pattern 2:	**1.57**	**0.56**	**9.03**	**0.48**	**0.33**	**0.30**	**1428.50**

Start/Taxi/Idle

					Emission Indices, lb/1000 lb						Emissions (lbs)							
segment	Power (%)	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	HC	CO	NOx	SO2	PM10	PM2.5	CO2e
[a]Start/Taxi Out	3	30	4168	2084.00	7.94	35.32	4.61	1.07	0.67	0.6	3214.59	16.547	73.607	9.607	2.230	1.396	1.250	6699.206

Taxi In/Shut Off

				Emission Indices, lb/1000 lb							Emissions (lbs)						
segment	Power (%)	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
[4]Taxi to Shut Off	3	30	4168	2084.00	7.94	35.32	4.61	1.07	0.67	0.6	3214.59	16.547	73.607	9.607	2.230	1.396	1.250	6699.206
	Power (%)				EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
[4]Hot Refueling	3	7200	4168	500160.00	7.94	35.32	4.61	1.07	0.67	0.6	3214.59	3971.270	17665.651	2305.738	535.171	335.107	300.096	1607809.334

[1]F-16 Flight Profile Maps, Dannelly Field, Cardno 2019

[2]*Dannelly_20190329_MASTER_PHK - Flight OperationsOPSCHECK.xlsx*

Guide for Air Force

[4]Data from installation, May 2019

Table 2. Current F-15C Operations

Type of Operation	Total Number of Operations	Emissions in lbs/op							Annual Emissions						
		HC	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**	**HC tons/year**	**CO tons/year**	**NOx tons/year**	**SO2 tons/year**	**PM10 tons/year**	**PM2.5 tons/year**	**CO2e tons/year**
Taxi/Idle Out	2,400	16.547	73.607	9.607	2.230	1.396	1.250	6699.206	19.86	88.33	11.53	2.68	1.68	1.50	8,039
A/B Departure	1,680	2.292	13.718	16.017	1.460	0.638	0.584	4387.360	1.93	11.52	13.45	1.23	0.54	0.49	3,685
MIL Departure	720	1.255	0.519	17.864	0.646	0.549	0.495	1940.028	0.45	0.19	6.43	0.23	0.20	0.18	698
Overhead Arrival 1	1,150	0.952	1.009	2.025	0.187	0.122	0.109	561.778	0.55	0.58	1.16	0.11	0.07	0.06	323
Overhead Arrival 2	1,150	1.089	1.229	2.284	0.213	0.138	0.124	638.745	0.63	0.71	1.31	0.12	0.08	0.07	367
SI Arrival	100	1.459	1.012	3.349	0.296	0.193	0.174	890.298	0.07	0.05	0.17	0.01	0.01	0.01	45
Pattern 1	38	1.645	0.580	10.309	0.522	0.368	0.332	1569.030	0.03	0.01	0.20	0.01	0.01	0.01	30
Pattern 2	12	1.566	0.555	9.032	0.475	0.332	0.299	1428.501	0.01	0.00	0.05	0.00	0.00	0.00	9
Taxi/Idle In	2,400	16.547	73.607	9.607	2.230	1.396	1.250	6699.206	19.86	88.33	11.53	2.68	1.68	1.50	8,039
Hot Refuel	1	3971.270	17665.651	2305.738	535.171	335.107	300.096	1607809.334	1.99	8.83	1.15	0.27	0.17	0.15	804
								Total in Tons/Year	**45.36**	**198.55**	**46.99**	**7.34**	**4.42**	**3.97**	**22,038.99**

Table 3. F-15C Aircraft Engine Maintenance Runups

Aircraft	Location Name	Dual Engine Operations					Emissions in lbs/1000 lbs fuel							Emissions (lbs)						
		Annual	**Power Setting Reported**	**Duration (hr)**	**FFR, lb/hr**	**Fuel Use lb**	**EIHC**	**EICO**	**EINOx**	**EISO2**	**EIPM10**	**EIPM2.5**	**EICO2e**	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
F-15C	Trim Pad Static	160.60	Idle	0.1666667	4168	111563.47	7.94	35.32	4.61	1.07	0.67	0.6	3214.59	885.81	3940.42	514.31	119.37	74.75	66.94	358,630.80
			Intermediate	0.0833333	5770	77221.83	2.89	0.86	22.20	1.07	0.70	0.63	3214.59	223.17	66.41	1714.32	82.63	54.06	48.65	248,236.53
			Afterburner	0.0166667	41682	111568.82	1.60	11.87	8.20	1.07	0.38	0.35	3214.59	178.51	1324.32	914.86	119.38	42.40	39.05	358,648.01
			Idle	0.0833333	4168	55781.73	7.94	35.32	4.61	1.07	0.67	0.6	3214.59	442.91	1970.21	257.15	59.69	37.37	33.47	179,315.40
	Hush House Signle Engine	80.74	Idle	0.25	1127	22747.93	3.79	49.58	4.64	1.07	3.13	2.82	3214.59	86.21	1127.84	105.55	24.34	71.20	64.15	73,125.27
			Intermediate	0.1666667	7685	103411.92	0.14	0.72	27.09	1.07	0.72	0.65	3214.59	14.48	74.46	2801.43	110.65	74.46	67.22	332,426.93
			Afterburner	0.25	54007	1090104.29	0.13	9.57	6.62	1.07	0.87	0.78	3214.59	141.71	10432.30	7216.49	1166.41	948.39	850.28	3,504,238.35
			Idle	0.0833333	1127	7582.64	3.79	49.58	4.64	1.07	3.13	2.82	3214.59	28.74	375.95	35.18	8.11	23.73	21.38	24,375.09
													Total Emissions in Tons/Year	**1.00**	**9.66**	**6.78**	**0.85**	**0.66**	**0.60**	**2539.50**

Table 4. Aircraft Summary

Emissions in Tons Per Year						
VOC	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
46.36	208.21	53.77	8.18	5.08	4.57	24578.49

TAB D. F-35 EMISSION CALCULATIONS - JAX IAP

Table 1. F-35 Individual Profile Emission Calculations[1,2,3]

3000 Mixing Ht | 1 kilometer 3,280.84 ft | 1 knot= 1.852 km/h | 1 knot = 101.268591 ft/min | Elevation: 29.2 ft MSL

SOx % EFSOx = 20 * S where EFSOx = SOX emission factor [pounds SOX emitted per thousand
20 = Factor which is derived by converting "weight percent" into units of "lb/1000 lb" and ther
molecular weight of sulfur
S = Weight percent sulfur conte
SOx% 0.107% Sulfur oxides calculated based on weight percent sulfur content of JP-8 in 2018 USAF Mobile Sources Guide
SOx Emission Factor EF = 2.14

SOx equation from Air Emissions Inventory Guidance Document for Mobile Sources at Air force Installations (revised August 2018)

JP-8 density = 6.885 lb/gal (based on analyzed value listed in Summary Table for JP-8, Petroleum Quality Infromation System 2013 Annual Report
JP-8 HHV= 0.135 MMBtu/gal default HHV from Table 2 of Federal GHG Accounting and Reporting Guidance, CEQ (2012)
75.2 kg CO2/MMBtu emission factor from Table 2 of Federal GHG Accounting and Reporting Guidance, CEQ (2012)
3.251 lb CO2/lb fuel burned

A/B Departure

Point	Distance	Height	Speed, kts	Power % ETR	
a	0	0	0	50	
b	2457	0	185	150	AB
c	3102	7	190	100	MIL
d	4454	50	205	100	MIL
e	5892	150	220	100	
f	13288	1060	300	100	
FG	19885	3000	300	70	
g	36788	7970.8	300	40	

	CO2	CO	NOx	HC	SO2	PM	PM2.5
Emissions in lb for AB Departure:	**1852.04**	**5.52**	**8.05**	**0.06**	**1.23**	**0.42**	**0.38**

MIL Departure

Point	Distance	Height	Speed, kts	Power % ETR	
a	0	0	0	50	
b	2963	0	160	100	MIL
c	6843	125	220	100	
d	9162	380	240	100	
e	10792	700	250	100	
EF	20077	3000	275	100	
f	28315	5041	300	100	

Emissions in lb for MIL Departure:	**1366.36**	**0.16**	**10.06**	**0.001**	**0.90**	**0.06**	**0.05**

Visual Arrival 1

Point	Distance	Height	Speed, kts	Power % ETR
c	60761	3471	300	15
CD	50457	3000	263	28
d	38437	2451	225	40
e	30380	1971	180	40
f	0	50	175	40

Emissions in lb for Visual Arrival1:	**1169.41**	**0.39**	**3.62**	**0.01**	**0.77**	**0.04**	**0.04**

Visual Arrival 2

Point	Distance	Height	Speed, kts	Power % ETR
b	60761	3471	300	15
BC	50457	3000	263	28
c	38437	2451	225	40
d	30380	1971	180	40
e	0	50	175	40

Emissions in lb for Visual Arrival2:	**1204.84**	**0.38**	**3.79**	**0.01**	**0.80**	**0.04**	**0.04**

Overhead Break Arrival 1

Point	Distance	Height	Speed, kts	Power % ETR
c	30751	3471	350	35
CD	27931	3000	280	35
d	21765	1971	210	35
e	18707	1971	200	35
f	16417	1971	190	40
g	15583	1741	190	40
h	6076	420	190	40
i	0	50	175	40

Emissions in lb for Overhead Break Arrival1:	**643.86**	**0.20**	**2.03**	**0.01**	**0.43**	**0.02**	**0.02**

Overhead Break Arrival 2

Point	Distance	Height	Speed, kts	Power % ETR
c	35606	3471	300	35
CD	32681	3000	255	35
d	26288	1971	210	35
e	20955	1971	200	40
f	17220	1971	200	40
g	15620	1741	180	40
h	6076	420	190	40
i	0	50	165	40

Emissions in lb for Overhead Break Arrival2:	**777.50**	**0.24**	**2.47**	**0.01**	**0.51**	**0.03**	**0.02**

VFR Pattern

Point	Distance	Height	Speed, kts	Power % ETR
a	0	50	175	40
b	2880	10	170	100
c	8000	140	260	35
d	9500	220	300	35
e	11000	350	280	35
f	17300	1500	215	55
g	19550	1971	210	55
h	26943	1971	210	40
i	31088	1971	210	40
j	35686	1871	210	40
k	44807	350	190	40
l	50641	0	175	40

Emissions in lb for VFR Pattern:	**772.49**	**0.19**	**3.20**	**0.00**	**0.51**	**0.03**	**0.02**

Table 2. Operations for F-35A

Operation	[2]Total Number of Operations	Emissions in lb per operation							Annual Emissions						
		[5]HC	[5]CO	[5]NOx	[5,6]SO2	[5]PM10	[5]PM2.5	[4]CO2	HC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO2 lb
[3]Idle/Taxi Out	3,061	0.00	0.14	0.35	0.08	0.00	0.00	121.81	11.25	433.68	1,060.32	246.74	13.02	13.02	372,858
A/B Departure	153	0.06	5.52	8.05	1.23	0.42	0.42	1,852	9.39	844.16	1,231.79	187.57	64.06	64.06	283,454
MIL Departure	2,908	0.00	0.16	10.06	0.90	0.06	0.06	1,366	3.53	475.56	29,264.63	2,629.32	166.80	166.80	3,973,315
Visual Arrival 1	110	0.01	0.39	3.62	0.77	0.04	0.04	1,169	1.21	42.63	399.37	85.37	4.49	4.49	129,014
Visual Arrival 2	17	0.01	0.38	3.79	0.80	0.04	0.04	1,205	0.17	6.52	65.21	13.73	0.72	0.72	20,745
Overhead Break Arrival 1	1467	0.01	0.20	2.03	0.43	0.02	0.02	644	7.76	295.19	2,980.33	624.93	32.80	32.80	944,370
Overhead Break Arrival 2	1467	0.01	0.24	2.47	0.51	0.03	0.02	777	9.10	352.34	3,624.33	754.64	39.62	39.62	1,140,377
VFR Pattern	100	0.00	0.19	3.20	0.51	0.03	0.03	772	0.36	19.03	320.32	51.11	2.77	2.77	77,242
[3]Idle/Taxi In	3061	0.00	0.15	0.23	0.07	0.00	0.00	99	12.86	450.81	700.09	201.46	10.56	10.56	304,439
Hot Refuel	1	0.00	0.04	0.00	0.00	0.00	0.00	7	0.00	0.04	0.00	0.00	0.00	0.00	7
								Total in Tons/Year	**0.03**	**1.46**	**19.82**	**2.40**	**0.17**	**0.17**	**3,623**

Table 3. F-35A Aircraft Engine Maintenance Runs

	HC	CO	NOx	SO2	PM	PM2.5	CO2e
Total in Tons/Year	**0.326**	**8.033**	**36.024**	**10.771**	**0.562**	**0.506**	**16,276**

Table 4. Aircraft Summary

Emissions in Tons Per Year						
VOC	CO	NOx	SO2	PM	PM2.5	CO2e
0.41	9.49	55.85	13.17	0.73	0.67	19,899

127 WG

Final

Conformity Evaluation Report for 127 WG, Selfridge Air National Guard Base, Michigan

July 2019

ACRONYMS AND ABBREVIATIONS

127 WG	127th Wing
ACAM	Air Conformity Applicability Model
AFI	Air Force Instruction
AGE	Aerospace Ground Equipment
AGL	Above Ground Level
ANGB	Air National Guard Base
AQCR	Air Quality Control Region
CAA	Clean Air Act
CAF	Combat Air Forces
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon Monoxide
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGB	National Guard Bureau
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
O_3	Ozone
Pb	Lead
$PM_{2.5}$	Particulate Matter Less Than or Equal to 2.5 Microns in Diameter
PM_{10}	Particulate Matter Less Than or Equal to 10 Microns in Diameter
PSD	Prevention of Significant Deterioration
ROCA	Record of Conformity Applicability
ROI	Region of Influence
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
U.S.	United States
USAF	United States Air Force
USC	United States Code
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

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1.0 INTRODUCTION

The National Guard Bureau (NGB) proposes to implement an aircraft conversion for the 127th Wing (127 WG) at Selfridge Air National Guard Base (ANGB) in Harrison Township, Macomb County, Michigan, approximately 20 miles north of Detroit, Michigan on the shore of Lake St. Clair. The 127 WG currently flies and maintains 18 A-10 Thunderbolt II aircraft and the KC-135 Stratotanker, an aerial refueler with global reach. The proposal is to convert the unit from the A-10 aircraft and operations to the F-35A Strikefighter aircraft and operations at Selfridge ANGB. The 127 WG is an integral component of the Combat Air Forces (CAF). The CAF defends the homeland of the United States (U.S.) as well as deploys forces worldwide to meet threats to ensure the security of the U.S. To fulfill this role, the A-10 pilots of the 127 WG must train as they would fight.

In accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] 4321-4347), Council on Environmental Quality (CEQ) *Regulations for Implementing the Procedural Provisions of NEPA* (40 Code of Federal Regulations [CFR] Parts 1500-1508), and Air Force Instruction (AFI) 32-7061 as promulgated at 32 CFR Part 989 *et seq.*, *Environmental Impact Analysis Process*, the NGB has prepared an Environmental Impact Statement (EIS), which considers the potential consequences to the human and natural environment that may result from implementation of this action. This Conformity Evaluation Report has been prepared in accordance with Section 176(c)(1) of the Clean Air Act (CAA) and as specified in requirements found in 40 CFR 93 Subpart B, and is included in Appendix B of the EIS.

This document addresses the U.S. Environmental Protection Agency's (USEPA's) General Conformity Rule requirements and how they relate to the actions associated with the implementation of the Proposed Action. The CAA requires any federal agency, such as the NGB, to assess whether their proposed action would contribute to further degradation of air quality or prevent the attainment of air quality standards. The NGB proposes to implement a major federal action that would contribute to regional air emissions at Selfridge ANGB in Macomb County, Michigan. Therefore, the Region of Influence (ROI) includes the ANGB as well as all of Macomb County. This is an area that does not meet air quality standards for several air pollutants (refer to Section 3.3, *Existing Air Quality Attainment Status*).

2.0 AIR QUALITY STANDARDS

Individual states are delegated the responsibility to regulate air quality in order to achieve or maintain air quality in attainment with these standards. The Michigan Department of Environmental Quality, Air Quality Division enforces air pollution regulations and sets guidelines

to attain and maintain the National Ambient Air Quality Standards (NAAQS). These guidelines are found in the Michigan State Implementation Plan (SIP). Table 1 summarizes the NAAQS.

Table 1. National Ambient Air Quality Standards

Pollutant		*Primary/ Secondary*	*Averaging Time*	*Level*	*Form*
Carbon Monoxide (CO)		Primary	8 hours	9 ppm	Not to be exceeded more than once per year
Carbon Monoxide (CO)		Primary	1 hour	35 ppm	
Lead (Pb)		Primary and secondary	Rolling month average[3]	0.15 µg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)		Primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
Nitrogen Dioxide (NO_2)		Primary and secondary	1 year	53 ppb (2)	Annual
Ozone (O_3)		Primary and secondary	8 hours	0.070 ppm(3)	Annual 4th-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	$PM_{2.5}$	Primary	1 year	12.0 µg/m^3	Annual mean, averaged over 3 years
Particle Pollution (PM)	$PM_{2.5}$	Secondary	1 year	15.0 µg/m^3	Annual mean, averaged over 3 years
Particle Pollution (PM)	$PM_{2.5}$	Primary and secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
Particle Pollution (PM)	PM_{10}	Primary and secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		Primary	1 hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
Sulfur Dioxide (SO_2)		Secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Notes: µg/m^3 = microgram per cubic meter; ppb = parts per billion; ppm = parts per million
(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m3 as a calendar quarter average) also remain in effect.
(2) The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O_3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.
(4) The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is a USEPA action requiring a state to resubmit all or part of its SIP to demonstrate attainment of the required NAAQS.
Source: USEPA 2016.

The CAA also established a national goal of preventing degradation or impairment in federally designated Class I areas. Class I areas are defined as those areas where any appreciable degradation in air quality or associated visibility impairment is considered significant. As part of the Prevention of Significant Deterioration (PSD) Program, Congress assigned mandatory Class I status to all national parks, national wilderness areas (excluding wilderness study areas or wild and scenic rivers), and memorial parks greater than 5,000 acres. In Class I areas, visibility impairment is defined as atmospheric discoloration (such as from an industrial smokestack), and a reduction in regional visual range. Visibility impairment or haze results from smoke, dust, moisture, and vapor suspended in the air. Very small particles are either formed from gases (sulfates, nitrates) or are emitted directly into the atmosphere from sources like electric utilities, industrial processes, and vehicle emissions. Stationary sources are regulated under the PSD Program, and the PSD permitting process requires a review of impacts to all Class I areas within 62 miles (100 kilometers) of any proposed major stationary source. Mobile sources, including aircraft and associated operations such as those occurring at Air National Guard installations, are not subject to the requirements of PSD.

2.1 AIR QUALITY DESIGNATIONS

As part of the CAA, the USEPA has established criteria for major pollutants of concern, called "criteria pollutants." These criteria pollutants include carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), particulate matter less than or equal to 10 microns in diameter (PM_{10}), particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead (Pb). Emissions of Pb are not addressed because the affected areas contain no significant sources of this criteria pollutant, and 127 WG operations would not result in substantial emissions of Pb. The criteria set for these pollutants, the NAAQS, represent maximum levels of background pollution that are considered safe, with an adequate margin of safety to protect the public health and welfare. Based on measured ambient criteria pollutant data, the USEPA designates areas in the U.S. as having air quality better than (attainment) or worse than (nonattainment) the NAAQS. Areas that lack monitoring data to demonstrate attainment or nonattainment status are designated as unclassified and are treated as attainment areas for regulatory purposes. Varying levels of attainment have been established for O_3, CO, and PM_{10} to indicate the severity of the air quality problem (i.e., the classification runs from moderate to serious for CO and PM_{10} and from marginal to extreme for O_3).

2.2 FEDERAL REQUIREMENTS

The CAA (42 USC §§ 7401-7671q, as amended) provided the authority for the USEPA to establish nationwide air quality standards to protect public health and welfare. Federal standards, known as the NAAQS, were developed for six criteria pollutants: O_3, NO_2, CO, SO_2, both coarse and fine

inhalable particulate matter PM_{10} and $PM_{2.5}$, and Pb (refer to Table 1). The Act also requires that each state prepare a SIP for maintaining and improving air quality and eliminating violations of the NAAQS. The CAA requires federal agencies to determine whether their proposed actions in nonattainment and maintenance areas conform with the applicable SIP, and demonstrate that their actions will not (1) cause or contribute to a new violation of the NAAQS; (2) increase the frequency or severity of any existing violation; or (3) delay timely attainment of any standard, emission reduction, or milestone contained in the SIP.

2.3 STATE REQUIREMENTS

The CAA requires each state to develop, adopt, and implement a SIP to achieve, maintain, and enforce federal air quality standards throughout the state. States develop SIPs on a pollutant-by-pollutant basis whenever there is a violation of one or more air quality standards. Michigan has adopted the federal ambient air quality standards and does not maintain any additional standards.

2.4 GENERAL CONFORMITY REGULATIONS

The General Conformity Rule was promulgated by the USEPA on November 30, 1993 at 40 CFR Part 93 Subpart B "*Determining Conformity of General Federal Actions to State or Federal Implementation Plans"* for all federal activities except those covered under transportation conformity (USEPA 1993). The General Conformity Regulations were revised by the USEPA on April 5, 2010 (75 *Federal Register* 17253-17279) and changed the existing regulations found in 40 CFR Part 51, Subpart W, and Part 93, Subpart B (USEPA 2010). The USEPA's modifications to 40 CFR Part 51, Subpart W, changed state or Tribal adoption and submittal of general conformity SIPs from a requirement to a voluntary measure in 40 CFR § 51.851(a). In addition, the USEPA provided in 40 CFR § 51.851(b) that until such time as USEPA approves a state's or Tribe's revision to the conformity implementation plan permitted under this section, that federal agencies must meet the requirements of 40 CFR Part 93, Subpart B.

The General Conformity Rule requires any federal agency responsible for an action in a nonattainment or maintenance area to determine that the action conforms to the applicable SIP. Emissions of attainment pollutants are exempt from conformity analysis. Actions would conform to a SIP if their annual direct and indirect emissions would remain less than the applicable *de minimis* thresholds. Formal conformity determinations are required for any actions that would equal or exceed these thresholds. The conformity determination process is intended to demonstrate that a proposed federal action would not: (1) cause or contribute to a new violation of the NAAQS; (2) increase the frequency or severity of any existing violation; or (3) delay timely attainment of any standard, emission reduction, or milestone contained in the SIP.

Analyses required by the General Conformity Regulations focus on the net increase in air emissions from a proposed action compared to ongoing historical conditions. Existing SIPs are presumed to have accounted for routine, ongoing federal agency activities. Conformity analyses are further limited to those direct and indirect emissions over which the federal agency has continuing program responsibility and control over. General conformity analyses are not required to analyze emission sources beyond the responsibility and control of the federal agency. Conformity determinations are also not required to address emissions that are not reasonably foreseeable or reasonably quantifiable.

2.5 GENERAL CONFORMITY ANALYSIS PROCEDURES

The USEPA General Conformity Regulations incorporate a stepwise process, beginning with an applicability analysis (USEPA 1993, 2010). According to USEPA guidance, before any approval is given for a federal action to go forward, the regulating federal agency must apply the applicability requirements found at 40 CFR § 93.153(b) to the federal action to evaluate whether, on a pollutant-by-pollutant basis, a determination of general conformity is required. If the regulating federal agency determines that the General Conformity Regulations do not apply to the federal action, no further analysis or documentation is required. However, if the General Conformity Regulations do apply to a federal action, the action proponent must make its own conformity determination in accordance with the criteria and procedures outlined in the implementing regulations, publish a draft determination of general conformity for public review, consider comments from interested parties, and then publish the final determination of general conformity.

3.0 ELEMENTS OF THE PROPOSED ACTION

The Proposed Action involves both construction of new facilities to accommodate the F-35A aircraft, and operational emissions associated with the F-35A aircraft.

3.1 CONSTRUCTION EMISSIONS

The Proposed Action would include construction activities at Selfridge ANGB to provide for additional infrastructure and facilities needed to support the proposed F-35A operations. Air quality impacts from construction would occur from (1) combustion emissions due to the use of fossil fuel-powered equipment; and (2) fugitive dust emissions ($PM_{2.5}$ and PM_{10}) during demolition activities, earth-moving activities, and the operation of equipment on bare soil.

The construction at Selfridge ANGB associated with the Proposed Action would occur between calendar years 2020 and 2023. In order to assess the most conservative scenario, all construction was assumed to occur in a single year, 2020.

3.2 OPERATIONAL EMISSIONS

Operational emissions associated with the Proposed Action include emissions associated with aircraft operations and associated equipment. Mobile source emissions include emissions from aircraft operations (take-offs and landings), aerospace ground equipment (AGE), personal vehicle operations, and maintenance aircraft operations performed with the engines still mounted on the aircraft. The Proposed Action would also include an increase of 85 personnel required to support the F-35A operations.

Under the Proposed Action, the 127 WG would convert from 18 A-10 aircraft to 18 F-35A aircraft and with each F-35A arrival, an A-10 would be removed from operation at the ANGB. The first F-35A could arrive as early as 2023 and all are anticipated to be located at Selfridge ANGB at some point in 2024. Baseline operations for the A-10 aircraft at Selfridge ANGB total 2,388 landings and take-offs and 322 closed patterns annually. The number of annual operations would increase by 673 additional landings and take-offs, and 302 additional closed patterns under the Proposed Action.

3.3 EXISTING AIR QUALITY ATTAINMENT STATUS

Macomb County Michigan is part of the Metropolitan Detroit-Port Huron Intrastate Air Quality Control Region (AQCR) (40 CFR 81.37). Currently, Macomb County is nonattainment for the 2015 O_3 standard, is a designated maintenance area for $PM_{2.5}$, and is partially a designated maintenance area for CO. CO is not included in this analysis because the portion of Macomb County that has been designated a maintenance area is far enough away that none of the flight tracks to or from Selfridge ANGB would traverse that area below the mixing height. The majority of ground-level O_3 formation occurs when nitrogen oxides (NO_x) and volatile organic compounds (VOCs) in the atmosphere below the mixing height chemically react in the presence of sunlight. For this reason, they are considered O_3 precursors. Similarly, NO_x, SO_2, and VOCs are considered precursors for $PM_{2.5}$. The applicable *de minimis* thresholds for the area are listed in Table 2.

Table 2. Applicable Criteria Pollutant *de minimis* Thresholds (tpy)

Affected Area	*VOCs*	*NO_x*	*SO_x*	*$PM_{2.5}$*
Macomb County, MI	100	100	100	100

Legend: NO_x = nitrogen oxides; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; PM_{10} = particulate matter less than or equal to 10 microns in diameter; SO_x = sulfur oxides; tpy = tons per year; VOC = volatile organic compound.
Source: 40 CFR 93.153(1)

4.0 GENERAL CONFORMITY EVALUATION

4.1 APPLICABILITY ANALYSIS

The first step in a general conformity evaluation is an analysis of whether the requirements apply to the federal action that is proposed in a nonattainment or a maintenance area. Unless exempted by the regulations or otherwise presumed to conform, a federal action requires a general conformity determination for each pollutant where the total of direct and indirect emissions caused by the federal action would equal or exceed an annual *de minimis* emission rate for any given maintenance or nonattainment pollutant (or precursor). If a proposed action would result in emission increases less than the identified applicable *de minimis* thresholds, then no conformity determination is required.

4.2 EXEMPTIONS FROM GENERAL CONFORMITY REQUIREMENTS

The general conformity requirements apply to a federal action if the net project emissions equal or exceed certain *de minimis* emission rates established in the General Conformity Regulations. The *de minimis* thresholds differ based on the severity of the nonattainment status. The only exceptions to this applicability criterion include certain federal actions that are presumed to conform because of the thorough air quality analysis required to comply with other statutory requirements. Examples of these actions include those subject to the New Source Review program and remedial activities under the Comprehensive Environmental Response, Compensation, and Liability Act. Other federal actions exempt from the conformity process include those actions that would result in no increase in emissions, or an increase in emissions that is clearly *de minimis*. Examples include continuing or recurring activities, routine maintenance and repair, and administrative and planning actions; however, the emissions that would result from this federal action do not meet any of these exempt categories. For this reason, a Level II Quantitative Assessment, as described in the *Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide – Fundamentals, Volume 1 of 2* (U.S. Air Force [USAF] 2017) was performed. This analysis is used to prepare an estimate of the worst-case annual net change (the total direct and indirect emissions associated with the Proposed Action) and these emissions were compared against *de minimis* thresholds for the pollutants of concern – VOCs, NO_x, $PM_{2.5}$, and SO_2. Emissions were estimated using flight operations data and flight profiles for the installation, and aircraft model-specific emission factors. These were used to quantify the Proposed Action emissions.

4.3 EMISSION ESTIMATES

Existing emissions quantified include emissions from the A-10 aircraft, which would be replaced under the Proposed Action by the F-35A aircraft. While the 127 WG operates other aircraft, specifically the KC-135 Stratotanker, and other military units at Selfridge ANGB operate aircraft,

only the operation of the A-10 aircraft was assessed for the current emissions. This is because none of the other operations would be affected by the transition to the F-35A. The annual operations as they occur today are anticipated to be the same as when the F-35A has completely replaced the A-10 in 2024.

To evaluate emissions from ongoing historical conditions for evaluating the net emissions increases/decreases associated with the Proposed Action, emissions from the A-10 aircraft operations, A-10 engine testing, and A-10-related AGE were evaluated. Emissions from the A-10 aircraft operations were calculated based on number of operations identified in the noise analysis in Section MI2.1 in the EIS to calculate aircraft operations below a default mixing height of 3,000 feet above ground level (AGL). Appendix B of the EIS provides a discussion of the methodology for quantifying emissions. Table 3 presents the emissions associated with operations of the A-10 aircraft.

Table 3. 127 WG A-10 Emissions at Selfridge ANGB (tons/year)

Emission Source	*VOCs*	*NO_x*	*SO_x*	*$PM_{2.5}$*
A-10 Aircraft Operations	30.49	4.56	1.19	3.40
Engine Testing	36.53	1.96	0.99	3.38
Aerospace Ground Equipment	31.06	65.96	3.23	8.14
Total A-10 Operations Emissions	98.08	72.48	5.41	14.92

Legend: CO = carbon monoxide; NO_x = nitrogen oxides; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; SO_x = sulfur oxides; VOC = volatile organic compound.

Construction activities at Selfridge ANGB include demolition or renovation of existing structures, construction of new structures, and infrastructure upgrades. Table 4 provides information on the construction projects anticipated ahead of the F-35A arrival to Selfridge ANGB.

Table 4. Construction Projects for Selfridge ANGB

Project	*SF to demolish (D), build (B) or renovate (R)*	*Truck Trips*
Demolish B171	4,745 (D)	24
Demolish B18	13,458 (D)	67
Flight Simulator	19,000 (B)	572
Hangar	31,000 (B)	711
AGE Addition	4,500 (B)	220
Weapons Loading Training	11,500 (B)	434
Distributed Spares	6,000 (B)	154
Interior renovations for 7 locations	129,874 (R)	240
	Total material brought in	**4,556 cubic yards**
	Total of material removed	**4,503 cubic yards**

Table 5 summarizes the annual and total construction emissions associated with the Proposed Action. The data in Table 5 show that the annual emissions for proposed construction activities would not exceed the General Conformity Rule *de minimis* thresholds as set forth in the CAA.

Table 5. 127 WG Construction Emissions in 2020 (tons/year)

Emission Source	*VOCs*	*NO_x*	*SO_x*	*$PM_{2.5}$*
127 WG Construction Projects	2.86	3.33	0.01	0.16

Legend: NO_x = nitrogen oxides; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; SO_x = sulfur oxides; VOC = volatile organic compound.

Based on the phasing schedule, the A-10 aircraft would be completely departed from Selfridge ANGB in 2024 and the F-35A aircraft would be at the full complement of 18 aircraft. Operational emissions associated with the Proposed Action are summarized in Table 6 along with a comparison with the baseline emissions for the A-10.

Table 6. 127 WG Projected Emissions, Selfridge, 2025 and Beyond (tons/year)

Emission Source	*VOCs*	*NO_x*	*SO_x*	*$PM_{2.5}$*
F-35 Aircraft Operations	0.06	24.00	3.44	0.25
Engine Testing	0.37	36.01	10.77	0.51
Aerospace Ground Equipment	5.42	15.60	1.09	1.56
Additional Staff Vehicles	0.20	0.17	0.00	0.00
Total Operational Emissions	6.05	75.78	15.30	2.32
A-10 Operational Emissions	98.08	72.48	5.41	14.92
Net Emissions Increase	**-92.03**	**3.30**	**9.89**	**-12.60**
De minimis Threshold	100	10	100	100
Equals or Exceeds Threshold?	No	No	No	No

Legend: NO_x = nitrogen oxides; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; SO_x = sulfur oxides; VOC = volatile organic compound.

As shown in Table 6, emissions associated with the Proposed Action at Selfridge ANGB would be below the General Conformity Rule *de minimis* thresholds for all pollutants.

4.4 APPLICABILITY OF GENERAL CONFORMITY TO THIS FEDERAL ACTION

The applicability of the General Conformity requirements to the Proposed Action was determined by comparing the federal action emissions to the conformity *de minimis* thresholds for all nonattainment and maintenance pollutants in the ROI. As shown in Table 6, the emissions of all pollutants are lower than their applicable *de minimis* thresholds.

5.0 FINDING OF CONFORMITY

In accordance with 40 CFR Part 93, Subpart B, 40 CFR Part 51, Subpart W and the 2017 *Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide – Fundamentals, Volume 1 of 2* (USAF 2017), the emissions due to the Proposed Action were evaluated, including reasonable foreseeable direct and indirect emissions. The applicability analysis has found that:

- General Conformity is not applicable to this proposed federal action,

- A Conformity Determination is not required, and
- The General Conformity Evaluation is complete with a completed Record of Conformity Applicability (ROCA) to document the conclusion (included in Appendix 1 to this document).

6.0 REFERENCES

United States Air Force (USAF). 2017. Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide – Fundamentals, Volume 1 of 2.

United States Environmental Protection Agency (USEPA). 1993. Determining Conformity of General Federal Actions to State or Federal Implementation Plans; Final Rule. 40 CFR Parts 6, 51, and 93. 30 November.

_____. 2010. Revisions to the General Conformity Rule Regulations; Final Rule. 40 CFR Parts 51 and 93. 5 April.

_____. 2016. National Ambient Air Quality Standards. Accessed at https://www.epa.gov/criteria-air-pollutants/naaqs-table

APPENDIX 1
RECORD OF CONFORMITY ANALYSIS

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AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: Emissions were derived manually using installation-specific data and through the Air Force's Air Conformity Applicability Model (ACAM) to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, Air Quality Compliance And Resource Management; the Environmental Impact Analysis Process (EIAP, 32 Code of Federal Regulations [CFR] 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the analysis.

a. Action Location:

Base: SELFRIDGE ANGB
State: Michigan
County(s): Macomb
Regulatory Area(s): Detroit, MI;

b. Action Title: USAF F-35A Operational Beddown, Air National Guard

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2020

e. Action Description:

The United States Air Force (USAF) is proposing to beddown F-35A aircraft at two of five alternative Air National Guard (ANG) locations. The F-35A would replace the existing F-15, F-16, or A-10 fighter attack aircraft at the two selected installations. This action would involve the beddown of one F-35A squadron consisting of 18 Primary Aircraft Authorized (PAA) with 2 Backup Aircraft Inventory at each of the two selected locations, thereby establishing two F-35A operational locations. Five alternative ANG locations (Figure 1.1-1) are being considered for this beddown:

- 127th Wing (127 WG) at Selfridge Air National Guard Base (ANGB), Michigan

- 124th Fighter Wing (124 FW) at Boise Air Terminal (Boise Airport), Boise, Idaho

- 125th Fighter Wing (125 FW) at Jacksonville International Airport (IAP), Jacksonville, Florida

- 115th Fighter Wing (115 FW) at Dane County Regional Airport, Madison, Wisconsin

- 187th Fighter Wing (187 FW) at Montgomery Regional Airport, Montgomery, Alabama

f. Point of Contact:

Name: Lesley Hamilton
Title: Sr. Associate
Organization: Cardno
Email:
Phone Number:

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated manually with installation-specific input on flight operations data and flight profiles and through ACAM for construction, aerospace ground equipment, and personnel on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

Conformity Analysis Summary:

Construction emissions are based on equipment operations for demolition, grading, building construction, application of architectural coatings, and materials transport.

2020 – Construction

Pollutant	Action Emissions (ton/yr)	General Conformity Threshold (ton/yr)	General Conformity Exceedance (Yes or No)
Detroit, MI			
VOC	2.86	100	No
NOx	3.33	100	No
SOx	0.01	100	No
PM 2.5	0.16	100	No

A-10 annual operations table represents the landings and take offs of the A-10, along with closed patterns (represented as touch and goes). Annual engine runups are also included.

2017 - A-10 Baseline Operations

Pollutant	Action Emissions (ton/yr)	General Conformity Threshold (ton/yr)	General Conformity Exceedance (Yes or No)
Detroit, MI			
VOC	98.08	100	No
NOx	72.48	100	No
SOx	5.41	100	No
PM 2.5	14.92	100	No

F-35A steady state operations table represents the landings and take offs of the F-35A, along with closed patterns (represented as touch and goes). Annual engine runups and additional commuting personnel are also included.

2025 - F-35A Steady State Operations

Pollutant	Action Emissions (ton/yr)	General Conformity Threshold (ton/yr)	General Conformity Exceedance (Yes or No)
Detroit, MI			
VOC	6.05	100	No
NOx	75.78	100	No
SOx	15.30	100	No
PM 2.5	2.32	100	No

The net change is the difference in emissions resulting from instituting the proposed action to homebase the F-35A as compared to not introducing the action.

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2025 Net Change

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	AIR QUALITY INDICATOR
Detroit, MI			
VOC	-92.03	100	No
NOx	3.30	100	No
SOx	9.89	100	No
PM 2.5	-12.60	100	No

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Lesley Hamilton

Lesley Hamilton, Sr. Associate

6/26/19
DATE

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AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, Air Quality Compliance And Resource Management; the Environmental Impact Analysis Process (EIAP, 32 Code of Federal Regulations [CFR] 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:

Base: SELFRIDGE ANGB
State: Michigan
County(s): Macomb
Regulatory Area(s): Detroit, MI;

b. Action Title: USAF F-35A Operational Beddown, Air National Guard

c. Project Number/s (if applicable):

d. Projected Action Start Date: 2020

e. Action Description:

The United States Air Force (USAF) is proposing to beddown F-35A aircraft at two of five alternative Air National Guard (ANG) locations. The F-35A would replace the existing F-15, F-16, or A-10 fighter attack aircraft at the two selected installations. This action would involve the beddown of one F-35A squadron consisting of 18 Primary Aircraft Authorized (PAA) with 2 Backup Aircraft Inventory at each of the two selected locations, thereby establishing two F-35A operational locations. Five alternative ANG locations (Figure 1.1-1) are being considered for this beddown:

- 127th Wing (127 WG) at Selfridge Air National Guard Base (ANGB), Michigan

- 124th Fighter Wing (124 FW) at Boise Air Terminal (Boise Airport), Boise, Idaho

- 125th Fighter Wing (125 FW) at Jacksonville International Airport (IAP), Jacksonville, Florida

- 115th Fighter Wing (115 FW) at Dane County Regional Airport, Madison, Wisconsin

- 187th Fighter Wing (187 FW) at Montgomery Regional Airport, Montgomery, Alabama

f. Point of Contact:

Name: Lesley Hamilton
Title: Sr Associate
Organization: Cardno
Email:
Phone Number:

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. Potential impacts to air quality are evaluated with respect to the extent, context, and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. The Council on Environmental Quality (CEQ) defines significance in terms of context and intensity in 40 CFR 1508.27. This requires that the significance of an action be analyzed in respect to the setting of the action and based relative to the severity of the impact. For attainment area criteria pollutants, the project air quality analysis uses the United States Environmental Protection Agency's Prevention of Significant Deterioration (PSD) permitting threshold of 250 tons per year as an initial indicator of the local significance of potential impacts to air quality. It is important to note that these indicators only provide a clue to the potential impacts to air quality. In the context of criteria pollutants for which the proposed project region is in attainment of a National Ambient Air Quality Standards (NAAQS), the analysis compares the annual net increase in emissions estimated for each project alternative to the 250 ton per year PSD permitting threshold. The PSD permitting threshold represents the level of potential new emissions below which a new or existing minor non-listed stationary source may acceptably emit without triggering the requirement to obtain a permit. Thus, if the intensity of any net emissions increase for a project alternative is below 250 tons per year in the context of an attainment criteria pollutant, the indication is the air quality impacts will be insignificant for that pollutant. Therefore, the worst-case year emissions were compared against the 250 ton per year Indicator and are summarized below.

Analysis Summary:

Construction emissions are based on equipment operations for demolition, grading, building construction, application of architectural coatings, and materials transport.

2020 - Construction

Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
CO	3.09	250	No
PM10	0.73	250	No

A-10 annual operations table represents the landings and take offs of the A-10, along with closed patterns. Annual engine runups are also included.

2017 A-10 Baseline Operations

Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
CO	226.53	250	No
PM10	23.61	250	No

F-35A steady state operations table represents the landings and take offs of the F-35A, along with closed patterns. Annual engine runups and additional commuting personnel are also included.

2025 - F-35A Steady State Operations

Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
CO	22.19	250	No
PM10	2.43	250	No

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

The net change is the difference in emissions resulting from instituting the proposed action to homebase the F-35A as compared to not introducing the action.

2025 Net Change

Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
CO	-204.34	250	No
PM10	-21.18	250	No

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

7/2/19

Lesley Hamilton, Sr Associate — DATE

TAB F. A-10 EMISSION CALCULATIONS - SELFRIDGE ANGB

Table 1. A-10A Individual Profile Emission Calculations

[1,2,3] **Inputs to Emissions Calculations** Elevation at Selfridge ANGB = 580 ft MSL

TF34-GE-100 Engines

3000 FT AGL Mixing Height

1	kilometer (km)	3,280.84	ft
1	knot =	1.852	km/h
1	knot =	101.2686	ft/min

A1DA-H3 A-10 Departure

Point	Distance	Height	Speed, kts	Power % N2	
a	0	0	0	90	MIL
b	4496	0	140	105	MIL
c	11970	500	200	105	MIL
d	19990	1920	200	97	MIL
e	30381	2420	220	70	Idle
f	60761	2420	250	90	Intermediate
FG	65166	3000	250	90	Intermediate
g	151903	14420	250	90	Intermediate

									Emission Indices, lb/1000 lb						Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM**	**PM2.5**	**CO2e**
a-a	0	0	0	0	90	0.08333	920	1.28	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.000	0.003	0.014	0.001	0.003	0.002	4.108
a-b	4496	0	140	14178	105	0.63333	5420	57.21	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.007	0.126	0.612	0.061	0.152	0.096	183.910
b-c	7474	250	170	17216	105	0.4341396	5420	39.22	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.005	0.086	0.420	0.042	0.104	0.066	126.067
c-d	8020	1210	200	20254	101	0.3959767	5420	35.77	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.004	0.079	0.383	0.038	0.095	0.060	114.986
d-e	10391	2170	210	21266	83.5	0.488611	780	6.35	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.001	0.014	0.068	0.007	0.017	0.011	20.419
e-f	30380	2420	235	23798	80	1.2765715	920	19.57	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.002	0.043	0.209	0.021	0.052	0.033	62.923
f-FG	4405	2710	250	25317	90	0.1740005	920	2.67	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.000	0.006	0.029	0.003	0.007	0.004	8.577
														Emissions in lb for Departure:		**0.02**	**0.36**	**1.73**	**0.17**	**0.43**	**0.27**	**521**

A1DA-H4 A-10 Departure

Point	Distance	Height	Speed, kts	Power % N2	
a	0	0	0	90	MIL
b	4496	0	140	105	MIL
c	11970	500	200	105	MIL
d	19990	1920	200	97	MIL
DE	29657	3000	210	83.5	Approach
e	33417	3420	220	70	Idle

									Emission Indices, lb/1000 lb						Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM**	**PM2.5**	**CO2e**
a-a	0	0	0	0	90	0.08333	920	1.28	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.000	0.003	0.014	0.001	0.003	0.002	4.108
a-b	4496	0	140	14178	105	0.63333	5420	57.21	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.007	0.126	0.612	0.061	0.152	0.096	183.910
b-c	7474	250	170	17216	105	0.4341396	5420	39.22	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.005	0.086	0.420	0.042	0.104	0.066	126.067
c-d	8020	1210	200	20254	101	0.3959767	5420	35.77	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.004	0.079	0.383	0.038	0.095	0.060	114.986
d-DE	9667	2460	205	20760	90.25	0.4656749	780	6.05	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.001	0.013	0.065	0.006	0.016	0.010	19.460
														Emissions in lb for Departure:		**0.02**	**0.31**	**1.49**	**0.15**	**0.37**	**0.23**	**449**

A1DB-H3 A-10 Departure

Point	Distance	Height	Speed, kts	Power % N2	
a	0	0	0	90	MIL
b	4496	0	140	105	MIL
c	11970	500	200	105	MIL
d	21266	2500	200	90	Intermediate
e	60761	2420	220	70	Idle
f	121522	2420	250	90	Intermediate
FG	125927	3000	250	90	Intermediate
g	212664	14420	250	90	Intermediate

									Emission Indices, lb/1000 lb						Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM**	**PM2.5**	**CO2e**
a-a	0	0	0	0	90	0.08333	920	1.28	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.000	0.003	0.014	0.001	0.003	0.002	4.108
a-b	4496	0	140	14178	105	0.63333	5420	57.21	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.007	0.126	0.612	0.061	0.152	0.096	183.910
b-c	7474	250	170	17216	105	0.4341396	5420	39.22	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.005	0.086	0.420	0.042	0.104	0.066	126.067
c-d	9296	1500	200	20254	97.5	0.4589775	5420	41.46	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.005	0.091	0.444	0.044	0.110	0.070	133.280
d-e	39495	2460	210	21266	80	1.8571546	780	24.14	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.003	0.053	0.258	0.026	0.064	0.041	77.610
e-f	60761	2420	235	23798	80	2.553185	920	39.15	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.005	0.086	0.419	0.042	0.104	0.066	125.847
f-FG	4405	2710	250	25317	90	0.1740005	920	2.67	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.000	0.006	0.029	0.003	0.007	0.004	8.577
														Emissions in lb for Departure:		**0.02**	**0.45**	**2.19**	**0.22**	**0.55**	**0.34**	**659**

A1DC-H3 A-10 Departure

Point	Distance	Height	Speed, kts	Power % N2	
a	0	0	0	90	MIL
b	4496	0	140	105	MIL
c	12152	400	200	90	Intermediate
d	48609	1420	200	90	Intermediate

e	60761	2420	220	70	Idle																	
f	121522	2420	250	90	Intermediate																	
FG	125927	3000	250	90	Intermediate																	
g	212664	14420	250	90	Intermediate																	
										Emission Indices, lb/1000 lb						Emissions (lbs)					
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM**	**PM2.5**	**CO2e**
a-a	0	0	0	0	90	0.08333	920	1.28	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.000	0.003	0.014	0.001	0.003	0.002	4.108
a-b	4496	0	140	14178	105	0.63333	5420	57.21	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.007	0.126	0.612	0.061	0.152	0.096	183.910
b-c	7656	200	170	17216	97.5	0.4447114	5420	40.17	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.005	0.088	0.430	0.043	0.107	0.067	129.137
c-d	36457	910	200	20254	90	1.8000152	5420	162.60	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.020	0.358	1.740	0.174	0.433	0.273	522.697
d-e	12152	1920	210	21266	80	0.5714177	780	7.43	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.001	0.016	0.079	0.008	0.020	0.012	23.879
e-f	60761	2420	235	23798	80	2.553185	920	39.15	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.005	0.086	0.419	0.042	0.104	0.066	125.847
f-FG	4405	2710	250	25317	90	0.1740005	920	2.67	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.000	0.006	0.029	0.003	0.007	0.004	8.577
														Emissions in lb for Departure:		**0.04**	**0.68**	**3.32**	**0.33**	**0.83**	**0.52**	**998**

A1DC-H4 A-10 Departure

Point	Distance	Height	Speed, kts	Power % N2	
a	0	0	0	90	MIL
b	4496	0	140	105	MIL
c	12152	400	200	90	Intermediate
d	48609	1420	200	90	Intermediate
DE	60609	3000	210	80	Approach
e	63799	3420	220	70	Idle

										Emission Indices, lb/1000 lb					Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power % N2	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM**	**PM2.5**	**CO2e**
a-a	0	0	0	0	90	0.08333	920	1.28	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.000	0.003	0.014	0.001	0.003	0.002	4.108
a-b	4496	0	140	14178	105	0.63333	5420	57.21	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.007	0.126	0.612	0.061	0.152	0.096	183.910
b-c	7656	200	170	17216	97.5	0.4447114	5420	40.17	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.005	0.088	0.430	0.043	0.107	0.067	129.137
c-d	36457	910	200	20254	90	1.8000152	5420	162.60	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.020	0.358	1.740	0.174	0.433	0.273	522.697
d-DE	12000	2210	205	20760	85	0.5780378	780	7.51	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.001	0.017	0.080	0.008	0.020	0.013	24.156
														Emissions in lb for Departure:		**0.03**	**0.59**	**2.88**	**0.29**	**0.71**	**0.45**	**864**

A1DA -10A Departure

Point	Distance	Height	Speed, kts	Power % N2	
a	0	0	0	93	MIL
b	4500	0	140	105	MIL
c	12000	500	200	105	MIL
d	20000	2500	220	97	MIL
DE	24286	3000	235	96.5	MIL
d	50000	6000	250	96	MIL

										Emission Indices, lb/1000 lb					Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM**	**PM2.5**	**CO2e**
a-a	0	0	0	0	93	0.63333	5420	57.21	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.007	0.126	0.612	0.061	0.152	0.096	183.910
a-b	4500	0	140	14178	105	0.317402	5420	28.67	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.003	0.063	0.307	0.031	0.076	0.048	92.169
b-c	7500	250	170	17216	101	0.4356499	5420	39.35	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.005	0.087	0.421	0.042	0.105	0.066	126.506
c-d	8000	1500	210	21266	96.8	0.3761802	5420	33.98	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.004	0.075	0.364	0.036	0.090	0.057	109.237
d-DE	4286	2750	227.5	23039	96.3	0.1860232	5420	16.80	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.002	0.037	0.180	0.018	0.045	0.028	54.018
														Emissions in lb for Departure:		**0.02**	**0.39**	**1.88**	**0.19**	**0.47**	**0.30**	**565.84**

A-10A Instrument Arrival

Point	Distance	Height	Speed, kts	Power % N2	
d	64500	3000	220	88	Approach
e	36457	1800	160	78	Approach
f	6076	300	140	75	Approach
g	0	50	130	75	Approach

										Emission Indices, lb/1000 lb					Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power %	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
d-e	28043	2400	190	19241	83	1.4574582	1840	44.70	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.098	0.729	0.255	0.048	0.278	0.095	143.677
e-f	30381	1050	150	15190	76.5	2.0000278	1840	61.33	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.134	1.000	0.350	0.066	0.381	0.130	197.164
f-g	6076	175	135	13671	75	0.444436	1840	13.63	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.030	0.222	0.078	0.015	0.085	0.029	43.813
														Emissions in lb for Instrument Arrival:		**0.26**	**1.95**	**0.68**	**0.13**	**0.74**	**0.25**	**384.65**

A-10A VFR Arrival

Point	Distance	Height	Speed, kts	Power % N2	
b	100000	5000	250	88	Approach
BC	77872	3000	250	88	Approach
c	61276	1500	250	88	Approach
d	40276	1500	250	88	Approach
e	26138	1500	200	70	Idle
f	20138	1500	180	78	Approach
g	6000	300	150	75	Approach
h	0	50	130	75	Approach

										Emission Indices, lb/1000 lb					Emissions (lbs)						

segment	Distance	Height	Speed, kts	speed, ft/min	Power % N2	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	HC	CO	NOx	SO2	PM10	PM2.5	CO2e
BC-c	16596	2250	250	25317	88	0.6555241	1840	20.10	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.044	0.328	0.115	0.022	0.125	0.043	64.622
c-d	21000	1500	250	25317	88	0.8294773	1840	25.44	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.056	0.415	0.145	0.027	0.158	0.054	81.771
d-e	14138	1500	225	22785	79	0.6204841	1840	19.03	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.042	0.310	0.108	0.020	0.118	0.040	61.168
e-f	6000	1500	190	19241	74	0.3118336	1840	9.56	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.021	0.156	0.055	0.010	0.059	0.020	30.741
f-g	14138	900	165	16709	76.5	0.8461147	1840	25.95	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.057	0.423	0.148	0.028	0.161	0.055	83.411
g-h	6000	175	140	14178	75	0.4232027	1840	12.98	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.028	0.212	0.074	0.014	0.081	0.028	41.720
															Emissions in lb for VFR Arrival:	**0.25**	**1.84**	**0.64**	**0.12**	**0.70**	**0.24**	**363.43**

A-10A Pattern

Point	Distance	Height	Speed, kts	Power % N2	
a	0	50	140	97	MIL
b	500	50	140	97	MIL
c	7000	200	200	97	MIL
d	16190	1620	220	93	Intermed
e	23544	1620	200	78	Intermed
f	30498	1620	200	78	Intermed
g	38751	300	140	75	Approach
h	45121	50	130	75	Approach

									Emission Indices, lb/1000 lb							Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power % N2	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM	EIPM2.5	EICO2	HC	CO	NOx	SO2	PM	PM2.5	CO2
a-b	500	50	140	14178	97	0.0352669	5420	3.19	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.000	0.007	0.034	0.003	0.008	0.005	10.241
b-c	6500	125	170	17216	97	0.3775632	5420	34.11	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.004	0.075	0.365	0.036	0.091	0.057	109.639
c-d	9190	910	210	21266	95	0.432137	5420	39.04	0.12	2.20	10.7	1.07	2.66	1.68	3214.59	0.005	0.086	0.418	0.042	0.104	0.066	125.486
d-e	7354	1620	210	21266	85.5	0.3458036	920	5.30	23.35	78.00	2.6	1.07	8.93	6.95	3214.59	0.124	0.414	0.014	0.006	0.047	0.037	17.045
e-f	6954	1620	200	20254	78	0.3433444	920	5.26	23.35	78.00	2.6	1.07	8.93	6.95	3214.59	0.123	0.411	0.014	0.006	0.047	0.037	16.924
f-g	8253	960	170	17216	76.5	0.4793891	1840	14.70	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.032	0.240	0.084	0.016	0.091	0.031	47.259
g-h	6370	175	135	13671	75	0.465941	1840	14.29	2.19	16.30	5.7	1.07	6.21	2.12	3214.59	0.031	0.233	0.081	0.015	0.089	0.030	45.933
															Emissions in lb for Pattern:	**0.32**	**1.46**	**1.01**	**0.12**	**0.48**	**0.26**	**372.53**

Start/Taxi/Idle

					Emission Indices, lb/1000 lb					Emissions (lbs)								
segment	Power (%)	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	HC	CO	NOx	SO2	PM10	PM2.5	CO2e
[a]Start/Taxi Out	3	35	780	455.00	39.45	106.7	2.1	1.07	8.13	3.6	3214.59	17.950	48.549	0.956	0.487	3.699	1.638	1462.638

Taxi In/Shut Off

					Emission Indices, lb/1000 lb					Emissions (lbs)								
segment	Power (%)	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	HC	CO	NOx	SO2	PM10	PM2.5	CO2e
[a]Taxi to Shut Off	3	15	780	195.00	39.45	106.7	2.1	1.07	8.13	3.6	3214.59	7.693	20.807	0.410	0.209	1.585	0.702	626.845
	Power (%)				EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	HC	CO	NOx	SO2	PM10	PM2.5	CO2e
[a]Hot Refueling	3	540	780	7020.00	39.45	106.7	2.1	1.07	8.13	3.6	3214.59	276.939	749.034	14.742	7.511	57.073	25.272	22566.422

[1]F-16 Flight Profile Maps, Dannelly Field, Cardno 2019

[2]*Dannelly_20190329_MASTER_PHK - Flight OperationsOPSCHECK.xlsx*

for Air Force Mobile

[a]Data from installation, May 2019

Table 2. Current A-10 Operations

Type of Operation	Total Number of Operations	Emissions in lbs/op							Annual Emissions						
		HC	CO	NOx	SO2	PM10	PM2.5	CO2e	HC tons/year	CO tons/year	NOx tons/year	SO2 tons/year	PM10 tons/year	PM2.5 tons/year	CO2e tons/year
Taxi/Idle Out	2,338	17.950	48.549	0.956	0.487	3.699	1.638	1462.638	20.98	56.75	1.12	0.57	4.32	1.91	1,710
A1DA-H3 Departure	967	0.019	0.357	1.734	0.173	0.431	0.272	520.989	0.01	0.17	0.84	0.08	0.21	0.13	252
A1DA-H4 Departure	967	0.017	0.307	1.493	0.149	0.371	0.234	448.531	0.01	0.15	0.72	0.07	0.18	0.11	217
A1DB-H3 Departure	55	0.025	0.451	2.195	0.219	0.546	0.345	659.399	0.00	0.01	0.06	0.01	0.02	0.01	18
A1DC-H3 Departure	55	0.037	0.683	3.322	0.332	0.826	0.522	998.155	0.00	0.02	0.09	0.01	0.02	0.01	27
A1DC-H4 Departure	55	0.032	0.591	2.876	0.288	0.715	0.452	864.008	0.00	0.02	0.08	0.01	0.02	0.01	24
A1DA Departure	239	0.021	0.387	1.883	0.188	0.468	0.296	565.840	0.00	0.05	0.23	0.02	0.06	0.04	68
Instrument Arrival	701	0.262	1.950	0.682	0.128	0.743	0.254	384.654	0.09	0.68	0.24	0.04	0.26	0.09	135
VFR Arrival	1,687	0.248	1.843	0.644	0.121	0.702	0.240	363.431	0.21	1.55	0.54	0.10	0.59	0.20	307
Pattern	322	0.319	1.465	1.009	0.124	0.477	0.263	372.525	0.05	0.24	0.16	0.02	0.08	0.04	60
Taxi/Idle In	2,338	7.693	20.807	0.410	0.209	1.585	0.702	626.845	8.99	24.32	0.48	0.24	1.85	0.82	733
Hot Refuel	1	276.939	749.034	14.742	7.511	57.073	25.272	22566.422	0.14	0.37	0.01	0.00	0.03	0.01	11
							Total in Tons/Year		**30.49**	**84.34**	**4.56**	**1.19**	**7.64**	**3.40**	**3,560.97**

Table 3. A-10 Aircraft Engine Maintenance Runups

Aircraft	Location	Dual Engine Operations					Emissions in lbs/1000 lbs fuel							Emissions (lbs)						
	Name	Annual	Power Setting Reported	Duration (hr)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	HC	CO	NOx	SO2	PM10	PM2.5	CO2e
A-10A	A10-A Engine Wash Alpha Pad	182.50	Idle	0.0833333	780	11862.50	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	467.98	1265.73	24.91	12.69	96.44	42.71	38133.07
			Intermediate	0.0416667	460	3497.92	23.35	78.00	2.60	1.07	8.93	6.95	3214.59	81.68	272.84	9.09	3.74	31.24	24.31	11244.37
			Idle	0.0416667	390	2965.63	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	116.99	316.43	6.23	3.17	24.11	10.68	9533.27
			Idle	0.0833333	780	11862.50	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	467.98	1265.73	24.91	12.69	96.44	42.71	38133.07
	A10-C Engine Wash Charlie Pad	182.50	Idle	0.0833333	780	11862.50	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	467.98	1265.73	24.91	12.69	96.44	42.71	38133.07
			Intermediate	0.0416667	460	3497.92	23.35	78.00	2.60	1.07	8.93	6.95	3214.59	81.68	272.84	9.09	3.74	31.24	24.31	11244.37
			Idle	0.0416667	390	2965.63	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	116.99	316.43	6.23	3.17	24.11	10.68	9533.27
			Idle	0.0833333	780	11862.50	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	467.98	1265.73	24.91	12.69	96.44	42.71	38133.07
	ARM/D S	3285.00	Idle	0.1666667	780	427050.00	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	16847.12	45566.24	896.81	456.94	3471.92	1537.38	1372790.66
	ARM/DE N	3285.00	Idle	0.1666667	780	427050.00	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	16847.12	45566.24	896.81	456.94	3471.92	1537.38	1372790.66
	Ops Chk C5	182.50	Idle	0.0833333	780	11862.50	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	467.98	1265.73	24.91	12.69	96.44	42.71	38133.07
			Intermediate	0.0416667	460	3497.92	23.35	78.00	2.60	1.07	8.93	6.95	3214.59	81.68	272.84	9.09	3.74	31.24	24.31	11244.37
			Idle	0.0416667	390	2965.63	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	116.99	316.43	6.23	3.17	24.11	10.68	9533.27
			Idle	0.0833333	780	11862.50	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	467.98	1265.73	24.91	12.69	96.44	42.71	38133.07
	Ops Chk C5 2	182.50	Idle	0.0833333	780	11862.50	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	467.98	1265.73	24.91	12.69	96.44	42.71	38133.07
			Intermediate	0.0416667	460	3497.92	23.35	78.00	2.60	1.07	8.93	6.95	3214.59	81.68	272.84	9.09	3.74	31.24	24.31	11244.37
			Idle	0.0416667	390	2965.63	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	116.99	316.43	6.23	3.17	24.11	10.68	9533.27
			Idle	0.0833333	780	11862.50	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	467.98	1265.73	24.91	12.69	96.44	42.71	38133.07
	Ops Chk C5B	182.50	Idle	0.0833333	780	11862.50	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	467.98	1265.73	24.91	12.69	96.44	42.71	38133.07
			Intermediate	0.0416667	460	3497.92	23.35	78.00	2.60	1.07	8.93	6.95	3214.59	81.68	272.84	9.09	3.74	31.24	24.31	11244.37
			Idle	0.0416667	390	2965.63	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	116.99	316.43	6.23	3.17	24.11	10.68	9533.27
			Idle	0.0833333	780	11862.50	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	467.98	1265.73	24.91	12.69	96.44	42.71	38133.07
	PRE/P C5	3285.00	Idle	0.1666667	780	427050.00	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	16847.12	45566.24	896.81	456.94	3471.92	1537.38	1372790.66
	PRE/P C5B	3285.00	Idle	0.1666667	780	427050.00	39.45	106.70	2.10	1.07	8.13	3.60	3214.59	16847.12	45566.24	896.81	456.94	3471.92	1537.38	1372790.66
													Total Emissions in Tons/Year	**36.53**	**98.93**	**1.96**	**0.99**	**7.56**	**3.38**	**2988.19**

Table 4. Aircraft Summary

Emissions in Tons Per Year						
VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
67.02	183.27	6.52	2.18	15.20	6.77	6549.16

TAB F. F-35 EMISSION CALCULATIONS -Selfridge ANGB

Table 1. F-35 Individual Profile Emission Calculations[1,2,3]

3000 Mixing Ht | 1 kilometer 3,280.84 ft | 1 knot= 1.852 km/h | 1 knot = 101.268591 ft/min | Elevation: 579 ft MSL

SOx % EFSOx = 20 * S where EFSOx = SOX emission factor [pounds SOX emitted per thousand
20 = Factor which is derived by converting "weight percent" into units of "lb/1000 lb" and ther
molecular weight of sulfur
S = Weight percent sulfur conte
SOx% 0.107% Sulfur oxides calculated based on weight percent sulfur content of JP-8 in 2018 USAF Mobile Sources Guide
SOx Emission Factor EF = 2.14

SOx equation from Air Emissions Inventory Guidance Document for Mobile Sources at Air force Installations (revised August 2018)

JP-8 density = 6.885 lb/gal (based on analyzed value listed in Summary Table for JP-8, Petroleum Quality Infromation System 2013 Annual Report
JP-8 HHV= 0.135 MMBtu/gal default HHV from Table 2 of Federal GHG Accounting and Reporting Guidance, CEQ (2012)
75.2 kg CO2/MMBtu emission factor from Table 2 of Federal GHG Accounting and Reporting Guidance, CEQ (2012)
3.251 lb CO2/lb fuel burned

A/B Departure

Point	Distance	Height	Speed, kts	Power % ETR	
a	0	0	0	50	
b	3000	0	170	150	AB
c	8000	200	300	100	
CD	17714	3000	300	100	
d	42000	10000	300	100	

	CO2	CO	NOx	HC	SO2	PM	PM2.5
Emissions in lb for AB Departure:	**2463.44**	**10.40**	**7.64**	**0.1162**	**1.63**	**0.76**	**0.68**

506B **MIL Departure**

Point	Distance	Height	Speed, kts	Power % ETR
a	0	0	0	50
b	3500	0	155	100
c	8000	200	220	100
d	12820	700	300	100
DE	20531	3000	300	100
e	44000	10000	300	100

Emissions in lb for MIL Departure:	**1288.98**	**0.15**	**9.63**	**0.001**	**0.85**	**0.05**	**0.05**

Straight In Arrival

Point	Distance	Height	Speed, kts	Power % ETR
d	53509	3000	250	30
e	30783	1800	180	40
f	6076	300	180	40
g	0	50	175	40

Emissions in lb for Straight In Arrival1:	**1267.68**	**0.40**	**3.96**	**0.01**	**0.84**	**0.04**	**0.04**

Pitch Out Arrival 1

Point	Distance	Height	Speed, kts	Power % ETR
b	115,091	3000	300	15
c	68144	1421	300	35
d	33717	1121	300	35
e	24791	1121	300	35
f	22020	1121	210	35
g	18075	1121	200	40
h	16028	1121	200	40
i	6080	420	180	40
j	0	50	165	40

Emissions in lb for Pitch Out Arrival1:	**1721.61**	**0.66**	**4.82**	**0.02**	**1.14**	**0.06**	**0.05**

Pitch Out Arrival 2

Point	Distance	Height	Speed, kts	Power % ETR
b	115,091	3000	300	35
c	83541	1620	300	35
d	40159	1620	300	35
e	29101	1620	300	35
f	23591	1620	210	35
g	18726	1620	200	40
h	15490	1270	200	40
i	5916	420	180	40
j	0	50	165	40

Emissions in lb for Pitch Out Arrival2:	**1940.35**	**0.64**	**5.82**	**0.02**	**1.28**	**0.07**	**0.06**

Pitch Out Arrival 3

Point	Distance	Height	Speed, kts	Power % ETR
b	115,091	3000	300	35
c	59983	1620	300	35
d	30550	1620	300	35
e	21560	1620	300	35
f	19140	1620	210	35
g	16775	1620	200	40
h	15340	1270	200	40
i	6080	420	180	40
j	0	50	165	40

Emissions in lb for Pitch Out Arrival3:	**1896.73**	**0.63**	**5.65**	**0.02**	**1.26**	**0.07**	**0.06**

VFR Touch and Go

Point	Distance	Height	Speed, kts	Power % ETR
a	0	50	175	40
b	2880	10	170	100
c	8000	140	260	35
d	9127	220	300	35
e	10235	350	300	35
f	13534	1100	215	55
g	17017	1620	210	55
h	18333	1620	210	55
i	19806	1620	210	40
j	25533	1620	210	40
k	32236	1620	210	40
l	33623	1400	210	40
m	42666	350	190	40
n	48705	50	175	40

Emissions in lb for VFR Touch and Go:	**611.60**	**0.14**	**2.69**	**0.00**	**0.40**	**0.02**	**0.02**

GCA Box

Point	Distance	Height	Speed, kts	Power % ETR
a	0	50	165	40
b	1817	10	145	100
c	6562	300	225	100
d	11500	1050	250	25
e	17760	1720	250	25
f	20000	1720	250	30
g	30966	1720	250	25
h	48137	1720	250	30
i	59451	1720	250	25
j	137016	1720	250	30
k	146230	1720	225	25
l	159235	1720	225	30
m	165750	1720	225	30
n	181408	1720	225	30
o	193118	1720	190	40
p	213617	800	175	40
q	228091	50	175	40

Emission Indices, lb/1000 lb

Emissions (lbs)

Emissions in lb for GCA Box:	**2044.46**	**1.04**	**4.47**	**0.04**	**1.35**	**0.07**	**0.06**

Table 2. Operations for F-35A 6 aircraft

[1]Type of Operation	[2]Total Number of Operations	Emissions in lb per operation							Annual Emissions						
		[5]HC	[5]CO	[5]NOx	[5,6]SO2	[5]PM10	[5]PM2.5	[4]CO2	HC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO2 lb
[3]Idle/Taxi Out	3,061	0.00	0.14	0.35	0.08	0.00	0.00	121.81	11.25	433.68	1,060.32	246.74	13.02	13.02	372,858
A/B Departure	153	0.12	10.40	7.64	1.63	0.76	0.76	2,463	17.77	1,591.82	1,169.13	249.42	115.67	115.67	376,906
MIL Departure	2,908	0.00	0.15	9.63	0.85	0.05	0.05	1,289	3.23	437.38	28,014.23	2,480.45	157.33	157.33	3,748,348
Straight In Arrival	918	0.01	0.40	3.96	0.84	0.04	0.04	1,268	9.74	366.50	3,638.30	770.34	40.42	40.42	1,164,106
Pitch Out Arrival 1	714	0.02	0.66	4.82	1.14	0.06	0.05	1,722	15.78	472.79	3,439.47	813.70	42.66	42.66	1,229,628
Pitch Out Arrival 2	714	0.02	0.64	5.82	1.28	0.07	0.06	1,940	12.90	456.16	4,153.25	917.08	48.05	48.05	1,385,857
Pitch Out Arrival 3	714	0.02	0.63	5.65	1.26	0.07	0.06	1,897	12.79	448.76	4,035.42	896.47	46.97	46.97	1,354,702
Touch and Gos	562	0.00	0.14	2.69	0.40	0.02	0.02	612	1.33	79.70	1,510.52	227.29	12.39	12.39	343,472
GCA Box Pattern	62	0.04	1.04	4.47	1.35	0.07	0.07	2,044	2.65	64.59	279.07	84.42	4.44	4.44	127,575
[3]Idle/Taxi In	3061	0.00	0.15	0.23	0.07	0.00	0.00	99	12.86	450.81	700.09	201.46	10.56	10.56	304,439
Hot Refuel	1	0.00	0.04	0.00	0.00	0.00	0.00	7	0.00	0.04	0.00	0.00	0.00	0.00	7
								Total in Tons/Year	**0.05**	**2.40**	**24.00**	**3.44**	**0.25**	**0.25**	**5,204**

Table 3. F-35A Aircraft Engine Maintenance Runs

	HC	CO	NOx	SO2	PM	PM2.5	CO2e
Total in Tons/Year	**0.326**	**8.030**	**36.010**	**10.767**	**0.562**	**0.506**	**16,270**

Table 4. Aircraft Summary

Emissions in Tons Per Year						
VOC	CO	NOx	SO2	PM	PM2.5	CO2e
0.43	10.43	60.01	14.21	0.81	0.75	21,474

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187 FW

RECORD OF AIR ANALYSIS (ROAA)

1. General Information: Emissions were derived manually using installation-specific data and through the Air Force's Air Conformity Applicability Model (ACAM) to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, Air Quality Compliance And Resource Management; the Environmental Impact Analysis Process (EIAP, 32 Code of Federal Regulations [CFR] 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the analysis.

a. Action Location:

Base: 187th Fighter Wing Installation
State: Alabama
County(s): Montgomery
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: USAF F-35A Operational Beddown - Air National Guard

c. Project Number/s (if applicable):

d. Projected Action Start Date: 2020

e. Action Description:

The United States Air Force (USAF) is proposing to beddown F-35A aircraft at two of five alternative Air National Guard (ANG) locations. The F-35A would replace the existing F-15, F-16, or A-10 fighter attack aircraft at the two selected installations. This action would involve the beddown of one F-35A squadron consisting of 18 Primary Aircraft Authorized (PAA) with 2 Backup Aircraft Inventory at each of the two selected locations, thereby establishing two F-35A operational locations. Five alternative ANG locations (Figure 1.1-1) are being considered for this beddown:

- 187th Fighter Wing (187 FW) at Montgomery Regional Airport, Montgomery, Alabama

- 125th Fighter Wing (125 FW) at Jacksonville International Airport (IAP), Jacksonville, Florida

- 115th Fighter Wing (115 FW) at Dane County Regional Airport, Madison, Wisconsin

- 124th Fighter Wing (124 FW) at Boise Air Terminal (Boise Airport), Boise, Idaho

- 127th Wing (127 WG) at Selfridge Air National Guard Base (ANGB), Michigan

f. Point of Contact:

Name: Lesley Hamilton
Title: Sr Associate
Organization: Cardno
Email:
Phone Number:

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total combined direct and indirect emissions associated with the action were estimated manually with installation-specific input on flight operations data and flight profiles and through ACAM for construction, aerospace ground

equipment, and personnel on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. Potential impacts to air quality are evaluated with respect to the extent, context, and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. The Council on Environmental Quality (CEQ) defines significance in terms of context and intensity in 40 CFR 1508.27. This requires that the significance of an action be analyzed in respect to the setting of the action and based relative to the severity of the impact. For attainment area criteria pollutants, the project air quality analysis uses the United States Environmental Protection Agency's Prevention of Significant Deterioration (PSD) permitting threshold of 250 tons per year as an initial indicator of the local significance of potential impacts to air quality. It is important to note that these indicators only provide a clue to the potential impacts to air quality. In the context of criteria pollutants for which the proposed project region is in attainment of a National Ambient Air Quality Standards (NAAQS), the analysis compares the annual net increase in emissions estimated for each project alternative to the 250 ton per year PSD permitting threshold. The PSD permitting threshold represents the level of potential new emissions below which a new or existing minor non-listed stationary source may acceptably emit without triggering the requirement to obtain a permit. Thus, if the intensity of any net emissions increase for a project alternative is below 250 tons per year in the context of an attainment criteria pollutant the indication is the air quality impacts will be insignificant for that pollutant. Therefore, the worst-case year emissions were compared against the 250 ton per year Indicator and are summarized below.

Analysis Summary:

Construction emissions are based on equipment operations for demolition, grading, building construction, application of architectural coatings, and materials transport.

2020 - Construction

Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.19	250	No
NOx	5.13	250	No
CO	4.57	250	No
SOx	0.01	250	No
PM 10	4.88	250	No
PM 2.5	0.25	250	No
CO2e	1,044	N/A	N/A

F-16 annual operations table represents the landings and take offs of the F-16C, along with closed patterns. Annual engine runups are also included.

RECORD OF AIR ANALYSIS (ROAA)

2017 - F-16 Annual Operations

Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	6.14	100250	No
NOx	48.08	250	No
CO	73.51	250	No
SOx	4.74	250	No
PM 10	8.20	250	No
PM 2.5	4.87	250	No
CO2e	11,760	N/A	N/A

F-35A steady state operations table represents the landings and take offs of the F-35A, along with closed patterns. Annual engine runups and additional commuting personnel are also included.

2025 - F-35A Steady State Operations

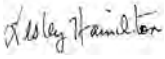
Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	6.58	250	No
NOx	80.95	250	No
CO	42.56	250	No
SOx	18.21	250	No
PM 10	2.57	250	No
PM 2.5	2.47	250	No
CO2e	26,744	N/A	N/A

The net change is the difference in emissions resulting from the proposed action to homebase the F-35A as compared to not introducing the action.

2025 Net Change

Pollutant	Action Emissions (ton/yr)	Air Quality Indicator Threshold (ton/yr)	Air Quality Indicator Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.44	250	No
NOx	32.88	250	No
CO	-30.95	250	No
SOx	13.47	250	No
PM 10	-5.62	250	No
PM 2.5	-2.40	250	No
CO2e	14,983	N/A	N/A

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.



7/2/19

Lesley Hamilton, Sr Associate — DATE

TAB B. F-16 EMISSION CALCULATIONS - DANNELLY FIELD

Table 1. F-16C Individual Profile Emission Calculations

[1,2,3] Inputs to Emissions Calculations Elevation at Dannelly = 221 ft MSL

F110-GE-100 Engines

3000 FT AGL Mixing Height

1	kilometer (km)	3,280.84	ft
1	knot =	1.852	km/h
1	knot =	101.2686	ft/min

F-16C Afterburner Departure

Point	Distance	Height	Speed, kts	Power % N2	
a	0	0	0	104	Max AB
b	2491	0	160	105	AB
c	9114	800	300	104	MIL
d	21874	2779	350	104	MIL
DE	22833	3000	350	92	Intermed
e	52255	9779	350	80	Intermed

									Emission Indices, lb/1000 lb						Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power % N2	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM**	**PM2.5**	**CO2e**
a-a	0	0	0	0	104	0.30000	18088	90.44	1.21	67.41	14.26	1.07	3.35	2.98	3214.59	0.109	6.097	1.290	0.097	0.303	0.270	290.728
a-b	2491	0	80	8101	97	0.307474406	18088	92.69	1.21	67.41	14.26	1.07	3.35	2.98	3214.59	0.112	6.248	1.322	0.099	0.311	0.276	297.971
b-c	6623	400	230	23292	104.5	0.284349291	11358	53.83	0.04	3.38	29	1.07	0.14	0.0003	3214.59	0.002	0.182	1.561	0.058	0.008	0.000	173.033
c-d	12760	1789.5	325	32912	104	0.387697093	11358	73.39	0.04	3.38	29	1.07	0.14	0.0003	3214.59	0.003	0.248	2.128	0.079	0.010	0.000	235.922
d-DE	959	2889.5	350	35444	98	0.027061601	7332	3.31	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.000	0.011	0.056	0.004	0.002	0.001	10.630
															Emissions in lb for A/B Departure:	**0.23**	**12.79**	**6.36**	**0.34**	**0.63**	**0.55**	**1008.28**

F-16C Mil Departure

Point	Distance	Height	Speed, kts	Power % N2	
a	0	0	0	103	MIL
b	3038	0	160	104	MIL
c	10937	800	300	104	MIL
d	21874	2779	350	104	MIL
DE	22833	3000	350	92	Intermed
e	52255	9779	350	80	Intermed

									Emission Indices, lb/1000 lb						Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power % N2	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
a-a	0	0	0	0	103	0.38333	11358	72.57	0.04	3.38	29	1.07	0.14	0.0003	3214.59	0.003	0.245	2.104	0.078	0.010	0.000	233.267
a-b	3038	0	80	8101	97	0.374992873	11358	70.99	0.04	3.38	29	1.07	0.14	0.0003	3214.59	0.003	0.240	2.059	0.076	0.010	0.000	228.191
b-c	7899	400	230	23292	104	0.339132576	11358	64.20	0.04	3.38	29	1.07	0.14	0.0003	3214.59	0.003	0.217	1.862	0.069	0.009	0.000	206.370
c-d	10937	1789.5	325	32912	104	0.332307453	11358	62.91	0.04	3.38	29	1.07	0.14	0.0003	3214.59	0.003	0.213	1.824	0.067	0.009	0.000	202.216
d-DE	959	2889.5	350	35444	98	0.027061601	7332	3.31	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.000	0.011	0.056	0.004	0.002	0.001	10.630
															Emissions in lb for MIL Departure:	**0.01**	**0.93**	**7.90**	**0.29**	**0.04**	**0.00**	**880.67**

F-16C IFR Arrival

Point	Distance	Height	Speed, kts	Power % N2	
a	176207	3779	250	80	Approach
AB	152541	3000	250	80	Approach
b	145827	2779	250	80	Approach
c	72913	1779	200	70	Idle
d	42533	1779	180	80	Approach
e	31596	1779	170	80	Approach
f	6076	300	160	80	Approach
g	0	30	150	70	Idle

									Emission Indices, lb/1000 lb						Emissions (lbs)						
segment	Distance	Height	Speed, kts	speed, ft/min	Power % N2	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
AB-b	6714	2889.5	250	25317	80	0.265194959	5080	22.45	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.130	0.220	0.024	0.031	0.020	72.178
b-c	72914	2279	225	22785	75	3.200026955	5080	270.94	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.008	1.563	2.650	0.290	0.371	0.247	870.947
c-d	30380	1779	190	19241	75	1.578917358	5080	133.68	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.004	0.771	1.307	0.143	0.183	0.122	429.732
d-e	10937	1779	175	17722	80	0.617142413	5080	52.25	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.002	0.301	0.511	0.056	0.072	0.048	167.967
e-f	25520	1039.5	165	16709	80	1.527291577	5080	129.31	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.004	0.746	1.265	0.138	0.177	0.118	415.681
f-g	6076	165	155	15697	75	0.387089417	5080	32.77	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.189	0.321	0.035	0.045	0.030	105.354
															Emissions in lb for IFR Arrival:	**0.02**	**3.70**	**6.27**	**0.69**	**0.88**	**0.58**	**2061.86**

F-16C SFO Arrival

Point	Distance	Height	Speed, kts	Power % N2	
a	176207	3779	350	80	Approach
AB	152541	3000	350	80	Approach
b	145827	2779	350	80	Approach
BC	142897	3000	300	75	Approach
c	72913	8279	250	70	Idle
d	60761	4279	210	70	Idle
DE	52990	3000	195	75	Approach
e	36457	279	180	80	Approach
f	29871	60	170	80	Approach
g	21697	1479	200	80	Approach
h	14672	1479	200	80	Approach
i	6076	300	160	80	Approach
j	0	30	150	70	Idle

										Emission Indices, lb/1000 lb						Emissions (lbs)					
segment	Distance	Height	Speed, kts	speed, ft/min	Power % N2	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
AB-b	6714	2889.5	350	35444	80	0.189424971	5080	16.04	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.000	0.093	0.157	0.017	0.022	0.015	51.556
b-BC	2930	2889.5	325	32912	77.5	0.089018932	5080	7.54	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.000	0.043	0.074	0.008	0.010	0.007	24.228
DE-e	16533	1639.5	187.5	18988	77.5	0.870703451	5080	73.72	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.002	0.425	0.721	0.079	0.101	0.067	236.978
e-f	6586	169.5	175	17722	80	0.371628411	5080	31.46	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.182	0.308	0.034	0.043	0.029	101.146
f-g	8174	769.5	185	18735	80	0.436302936	5080	36.94	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.213	0.361	0.040	0.051	0.034	118.748
g-h	7025	1479	200	20254	80	0.346849892	5080	29.37	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.169	0.287	0.031	0.040	0.027	94.402
h-i	8596	889.5	180	18228	80	0.471573218	5080	39.93	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.230	0.390	0.043	0.055	0.036	128.347
i-j	6076	165	155	15697	75	0.387089417	5080	32.77	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.189	0.321	0.035	0.045	0.030	105.354
														Emissions in lb for SFO Arrival:		**0.01**	**1.55**	**2.62**	**0.29**	**0.37**	**0.24**	**860.76**

F-16C Overhead Arrival

Point	Distance	Height	Speed, kts	Power % N2	
a	151903	8279	350	80	Approach
AB	83506	3000	350	80	Approach
b	63799	1479	350	80	Approach
c	15190	1479	200	80	Approach
d	6076	300	160	80	Approach
e	0	30	130	70	Idle

										Emission Indices, lb/1000 lb						Emissions (lbs)					
segment	Distance	Height	Speed, kts	speed, ft/min	Power % N2	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
AB-b	19707	2239.5	350	35444	80	0.555997852	5080	47.07	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.272	0.460	0.050	0.064	0.043	151.325
b-c	48609	1479	275	27849	80	1.745457279	5080	147.78	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.004	0.853	1.445	0.158	0.202	0.134	475.059
c-d	9114	889.5	180	18228	80	0.499990497	5080	42.33	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.244	0.414	0.045	0.058	0.039	136.082
d-e	6076	165	145	14684	75	0.413785239	5080	35.03	0.03	5.77	9.78	1.07	1.37	0.91	3214.59	0.001	0.202	0.343	0.037	0.048	0.032	112.619
														Emissions in lb for Overhead Arrival:		**0.01**	**1.57**	**2.66**	**0.29**	**0.37**	**0.25**	**875.08**

F-16C VFR Pattern

Point	Distance	Height	Speed, kts	Power % N2	
a	0	30	130	70	Intermed
b	729	10	160	104	MIL
c	10937	800	300	104	MIL
d	18340	1479	300	104	MIL
e	42541	1479	250	80	Intermed
f	51649	300	160	80	Intermed
g	57975	30	150	70	Approach

										Emission Indices, lb/1000 lb						Emissions (lbs)					
segment	Distance	Height	Speed, kts	speed, ft/min	Power % N2	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
a-b	729	20	145	14684	87	0.04965	7332	6.07	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.000	0.021	0.103	0.006	0.004	0.002	19.502
b-c	10208	405	230	23292	104	0.43827	11358	82.96	0.04	3.38	29	1.07	0.14	0.0003	3214.59	0.003	0.280	2.406	0.089	0.012	0.000	266.695
c-d	7403	1139.5	300	30381	104	0.24368	11358	46.13	0.04	3.38	29	1.07	0.14	0.0003	3214.59	0.002	0.156	1.338	0.049	0.006	0.000	148.282
d-e	24201	1479	275	27849	92	0.86901	7332	106.19	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.005	0.368	1.797	0.114	0.062	0.044	341.368
e-f	9108	889.5	205	20760	80	0.43873	7332	53.61	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.003	0.186	0.907	0.057	0.031	0.022	172.342
f-g	6326	165	155	15697	75	0.40302	7332	49.25	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.002	0.171	0.833	0.053	0.029	0.020	158.314
														Emissions in lb for VFR Pattern:		**0.02**	**1.18**	**7.38**	**0.37**	**0.14**	**0.09**	**1106.50**

F-16C IFR Pattern

Point	Distance	Height	Speed, kts	Power % N2	
a	0	30	130	70	Intermed
b	729	10	160	104	MIL
c	10937	800	300	104	MIL
d	18340	1479	300	104	MIL
e	36655	1479	350	104	MIL
f	170251	1479	300	80	Intermed
g	221997	1479	250	80	Intermed
h	281810	1479	250	80	Intermed
i	313008	30	150	70	Approach

										Emission Indices, lb/1000 lb						Emissions (lbs)					
segment	Distance	Height	Speed, kts	speed, ft/min	Power % N2	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM	EIPM2.5	EICO2	**HC**	**CO**	**NOx**	**SO2**	**PM**	**PM2.5**	**CO2**
a-b	729	20	145	14684	87	0.049646056	7332	6.07	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.000	0.021	0.103	0.006	0.004	0.002	19.502
b-c	10208	405	230	23292	104	0.438266279	11358	82.96	0.04	3.38	29	1.07	0.14	0.0003	3214.59	0.003	0.280	2.406	0.089	0.012	0.000	266.695
c-d	7403	1139.5	300	30381	104	0.243675421	11358	46.13	0.04	3.38	29	1.07	0.14	0.0003	3214.59	0.002	0.156	1.338	0.049	0.006	0.000	148.282
d-e	18315	1479	325	32912	104	0.556479016	11358	105.34	0.04	3.38	29	1.07	0.14	0.0003	3214.59	0.004	0.356	3.055	0.113	0.015	0.000	338.630
e-f	133596	1479	325	32912	92	4.059152098	11358	768.40	0.04	3.38	29	1.07	0.14	0.0003	3214.59	0.031	2.597	22.284	0.822	0.108	0.000	2470.083
f-g	51746	1479	275	27849	80	1.858101017	7332	227.06	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.011	0.788	3.842	0.243	0.132	0.093	729.905
g-h	59813	1479	250	25317	80	2.362548907	7332	288.70	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.014	1.002	4.885	0.309	0.167	0.118	928.063
h-i	31198	754.5	200	20254	75	1.540359136	7332	188.23	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.009	0.653	3.185	0.201	0.109	0.077	605.088
														Emissions in lb for IFR Pattern:		**0.08**	**5.85**	**41.10**	**1.83**	**0.55**	**0.29**	**5506.25**

Start/Taxi/Idle

					Emission Indices, lb/1000 lb					Emissions (lbs)							
segment	Power (%)	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**
[a]Start/Taxi Out	3	35	1111	648.08	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	0.143	15.625	2.443	0.693	1.685	0.726	2083.322

Taxi In/Shut Off

					Emission Indices, lb/1000 lb					Emissions (lbs)							
segment	Power (%)	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	**HC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2e**

segment	Power (%)	Time (min)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	HC	CO	NOx	SO2	PM10	PM2.5	CO2e
[4]Taxi to Shut Off	3	10	1111	185.17	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	0.041	4.464	0.698	0.198	0.481	0.207	595.235
	Power (%)				EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	HC	CO	NOx	SO2	PM10	PM2.5	CO2e
[4]Hot Refueling	3	1200	1111	22220.00	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	4.888	535.724	83.769	23.775	57.772	24.886	71428.190

[1]F-16 Flight Profile Maps, Dannelly Field, Cardno 2019
[2]*Dannelly_20190329_MASTER_PHK - Flight OperationsOPSCHECK.xlsx*
for Air Force Mobile
[4]Data from installation, May 2019

Table 2. Current F-16C Operations

Type of Operation	Total Number of Operations	Emissions in lbs/op							Annual Emissions						
		HC	CO	NOx	SO2	PM10	PM2.5	CO2e	HC tons/year	CO tons/year	NOx tons/year	SO2 tons/year	PM10 tons/year	PM2.5 tons/year	CO2e tons/year
Taxi/Idle Out	3,076	0.143	15.625	2.443	0.693	1.685	0.726	2083.322	0.22	24.03	3.76	1.07	2.59	1.12	3,204
A/B Departure	1,846	0.227	12.786	6.357	0.336	0.633	0.547	1008.284	0.21	11.80	5.87	0.31	0.58	0.50	930
MIL Departure	1,230	0.011	0.926	7.905	0.293	0.040	0.001	880.674	0.01	0.57	4.86	0.18	0.02	0.00	542
IFR Arrival	327	0.019	3.701	6.273	0.686	0.879	0.584	2061.858	0.00	0.60	1.02	0.11	0.14	0.10	337
SFO Arrival	80	0.008	1.545	2.619	0.287	0.367	0.244	860.758	0.00	0.06	0.10	0.01	0.01	0.01	34
Overhead Arrival	2,669	0.008	1.571	2.662	0.291	0.373	0.248	875.085	0.01	2.10	3.55	0.39	0.50	0.33	1,168
VFR Pattern	787	0.016	1.183	7.384	0.368	0.143	0.088	1106.503	0.01	0.47	2.90	0.14	0.06	0.03	435
IFR Pattern	87	0.076	5.853	41.096	1.833	0.552	0.291	5506.247	0.00	0.26	1.80	0.08	0.02	0.01	241
Taxi/Idle In	3,076	0.041	4.464	0.698	0.198	0.481	0.207	595.235	0.06	6.87	1.07	0.30	0.74	0.32	915
Hot Refuel	1	4.888	535.724	83.769	23.775	57.772	24.886	71428.190	0.00	0.27	0.04	0.01	0.03	0.01	36
								Total in Tons/Year	**0.52**	**47.02**	**24.98**	**2.61**	**4.71**	**2.44**	**7,842.49**

Table 3. F-16C Aircraft Engine Maintenance Runups

Aircraft	Location Name	Single Engine Operations					Emissions in lbs/1000 lbs fuel							Emissions (lbs)						
		Annual	Power Setting Reported	Duration (hr)	FFR, lb/hr	Fuel Use lb	EIHC	EICO	EINOx	EISO2	EIPM10	EIPM2.5	EICO2e	HC	CO	NOx	SO2	PM10	PM2.5	CO2e
F-16C	F16-MaxHH	15.99	Idle	0.23333333	1127	4204.05	3.79	49.58	4.64	1.07	3.13	2.82	3214.59	15.93	208.44	19.51	4.50	13.16	11.86	13,514.29
			Afterburner	0.08333333	54007	71950.83	0.13	9.57	6.62	1.07	0.87	0.78	3214.59	9.35	688.57	476.31	76.99	62.60	56.12	231,292.40
			Afterburner	0.08333333	54007	71950.83	0.22	24.11	3.77	1.07	2.60	1.12	3214.59	15.83	1734.73	271.25	76.99	187.07	80.58	231,292.40
			Afterburner	0.08333333	54007	71950.83	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	3.60	249.67	1217.41	76.99	41.73	29.50	231,292.40
			Afterburner	0.1	54007	86340.99	0.22	24.11	3.77	1.07	2.60	1.12	3214.59	19.00	2081.68	325.51	92.38	224.49	96.70	277,550.89
			Afterburner	0.3	54007	259022.97	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	12.95	898.81	4382.67	277.15	150.23	106.20	832,652.66
			Afterburner	0.01666667	54007	14390.17	0.22	24.11	3.77	1.07	2.60	1.12	3214.59	3.17	346.95	54.25	15.40	37.41	16.12	46,258.48
			Afterburner	0.1	54007	86340.99	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	4.32	299.60	1460.89	92.38	50.08	35.40	277,550.89
			Afterburner	0.1	54007	86340.99	0.22	24.11	3.77	1.07	2.60	1.12	3214.59	19.00	2081.68	325.51	92.38	224.49	96.70	277,550.89
			Afterburner	0.15	54007	129511.49	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	6.48	449.40	2191.33	138.58	75.12	53.10	416,326.33
			Afterburner	0.01666667	54007	14390.17	0.22	24.11	3.77	1.07	2.60	1.12	3214.59	3.17	346.95	54.25	15.40	37.41	16.12	46,258.48
			Afterburner	0.01666667	54007	14390.17	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	3.17	346.95	54.25	15.40	37.41	16.12	46,258.48
	Park 1 - Oil1	61.17	Idle	0.08333333	1111	5663.69	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	1.25	136.55	21.35	6.06	14.73	6.34	18,206.45
			Intermediate	0.0125	7332	5606.60	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.28	19.45	94.86	6.00	3.25	2.30	18,022.91
			Idle	0.30416667	1111	20672.48	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	4.55	498.41	77.94	22.12	53.75	23.15	66,453.54
	Park 1 - Pre1	1230.05	Idle	0.25	1111	341646.39	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	75.16	8237.09	1288.01	365.56	888.28	382.64	1,098,253.06
	Park 1 - Idle Run	61.17	Idle	0.46666667	1111	31716.68	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	6.98	764.69	119.57	33.94	82.46	35.52	101,956.12
	Park 2 - Oil2	15.29	Idle	0.08333333	1111	1415.75	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	0.31	34.13	5.34	1.51	3.68	1.59	4,551.07
			Intermediate	0.0125	7332	1401.48	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.07	4.86	23.71	1.50	0.81	0.57	4,505.19
			Idle	0.30416667	1111	5167.50	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	1.14	124.59	19.48	5.53	13.44	5.79	16,611.40
	Park 2 - Pre2	307.59	Idle	0.25	1111	85431.87	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	18.80	2059.76	322.08	91.41	222.12	95.68	274,628.44
	Park 2 - Idle Run	15.29	Idle	0.46666667	1111	7929.17	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	1.74	191.17	29.89	8.48	20.62	8.88	25,489.03
	Park 3 - Oil3	61.17	Idle	0.08333333	1111	5663.69	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	1.25	136.55	21.35	6.06	14.73	6.34	18,206.45
			Intermediate	0.0125	7332	5606.60	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.28	19.45	94.86	6.00	3.25	2.30	18,022.91
			Idle	0.30416667	1111	20672.48	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	4.55	498.41	77.94	22.12	53.75	23.15	66,453.54
	Park 3 - Pre3	1230.05	Idle	0.25	1111	341646.39	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	75.16	8237.09	1288.01	365.56	888.28	382.64	1,098,253.06
	Park 3 - Idle Run	61.17	Idle	0.46666667	1111	31716.68	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	6.98	764.69	119.57	33.94	82.46	35.52	101,956.12
	Park 4 - Oil4	15.29	Idle	0.08333333	1111	1415.75	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	0.31	34.13	5.34	1.51	3.68	1.59	4,551.07
			Intermediate	0.0125	7332	1401.48	0.05	3.47	16.92	1.07	0.58	0.41	3214.59	0.07	4.86	23.71	1.50	0.81	0.57	4,505.19
			Idle	0.30416667	1111	5167.50	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	1.14	124.59	19.48	5.53	13.44	5.79	16,611.40
	Park 4 - Pre4	307.59	Idle	0.25	1111	85431.87	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	18.80	2059.76	322.08	91.41	222.12	95.68	274,628.44
	Park 4 - Idle Run	15.29	Idle	0.46666667	1111	7929.17	0.22	24.11	3.77	1.07	2.6	1.12	3214.59	1.74	191.17	29.89	8.48	20.62	8.88	25,489.03
													Total Emissions in Tons/Year	**0.17**	**16.94**	**7.42**	**1.03**	**1.87**	**0.87**	**3092.58**

Table 4. Aircraft Summary

Emissions in Tons Per Year						
VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
0.69	63.96	32.40	3.64	6.58	3.31	10935.06

TAB B. F-35 EMISSION CALCULATIONS - Dannelly Field

Table 1. F-35 Individual Profile Emission Calculations[1,2,3]

		3000	Mixing Ht	1 kilometer	3,280.84 ft
				1 knot=	1.852 km/h
				1 knot =	101.268591 ft/min
				Elevation:	221 ft MSL

SOx % EFSOx = 20 * S where EFSOx = SOX emission factor [pounds SOX emitted per thousand
20 = Factor which is derived by converting "weight percent" into units of "lb/1000 lb" and ther
molecular weight of sulfur
S = Weight percent sulfur conte

SOx% 0.107% Sulfur oxides calculated based on weight percent sulfur content of JP-8 in 2018 USAF Mobile Sources Guide

SOx Emission Factor EF = 2.14

SOx equation from Air Emissions Inventory Guidance Document for Mobile Sources at Air force Installations (revised August 2018)

JP-8 density = 6.885 lb/gal (based on analyzed value listed in Summary Table for JP-8, Petroleum Quality Infromation System 2013 Annual Report

JP-8 HHV= 0.135 MMBtu/gal default HHV from Table 2 of Federal GHG Accounting and Reporting Guidance, CEQ (2012)

75.2 kg CO2/MMBtu emission factor from Table 2 of Federal GHG Accounting and Reporting Guidance, CEQ (2012)

3.251 lb CO2/lb fuel burned

A/B Departure

Point	Distance	Height	Speed, kts	Power % ETR	
a	0	0	0	50	
b	3000	0	170	150	AB
c	8000	200	300	100	
CD	17714	3000	300	100	
d	42000	10000	300	100	

	CO2	CO	NOx	HC	SO2	PM	PM2.5
Emissions in lb for AB Departure:	**2463.44**	**10.40**	**7.64**	**0.1162**	**1.63**	**0.76**	**0.68**

506B **MIL Departure**

Point	Distance	Height	Speed, kts	Power % ETR
a	0	0	0	50
b	3500	0	155	100
c	8000	200	220	100
d	12820	700	300	100
DE	20531	3000	300	70
e	44000	10000	300	40

Emissions in lb for MIL Departure:	**1288.98**	**0.15**	**9.63**	**0.001**	**0.85**	**0.05**	**0.05**

Straight In Arrival 1

Point	Distance	Height	Speed, kts	Power % ETR
c	145827	2779	300	15
CD	161427	3000	275	28
d	75241	1779	250	40
e	54685	1779	250	30
f	45880	1779	250	30
g	31596	1779	180	40
h	6076	300	180	40
i	0	50	175	40

Emissions in lb for Straight In Arrival1:	**2226.30**	**1.33**	**6.01**	**0.05**	**1.47**	**0.08**	**0.07**

Straight In Arrival 2

Point	Distance	Height	Speed, kts	Power % ETR
c	121520	2779	300	15
BC	131748	3000	300	15
d	75241	1779	300	40
e	62457	1779	300	30
f	45880	1779	250	30
g	31596	1779	180	40
h	0	50	175	40

Emissions in lb for Straight In Arrival2:	**2307.63**	**0.75**	**7.11**	**0.02**	**1.53**	**0.08**	**0.07**

Pitch Out Arrival 1

Point	Distance	Height	Speed, kts	Power % ETR
c	115,091	2779	300	35
CD	123951	3000	300	35
d	75000	1779	300	35
e	52000	1479	300	35
f	40355	1479	300	35
g	30811	1479	210	35
h	22000	1479	200	40
i	15620	1479	200	40
j	6076	420	180	40
k	0	50	165	40

Emissions in lb for Pitch Out Arrival1:	**2139.60**	**0.71**	**6.40**	**0.02**	**1.42**	**0.07**	**0.07**

Pitch Out Arrival 2

Point	Distance	Height	Speed, kts	Power % ETR
c	115,091	2779	300	35
CD	125940	3000	300	35
d	66000	1779	300	35
e	49000	1479	300	35
f	37317	1479	300	35
g	21804	1479	210	35
h	18700	1479	200	40

i	15620	1479	200	40
j	6076	420	180	40
k	0	50	165	40

Emissions in lb for Pitch Out Arrival2: 1056.62 0.35 3.20 0.01 0.70 0.04 0.03

Pitch Out Arrival 3

Point	Distance	Height	Speed, kts	Power % ETR
c	115,091	2779	300	35
CD	127819	3000	300	35
d	57500	1779	300	35
e	43400	1479	300	35
f	31241	1479	300	35
g	21697	1479	210	35
h	18650	1479	200	40
i	15620	1479	200	40
j	6076	420	180	40
k	0	50	165	40

Emissions in lb for Pitch Out Arrival3: 2132.73 0.71 6.34 0.02 1.41 0.07 0.07

Pitch Out Arrival 4

Point	Distance	Height	Speed, kts	Power % ETR
c	115,091	2779	300	35
CD	123598	3000	300	35
d	76598	1779	300	35
e	60000	1479	300	35
f	40355	1479	300	35
g	30811	1479	210	35
h	23200	1479	200	40
i	15620	1479	200	40
j	6076	420	180	40
k	0	50	165	40

Emissions in lb for Pitch Out Arrival 4: 2137.66 0.70 6.40 0.02 1.41 0.07 0.07

Touch and Go

Point	Distance	Height	Speed, kts	Power % ETR
a	0	50	165	40
b	763	10	145	100
c	9800	300	225	100
d	18250	1479	225	55
e	24000	1479	210	40
f	32650	1479	200	40
g	40566	1479	200	40
h	53132	420	180	40
i	57976	50	165	45

Emissions in lb for Touch and Go: 1962.25 0.43 9.77 0.01 1.30 0.07 0.07

IFR Pattern

Point	Distance	Height	Speed, kts	Power % ETR
a	0	50	165	40
b	1519	10	145	100
c	6562	300	225	100
d	12449	1050	250	25
e	20587	1779	250	25
f	38171	1779	250	30
g	169801	1779	250	40
h	221827	1779	175	40
i	281810	1779	175	40
j	313406	50	165	40

Emissions in lb for IFR Pattern: 6733.74 2.20 21.76 0.06 4.46 0.24 0.21

Table 2. Operations for F-35A

[1]Type of Operation	[2]Total Number of Operations	Emissions in lb per operation							Annual Emissions						
		[5]HC	[5]CO	[5]NOx	[5,6]SO2	[5]PM10	[5]PM2.5	[4]CO2	HC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO2 lb
[3]Idle/Taxi Out	3,061	0.22	8.36	0.96	1.00	0.05	0.05	1,507.85	670.60	25,603.67	2,942.01	3,054.31	162.53	162.53	4,615,540
A/B Departure	153	0.12	10.40	7.64	1.63	0.76	0.76	2,463	17.77	1,591.82	1,169.13	249.42	115.67	115.67	376,906
MIL Departure	2,908	0.00	0.15	9.63	0.85	0.05	0.05	1,289	3.23	437.38	28,014.23	2,480.45	157.33	157.33	3,748,348
Straight In Arrival 1	27	0.05	1.33	6.01	1.47	0.08	0.08	2,226	1.32	35.98	162.24	39.78	2.12	2.12	60,110
Straight In Arrival 2	306	0.02	0.75	7.11	1.53	0.08	0.08	2,308	6.69	230.38	2,176.70	467.28	24.45	24.45	706,135
Pitch Out Arrival 1	86	0.02	0.71	6.40	1.42	0.07	0.07	2,140	1.73	60.99	552.79	122.33	6.41	6.41	184,862
Pitch Out Arrival 2	306	0.01	0.35	3.20	0.70	0.04	0.03	1,057	2.96	105.63	980.04	213.96	11.22	11.22	323,325
Pitch Out Arrival 3	1338	0.02	0.71	6.34	1.41	0.07	0.07	2,133	27.06	947.07	8,486.61	1,888.63	98.95	98.95	2,854,017
Pitch Out Arrival 4	27	0.02	0.70	6.40	1.41	0.07	0.07	2,138	0.54	19.09	173.45	38.34	2.01	2.01	57,931
Touch and Gos	875	0.01	0.43	9.77	1.30	0.07	0.07	1,962	7.21	376.64	8,548.65	1,135.94	64.37	64.37	1,716,578
IFR Pattern	97	0.06	2.20	21.76	4.46	0.24	0.24	6,734	6.19	214.07	2,114.65	433.13	23.03	23.03	654,520
[3]Idle/Taxi In	3061	0.16	5.98	1.04	0.81	0.04	0.04	1,226	485.61	18,305.43	3,172.51	2,483.76	131.89	131.89	3,753,344
Hot Refuel	1	19.48	743.94	85.48	88.75	4.73	4.73	134,109	19.48	743.94	85.48	88.75	4.73	4.73	134,109
								Total in Tons/Year	**0.63**	**24.34**	**29.29**	**6.35**	**0.40**	**0.40**	**9,593**

Table 3. F-35A Aircraft Engine Maintenance Runs

	HC	CO	NOx	SO2	PM	PM2.5	CO2e
Total in Tons/Year	0.326	8.030	36.010	10.767	0.562	0.506	16,270

Table 4. Aircraft Summary

Emissions in Tons Per Year						
VOC	CO	NOx	SO2	PM	PM2.5	CO2e
1.09	32.37	65.30	17.11	0.96	0.91	25,863

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