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OFFICE OF THE ASSISTANT SECRETARY (ENERGY,  
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WASHINGTON, DC 20350-1000

19 March 2020

The Honorable Adam Smith Chairman  
Committee on Armed Services  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

Pursuant to Section 325 of the National Defense Authorization Act for Fiscal Year 2020 (Public Law 16-92), the Department of the Navy (DON) submits the enclosed Report to Congress on DON's Real-Time Aircraft Noise Monitoring Plan for two Navy installations on the west coast of the United States.

Similar letters have been sent to Chairman Inhofe, Chairman Shelby and Chairman Visclosky. If I can be of further assistance, please let me know.

Sincerely,

Kamig Ohannessian  
Deputy Assistant Secretary of the Navy (Environment)

Enclosure Copy

to:  
The Honorable William M. "Mac" Thornberry Ranking  
Member

**REPORT TO CONGRESS**

**ON**

**REAL TIME AIRCRAFT NOISE MONITORING  
PLAN**

**19 MARCH 2020**

**Prepared by:  
Department of the Navy  
2000 Navy Pentagon  
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The estimated cost of this report or study for the Department of Defense is approximately \$18,500 for the 2020 Fiscal Year. This includes \$3,500 in expenses and \$15,000 in DoD labor.

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# 1. Introduction

## 1.1. Aircraft Noise Monitoring

The National Defense Authorization Act (NOAA) for Fiscal Year 2020 (FY20) directed the Department of the Navy (Navy) to provide a report to the congressional defense committees not later than December 1, 2020, on the real-time sound monitoring at no fewer than two Navy installations and their outlying landing fields on the west coast.

In addition, the NOAA directed the Navy to submit its plan for real-time sound monitoring not later than 90 days after the date of enactment of the FY20 NOAA, i.e., by March 20, 2020. The Department of the Navy is submitting the plan for real time aircraft noise monitoring. This plan provides an overview of the monitoring approach, monitoring location identification, data collection and analysis.

## 1.2. FY20 NDAA Summary Language

### SEC. 325. REAL-TIME SOUND-MONITORING AT NAVY INSTALLATIONS WHERE TACTICAL FIGHTER AIRCRAFT OPERATE.

- a) *Monitoring.*--The Secretary of the Navy shall conduct real-time sound-monitoring at no fewer than two Navy installations and their associated outlying landing fields on the west coast of the United States where Navy combat coded FIA-18, EIA-18G, or F-35 aircraft are based and operate and noise contours have been developed through noise modeling. Sound monitoring under such study shall be conducted:
- 1) during times of high, medium, and low activity over the course of a 12-month period; and
  - 2) along and in the vicinity of flight paths used to approach and depart the selected installations and their outlying landing fields.
- b) *Plan for Additional Monitoring.*--Not later than 90 days after the date of the enactment of this Act, the Secretary of the Navy shall submit to the congressional defense committees a plan for real-time sound monitoring described in subsection (a) in the vicinity of training areas predominantly overflown by tactical fighter aircraft from the selected installations and outlying landing fields, including training areas that consist of real property administered by the Federal Government (including Department of Defense, Department of Interior, and Department of Agriculture), State and local governments, and privately owned land with the permission of the owner.
- c) *Report Required.*--Not later than December 1, 2020, the Secretary of the Navy shall submit to the congressional defense committees a report on the monitoring required under subsection (a). Such report shall include--
- 1) the results of such monitoring;
  - 2) a comparison of such monitoring and the noise contours previously developed with the analysis and modeling methods previously used;
  - 3) an overview of any changes to the analysis and modeling process that have been made or are being considered as a result of the findings of such monitoring; and
  - 4) any other matters that the Secretary determines appropriate.
- d) *Public Availability of Monitoring Results.*--The Secretary shall make the results of the monitoring required under subsection (a) publicly available on a website of the Department of Defense.

**Commented [LK1]:** The language in this is somewhat conflicting in that there are some points the Navy could argue they are not required to monitor in Olympic – I’ve flagged them just as FYIs. Basically, though, the monitoring plan doesn’t address b) at all.

**Commented [LK2]:** Specifies landing fields

**Commented [LK3]:** Specifies areas with noise contours (no noise maps were developed for Olympic MOA, a point that was critiqued in the SEIS).

**Commented [LK4]:** Indicates monitoring should occur for Olympic MOA – this is not addressed at all in the monitoring plan. Senator Cantwell’s press release/media articles in December support that that was intended, though.

**Commented [LK5]:** \*\*\*This could be read as results=“a report” or results=the raw data. Definitely push for the data; raw data allows independent verification (e.g., comparing with data collected by community or other noise monitoring, either around the same time or in other periods) and also re-analysis using other metrics (vs. the same old 24-hour DNL averages). Even if the data isn’t available for download, the criteria under which it can be requested/obtained should be made clear.

## 2. Aircraft Noise Monitoring Plan

### 2.1. Approach

The Navy will conduct real-time noise monitoring of aircraft-in-flight at two installations to allow comparative analysis of actual noise levels with noise modeling tools and previously modeled noise contours. To meet this objective, the Navy will collect real time aircraft sound and operational data at Naval Air Station (NAS) Whidbey Island, including Naval Outlying Landing Field (NOLF) Coupeville, Washington, and NAS Lemoore, California. The Navy will collect data during periods of high, medium, and low flight activity in increments over a 12-month period. Sound will be measured at discrete monitoring locations along and in the vicinity of departure and arrival flight paths, and also include training areas overflown by tactical fighter aircraft.

Analysis of collected real time aircraft sound and operational data will assess: 1) accuracy of the Department of Defense (DoD) aircraft noise modeling tool, and 2) accuracy of previously modeled contours at NAS Whidbey Island and NAS Lemoore. The results of the monitoring study will document monitored noise levels, provide comparisons with modeled contours developed as a part of this effort as well as with previously modeled aircraft noise contours, and address recommendations for potential revisions and improvements to the noise analysis process and tools, if applicable.

The study will include an assessment of previously developed noise contours from recent and relevant National Environmental Policy Act (NEPA) documentation or Air Installations Compatible Use Zones (AICUZ) studies as appropriate.

### 2.2. Monitoring Locations

Based upon the requirements in Sec 325 of the NOAA, the Navy selected NAS Whidbey Island (including NOLF Coupeville) and NAS Lemoore for this monitoring effort. Both installations lie on the west coast of the United States and host Navy combat coded F/A-18, E/A-180, or F-35 aircraft. These installations both have noise contours developed using standard Navy noise modeling procedures.

The Navy selected NAS Whidbey Island due to interest in the noise landscape in that area and because of its varying topography, which influences aircraft noise propagation. The Navy selected NAS Lemoore as a second location due to its high level of flight activity, flat topography, and surrounding land uses that offer minimal variability and are conducive to consistent outdoor acoustical measurements.

### 2.3. Data Collection

The Navy does not routinely monitor real-time aircraft noise due to the robust DoD-approved noise modeling tools and software available to predict aircraft noise contours for long-term planning and assessment. In the absence of a standard DoD or Navy methodology for monitoring aircraft noise, the Navy will rely on guidance outlined in the American National Standards Institute/Acoustical Society of America (ANSI/ASA) S12.9 Part 2: "Quantities and Procedures for Description and Measurement of Environmental Sound. Part 2: Measurement of Long-term, Wide Area Sound" to undertake this monitoring effort.

**Commented [LK6]:** The legislation says "at least 2", but clearly they are going with the minimum

**Commented [LK7]:** \*\*\*No sites on the Olympic Peninsula. Senator Cantwell's press release from 12-10-19 about the legislation says "It also requires the Secretary of Defense to work with the Director of the National Park Service and the Chief of the Forest Service to come up with a plan within six months for real-time noise monitoring above or adjacent to nearby public lands, including Olympic National Park, Olympic National Forest, and Ebey's Landing National Historical Reserve" However, as is, no sites are proposed for Olympic region currently.

**Commented [LK8]:** \*\*\*More clarity is needed here, and it's fairly important – does high-med-low mean hours/day of training, FCLP sessions (on Whidbey)...? Basically, what scale is being used to identify low-med-high activity, and can it be independently verified, for, by example, comparing it with the flight notifications for FCLP training, or FAA records of when the Olympic MOA is activated. (Even these two methods I've suggested would be really imperfect, but, unless the Navy make their actual training schedule available, it's all the information that is currently publicly available.) My big take-home point is, how can we know that the Navy doesn't monitor periods of very low-low-med activity and just call them low-med-high? Except of course by doing our own monitoring and showing that the ranges don't match...but way better to cut this off at the pass ahead of time.

**Commented [LK9]:** \*\*\*For the Olympic Peninsula, additional goals would be to 1) develop noise contours in and around the MOA and along transit paths, including 2) establishing the extent of the noise footprint outside of the MOA (i.e., we know there is substantial noise in at least one location outside the MOA).

**Commented [LK10]:** This interpretation of "results" is definitely not the raw data

**Commented [LK11]:** Yep, here is where they are leaning on the noise contours as a criteria for where to monitor (Olympic doesn't have contours, but that's because they didn't make them)

**Commented [LK12]:** \*\*An overarching critique: NPS Night Skies Program are international leaders in measuring noise, with dozens of highly cited publications/reports/well developed protocols. I've put some specific recommendations on methods below, but really, it is a glaring omission if they are not working in close consultation with that group to plan the monitoring. Definitely on the Peninsula, where NPS monitored 10 locations in 2010-2011 (report attached). NPS also developed protocols to monitor these specific jets at Ebey's (report attached). So not having a clear plan to incorporate their expertise is just willful ignorance (to me, it really indicates that this monitoring is a bare-minimum approach strictly geared toward validating their noise modeling, vs. an evaluation of noise impacts on the community).

The ANSI standard for measuring environmental sound recommends four 7-day monitoring periods during the seasons (winter, spring, summer, fall) to capture data in a variety of weather conditions. The 7-day monitoring periods allow for measurements during periods of high, medium, and low intensities of operational activity.

During the 7-day monitoring periods, the Navy team will place at least 10 Sound Level Meters (SLM) at pre-determined locations "along and in the vicinity of flight paths" consistent with the requirement in Section 325 of the NOAA. To the greatest extent possible, placement of the SLMs will be in locations where external sound sources (e.g., cars, trains, commercial aircraft, or construction noise) are minimal, and where the target source (military aircraft) will be the dominant source of sound to ensure accurate noise data collection. The Navy will consult with local communities and other federal agencies to place the SLMs in locations of interest/concern to the community. During collection of acoustical measurements, a team of observers will record real time air operations information including flight paths, aircraft type, and runway usage. These operational data are required for the noise modeling analysis described in section 2.4 below.

#### 2.4. Data Analysis

To assess the accuracy of the DoD aircraft noise modeling tool, actual operational data for the daily, 7-day, and combined total time periods will be used to model aircraft sound. In addition, acoustic analysts will develop predicted noise metrics, including standard single event and cumulative noise metrics. These models and predicted metrics will then be compared to the real-time monitored noise data to determine alignment and variability between the two. The Navy intends to use a statistical analysis tool to calculate probability of consistency of the models to monitored noise data.

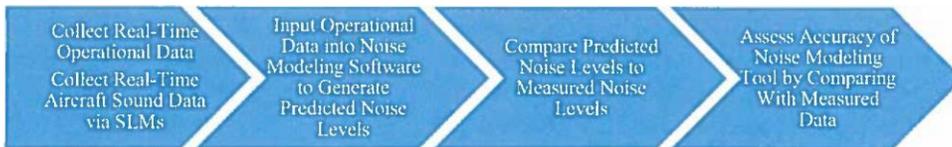


Figure 1. Process for determining the accuracy of the DoD aircraft noise modeling tool

To determine if previously modeled noise contours from NEPA or AICUZ studies at NAS Whidbey Island and NAS Lemoore accurately predicted noise levels, the Navy will statistically compare the models to the real time monitored noise data. This will allow the Navy to determine if previously modeled contours are consistent with the real time noise data collected during periods of operational activity.



Figure 2. Process for determining accuracy of previously modeled contours at NAS Whidbey and NAS Lemoore

**Commented [LK13]:** On Whidbey, using a 7-day period doesn't guarantee getting the real range of low-med-high because there are weeks where they don't fly at all; it really should be based on the FCLP training schedule and represent the low-med-high in terms of numbers of FCLP sessions per day. I have data from past schedules, which can range from (min=1 max, 6= sessions/day/airfield); however, that range was from before the Record of Decision. Still, if I know that information, the Navy definitely has it.

On the Peninsula, since they are flying most weekdays, 7 days is more reasonable. Personally, I suggest more like 10-12 to be sure and capture the low-med-high variability, but 7 days \* 4 seasonal periods isn't terrible. Again, however, it should be tied to something that can be independently verified and/or made clear how low-med-high is determined based on a training schedule or number of hours/training per day. Otherwise, they really can choose to monitor in light training weeks, and over-represent the low end. This is especially true in Olympic because – unlike the FCLP

**Commented [LK14]:** \*\*In Olympic, this needs to include audio as well as sound pressure level meters, same way NPS does; this is because the difference from ambient noise is not as big, so it's too difficult to distinguish jet activity based solely on sound pressure levels. You can make educated guesses, but – depending on the location/season – there can be a lot of wind/rain/surf that is also fairly loud. It doesn't mean you can't hear the jets through the wind/rain etc, it just means that the impact can't be picked out/measured based only on sound pressure levels (which is simply dB/second). There is no need to reinvent the wheel, the National Park Service has standard monitoring protocols (NPS always us

**Commented [LK15]:** So, NPS published an analysis of noise monitoring in five locations (Lee and MacDonald 2016, attached) in 2010-2011. However, they have monitoring data – which is both audio + sound pressure levels – for a few more locations than that, between 2010 and 2015. Replicating these sites would be a great start, in part because they are popular areas in the park, and in part because there is data to compare/build on. I have used these lists to make a quick table of 10 locations that I would prioritize for monitoring on the Peninsula and why; but really, this is a good example of why the Navy should work closely with the Park.

**Commented [LK16]:** Good. This is part of the raw data that should be public, which would allow verification using comparable protocols (i.e., could do our own monitoring that relates noise to usage)

**Commented [LK17]: Whidbey:** assuming they fully capture the low-med-high scenarios (vs. verylow-low-med), and accurately relate those to how often jets are flying, there is nothing wrong with this approach. It's strictly geared toward validating their current contours/modeling vs. monitoring impact on the community, but it's arguable that the legislation requires more than this (section c).

**\*\*\*Olympic:** There are no noise contours for Olympic (because the Navy didn't create them). So, a comparable analysis would contrast the monitoring data with their Noise Analysis (Appendix J, SEIS). That Noise Analysis was ver

### 3. Milestones and Deliverables

To meet the 12-month monitoring requirement specified in Sec 325 of the FY20 NOAA, the Navy intends to follow the timeline described below. Navy will provide an interim report on noise monitoring results in December 2020 with the final report planned for delivery in the summer of 2021.

20 Dec 2019	NOAA signed
14 Feb 2020	Monitoring SOW finalized
20 Mar 2020	Monitoring Plan due to Congress
30 Mar 2020	Contract/delivery order awarded
Apr 2020	Kickoff meetings/ initial site visits
Summer 2020	12-Month monitoring window begins
Summer 2020	▶ First 7-day monitoring period
Fall 2020	▶ Second 7-day monitoring period
Sept 2020	Initial / preliminary monitoring results
Winter 2020	▶ Third 7-day monitoring period
1 Dec 2020	Status report due to Congress
Spring 2021	▶ Fourth 7-day monitoring period
Summer 2021	Final report to Congress

**Commented [LK18]:** Their only planned input is on the locations to be monitored. After the contract is delivered it's very unlikely that changes in methods or analysis or planned products will happen; that leaves locations.

**Commented [LK19]:** Timeline for website/results/raw data available to public?

Table 1: Planned timeline of monitoring periods and report development.

### 4. Conclusion

The Navy will submit a report to the congressional defense committees on the results of the monitoring study. The report will include: (1) the results of such monitoring; (2) a comparison of such monitoring with noise contours developed as a part of this effort and with previously developed noise modeling; and (3) an overview of any changes to the analysis and modeling process that have been made or are being considered as a result of the findings of such monitoring.

**Commented [LK20]:** Is posting this report on a website the planned extent of making the results publicly available? That might meet the letter but definitely not the spirit of the law.