OUTLYING FIELD COUPEVILLE: ITS TIME HAS PASSED

An Analysis of the Arguments

Technical Committee of Citizens of Ebey's Reserve
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Outlying Field Coupeville:
Its Time Has Passed

1. Executive Summary

1.1 The Findings

In this white paper, Citizens of Ebey's Reserve (COER) examines the arguments surrounding the Navy's use of Outlying Field Coupeville (OLFC) and provides the following compelling evidence and arguments from which we conclude it is time to decommission OLFC and relocate the training:

1. The Navy claims OLFC as an ideal training location for flight carrier landing practice (FCLP). In reality, however, it fails to provide the desired for "as-you-fight" training needs: wrong density altitude, wrong runway length, wrong darkness needs, wrong wind direction, wrong amount of surrounding acreage, and wrong compliance with the Navy's own Air Installations Compatible Use Zones (AICUZ) planning document prepared to ensure community health and well-being.

2. To counter public resistance the Navy has tried to convince the Whidbey Island community that OLFC was "here first," which seems a rather desperate concoction to mask simple history. Constructed in WWII as an emergency landing strip, OLFC lay largely dormant until the late 1960s when the Navy activated it for FCLP use. Both Coupeville and the Admirals Cove development were here before the Navy imposed FCLPs on this historic town and its surrounding community.

3. The Navy never conducted an Environmental Impact Statement for its Prowlers or its Growlers, and the Environmental Assessments that were conducted used cherry-picked and manipulated data to produce the desired finding of *no significant impact*. Under that light, what credibility might be expected from the ongoing EIS?

4. The current military jets using OLFC (the EA-18G Growlers) emit unparalleled noise and yet they are conducting FCLPs at just altitudes under 500 feet, which is actually forbidden by the FAA, as codified by the U.S. Supreme Court. In so doing, they have created an undefendable civilian health risk, including both hearing and systemic impacts related to high-intensity, low-frequency sound pressure that penetrates into body organs.

5. In examining the significant health risks that the toxic Growler noise has created for exposed civilians, Dr. James Dalgren (UCLA professor on staff at Cedars Sinai Hospital) concluded that "*the Navy has created a public health emergency at Central Whidbey Island*," which he qualified as increased risk of *"more strokes, more severe strokes, strokes at a younger age, cardiovascular events such as arrhythmias, heart attacks, hypertension, psychological damage such as anxiety, depression and panic attacks, along with sleep disorders, weight gains, hearing loss, tinnitus, and in children, especially, troubling learning disorders and attention deficit disorder."*

6. For its military and civilian staff, the Navy's has required identification of "hazardous noise areas," All personnel working in such areas must be enrolled in a program that requires routine health monitoring and proper training and mandatory use of effective hearing protection devices. Residential areas under the OLFC racetrack, however, far exceed the Navy's threshold for designation of a hazardous noise zone. No such protections have been offered for the residential areas under the OLFC racetrack; instead, the Island County Health Department, adopted a resolution denying any health issues related to FCLPs, presumably because to do so was politically inconvenient.

7. The Growler's F-18 airframe is one of the most accident-prone military airframes in existence. Between 1980 and 2014 the F-18 sustained 39 incidents, while its predecessor, the EA-6B (Prowler), sustained just 7 incidents. Uncorrected for the far greater number of sorties flown by the Prowler, the F-18 airframe is minimally 5.5 times more likely to sustain an incident than the Prowler. And the most dangerous aspects of flying—approach and takeoff—occur 6000 to more than 9000 times right over the rooftops of residences within the FCLP zone.

8. Growler noise is clearly incompatible with Ebey's Landing National Historical Reserve, the first Historical Reserve in the Nation. While Growler FCLPs can be relocated, this National Park and its vulnerable structures cannot. A 2016 sound study concluded that noise in the park at 2016 levels is a problem of concern.

9. The OLFC issue can only be resolved by politicians accepting their duty responsibility to the public and applying their influence on the Navy to make them understand that the time has come decommission OLFC and move the Growler FCLP training to an environmentally appropriate location.

1.2 The Backup

Most WWII runways were deactivated years ago, but not the several miles from the historic town of Coupeville, Washington. Although constructed for small fixed-wing propeller-driven fighter planes, the Navy reactivated this 1943 landing strip in the late 1960s to mimic an aircraft carrier and provide for flight carrier landing practice (FCLP). In the intervening 50 or so years, not only have the jets evolved into the fastest and loudest jets ever operated by the Navy, but the population density in this historically rural community increased significantly without any attention to encroachment. Moreover, the current EA-18G "Growler" (F/A-18 airframe) is far more likely to crash than its predecessor, the Prowler.

The Navy normally requires at least 30,000 unsettled acres to conduct a training program like this, which is impossible in Coupeville. Instead, thanks to waivers the Navy has granted itself, coupled with permission from local policymakers, it carries on FCLP training in a 700-acre vestige of WWII. The Growler operations there currently inflict noise levels so detrimental to civilian health that one medical specialist has called it a "medical emergency." Yet the Navy and politicians have largely dismissed public concerns..

In response, Citizens of Ebey's Reserve (COER) was formed in 2012 to challenge inaction by the Navy and the long-standing political embeddedness and patronization of the Navy. COER's foremost mission is to advocate for those whose lives have been gravely impacted by the Growler FCLPs and to promote the only truly viable solution—that is, close the OLFC and relocate the Navy's FCLP needs to a welcoming 21st century location.

This white paper briefly examines the 75-year history of OLFC. Our main focus, however, is on the arguments for and against closing the field. We clearly show that OLFC's problems are significant, that the Navy continued insistence on using this outdated site defies common sense and threatens the well-being of thousands of Whidbey Island families. The time for change is overdue.

In **Section 1** we discuss historic failure of the Navy and Island County to manage this problem. For example, the Navy's 2005 analysis in its Air Installation Compatible Use Zones (AICUZ) concludes that the area surrounding OLFC is "largely rural," which is hardly an apt description of the well-populated community of Coupeville and Admirals Cove.

The AICUZ stipulates that within the 65-dB noise contour (Noise Zone 2) there should be no residences and only very restrictive other uses. Yet within that noise contour are over 1000 residential properties, a heavily used County recycle center, an Olympic-sized outdoor swimming pool at Admirals Cove, a new federally funded transit facility with above ground fuel storage tanks, Island County's Rhododendron Park for youth soccer and softball events, a newly

constructed animal shelter, and a heavily used dog park. And there was a very nice but economically failing motel that has just recently been sadly purchased as a residence for homeless youngsters that lies directly adjacent to the dangerous takeoff area, one of the loudest portions of the OLFC flightpath (110-120 dBA).

Further within the OLFC noise contours are Ebey's Landing National Historical Reserve and historic buildings, Fort Casey Sate Park, the town of Coupeville (second oldest town in Washington), the County hospital, County offices, a commercial district, Southern Pacific University Conference Center campus with outdoor swimming pool, public elementary and high schools and athletic fields for 800 youths, and a private day care facility. Categorizing all these uses as "rural" is nonsensical.

Instead of stopping development affected by the FCLP, the County issued a noise disclosure statement that is so general and so minimalist that many buyers and renters have made significant investments with almost no real understanding of the noise problem. As a result, many have been forced to relocate, generally at a loss and at considerable disruption to their lives. Even if the disclosure warnings were more informative, they would not change the reality that *the Navy's own planning guidelines stipulate that within Noise Zone 2 there should be no residences whatsoever*.

In **Section 2** we examine the Navy's logic published in its 2005 and 2012 Environmental Assessments, both producing the always "*finding of no significant impact*" (or FONSI). We point out five serious and obvious data problems in their analysis. Any one of these problems, if correctly addressed, would probably have made FONSI unsustainable. We also examine in this section, the Navy's presumed reason for advocating its continuing use of OLFC, i.e., because it is convenient.

In **Section 3** we examine the Navy's stated reasons to not relocate, such as cost, the distance of alternatives from the NASWI, and the putative quality of the local training conditions. While COER accepts some legitimacy for those arguments, we show that each is largely inaccurate, deceptive, and not supported by the facts:

- The purported need to practice at sea level matters is always raised by the Navy, but "density altitude" is what really matters because density altitude is the elevation the jet "feels" it is operating at. The density altitude at OLFC turns out to be significantly less than what pilots will experience in the Persian Gulf or in the South China Sea. Other west coast training sites, however, much more closely replicate the density altitude pilots will experience in either of those combat locations.

- Another argument—that "the Navy was here first" granting it grandfather rights—is a red herring. Coupeville and surrounding residential development preceded the field's late 1960s conversion from emergency WWII use to FCLP jet use.

- Still another argument, that the OLFC is unusually dark and thus resembles sea conditions, is also unpersuasive. The final approach is just a few hundred feet above a well-lite 600-property residential development and a few hundred exposed yards from Whidbey Island's only state travel route (SR 20).

Again, it appears that the Navy is grasping for legitimate-sounding reasons to mask a decision guided by convenience.

In **Section 4** we examine six reasons why moving FCLPs to an environmentally appropriate and welcoming venue is necessary: (1) current Navy outlying field standards are not and cannot be met at OLFC, (2) health risks imposed by Growlers are unacceptable and beyond mitigation, (3) safety risks to the surrounding population are equally unacceptable, (4) impacts on local real estate values have been severely detrimental, (5) impacts on national, state, and county parks, while harder to measure, appear to be detrimental, and (6) the Navy ultimately needs a training frequency that OLFC cannot provide. The cumulative impact of these points is that there's no sensible rationale for the Navy to continue beat the OLFC dead horse.

For example, regarding #1 above, a contemporary outlying field demands at least 30,000 acres of relatively undeveloped land to provide acceptable civilian safeguards and livability. Encompassing about 700+ acres, OLFC falls about 29,000 acres short of standard, and its 5,200-foot-long runway is nearly 3000 feet short of standard. Neither acreage nor runway length are expandable given the existing encroachment.

In 2012 there were nearly 43 Growler landing or takeoff operations at OLFC for each weekday (Monday–Friday) in the year. Given the existing development, this level of activity severely impinges on the people, communities, and ecosystems underneath the flight paths, not only putting health at risk, but also by the taking of one's property right to converse with family or guests, to conduct business, to listen to music or TV, etc. Such impingements cannot be mitigated except by moving the program.

In **Section 5** we examine alternative locations for Growler FCLP training. Although COER has long-advocated for abandoning the outdated problematic OLFC and transition to a welcoming 21st century FCLP venue, we realize this analysis is really the job of the Navy. The options we present include a wide variety of both military and non-military sites, as well as the use of flight simulators, which can exactly mirror actual landing and takeoff conditions on an aircraft carrier, not to mention significant fuel-cost savings. To date, the Navy has failed to provide a credible explanation of why relocating OLFC Growler practice is so problematic that it warrants the undefendaable impacts on civilians.

Our final conclusions are presented in **Section 6**. These conclusions, and the work undertaken by COER, represents tens of thousands of personal dollars and thousands of hours of personal time to discover the facts surrounding the impacts of the OLFC and identify the alternatives. Our determined intent through our efforts is to (1) increase public and political awareness and check the Navy's accustomed carte blanche business card to the Town of Coupeville, (2) expose the too easily hidden political pandering and mutual back-scratching tainting the only OLFC solution, and (3) ratchet back mindless propaganda like "The Sound of Freedom" (as good for you thing), the absurdity of which might be exposed this way, "The Sun is Life" (but don't look at it directly).

2. Background: Outlying Field Coupeville

Originally built and constructed as an emergency World War II landing strip, Outlying Field Coupeville (OLFC) is located about 10 nautical miles south Naval Air Station Whidbey Island (NASWI) and Ault Field at NASWI. The OLFC, at an elevation of 199 feet mean sea level, is used by NASWI jet pilots for field carrier landing practice (FCLP).

The town of Coupeville, just 2 miles northwest of OLFC, is the County seat with offices, a hospital, schools, and 1,800 residences. The Island's main north–south highway, built in 1967, runs parallel with OLFC and within a few hundred yards of the field's north end. In 2013 traffic numbers along this route were recorded by the Washington Department of Transportation at an average weekday total of 8,483 vehicles and an average daily total of 8,071. The crossing jets are so suddenly loud and low that unaware drivers, especially tourists, are often startled, creating risk of accidents and travel flow stoppage. When FCLP training is ongoing, the shoulders of this heavily traversed highway are invariably clogged with cars and people gawking at the jets bouncing a few hundred yards away, creating additional accident risks.

Public record shows that the Secretary of the Navy offered to release the OLFC to the public (Island County) years ago. Island County inaction not only failed to obtain the OLFC for the public, but also resulted in OLFC being reactivated by the Navy in 1967. But even then, Navy use was supposed to be part-time and shared with civilian use. This never materialized, even though the Port of Coupeville added OLFC to its Master Plan for future community use. This lack of interest, foresight, and action allowed OLFC to drift forward into time without thoughtful and meaningful plans other than the needs and circumstances of the moment.

As a result, NASWI now conducts FCLPs for its EA-18G Growlers at OLFC, as well as Ault Field. The Navy indicates that the OLFC operates from 0800 to 2400 hours Monday through Friday, although weekend flying is now being considered as a result of the Navy's 2012 Environmental Assessment, and FCLPs now extend beyond 2400 hours.

The single OLFC runway is approached from the northwest (path 14 on magnetic heading 137°) or from the southeast (path 32 on magnetic heading 317°). Navy guidelines for Growler use of the runway headings have called for a 50/50 split in the use of the two paths. In fact, the Wyle reports of 2004[1] and 2012, which address modeling of Growler jet noise for OLFC, are based on this 50/50 split between paths 14 and 32, even though path 14 has been reported to be

[1] Aircraft Noise Study For Naval Air Station Whidbey Island and Outlying Field Coupeville Washington, WR 04-26, Wyle, October 2004

functionally inappropriate for Growler FCLP use and is now rarely used. As a result, path 32, the far more populated path, is now used almost exclusively. Path 32 is the racetrack on the left in the schematic below.

2.1 Understanding the Problem

The number of annual aircraft operations and the type of aircraft using the airstrip has changed through the years without any long-term Navy/County plan to address how changes might impact community development around OLFC. In the late 1960s the Navy began using the field for FCLPs. The Navy handed responsibility for adjacent land uses over to Island County, which provided little oversight of development around OLFC and disregarded military land-use guidelines intended to thwart development and ensure compatibility of naval operations within the adjacent community of Coupeville. Navy guidelines were updated with changing times, but nevertheless, both the County and the Navy disregarded those guidelines, and even today development is still ongoing unabated in these high-noise, high-health, and safety-risk zones.

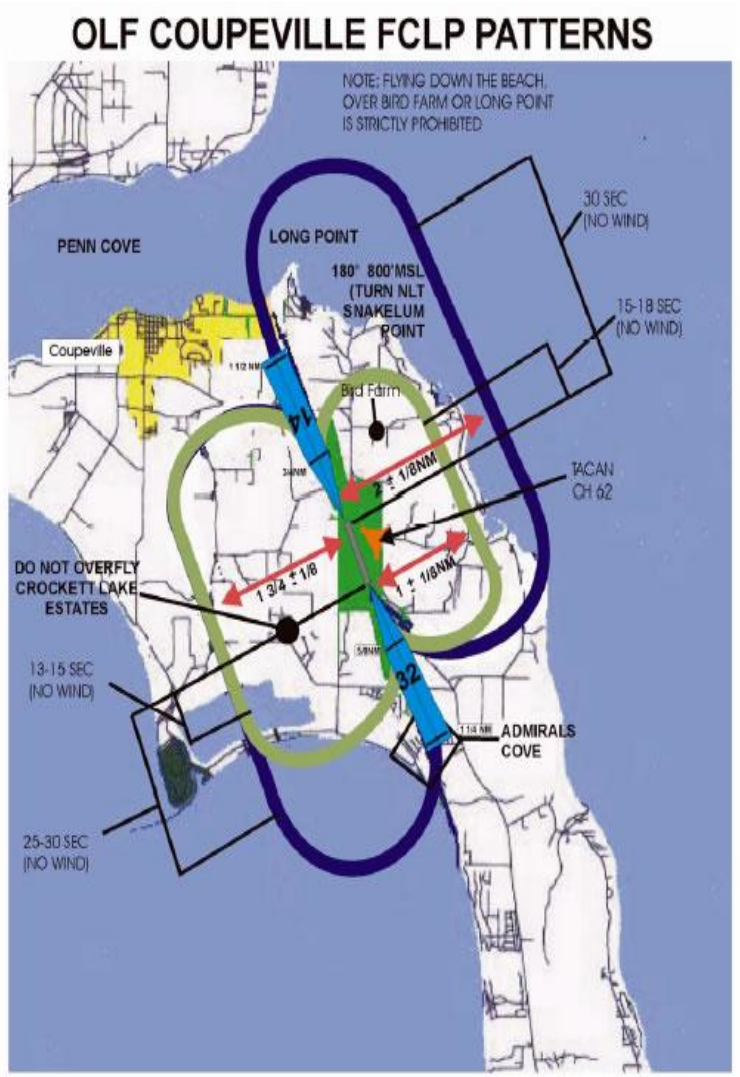

ILLUSTRATION (8)

The Growlers (F/A-18 airframe) are, to date, the loudest jets operating at OLFC and the most crash-prone airframe, i.e., the F-18, is at a minimum 5.6 times as likely to have *mishaps* than its predecessor, the Prowler (see section 4.3). And, according to the Navy's 2005 Air Installations Compatible Use Zones (AICUZ)

during landing approach the Growler is about 165% of the Prowler loudness and during takeoff is about 140% of Prowler loudness. At OLFC, the FCLP takeoffs and landings are over the most populous areas of the two racetrack paths (14 and 32). In 2012 there were nearly 43 Growler operations (1 landing + 1 takeoff = 2 operations) at OLFC for each weekday (Monday–Friday) of the year.

In addressing the transition to Growler use of OLFC, the Navy's 2005 AICUZ study mentions four objectives. One of these is "to coordinate with federal, state, and local officials to encourage compatible land use development around the air installation." This objective, in the face of adjacent development that continues unabated today, was never seriously addressed by the Navy or Island County. In its eagerness to support the Navy, Island County allowed a wide variety of incompatible land uses, including residential development, schools, government installations, businesses, and public facilities, as well as local, state, and federal parks.

The world today, however, is no longer that of the 1960s. Military jets have advanced and become significantly louder, and the public is better informed of the encroachment and less tolerant. Island County's failure to act responsibly and prevent development around OLFC has wound up pitting the health, safety, livability, and economic well-being of Whidbey Island citizens against the Navy and its civilian employees. The conflict has fomented factions, discord, animus, and lawsuits, and some fear that these will increase consideration of base realignment and closure (BRAC). This dissonance and friction, we believe, will certainly continue and acerbate until the obvious and inevitable conclusion is realized: That OLFC cannot coexist with a growing community hemmed in and hammered by jet noise.

COER has steadfastly maintained that the only solution is to close the OLFC and relocate the Navy's Growler FCLPs to a welcoming and environmentally insensitive area. This can be done economically now, or if unwisely delayed, then later at much greater overall cost.

2.2 Weak Environmental Assessments and Misrepresentations

Between 1971 and 2008, the Navy used the quieter EA-6B Prowler for its Airborne Electronic Attack mission and pilot landing practice at OLFC. Around 2004, the Navy began its review for replacing its NASWI-based EA-6B Prowlers with the EA-18G Growlers, a variant of the F/A-18F Super Hornet strike fighter aircraft. The EA-18G is equipped with an improved electronic weapons system compared with the EA-6B, allowing it to perform an advanced electronic attack mission.

When the Navy introduced the EA6-B Prowlers at OLFC, it initiated but never completed an Environmental Impact Statement (EIS), and officially withdrew from this process in the Federal Register in 1999. There is also a signed Navy Memorandum of Agreement from that period agreeing to study the Prowler impact on Ebey's Landing National Historical Reserve and its many historic structures, but it never followed through on its commitments.

The Navy avoided its NEPA obligations by claiming "no significant impact" from either the Prowlers or the Growlers. Not only does this conclusion strain credulity, but there is also no actual evidence record of any meaningful studies being done by the Navy to prove no significant impact of Prowler FCLPs on the environment, on historic structures, on health, on safety, or on the island's economics.

Contrary to the Navy's assertions in its 2005 Environmental Assessment (EA) that the number of flight operations at OLFC would decrease, the number actually increased significantly. For example, in 2013, operations were conducted only through May, when operations were suspended for the 11 months following the filing of COER's NEPA lawsuit. The Commander of NASWI attributed this suspension to the fact that the Navy had by May 2013 already exceeded its EA projection numbers. The Navy also exceeded the target by about 3,000 operations in 2011 and 2012.

For the Navy to complete an EIS now on a Growler transition does not satisfy the requirements of NEPA because no analysis of the 82 or so Growlers now stationed at NASWI was ever performed. In fact, no EIS was conducted on the Prowlers or on the transition from Prowlers to Growlers**.** To consider whether a 10% increase in noise is problematic while dismissing the existing 90% as a non-problem, cannot be rationally justified. A proper EIS should be examining the impact of all Growlers to be stationed at NASWI against a baseline of no jets at all (Prowlers or Growlers) and no FCLPs or other low-level operations. Nevertheless, in 2012 the Navy asserted that since an EIS was not needed in 2005, it was not needed in 2012 and was therefore free to expand FCLP training numbers at OLFC, including flights on Saturdays. Today the Navy continues to add Growler jets and squadrons at NASWI, without an EIS having been completed.

In addition, the Navy used inappropriate data to produce the 2005 EA and 2012EA "finding of no significant impact" (FONSI) for the completed transition of Prowlers to Growlers at OLFC in 2013. The following Navy data provided to Wyle for its noise study[2] disagrees with actual data obtained via the Freedom of Information Act.

[2] Aircraft Noise Study For Naval Air Station Whidbey Island and Outlying Field Coupeville Washington, WR 04-26, Wyle, October 2004

1) Wyle in both 2004 and 2012 based noise analyses on a 50:50 split-use of OLFC paths 14 and 32. However , use of path 14 has never been near 50%, but instead 5% to 25%. The Navy affirmed in the lawsuit trial record and as iterated by Judge Zilly in his decsion,[3] "*…it is apparent that flight path 14 is now rarely used for FCLP operations….*" So, path 32 has and will be used almost exclusively. Had Wyle used 90% for path 32 instead of 50% it would have increased the noise impact area over the most populous area of the racetrack and correspondingly expanded the noise contours in those areas.

2) Wyle also indicated its use of OLFC after 10 PM is 5.8% of the landing practices, and Wyle based its day-night noise level (DNL) analysis on that percentage (note: night operations drive the DNL level way up due to a 10-fold mathematical weighting penalty). However, rather than 5.8%, the actual after 10 PM operations from 2007 to 2012 averaged 24% to 63% (Table 1). So, Wyle's 2004 and 2012 DNL contours based on 5.8% night FCLPs, makes the DNL values and contours far less that had the 2007-2012 average (35%) had been used. Even in 2014, following COER's lawsuit, the Navy's night use was 18% night, or 3 times the level used by Wyle.

3) The 2005 EA and attendant 2004Wyle noise study were based on the dubious selection of a single year, 2003, to represent the number of FCLP operations over the baseline years prior to the 2005 EA. The EA stipulated that Navy plans for 2013 and beyond called for 6120 operations annually at OLFC, the so-called "*projected operations*." If the historical base of operations (the so-called "*existing condition*") was greater than the *projected* 6120, then the *projected* number of operations would be less than the *existing condition*. That, in turn, would make the *projected operations* produce less noise than the historical *existing condition*, and that would help establish no environmental impact for

[3] Citizens of Ebey's Reserve v. U. S. Navy, Quote from base commander Nortier's declaration to Judge Zilly [Citizens of Ebey's Reserve v. U. S. Navy]: "OLF Coupeville has one runway oriented generally North/South, and is called runway 32 or 3 runway 14, depending on direction of approach. The weather and winds determine the direction in which to conduct FCLPs. The local prevailing winds support runway 32 usage most of the 4 year. FCLP flight patterns for OLF Coupeville were historically used by the EA-6B and A-6 aircraft, which shared similar flight characteristics. In the past, the flight pattern for runway 14 5 was adjusted for noise abatement purposes for homes on the eastern coastal boundary. Additionally, noise abatement procedures were designed to avoid flying over Long Point and a 6 bird farm that is no longer in existence, and those procedures are still followed. Even with these modifications to the pattern, the EA-6B and A-6 could operate within acceptable parameters and use runway 14 when the meteorological conditions favored this runway. The EA-18G has a slightly different required flight profile in the FCLP pattern due to differences in weight and flight characteristics. As a result, the EA-18G cannot safely operate within the confines of the daytime runway 14 parameters currently in place. The Navy is examining runway usage and historical noise abatement procedures as part of its ongoing EA -18G Environmental Impact Study. Until that study is complete, runway 14 is rarely used for FCLPs." https://ja.scribd.com/mobile/document/267136375/2015-05-29-Declaration-of-Captain-Mike-Nortier-With-2-Appendices

the transition to Prowlers. So, the Navy selected 2003 as the base year, which at 7682 operations was the only year of the six preceding years that exceeded the 6120 *projected* operations. Had any year other than 2003 been selected for the comparison year (e.g., 2002 = 4100 operations, or 2001 = 3568, or an average of 2002-2004 = 5117), then the *existing condition* would have been lower than the 6120 *projected operations* and produced an increase in noise, rather than a decrease. No respectable statistician would establish a baseline from a single stochastic year, especially given the wide variation in annual operation totals.

However, rather than one year, the 2012 EA and 2012 Wyle noise study used a 6-year average (2005-2010), which would more fairly represent an *existing condition*. Only one problem: The FCLP operations FOIA data the Navy provided to COER (Table 1a) produces an average for those 6 years of 4206 operations (about 4700 including arrivals/departures), not 6120, or about a 1400 operations fewer than used by Wyle—a discrepancy of about 30% (1400/4700). Had COER's FOIA data been used by Wyle as the baseline existing condition, the projected DNLs produced by NOISEMAP would have been greater, and the noise contours would have been larger.

4) In 2005 the Navy asserted in their 2005 AICUZ document that on approach to touchdown Growlers are at 114 decibels (dB) at 1000 feet above ground, or 7 dB louder than Prowlers at 107 dB. But the 2012 Navy feed to Wyle somehow found that Growlers on approach were 109 dB and the Prowler was 111 dB. So, in those 7 years between 2005 and 2012, the Growlers inexplicably grew 5 dB quieter and the Prowlers grew 7 dB louder (Table 1b). Likewise, in those 7 years the departure takeoff for the Growler had become 2 db quieter, while inexplicitly the Prowler had become 2 dB louder. And the Prowler downwind leg of the FCLP at 1000 ft was 4 dB louder than the Growler in 2005, but in 2012 the Prowler was 8 dB louder. Which of those disparate Prowler vs. Growler metrics is believable, if any? Note too that Growlers, on their approach and takeoff on either path, cross the most populous portion of the racetrack, often at 200-400 feet above rooftops. By comparison, the FAA with its quieter commercial aircraft standards strictly requires no flyovers be less than 500 feet over people or homes, a rule the Navy claims it honors.

5) The well-established standards for calculating an annual 24-hour average DNL is different for airports used daily versus those used intermittently. Those used daily are to be calculated based on all 365 days of use in the year; DNLs for airstrips used intermittently are customarily based on just the "busy days" of use. If airport use is just 50 days of use per year, the DNL should be averaged over just those 50 days, not all 365 days. Averaging OLFC use over 365 days would reduce the area under each noise

contours, while use of 50 days would increase those areas. As explained by noise internationally prominent noise expert Sandy Fidell (Fidell Associates, Inc.)[4], "*DNL is, by definition, a 24 hour noise measure. Thus, DNL contours are intended to represent the aircraft noise exposure during a hypothetical, but "typical" or otherwise representative day of the year.*" FOIA data obtained by COER reveals that Navy use of OLFC is about 40 to 50 days per year, but that all 365 days of the year (not busy days) were used in calculating the annual average, artificially lowering the DNLs. As Fidell explains, "*averaging the exposure created on one night per month over a year is a pretty big stretch: 10*log(12/365) is about a 15 dB underestimate of exposure on nights when FCLP operations are conducted.*"[5]

Individually, each of those five data irregularities have a profound effect on the environmental impacts related to jet noise. Given the use of these oddly inappropriate data that led to the finding of no impact at OLFC for the Prowler–Growler transition, the 2005 and 2012 EA should have been invalidated. And it would have been had COER been able to discover these facts before the statute of limitations for court action ran out. However, the data distortions seem to violate The Data Quality Act passed through Congress in Sec. 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-554; H.R. 5658), and COER is examining that closely. See http://www.foreffectivegov.org/node/3479 .

Table 1a.—Number of jet FCLP bounces (i.e., bounces, where 1 bounce = 2 operations) at OLFC from 2007 to 2013 Numbers in brackets are the percentages of day, night, and combined bounces on path 32 (the south approach) vs. path 14 (north approach).

	Day Bounces		Night Bounces		Combined			% Night
Year	Path 14	Path 32 [%]	Path 14	Path 32 [%]	Path 14	Path 32 [%]	Total Bounces	
2005	Not available						3,529	na
2006	Not available						3,413	na

[4] President, Fidell Associates; positions held at Bolt Beranek and Newman and successor organizations: Director, Environmental Technologies Department; Manager, Environmental Research and Data Systems Department; Senior Manager; Lead Scientist; Senior Scientist; Manager, Los Angeles Computer Laboratory. Honors, Societies, Advisory positions: Acoustical Society of America (Fellow); Associate Editor, Journal of the Acoustical Society of America; U.S. Representative to International Standards Organization Technical Advisory Group on Community Response Questionnaire Standardization (ISO/TC43/SC1/WG49), and to ISO Working Group 45 on Community Response to Noise; Acoustical Society of America Representative to I-INCE Technical Study of "Metrics for Environmental Noise Assessment and Control"; Acoustical Society of America, Technical Committee; National Research Council Committee on Hearing, Bioacoustics and Biomechanics; Current or past member of the American National Standards Institute, Committee on Bioacoustics, Working Groups on Environmental Noise Measurement and Assessment and Auditory Magnitudes, and Community Response to Noise Levels; American Helicopter Society, Committee on Acoustics; IEEE Power Engineering Society, Audible Sound and Vibration Subcommittee; Design Review Group for FAA's Integrated Noise Model software; BBN Outstanding Publications Awards in1989, 1991, 1996.

[5] Noise Archive as Related to Navy Growler Use of Outlying Field Coupeville. Compiled by: Citizens of Ebey's Reserve, November 2016.

2007	709	575 [48%]	197	507 [72%]	906	1082 [64%]	1988	35
2008[a]	162	96 [37%]	0	168 [100%]	162	264 [62%]	1274[a]	na[a]
2009	565	1437 [72%]	14	630 [98%]	579	2067 [78%]	2646	24
2010	1021	1368 [57%]	256	593 [70%]	1277	1961 [61%]	3238	26
2011	686	2356 [77%]	315	1332 [69%]	1001	3688 [79%]	4689	35
2012	454	1288 [74%]	596	2496 [81%]	1050	3784 [78%]	4834	64
2013							3100[b]	
2014		2490[c]		546[c]		3036[c]	3036	18
2015	Not presently available							
2016	Not presently available							

[a] The 2008 data provided are incomplete for the day/night/combined columns; hence, those data do not total across to 1274, which is the Navy's reported totals for those years.

[b] Minimal estimate.

[c] The FOIA data did not break out the number of uses of path 14 but it was no more than one or two sessions, so for practical purposes it was very close to 100% path 32.

Table 1b.—Disagreements on Growler vs. Prowler noise levels.

Jet type	Approach @ 1000 feet (SEL, dB)		Departure @ 1000 feet (SEL, dB)		Downwind leg cruise @1000 feet (SEL, dB)	
	2005 AICUZ	2012 EA	2005 AICUZ	2012 EA	2005 AICUZ	2012 EA
Prowler	107	111 (+4)	114	116 (+2)	117	109
Growler	114	109 (–2)	117	109 (–8)	113	101

2.3 Land Use Around OLFC

Although the County and Navy have collaborated to put in place some limited easements around OLFC, it amounts to window-dressing because the encroachment has already happened and is financially entrenched. The most recent token acquisition, 54 acres on Keystone Hill, was purchased by the Navy from the town of Coupeville. Yet all easements added together amount to less than 700 acres or 2.3% of the Navy-acknowledged 30,000 acres needed for a contemporary Growler outlying field.

Instead of restricting development around the OLFC, Island County has welcomed both residential and commercial development. The County ignored proper execution of its own ordinance requiring property-buyer notification of significant jet noise, until challenged in court by owners. Even now, the County's notice does not adequately address the dangers and risks (see Section 4.4 for more details).

Furthermore, the County has not designated accident potentialzones (APZs) at the ends of the OLFC runway. Nor has the County respected the Navy's 2005 AICUZ[6] stipulation of no residences within a Noise Zone 2 area, i.e., within noise contours of 65 dB or greater (Table 6-2 in the AICUZ). In fact, county-facilitated encroachment at OLFC violates the Navy's 2005 AICUZ land-use guidelines. Yet the AICUZ dismisses its own zero-housing stipulation and tries to rationalize the encroachment by characterizing the area around OLFC as having a "largely rural nature."

Now situated within that mostly the Noise Zone 2 (that so-called "rural area"; see Figure 4-3 and Table 6-2 in the 2005 AICUZ) are over 1000 residences, a historic B&B, a heavily used County recycle center, an Olympic-sized outdoor swimming pool at Admirals Cove, a large recently constructed federally funded transit facility with above ground fuel storage tanks, Island County's Rhododendron Park for soccer and softball events, a newly constructed animal shelter, a heavily used dog park, about 4 miles of state route 20 (the main north/south highway on Whidbey Island), and working agricultural fields and livestock. And, directly adjacent to the takeoff area is a residence for up to 90 homeless youngsters—one of the loudest portions of the racetrack (110-120 dB) and directly under the dangerous takeoff/approach area, the most accident prone portions of the flightpath.

Included in OLFC flight patterns are Ebey's Landing National Historical Reserve and historic buildings, Fort Casey Sate Park and, the town of Coupeville (second oldest town in Washington), the County hospital, County offices, an assisted living facility, a commercial district, Southern Pacific University Conference Center campus with outdoor swimming pool, public elementary and high schools and athletic fields for 800 youths, and a private day care facility.

So, the AICUZ declaration of the surrounding area as having a "largely rural nature" is a disingenuous justification for disregarding its own land-use stipulations.

2.4 Navy Intransigence

As residents of Whidbey Island, we appreciate that it's a great place to live and sympathize with the Navy's desire to stay here. Continuing to use OLFC as it is doing now is the easiest alternative for the Navy. But that convenience must be weighed against the OLFC's shortfalls and problems that have exacerbated with unacceptable Growler noise and a more enlightened public concerned about the impacts.

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[6] AICUZ Study Update for Naval Air Station Whidbey Island's Ault Field and Outlying Landing Field Coupeville, Washington. Final Submission. March 2005

While COER agrees that FCLPs are an essential part of Growler pilot training, we disagree that FCLP training can only be conducted at OLFC (as addressed in Section 4). We argue that civilian rights and expectations versus the Navy's militarily training objectives at OLFC are not mutually exclusive, rather that the Navy's obstinate deflection of an alternative FCLP venue fails to reflect sound judgement or the good-neighbor policy it claims to practice.

The Navy has iteratively insisted that OLFC is essential to the NASWI; below we examine those arguments.

3. Navy Claims OLFC Is Essential

The Navy's arguments for maintaining OLFC are not without some measure of reason, but the overriding question is whether those reasons are sufficient to justify the Growler impacts on citizen health, safety, and economic well-being, let alone the negative impacts on its public image and the attendant risks of a BRAC. Given the certain reality that those serious impacts cannot be otherwise mitigated, that public outcry is not going away, and that the F-35, (a significantly louder aircraft) is programmed to replace the Growler, the Navy will ultimately be forced to transition to a realistic 21st century outlying field for NASWI. With that in mind, we examine below the efficacy of the Navy's arguments to retain its use of OLFC and whether clinging to an outdated and unsafe outlying field is sensible.

3.1 Prohibitive Cost of an Alternative OLF

The Navy is of course concerned about costs to relocate FCLPs elsewhere. Taxpayers like us are too. But is cost a justifiable concern or is it a pretense?

A single Growler costs $85-100 million. Fifteen new Growlers were funded in 2014 at a taxpayer cost approaching $1.5 billion. The cost to relocate the OLFC pales by comparison. While transition to an alternative outlying field would involve costs that would vary with the selected site, estimates are likely to be far less than the cost of one or two Growlers.

If the Navy can afford to buy 15-45 new Growlers, it seems hard to credulously argue that it costs too much to relocate Growler FCLPs to an appropriate and welcoming 21st century site, and it is not as simple as just examining the costs to relocate FCLP practice. Overlooked are the significant costs for continuing to operate OLFC: the human costs, community discord, the continuation of controversy and legal battling, and the adverse effects on the Navy's good-neighbor image and public support, perhaps provoking the risk of a BRAC (Base Realignment and Closure).

3.2 Distance and Scheduling Ease

The Navy has stated that the reasons for continuing its use of OLFC are ease of scheduling and that the distance to *anyplace* else is problematic. However, the OLFC itself requires frequent rescheduling because of unacceptable southerly wind conditions that predominate from fall through spring. For example, in 2016 there were 46 days when OLFC was scheduled for practice, and of those, practice on 15 days was cancelled (33%), mostly in the winter and early spring.

The Navy also argues it is important to have pilots practice close to home to lead a normal life with friends and family. While certainly a persuasive objective, use of some other FCLP site need not greatly impact pilots' lives. The speed of Growlers means they can reach venues 300 miles away in just minutes. Moreover, the number of FCLPs planned for OLFC translates to a few days per pilot per year, so deployment for those days to an alternative site would have a small impact. Furthermore, many civilians have to travel for their job, some extensively, yet manage to live normal lives. It is therefore hard to give this Navy argument greater weight than the costs now OLFC use imposes on thousands of families in Coupeville.

3.3 Simulation of Actual Carrier Landing Conditions

The Navy argues that OLFC is essential for simulating actual carrier landing conditions. We agree that good simulation is essential, but does OLFC actually meet that need or do inappropriate density altitude and problematic weather conditions make OLFC far less than actual *train as we fight* conditions?

The Navy states that FCLP training should be at conducted at <200 feet above sea level to simulate actual carrier landing elevation. That argument, while sounding reasonable, conveniently ignores "*density altitude*." Aircraft performance is based on *density altitude*, **not** *true altitude* above sea level. Density altitude is pressure altitude corrected for nonstandard temperature—i.e., it is a combination of barometric pressure, temperature, and humidity. Higher temperatures, altitude, and increased moisture reduce the density of the air. So, in a sense, density altitude is the altitude at which the airplane "feels" it is flying.

A reduction in air density reduces engine power, aerodynamic lift, and drag. The EA-18G flight manual cautions pilots to calculate density altitude before each takeoff. That is, because aircraft behave according to density altitude rather than actual altitude, landing or taking off during high-density altitude conditions necessarily increases approach speed and involves longer landing roll and longer takeoff roll.

Table 2 compares density altitude of four possible western U.S. sites where NASWI could conduct FCLP training and compares them to both OLFC and actual real world carrier launch conditions in the troubled South China Sea and the Persian Gulf (the two most likely areas for carrier launches to occur from). Compared to these other west coast Navy sites, the OLFC offers the worst venue for "train as we fight" conditions.

Table 2.—Density altitude comparisons at four west coast FCLP training options versus actual carrier launch conditions in the Persian Gulf and South China Sea. These examples are based on an "average day" at each location [from www.USA.com].

Location	Elevation (feet)[1]	Air Temp. (°F)	Barometric Pressure[2]	Dew Point	Density Altitude
FCLP Training at OLF Coupeville					
OLFC	200	51	29.92	35	**337**
FCLP Training Sites, U.S. West Coast					
Lemoore NAS, CA	230	62	29.92	56	**678**
Moses Lake, WA	1189	50	29.92	45	**1010**
El Centro, CA	–40	75	29.92	40	**1284**
Yakima Training Area	1370	77	29.92	43	**2963**
Actual Carrier Launch Sites					
Persian Gulf	60	88	29.92	88	**2182**
Manilla[3]	60	88.2	29.92	79	**2367**
Ho Chi Minh City[3]	60	90.3	29.92	81	**2525**

[1] Airfield elevations were taken from FAA Airfield Diagrams, and actual carrier elevations are mean sea level plus 60 feet to the flight deck.

[2] FAA "standard day" barometric pressure is 29.92.

[3]Historical climatological data was not available for the South China Sea, as bounded by Manila and Ho Chi Minh City, but weather for these two cities should closely approximate.

In addition to density altitude, wind conditions need to reflect what pilots experience when

landing on a carrier. For OLFC this is explained by the email below from Mike Welding, T CIV NAS Whidbey Island, N01P, (sent Thursday, January 09, 2014 7:16 AM to a COER member):

> *"[F]for Field Carrier Landing Practice (FCLP) operations at OLF… the pattern the pilots fly are intended to simulate as closely as possible, the approach and landing on an aircraft carrier. Aircraft carriers always have wind flowing over the deck as they sail at speeds that can approach 30 knots. At OLF, if the winds are out of the south, the best approach is from the north."*

However, at OLFC winds frequently do not reflect what pilots experience with carrier landings and takeoffs. Winds at OLFC are predominantly out of the south (7-8 months of the year) from fall through spring when southerly winds commonly exceed 5 knots. On such winds, approach and takeoff should be from the north and into the wind, which means Path 14 should be used. However, the Navy has indicated that Path 14 is can only be rarely used, as explained by base commander Nortier's declaration to Judge Zilly [Citizens of Ebey's Reserve v. U. S. Navy Citizens of Ebey's Reserve]:

> *OLF Coupeville has one runway oriented generally North/South, and is called runway 32 or runway 14, depending on direction of approach. The weather and winds determine the direction in which to conduct FCLPs. The local prevailing winds support runway 32 usage most of the year. FCLP flight patterns for OLF Coupeville were historically used by the EA-6B and A-6 aircraft, which shared similar flight characteristics. In the past, the flight pattern for runway 14 was adjusted for noise abatement purposes for homes on the eastern coastal boundary. Additionally, noise abatement procedures were designed to avoid flying over Long Point and a bird farm that is no longer in existence, and those procedures are still followed. Even with these modifications to the pattern, the EA-6B and A-6 could operate within acceptable parameters and use runway 14 when the meteorological conditions favored this runway. The EA-18G has a slightly different required flight profile in the FCLP pattern due to differences in weight and flight characteristics. As a result, the EA-18G cannot safely operate within the confines of the daytime runway 14 parameters currently in place. The Navy is examining runway usage and historical noise abatement procedures as part of its ongoing EA -18G Environmental Impact Study. Until that study is complete, runway 14 is rarely used for FCLPs.*

So, nearly all FCLPs have to be fit into Path 32 on days when the southerly winds are under 5 knots, even though jets never land with the wind on carriers. Instead they land against a 20 to 35 knot headwind, not a 5-knot tailwind. Even during the summer, when OLFC winds are generally negligible, FCLPs are rarely into any headwind. Hence, wind conditions at OLFC are generally the opposite of the carrier landing conditions.

And although the Navy claims it only conducts FCLPs at OLFC in tailwinds of less than 5 knots, Growlers have been observed on a number of occasions practicing with southerly tailwinds of up to 10 knots and on one occasion, about 15-knot tailwinds, which is patently dangerous. If a malfunction were to necessitate a full-stop landing, the ground roll would be significantly longer

with a tailwind (1.5% per knot). Because the OLFC landing strip is only 5400 feet long, an aircraft could continue off the end of the runway. This could result in loss of the aircraft and crew and civilian residences, as well as endanger traffic on the three adjacent roadways and crowds that park unsafely along those roads to watch the FCLPs.

COER agrees that our pilots should have the best possible training, and the Navy should surely agree that it would be well worth the small added cost to provide a training site that actually provides realistic carrier landing and takeoff conditions.

3.4 Need for Dark Conditions

The Navy seeks a dark location for night FCLPs because when taking off and landing on carriers pilots must often do so in the dark. However, OLFC provide such darkness. During the final 20-30 seconds of the approach on Path 32 pilots cross Admirals Cove at 200 to 400 feet above the relatively dense residential lighting. On the rare occasions when Path 14 is used, pilots approach over residences and then cross at 200 feet directly over state route 20[7] with its vehicle lights, the only island route linking Deception Pass and the Keystone and Port Townsend Ferries. In that area cars run parallel and within a few hundred yards of the air strip, so headlights are coming at and with the pilots during landings and takeoffs. While there is some darkness, the peripheral residential and highway lighting is surely not something pilots would experience when landing on a carrier.

3.5 Navy Here First

The often-stated contention that the "Navy was here first" misrepresents actual history; is materially irrelevant; and insults the Skagit Indians (one of four groups of Salish Indians), the European settlers, and the founding families of the historic town of Coupeville – the second oldest town in Washington State and product of the Donation Land Claim Act of 1850 that brought an influx of settlers to the region. Nevertheless, the "Navy-first" argument has become so commonly touted out that even Governor Inslee on a PBS talk show in February 2015 mentioned it as a reason to dismiss arguments against moving Growlers from OLFC. In spite of such banter, the Navy is actually a johnny-come-lately to Whidbey Island, not arriving until the 1940s, and even then, it took several decades before OLFC was adopted for Navy FCLP use.

Even Admirals Cove, a community of over 600 properties lying directly under the FCLP approach, was planned and initiated in the mid-1960s, at which time public records show the

[7] Traffic numbers along state route 20 in 2013 were recorded by the Washington Department of Transportation at an average weekday total of 8,483.

Navy was intending to release OLFC to Island County. It was even offered to the developers of Admirals Cove, but they declined, not realizing that inaction by the County would fail to obtain OLFC for public use. So, when Admirals Cove was developed, the Navy's plans for the outlying field were conversion to nonmilitary use, and even after OLFC was reactivated in 1967, the Navy's use was supposed to be part-time along with civilian use.

So no, the Navy's use of OLFC evolved and morphed in episodic stages following development of Admirals Cove and well after Coupeville was founded, and regrettably, it happened without serious attention to the Navy's own planning guide (Air Installations Compatible Use Zones Plan). The "Navy first" argument is a red herring, an unsupportable and contrived argument that diverts confronting the OLFC problem.

3.6 Buyers Were Warned

Although the Navy's 2005AICUZ stipulates the area around OLFC is not acceptable for human habitation, the County has done nothing to stop encroachment that exposes civilians to unlivable jet noise. Instead, the County adopted two jet noise disclosure forms: (1) a short cryptic sentence or two to buyers warning that military jets are in the area, and (2) a multi-paged set of noise-impact building codes for contractors. The notice to buyers fails to mention any impacts on human health, albeit it would seem that health impacts and risks to civilians, and the severe impacts on daily life should deserve as much attention as pages of building codes.

The absence of real disclosure has misled many new home buyers and renters. Take, for example, the nurse who while in South Carolina rented a home in Admirals Cove to transition to her new job on Whidbey Island. She signed the notice and a lease, having no idea how unbearable the noise would be. After a few months, she had to relocate at great personal upheaval and financial cost. She angrily quipped, "I wouldn't live here if rent was free." Her story is far from unique. Anecdotes like this ill-informed buyer are perpetual, each such story reflecting personal anguish, disruption, and cost.

Even those who are reasonably familiar with the jet noise, but never have lived under it, often have trouble fathoming the impact until it is too late and they are forced to confront whether they can live with it. Many are driven to relocate, while realtors benefit from the rollover. As a result, the overall frustration and moral indignation is deepening. Impacted residents feel duped and embittered, and their bitterness does not go away but is openly expressed in negative images of Whidbey Island and the Navy.

The Island County Health Department knows it has a noise-based health issue at OLFC. For example, the Public Health Department, for a short plat subdivision (permit SHP #343/02) in Admirals Cove, required the following statement appear on the final mylar:

> *"This short subdivision lies within AICUZ Noise Zone 2 meaning that noise levels of up to 115 decibels may be reached and the severity is such that individuals may experience adverse health effects."*

Instead of making that, and other relevant health details available to buyers, the county has it hidden away on the mylar where few if any will ever stumble into it. And even if it were publically flagged, most folks don't know what a decibel is, let alone what 65 or 115 of them means, or how long or frequent the exposure can be before damage occurs, or what the related range of impacts might be. That information and so much more should be part of the disclosure to buyers, yet it remains under the carpet. Even after COER members confronted at the health board's monthly meeting on April 19 and May 17, 2016, the board dismissed the health problem and in August passed a resolution stating there was no health issue related to Growler noise.

This refusal by the county falls so short of adequate warning and disclosure that it verges on intentional withholding that panders to business interests rather than public health. So it seems really disingenuous to argue that "buyers were warned."

3.7 Summation of Navy Reasoning

While the Navy's has iteratively insisted that OLFC is essential to the NASWI, its arguments are unconvincing. The fact that FCLPs were conducted at alternative locations from May to December of 2013 and into much of 2014 underscores that there are reasonable alternatives to the OLFC. Although OLFC is certainly a convenience for the Navy because of its handy proximity to NASWI, the price of that convenience on the greater Coupeville community falls far short of justifying OLFC's continued use.

4. COER Claims OLFC Is Not Essential

Jets are mobile and can move. Towns, hospitals, homes, historic areas, parks and schools cannot easily move – nor should they have to. Below we examine six significant reasons for closing OLFC and relocating FCLP training, and we offer solid alternatives that deserve serious study.

4.1 OLFC Status: Substandard and Inadequate

During the most recent attempt to build an outlying field in eastern North Carolina, the Navy sought 30,000 acres of relatively undeveloped land as the current-day threshold to provide

civilian safety and to prevent unreasonable encroachment. By comparison OLFC falls 29,300 acres short. At only 700 acres of land and a 5,200-foot-long runway (about 3000 feet short of Growler landing standard) OLFC can only be classified as substandard and inadequate, and, neither acreage nor runway length are expandable. In fact, the Navy had to issue itself a permanent waiver in order to continue to use the runway.

Centering a 30,000-acre mylar over a map of the OLFC area would show inclusion of three public schools, the historic town of Coupeville (approximately 2000 residents), historic farms and homes, Admirals Cove with over 600 single home properties, a National Historic Reserve, a state park, several local parks, the island's main north-south highway averaging over 8,000 vehicles per day (route 20), and much more (see Section 2.3). An inflight emergency could be catastrophic. Accident potential zones (APZs) have not been designated at either end of the runway. If APZs were designated, they would violate Navy standards, because the APZ-1 would include over 600 residential homes and businesses.

In 1987, a Navy planning document (Navy document 101) reviewed and reported the status of the OLFC for future use. It notes the depth of the concrete and below-standard length of the OLF landing strip as insufficient for new jets and increased use. The new, heavier aircraft cannot land at OLFC safely. If a jet requires an emergency landing, it would not be allowed to take off, and would need to be trucked back to NASWI in Oak Harbor. That 1987 report recommended alternatives to OLFC be investigated by the Navy because of the encroachment issue. Instead, the Navy decided to putatively "resolve" the encroachment matter and customary procedure of issuing temporary waivers by issuing itself a permanent waiver.

Another problem dogging the adequacy of the OLFC, as previously discussed, is the weather: frequent wind, fog, and major rain events. Winds for about 8 months in the year are predominantly from the south (i.e., tailwinds), which means either canceling scheduled FCLPs or making pilots land and takeoff with a tailwind, something never done on carriers (see Section 3.3). Climate change predictions for the Puget Sound area are that there will be more severe rain and wind events in the winter, which will compact FCLP training into even fewer acceptable days. Most of these unacceptable flying days will be in the winter, which will force more FCLP sessions into warm summer days, when residents want to be outside and need to have windows open. Night flights must take off later during the summer, which exacerbates the problems with late-night (10 PM to 1 AM) training including sleep loss and annoyance.

In addition, both flight paths (14 and 32) require low-level approaches over neighborhoods at altitudes under 500 feet, in some areas as low as 200-300 feet. The FAA, however, requires no flights below 500 feet over homes or people, as codified by the Supreme Court. The court has ruled that a property owner controls use of the airspace 500 feet above their property and may

make any legitimate use of their property that they want, even if it interferes with aircraft overflying the land (https://en.wikipedia.org/wiki/Air_rights). This is an FAA a rule the Navy claims to honor as explained by this Oak Ridge National Laboratory Report[8]:

> The military services are committed to safety and to minimizing the collateral noise associated with low-level flight training. The U. S. Air Force, for example, has set numerous restrictions and tailored its training to reduce noise as much as possible. The DoD in general, in addition to following its own flying rules of low-level altitudes and airspeed, also follows those in Federal Aviation Regulation 91.79 which states that no plane may fly closer than "500 ft [152 m] from any person, vessel, vehicle, or structure." (USAF Fact Sheet 96-17) In addition, because of the greater potential for human annoyance during sleeping hours, low-level flying by military fixed-wing aircraft generally occurs during daylight hours; low-level flying near densely populated areas is prohibited.

On approach to and departure from an OLFC bounce, Growlers cannot comply with this 500-foot rule, and must cross over hundreds of residence, a well-used children's athletic field, dog park, county park trail system, and crowded recycle center. It is an uncompensated taking.

4.2 OLFC Noise: Unmitigatable Impacts

4.2.1 Day-Night Noise Level

The Navy's metric of choice to evaluate noise is the day–night noise level (DNL), which is an annualized 24-hour night-weighted mean of quiet times averaged with noisy times. It is not appropriate for evaluating noise effects on human health, but it is a well-established method to evaluate *community annoyance* and to guide land-use planning, as stated in the Navy's 2005 AICUZ (pages 4-6)[9]:

> *"However, individuals do not "hear" DNL. The DNL contours are* ***intended for land use planning***, ***not to describe what someone hears when a single event occurs***. *Individual or single noise events are described in terms of the Sound Exposure Level (SEL) in units of*

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[8] *Ecological Risk Assessment Framework for Low-Altitude Overflights by Fixed-Wing and Rotary-Wing Military Aircraft.* January 2000. Rebecca A. Efroymson (Oak Ridge National Laboratory), Winifred Hodge Rose and Sarah Nemeth (U. S. Army Construction Engineering Research Laboratory), and Glenn W. Suter II (U. S. Environmental Protection Agency). Research sponsored by the Strategic Environmental Research and Development Program of the U. S. Department of Defense under Interagency Agreement 2107-N218-S1 under contract DE-AC05-00OR22725 with UT-Battelle, LLC. Publication No. 5010, Environmental Sciences Division, ORNL. https://www.researchgate.net/publication/252522677

[9] AICUZ Study Update for Naval Air Station Whidbey Island's Ault Field and Outlying Landing Field Coupeville, Washington. Final Submission. March 2005. (This study was produced by The Onyx Group of Alexandria, VA and San Diego, CA, under the direction of the NAVFAC Southwest)

> *dB* [decibels][10]. *SEL takes into account the amplitude of a sound and the length of time during which each noise event occurs. It thus provides a direct comparison of the* ***relative intrusiveness*** *among single noise events of different intensities and durations of aircraft overflights.* (emphasis added)

Most of the DNL annoyance research has been derived from studies of commercial airports, which generally have frequent daily traffic, but lower maximum sound levels than military jets. Paul Schomer (Standards Director, Emeritus, Acoustical Society of America, Schomer and Associates, Inc.), questions the unsubstantiated extension of commercial DNLs into untested and unsubstantiated military regions, producing noise so loud that hearing protection and warning signs should be required. The reason for his skepticism, as Schomer points out, is that a "*65 DNL for a year is 91 dB if it comes in one day, 140 dB in 1 second, and 170 dB in 1 ms.*" In any one of those examples, permanent hearing loss would occur, so the 65 DNL would falsely indicate no impact, which clearly shows why DNLs are useless for evaluating health impacts or humans or wildlife.

The DNL averages do not inform as to the noise magnitude, duration, or number of single hazardous noise events but attempt to characterize the overall noise experience in a 24-hour period. Indeed, as stated in USACHPPM (1998; page 28), [11] "although the DNL has been emphasized by the DoD and especially the Army as the primary noise exposure metric, this metric applies to community annoyance and is seldom related to behavioral or reproductive effects of wildlife.

However, as for its limited function as an annoyance metric, in 1992 the Federal Aviation Administration (FAA), based on a synthesis of 1978 studies, established in Regulation Part 150 that a maximum average DNL of 65 dB or above is incompatible with residential communities, and that communities in affected areas may eligible for mitigation such as soundproofing.

That 65 DNL was derived by the Federal Interagency Committee on Noise (FICON) from a dose/response curve—the Schultz Curve—showing that 13.2% of the population is highly annoyed by aircraft noise at a 65 DNL. Accepting that input from FICON, the FAA and

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[10] Noise is measured on a log scale in decibel (dB) units. Loudness is a measurement index of the sound we perceive, and hence how it affects our psyche and functionality; sound pressure intensity is the more important metric when it comes to hearing damage and pressure impacts on the body.

[11] *Ecological Risk Assessment Framework for Low-Altitude Overflights by Fixed-Wing and Rotary-Wing Military Aircraft.* January 2000. Rebecca A. Efroymson (Oak Ridge National Laboratory), Winifred Hodge Rose and Sarah Nemeth (U. S. Army Construction Engineering Research Laboratory), and Glenn W. Suter II (U. S. Environmental Protection Agency). Research sponsored by the Strategic Environmental Research and Development Program of the U. S. Department of Defense under Interagency Agreement 2107-N218-S1 under contract DE-AC05-00OR22725 with UT-Battelle, LLC. Publication No. 5010, Environmental Sciences Division, ORNL. https://www.researchgate.net/publication/252522677

Congress subsequently adopted 13.2% as the *annoyance threshold that should not be exceeded*, and 65 DNL became the standard.

The Navy's Air Installations Compatible Use Zones (AICUZ)[12] similarly adopted the 65 DNL for its land-use compatibility determinations concerning aircraft noise. The AICUZ noted the sources as the Federal Interagency Committee on Urban Noise, "Guidelines for Considering Noise In Land Use Planning and Control" (Reference (km)) as endorsed by FICON in the "Federal Agency Review of Selected Airport Noise Analysis Issues" (see section 2.b in http://www.dtic.mil/whs/directives/corres/pdf/416557p.pdf).

However, new scientific information now shows the 1978 studies and dose/response curve were flawed, invalidating the 65 DNL threshold. On March 9, 2016, the International Organization for Standardization (ISO)—an independent, non-governmental organization of 162 national standards bodies—published a revision of ISO standard on measurement and assessment of environmental noise. The revised ISO standard reflects 5 years of analysis by an ISO technical committee, which produced the new dose/response curve based on 21st century research. An American National Standards Institute (ANSI) version of the ISO standard followed, which further mirrors ISO findings and validates the ubiquitous concurrence of worldwide noise experts. That is, to be consistent with 13.2% annoyance, the correct standard needs to be reduced to 55 DNL.

The technical team's findings show that at 65 DNL, actually 28% of individuals will be highly annoyed by aircraft noise, rather than the old, erroneous prediction of 13.2%, or over twice the now invalidated dose/response curve. So, to achieve the congressional limit of 13.2%, the FAA will need to adopt 55 DNL as the new standard because Congress can no longer hold up the old standard as scientifically valid.

Aside from the Schultz curve misrepresentation, the well-established standards for calculating an annual 24-hour average DNL is different for airports used daily versus those used intermittently. Those used daily are to be calculated based on all 365 days of use in the year; DNLs for airstrips used intermittently are customarily based on just the "busy days" of use. If airport use is just 50 days of use per year, the DNL should be averaged over just those 50 days, not all 365 days. That is because the objective of the DNL is to analyze noise annoyance, the evaluation must focus on the days when the noise is occurring. If the noise occurs on just one day in the year (e.g., the 4th of July), it makes no sense whatsoever to calculate the average DNL for the year by averaging it in with the 364 other quiet days in the year because those 364 days are not relevant to understanding the annoyance level from fireworks. Likewise, by definition, the DNL relevant to evaluating jet noise annoyance can only be determined for days the jets are flying.

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[12] AICUZ Study Update for Naval Air Station Whidbey Island's Ault Field and Outlying Landing Field Coupeville, Washington. Final Submission. March 2005. (This study was produced by The Onyx Group of Alexandria, VA and San Diego, CA, under the direction of the NAVFAC Southwest)

Averaging OLFC use over 365 days reduces the area under each OLFC noise contour, while use of 50 days would increase those areas. As explained by noise internationally prominent noise expert Sandy Fidell (Fidell Associates, Inc.), "*DNL is, by definition, a 24 hour noise measure. Thus, DNL contours are intended to represent the aircraft noise exposure during a hypothetical, but "typical" or otherwise representative day of the year.*" FOIA data obtained by COER reveals that Navy use of OLFC is about 40 to 50 days per year, but that all 365 days of the year (not busy days) were used in calculating the annual average, artificially lowering the DNLs. As Fidell explains, "*averaging the exposure created on one night per month over a year is a pretty big stretch: 10*log(12/365) is about a 15 dB underestimate of exposure on nights when FCLP operations are conducted.*

4.2.2 Modelled versus On-Site Data

In 2013, COER engaged an independent noise study (JGL Noise Study[13]) to obtain actual on-site Growler noise data at OLFC (summarized in Appendix A). We commissioned the JGL study, rather than simply accept the computer-modeled data used by Wyle Labs because we believed on-site validation was critical. The Navy asserted it was not necessary; studies reveal, however, that modeled contours have failed to reflect actual on-site measurements. A study of 36 sites around Raleigh–Durham airport[14] found the modeled data consistently underestimated the actual on-site noise by 5-15 decibels; that is, the actual noise levels were roughly 50% to 150% louder than the NOISEMAP (1991–1998) and INM (1999–2002) models had indicated.

The need for on-site noise data in order to achieve accurate noise contour mapping is specified by the World Health Organization in an extensive analysis of the effects of noise on human health[15]:

> While estimates of noise emissions are needed to develop exposure maps, measurements should be undertaken to confirm the veracity of the assumptions used in the estimates…As indicated in Chapter 2 modeling is a powerful tool for the interpolation, prediction and optimization of control strategies. However, models need to be validated by monitoring

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[13] Whidbey Island Military Jet Noise Study, JGL Acoustics report to David Mann, June 10, 2013, available at http://citizensofebeysreserve.com/References/Files/JGL%20Noise%20Report.pdf)

[14] Technical Report on Preparation of Day-Night Sound Level (DNL) Contours of Aircraft Noise During 2003 Raleigh-Durham International Airport North Carolina. March 2005. HMMH Report 295097.001 . Harris Harris Miller & Hanson, Inc., 15 New England Executive Park, Burlington, MA 01803 http://198.1.119.239/~flyrduco/rduaircraftnoise/noiseinfo/downloads/RDU_2003_DNL.pdf

[15] Berglund, B., Lindvall, T. and Schwela, D.H (Eds.). 1999. HWO. Guidelines for community noise. World Health Organization, Geneva. < http://www.bvsde.paho.org/bvsci/i/fulltext/noise/noise.pdf >

> data…the accuracy of the various models available depends on many factors, including the accuracy of the source emissions data...

In a 2015 sound study at two sites in Ebey's Landing National Historical Reserve adjacent to OLFC [16], the median sound pressure level (SPL) was compared between modeled and measured on-site data. The modeled decibel levels underestimated on-site measurements at one site by 6.8 to 5.5 dB and at the other site by 11.6 to 10.2 dB. (Note that every +3 dB increase in SPL doubles sound intensity of SPL. So, +6 dB is 4 times the intensity and +9 dB is 8 times the intensity.)

4.2.3 Sound Exposure Level and Health

The DNL metric used to index annoyance is not the appropriate metric to evaluate impacts of virulent noise on health any more than the average wind speed in New Orleans throughout the year of 2004 is relevant to understanding the damage done by Hurricane Katrina. Whether wind or noise, it is exposure to hyper-intense periods that do the damage, not the benign periods.

Toxic noise produces an intertwined psychological, physical, and physiological reaction to sound, and that biological reaction includes reactions to the sound vibrations that penetrate into the entire body (just as it rattles buildings). So, to evaluate the biological complement of noise effects on health, single noise event metrics are used, such as, *sound exposure levels* (SELs), which the Navy sometimes references.

The above-mentioned independent noise study that COER commissioned (JGL Noise Study[17]) examined Growler flyover noise at five locations around OLFC while Growlers conducted FCLPs on Path 32. One site was directly under the approach over Admirals Cove and another was at a youth ballpark adjacent to and under the takeoff path. At each site about 30 Growler flyovers were recorded, and sound levels for each such flyover at all four outdoor sites were between 110 and 130+ dB.

At the ballpark/playground, where youths and parents were trying to enjoy a softball game conversation and cheers were drowned out by Growler noise of over 130 dB. In that recorded session of FCLPs, each parent and child present experienced a cumulative 2.25 minutes of noise over 100 dB or about 1 minute over what EPA has identified as a noise dose sufficient to cause permanent hearing loss (Appendix A). That is, if someone in a 24-hour period is exposed to 1.5

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[16] Ashley Pipkin, 2016. Ebey's Landing National Historical Reserve Acoustical Monitoring Report, Natural Resource Report NPS/ELBA/NRR—2016/1299. U.S. Department of the Interior, National Park Service, Natural Resource Stewardship and Science, Natural Sounds and Night Skies Division, Fort Collins, Colorado.

[17] Whidbey Island Military Jet Noise Study, JGL Acoustics report to David Mann, June 10, 2013, available at http://citizensofebeysreserve.com/References/Files/JGL%20Noise%20Report.pdf)

minutes of noise over 100 dB, the EPA indicates that individual will likely suffer some permanent hearing loss.

That ballpark session (duration = 36 minutes, flyovers = 28 or 1 flyover every 1.3 minutes) was with only two Growlers flying. Had there been four flying (about 1 flyover every 45 seconds), which often is the case, that 2.5 minutes of exposure time would have nearly doubled to 4 minutes. Noise levels were quite similar at the Admirals Cove, where kids and adults were trying to enjoy outdoor recreation, including their outdoor Olympic size swimming pool.

This is reinforced by the National Institute for Occupational Safety and Health (NIOSH). They assert that above a critical noise level, the mechanism of hearing damage changes from one based on cumulative noise exposure (i.e., the combination of magnitude and duration of sound) to a mechanism based on sound pressure intensity alone, regardless of duration (Appendix A). They estimate 115 to 120 dBA as the critical noise level at which human hearing is subject a permanent hearing threshold shift. And of course, each time this happens, each subsequent loss adds to prior loss.

The Navy has argued that the 2013 JGL noise study lacked statistical robustness because it was a stochastic one-time sample that might lack repeatability due to weather. That possibility lacks pragmatic significance because all sites were well within one mile of the jet track, which Lilly explained this way:

> *Temperature profiles, humidity, and wind all can affect the resulting sound level, but these environmental effects are insignificant unless the listener is at least a mile or more away from the source. The greater the distance, the greater the effect. Sometimes the environmental conditions will cause the noise level to increase by 10 dB (or more) and other times it might decrease the level by 10 dB (or more). Atmospheric conditions will have no impact on the areas directly below (or within a mile of) the flight patterns.* (Jerry Lilly, JGL Acoustics)

Nevertheless, to resolve the possibility that the May 2013 JGL noise sampling was atypical of routine FCLPs at OLFC, we again commissioned a second set of samples in February 2016 with repeat sampling at the two of the same sites and at two additional sites not sampled in 2013. Samples at the 2016 repeated sites produced almost identical results with the 2013 measurements, while the two new sites showed that noise was extremely consistent across the full approach path above Admirals Cove. The consistency between the two independent sampling periods is expressed by the very low standard deviation and show that the JGL measurements were reliable and valid. As explained by JGL:

> *The primary purpose for this study* [2016 study] *was to determine if there is any significant difference in the measured noise levels when compared with the data collected in 2013. …The fact that the measured change from 2013 to 2016 is less than half of the standard deviation of the maximum noise level within a single session suggests that the difference is insignificant. <JGL Acoustics>*

It is also noteworthy that the JGL documented SELs at position 1 and 6, which are under the path 32 approach over Admirals Cove. His readings are very similar to the approach SELs for Growlers stated in the 2005 AICUZ. In addition the National Park Service during 31 days in July and August 2016 conducted on-site noise recordings at a site (EBLA001) directly between JGL sites 2 and 3 under the FCLP path. The NPS reported[18] noise levels within just 5 to 7 dBA of those recorded by JGL at sites 2 and 3.

To address health issues related to the JGL noise data, COER retained a well-known environmental and occupational health physician, Dr. James Dalgren, professor at UCLA and on the staff at Cedars Sinai Hospital in Los Angeles, to review the Lilly and Wyle sound data and advise as to the attendant health risks. His conclusion in July 2014 is that "*the Navy has created a public health emergency at Central Whidbey Island*." He went on to say:

> *"If there was a poisonous gas cloud over Central Whidbey and people were falling over dead, they would know why. But because the health impacts are more gradual and cumulative most citizens do not yet know why they are suffering more strokes, more severe strokes, strokes at a younger age, cardiovascular events such as arrhythmias, heart attacks, hypertension, psychological damage such as anxiety, depression and panic attacks, along with sleep disorders, weight gains, hearing loss, tinnitus, and in children, especially, troubling learning disorders and attention deficit disorder."*

As per state and national guidelines and law addressing noise exposure, Coupeville has sustained noise levels above the "community exposure level" threshold. This is reflected in a review of the scientific literature on noise–health studies by experts at the University of Washington, which confirms that public health is a real issue of great concern under OLFC's jet shadow. All of that extensive research information has been compiled and is available at COER's website[19].

In an extensive examination of the effects of noise on human health, World Health Organization established the following noise standard maximums for dwellings.[20]

> The effects of noise in dwellings, typically, are sleep disturbance, annoyance and speech interference. For bedrooms the critical effect is sleep disturbance. Indoor guideline values for bedrooms are 30 dB LAeq for continuous noise and 45 dB LAmax for single sound events. Lower noise levels may be disturbing depending on the nature of the noise source. At night-time, outside sound levels about 1 metre from

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[18] Ashley Pipkin, 2016. Ebey's Landing National Historical Reserve Acoustical Monitoring Report, Natural Resource Report NPS/ELBA/NRR—2016/1299. U.S. Department of the Interior, National Park Service, Natural Resource Stewardship and Science, Natural Sounds and Night Skies Division, Fort Collins, Colorado.

[19] http://citizensofebeysreserve.com/Files/Community%20Aircraft%20Noise_A%20Public%20Health%20Issue.pdf

[20] Berglund, B., Lindvall, T. and Schwela, D.H (Eds.). 1999. Guidelines for community noise. World Health Organization, Geneva. < http://www.bvsde.paho.org/bvsci/i/fulltext/noise/noise.pdf >

> facades of living spaces should not exceed 45 dB LAeq, so that people may sleep with bedroom windows open. This value was obtained by assuming that the noise reduction from outside to inside with the window open is 15 dB.

The JGL (2013) report documented the levels of Growler noise inside a contemporary to-code home under the OLFC jet path. Both unweighted and A-weighted scales of the 45-minute recording of a Growler session at OLFC show that the WHO 45-dB ceiling was continuously exceeded by 25 to 45 dB on the unweighted scale and by 5 to 65 dBA on the A-weighted scale; i.e., no readings were below 45 dB throughout the 25-minute recording period.

That WHO study (Berglund, et al. 1999) also set maxima for schools and hospitals; those levels cannot be met in the Coupeville area when Growlers are practicing at OLFC: mmm

> **In Schools and Preschools**. For schools, the critical effects of noise are speech interference, disturbance of information extraction (e.g. comprehension and reading acquisition), message communication and annoyance. To be able to hear and understand spoken messages in class rooms, the background sound level should not exceed 35 dB LAeq during teaching sessions. For hearing impaired children, a still lower sound level may be needed.
>
> **In Hospitals**. Since patients have less ability to cope with stress, the LAeq level should not exceed 35 dB in most rooms in which patients are being treated or observed. Attention should be given to the sound levels in intensive care units and operating theaters. Sound inside incubators may result in health problems for neonates, including sleep disturbance, and may also lead to hearing impairment.

Haralabidis et al. (2008)[21] examined health impacts of jet noise on blood pressure (BP) and heart rate (HR) during night-time sleep in 140 subjects living near four major European airports. Excerpts from that study reveal an effect on BP (emphasis added).

> METHODS AND RESULTS:
>
> Non-invasive ambulatory BP measurements at 15 min intervals were performed. Noise was measured during the night sleeping period and recorded digitally for the identification of the source of a noise event. Exposure variables included equivalent noise level over 1 and 15 min and presence/absence of event (with LAmax > 35 dB) before each BP measurement. Random effects models for repeated measurements were applied. **An increase in BP (6.2 mmHg (0.63-12) for systolic and 7.4 mmHg (3.1, 12) for diastolic) was observed over 15 min intervals in which**

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21 Haralabidis et al., 2008: Acute effects of night-time noise exposure on blood pressure in populations living near airports. Eur Heart J. 2008 Mar;29(5):658-64.

> **an aircraft event occurred.** A non-significant increase in HR was also observed (by 5.4 b.p.m.). Less consistent effects were observed on HR. When the actual maximum noise level of an event was assessed there were no systematic differences in the effects according to the noise source.
>
> CONCLUSION:
>
> **Effects of noise exposure on elevated subsequent BP measurements were clearly shown**. The effect size of the noise level appears to be independent of the noise source.

An extensive literature analysis by the Navy indicated a number of correlations showing impacts of noise greater than 85 dBA on the developing fetus, as discussed in greater detail in Appendix A. Consequently, during pregnancy, the Navy has decided that women should not be exposed to extended periods of noise above 84 dB, as below from http://www.operationalmedicine.org/ed2/Enhanced/Pregnancy/EnvironmentalHazardsDuringPregnancy.htm :

> Pregnant women should wear hearing protection when exposed to ambient noise levels above 84dBA, including infrequent impact noise…Brief exposure (5 minutes per hour or less) of hearing-protected pregnant women to ambient noise above 84dBA in order to transit high noise areas is probably safe. Prolonged exposure to this level of noise is not recommended…Pregnant women should avoid any exposure to ambient noise greater than 104dBA (corresponding to the need for double hearing protection), unless absolutely essential for quickly moving through a high noise area. The abdominal wall muffles (attenuates) the noise only somewhat and these very noisy areas may pose significant problems for the developing fetus.

Many reproductive women live under the OLFC flight path and are exposed to levels of Growler noise that far exceed safe levels for their developing fetus.

4.2.4 Hearing Conservation Zones

If Admirals Cove and other areas under the OLFC flight path were a military installation, the area would be designated as a *hearing conservation* zone[22], and everyone living there would be required to wear significant hearing protection. A hearing conservation zone represents a "hazardous noise area" defined as those areas where the 8-hour time-weighted average exceeds 84 dBA (or 140 dB peak sound pressure level, SPL for impact or impulse noise) for more than 2 days in any month. Military and civilian personnel working in such areas are put in the Navy's

[22] Navy and Marine Corps Public Health Center Technical Manual NMCPHC – TM 6260.51.99-2. Navy Medical Department Hearing Conservation Program Procedures. Navy and Marine Corps Public Health Center, September 15, 2008. http://www.public.navy.mil/surfor/Documents/6260_51_99_2_NMCPHC_TM.pdf

Hearing Conservation Program and are identified as "at risk." The program requires frequent hearing tests and health monitoring, and according to section C1.3.2 of the program, when a permanent threshold shift (PTs)—i.e., hearing loss—is identified, the commanding officer must act to prevent further hearing loss.

Paul Schomer (Standards Director, Emeritus, Acoustical Society of America, Schomer and Associates, Inc.) analyzed the 2013 JGL study data and found, for example, that anyone at position 1(Admirals Cove community) would, in just two flying periods in a given day, accrue a noise dose equal to 115% of the Navy's dosage threshold for a hearing conservation zone --i.e., >84 dBA for 2 days in any given month (see Appendix A, Table A.1). Yet Growler practices at OLFC often exceed two sessions in a single day and up to 10 to 15 or more days of such FCLP practice can be conducted in a single month. So, the OLFC area is significantly above the threshold for the Navy designation of a hazardous noise hearing conservation zone. For example, in 14 days in July 2012 there were 1,122 overflights of Admirals Cove, or an average of 80 overflights for each flying day that month. The noise that residents experienced that July exceeded the Navy's Hearing Conservation Zone threshold by more than 18 fold.

While other months do not consistently rise to that grim level, they do routinely exceed the military's "*at risk"* threshold, yet civilians experiencing health risk apparently do not deserve the attention and protection the Navy provides its personnel.

4.2.5 Low-Frequency Noise Effects on Health

All noise consists of pressure fluctuations in the air. Low-frequency noise (LFN) fluctuations are at between 20 and 160 times/sec. Most everyday sounds fluctuate much faster than this (up to 16,000 times/sec), so the term "low frequency" means the fluctuations are relatively slow compared with other types of sound. In audiology, the measured range is restricted to the frequencies relevant to speech 125–8000 Hz. Low frequencies are loosely defined as those below this range, which are typically heard as a low rumble. Sometimes there is also a sensation of vibration or pressure on the ears.

Low-frequency noise travels further than higher frequencies due sound "attenuation" sound loss to heating of the medium it is propagating through. The attenuation of sound waves is frequency-dependent in most materials; low frequencies are not absorbed at nearly the same rate as high frequencies, so low frequencies travel further through air. (https://en.wikibooks.org/wiki/Engineering_Acoustics/Outdoor_Sound_Propagation).

The Growler sound profile is substantially different from the Prowler. From the Navy's own website: "The EA-18G has more low-frequency content than the Prowler. Close to the airfield,

there might be a slight increase in potential for noise-induced vibration in areas where the peak sound levels exceed 110 dB."

The 2012 Wyle noise study reiterates that:

> The EA-18G Growler is recognizable by the low frequency "rumble" of its jet engines, whereas the EA-6B Prowler is associated with a higher frequency sound of its jet engines. With its increased low-frequency content, Growler take-off events have the higher potential to cause noise induced vibration. Noise-induced structural vibration may also cause annoyance to dwelling occupants because of induced secondary vibrations, or rattling of objects within the dwelling such as hanging pictures, dishes, plaques, and bric-a-brac. (p 1-15)

Sound propagation through hard surfaces, such as walls, is also affected by sound reflection, which is also frequency-dependent. High frequencies are better reflected than low frequencies, which are able to pass through hard barriers.

According to Mireille Oud, a medical physicist in an article *Low-Frequency Noise: a biophysical phenomenon*, "there is no shielding against LFN. Since LFN propagation is mainly structure-borne, closing doors and windows is not effective. Earplugs are of no use, because LFN bypasses the eardrum." [23]

Just as LFN vibration affects structures, those same vibrations invade the human body and impact organ systems. The impacts of LFN on human health have been widely documented; the following are examples:

> 7 Hz: Supposedly the most dangerous frequency corresponding with the median alpha-rhythm frequencies of the brain. It has also been alleged that this is the resonant frequency of the body's organs; therefore, organ rupture and even death can occur at prolonged exposure.[24]

> 1–10 Hz**:** "Intellectual activity is first inhibited, blocked, and then destroyed. As the amplitude is increased, several disconcerting responses have been noted. These responses begin a complete neurological interference. The action of the medulla is physiologically blocked, its autonomic functions cease." [25]

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[23] Mireille Oud, Low-frequency Noise: a biophysical phenomenon, Presented at Congress "Noise, Vibrations, Air Quality, Field & Building", 6 November 2012, Nieuwegein, The Netherlands.

[24] Organ Music Instills Religious Feelings,' by Jonathan Amos, 9/8/2003

[25] *Gavreau V., "Sons graves intenses et infrasons" in: Scientific Progres – la Nature (Sept. 1968) p. 336-344*

> 43–73 Hz**:** "…lack of visual acuity, IQ scores fall to 77% of normal, distortion of spatial orientation, poor muscular coordination, loss of equilibrium, slurred speech, and blackout." [26]
>
> 50–100 Hz: "…intolerable sensations in the chest and thoracic region can be produced—even with the ears protected. Other physiological changes that can occur include chest all vibration and some respiratory rhythm changes in human subjects, together with hypopharyngeal fullness (gagging). The frequency range between 50 and 100 Hz also produces mild nausea and giddiness at levels of 150–155 dB, at which point subjective tolerance is reached. At 150–155 dB or 0.63–1.1 kPa [Pa is the SI symbol for pascal or pressure/stress; k = kilo or 1000], respiration-related effects include substernal discomfort, coughing, severe substernal pressure, choking respiration, and hypopharyngeal discomfort." [27]
>
> 100 Hz: At this level, a person experiences irritation, "mild nausea, giddiness, skin flushing, and body tingling." Following this, a person undergoes "vertigo, anxiety, extreme fatigue, throat pressure, and respiratory dysfunction." [28]

Numerous studies demonstrate the well-known characteristics and adverse impacts of LFN, impacts not assessed by the Navy in its 2012 EA. That research strongly supports serious health effects of LFN like vertigo, disturbed sleep, stress, hypertension, and heart rhythm disorders. One such study[29] had this to say:

> Although the effects of lower intensities of low frequency noise are difficult to establish for methodological reasons, evidence suggests that a number of adverse effects of noise in general may be greater for low frequency noise than for the same noise energy in higher frequencies: loudness judgments and annoyance reactions are greater for low frequency noise than other noises for equal sound pressure level regardless of which weighting scheme is employed (Goldstein, 1994); annoyance is exacerbated by rattle or vibration induced by low frequency noise; speech intelligibility may be reduced more by low frequency noise than other noises (except those in the frequency range of speech itself because of the upward spread of masking) (Pickett, 1959; Loeb, 1986).

Another study[30] summarized 25 years of research on health impacts pertaining to LFN:

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[26] *Gavreau V., "Sons graves intenses et infrasons" in: Scientific Progres – la Nature (Sept. 1968) p. 336-344*

[27] Acoustic Trauma: Bioeffects of Sound,' by Alex Davies

[28] *Gavreau V., "Sons graves intenses et infrasons" in: Scientific Progres – la Nature (Sept. 1968) p. 336-344*

[29] Stalker, From a Short History of Sound Weapons Pt2: Infrasound, January 14, 2008

[30] Respiratory pathology in vibroacoustic disease: 25 years of research, Branco NA[1], Ferreira JR, Alves-Pereira M.

Abstract: Respiratory pathology induced by low frequency noise (LFN, < 500 Hz, including infrasound) is not a novel subject given that in the 1960's, within the context of U.S. and U.S.S.R. Space Programs, other authors have already reported its existence. Within the scope of vibroacoustic disease (VAD), a whole-body pathology caused by excessive exposure to LFN, respiratory pathology takes on specific features. Initially, respiratory pathology was not considered a consequence of LFN exposure; but today, LFN can be regarded as a major agent of disease that targets the respiratory system.

The authors concluded, in part, with this statement:

> In persons exposed to LFN on the job, respiratory complaints appear after the first 4 years of professional activity. At this stage, they disappear during vacation periods or when the person is removed from his /her workstation for other reasons. With long-term exposure, more serious situations can arise, such as, atypical pleural effusion, respiratory insufficiency, fibrosis and tumours. There is no correlation with smoking habits. In LFN-exposed animal models, morphological changes of the pleura, and loss of the phagocytic ability of pleural mesothelial cells (explaining the atypical pleural effusions). Fibrotic lesions and neo-vascularization were observed along the entire respiratory tract. Fibrosis lesions and neovascularisation were observed through- out the respiratory tract of the animals seen. Pre-malignant lesions, metaplasia e displasia, were also identified.

And the authors further explain, "LFN is an agent of disease and the respiratory tract is one of its preferential targets. The respiratory pathology associated with VAD needs further in-depth studies in order to achieve a greater understanding, and develop methods of pharmacological intervention."

Excerpts from another publication: Noise-induced extra-aural pathology: a review and commentary, Alves-Pereira M[,>] further define LFN health effects.

Abstract: The focus of this review paper will be the effects of acoustic phenomenon (noise), characterized by large pressure amplitude ≥≥90 dB) and low frequency (≤≤500 Hz) (LPALF) on humans and animal models. Current concepts imply the assumption that such LPALF noise impinges only on, or through, the somatic medium of the auditory system. As a consequence of this assumption, the effect of noise on humans is only regulated for purposes of hearing conservation. Guidelines and regulations governing occupational noise assessments are biased toward the subjective human perception of sound. The author will not make the assumption that airborne acoustic phenomena impacts only on the auditory system, and will present a literature review providing evidence for such position. The purpose of this review paper is to defend the existence of extra-aural, noise-induced pathology, particularly the vibroacoustic disease; and to advance the recognition that the respiratory tract could very well be a target organ of this environmental stressor.

An epidemiological survey[31] examined LFN from plant and appliances in or near domestic buildings by comparing an exposed test group (27 individuals) to a control group (22 individuals) that had comparable dwelling conditions to the test group, except that there was no LFN.

There were 27 individuals in the test group and 22 in the control group. The test group suffered more from their noise exposure than the control group did, as indicated in the table below.

Symptom	**Test group %**	**Control group %**
Chronic fatigue	59	38
Heart ailments anxiety, stitch, beating palpitation	81	54
Chronic insomnia	41	9
Repeated headaches	89	59
Repeated ear pulsation, pains in neck, backache	70	40
Frequent ear vibration, eye ball and other pressure	55	5
Shortness of breath, shallow breathing, chest trembling	58	10
Frequent irritation, nervousness, anxiety	93	59
Frustration, depression, indecision	85	19
Depression	30	5

It is important to note that while the intensity of Growlers practice at OLFC is not constant but episodic, the sound intensity far exceeds anything like the intensity the subjects above experienced.

The World Health Organization recognizes the special health created by LFN, as summarized in its publication on Community Noise[32] (Berglund et al., 2000):

> For noise with a large proportion of low frequency sounds a still lower guideline (than 30dBA) is recommended…When prominent low frequency components are present, noise measures based on A-weighting are inappropriate…It should be noted that a large proportion of low frequency components in a noise may increase considerably

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31 Alves-Pereira M, Noise-induced extra-aural pathology: a review and commentary,1999
Mirowska and Mroz. 2000. As reported in https://www.wind-watch.org/documents/review-of-published-research-on-low-frequency-noise-and-its-effects/

32 World Health Organization, Guidelines for Community Noise , edited by B. Berglund, T. Lindvall, and D. H.
Schuela, Cluster of Sustainable Development and Healthy Environment, Department of the Protection of the Human Environment, Occupational and Environmental Health, Geneva, Switzerland, 1999.

> the adverse effects on health…The evidence on low frequency noise is sufficiently strong to warrant immediate concern.

Finally and perhaps most sadly, numerous studies have been documented health impacts on the developing fetus (see Section 4.2.3), but only one study focused on LFN. As reiterated in http://oem.msu.edu/userfiles/file/News/Hv6n3.pdf that study examined 131 children ages 4-10 from Quebec. It showed a 3-fold increased risk of LFN-induced hearing loss in children whose mothers had been exposed to 85-95 dB, particularly if these exposures involved a strong component of low-frequency noise.

4.3 Safety

While OLFC does not meet the operations threshold for designating accident potential zones (APZs), in 2011 and 2012 operations came very close to crossing that threshold, which is 5000 operations at either end of the runway. It is important to understand that the 5000 operations threshold is a completely arbitrary figure at which risk becomes suddenly manifest. Each operation involves risks, and hence, the greater the number of operations the greater the risk.

Operations at OLFC may not cross that arbitrary threshold, but there are other fundamental considerations that are not found at contemporary airfields and that greatly exacerbate safety risk at OLFC. Those are the very limited undeveloped acreage, extensive encroachment of all kinds including fuel storage tanks, and substandard runway length (see Sections 2.3 and 4.1).

And there still other risk factors: (1) the potential for pilot error, many being student pilots (see https://aviation-safety.net/wikibase/wiki.php?id=57241: fatal OLFC student crash 28 Dec. 1982, three killed), (2) the F-18's deplorable safety record, (3) takeoffs and landings are the two most dangerous segments of sorties, (4) things fall off these high-power jets, and (5) bird aircraft strike hazards (BASH), which are especially common during low-level operations. So, regardless of whether APZs are designated or undesignated, OLFC is a major safety risk with potentially dire consequences.

The Growler's F-18 airframe is one of the most accident-prone military airframes in existence. Military jets as a whole are 67 times more likely to crash than are passenger jets, so that 67 would be multiples higher for the Growler because it is more accident-prone than other military jet airframe. Between 1980 and 2014 the F-18 sustained 39 incidents, while its predecessor, the EA-6B (Prowler), sustained just 7 incidents, even though the Growler flew far fewer sorties (see Appendix B). That equates to 1.15 incidents per year for F-18 versus 0.21 incidents per year for the Prowler. On a per-year basis uncorrected for the number of sorties each airframe has flown, the F-18 airframe is 5.5 times more likely to sustain an incident that the Prowler. Another

credible, independent analysis put the Growler at 10–36 times more likely to crash than the Prowler https://washingtonenvironmentalprotectioncoalition.org/3-how-growler-jets-harm-people/3-2-growler-jets-36-times-more-likely-to-crash-than-prowler-jets

While pilot error is part of the incident data, it factors in as part of the reason for the higher F-18 incident rate simply because of greater human performance demands. For example:

> United States Navy Blue Angels McDonnell-Douglas F/A-18 Hornet, BuNo *162437*, crashes into a residential neighborhood…killing the pilot. Military investigators blame pilot for his fatal crash. A report obtained by The Associated Press said that Lieutenant Commander Kevin Davis got disoriented and crashed after not properly tensing his abdominal muscles to counter the gravitational forces of a high-speed turn. (April 27, 2007)
> United States Navy Blue Angels McDonnell-Douglas F/A-18 Hornet, On June 2, 2016 Blue Angels no. 5 crashed on takeoff while preparing for an airshow. The plane crashed approximately two miles from the end of the runway. Marine Capt. Jeff Kuss, the pilot, did not eject and died in the crash. Observers speculated that he did not eject because he was directing the aircraft away from a large apartment complex. The similarities to FCLP operations two miles from schools and a hospital are obvious. That was the third FA 18 crash that week.

In addition, as reported by The Hill, it is likely that hypoxia may be contributing to the pilot-caused accident rate of the F-18 airframe (Growler), and the military has identified a variety of likely Growler issues as the cause (see end of Appendix B). And, "wave-offs," when they occur, increase pilot workload at a critical moment in the FCLP approach and add to the risk, as does the fact that FCLPs are being conducted by new pilots managing the most incident-prone jets in history makes OLFC a tragedy in waiting.

A retired Northwest Airlines Captain[33] and military flight instructor explains the risks as follows.

> It is my opinion that [FCLPs] at OLF utilizing runway 32, with the potential for engine failure, mechanical disability, or control loss during low level approaches, would dictate immediately maintaining runway heading and climbing for altitude to assess the situation if possible. Directly ahead within approximately a quarter mile is the location of Whidbey Island's Transit Fuel Depot, and an additional mile further, the township of populated Coupeville. Operating on runway 14 would put the community of Admiral's Cove, within approximately 1 to 1.25 miles, directly in line for potential disaster considering similar circumstances. The EA-18G Growler has a high approach

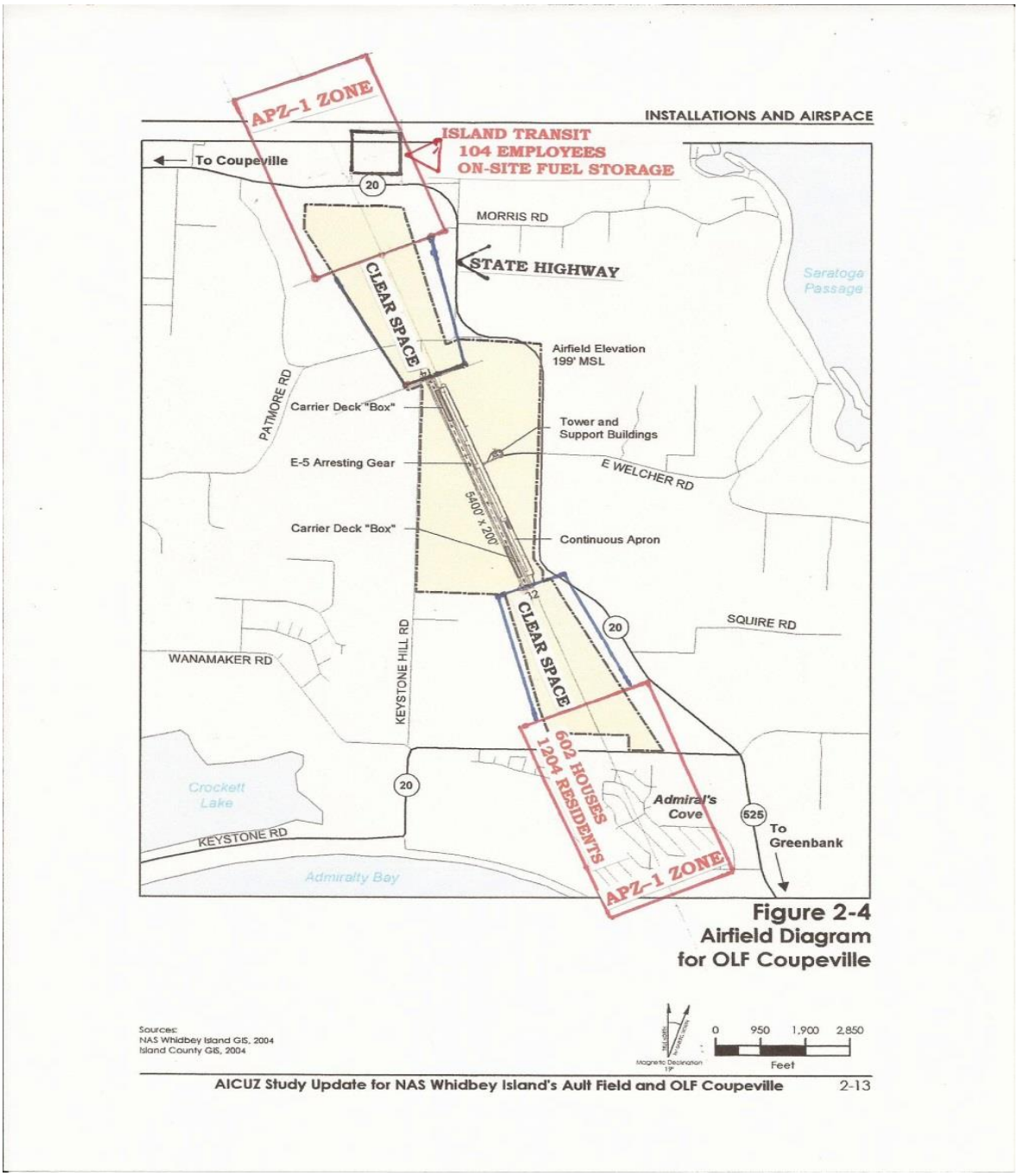
[33] Mark Harmon, Captain, Retired, Northwest Airlines, 38 years of experience, totaling 28,000 hours in a variety of jet and propeller powered aircraft; holds licenses in ground instruction for FAA basic, advanced, instructor, and flight engineer certification.

> speed of 160 to 180 knots dependent upon aircraft weight and density altitude, a speed greater than the EA-6 Prowler, and therefore travels a greater distance whether in a banked turn or straight ahead, thus creating greater potential for reaching the locations previously mentioned. Impacting the ground at high speeds utilizing aircraft carrier approach, landing, and go around techniques could easily carry the aircraft's momentum to these distant locations with disastrous results.
>
> Of the many reasons for dismissing naval carrier practice at OLF, to include noise and others, this safety issue must be the most predominate…My first impression of this 5400 foot runway is that it is not able to accommodate the high speeds that the EA-18G needs to maintain in a safe training environment and especially if an emergency arises with only one course of action that may or may not put the surrounding population in jeopardy!

The Admirals Cove area is densely populated. On approach to OLFC on path 32, Growlers cross the full center of that neighborhood at elevations of about 200 to 400 feet above the residences at a rate of about one overflight every 60 to 85 seconds. Nearly all of that development is within an undesignated APZ-1, which if designated, should have no residential development. Yet Admirals Cove and adjacent Pelicar Shores includes over 600 residential properties.

Furthermore, within that approach over Admirals Cove, large numbers of migratory waterfowl, resident gulls, eagles, and a wide variety of harriers, exacerbate bird strike (BASH) risks and the potential for serious accidents. Navy data on Prowler/Growler BASHs of NASWI show that from June 26, 2001, to September 6, 2013, a total of 133 strikes occurred.

Figure 1. — Map of OLFC showing landing strip, clear zone, and undeclared Accident potentialZone 1 (APZ-1). Note that the southern APZ-1 includes all of Admirals Cove or about 600 properties. The APZ-2 area extends much further beyond the APZ-1.



As phoned into the Navy, on August 17, 2016, afternoon FCLPs provoked 100s up to ~1000 gulls to rise up off the Admirals Cove lake and the adjacent nearshore sound waters. As a jet passed, they would rise up in huge swirls and settle back down after it was past, over and over until after over an hour they finally departed and headed south across the Puget Sound. While many did not rise high enough to enter the jet path, a significant number did. There was no indication that that ground control or the pilots were aware of the situation, but they did monitor the rest of the practice week.

Adding to these risks is pilot acuity. The Navy is on record as stating that late night FCLPs are needed because *pilots need to get used to flying when they are tired* since that is what they will experience in actual conditions. That may be, but tiredness also increases accident risks. One obvious way to mitigate civilian risk is to conduct FCLPs where there are no civilians, and another is use of flight simulators where tiredness-based error involves no loss of aircraft or life (see Section 5 for more on flight simulators).

Mishaps related specifically to the jets at NASWI are detailed in Appendix C, and things falling off NASWI Growlers and Prowlers are detailed in Appendix D. The greater Coupeville area is at risk of such incidents, mishaps, and things falling off jets.

4.4 Real Estate

The louder and more frequent use of OLFC since 2006 has measurably impacted the local real estate market. The pronounced effect is clearly demonstrated in the Coupeville area (see Figure 2), the postal area code most impacted by OLFC jet practice. Coupeville home sales show a steep decline from 2008 to 2012, opposed to increases in Langley, Freeland, and Island County. From 2006 to 2009 the average price of Coupeville homes hovered mostly about $200 thousand, but from 2010 through 2014 the average price was below $200 thousand except for two quarters. That reduction correlates with the increase in jet noise awareness and with OLFC operations, which reached recent highs in 2011 and 2012 that were about 4 times the number of Prowler operations between 2001–2009 (see Table 3). Because of heightened public discourse since 2010, residents are gradually becoming increasingly concerned about how Growler noise affects their health and that of their children, and the real estate market is showing that dampening effect.

Figure 2.—Home sales in Langley and Freeland, which are more distant and unaffected by OLFC, show an increase, whereas sales in Coupeville show a decrease probably related to the increase in Growler use of OLFC.

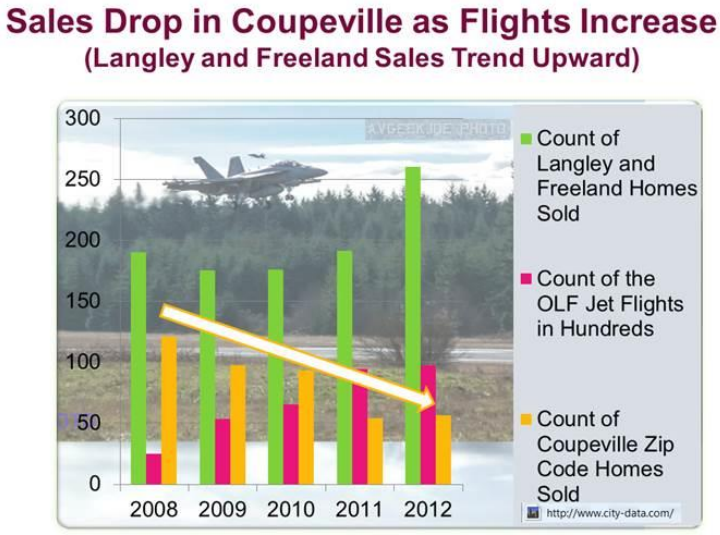
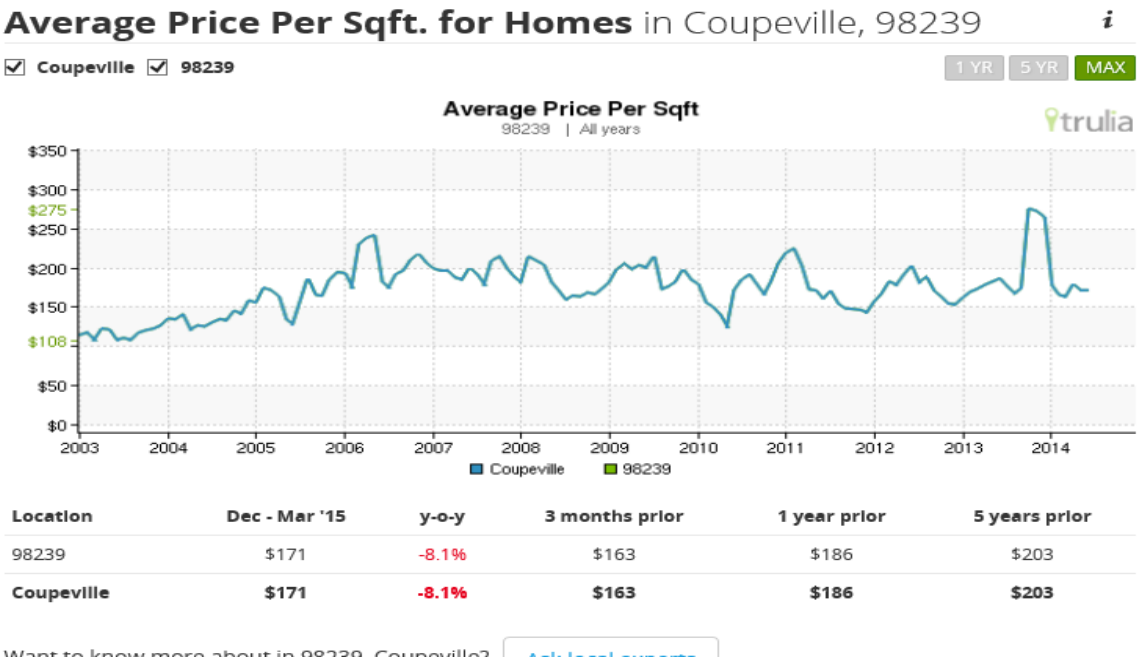


Figure 3—Home Sales for Coupeville area homes, 2003–2014



4.5 Desecration of Ebey's Landing National Historical Reserve

Ebey's Landing National Historical Reserve, a National Park Service Collaboration, comprises 24,000 acres under and adjacent to the OLFC flight path. It is the first Historical Reserve in the nation. This section is largely based on 2015 noise study at the Reserve conducted by the National Park Service (NPS)[34]. Justification for the study was explained as follows.

> The NPS and Navy agreed that additional acoustic information, collected at the Reserve, would be beneficial for the NPS to adequately respond to the NEPA (National Environmental Policy Act) document being prepared by the Navy. In July 2015, NPS started acoustic data collection.
>
> Natural sounds are integral to ecosystem function and are one of the many resources and values that NPS managers are responsible for preserving and restoring. NPS evaluates federal actions that may impact the human and natural environment of units within the national park system. The acoustic environment, like air, water or wildlife, is a valuable resource that can be substantially degraded by inappropriate sound levels and frequencies. Intrusive sounds (noise) are of concern to NPS managers because they can impede the ability to accomplish the NPS mission of resource protection and public enjoyment. Anthropogenic noise may also disrupt ecosystem processes by interfering with predator prey relationships and the ability of wildlife to communicate, establish territory, reproduce, support and protect offspring (Siemers and Schaub, 2011; Schroeder et al., 2012; McClure et al., 2013). People visit national parks to see, hear and experience myriad phenomena associated with specific natural and cultural environments. Yet, in many cases, those environments are being increasingly impacted by anthropogenic noise altering their experience (Lynch, Joyce, and Fristrup, 2011).

Aircraft noise impacts the structural integrity of the historic buildings within the Reserve. Because the structural components of these buildings and other historical sites are especially fragile, aircraft noise impacts such sites more severely than newer, modern structures (Hanson, et al.1991). Even though there is evidence of structural noise damage to buildings within the Reserve, the Navy's 1994 Memorandum of Agreement to mitigate noise impact on historic structures was never implemented.

The historic structures in Ebey's Reserve--more than 400 structures in all--are being actively restored yet cannot be protected from noise damage by the low-flying Growlers, which produce low-frequency noise that greatly exacerbates vibrational damage problems (see Section 4.2.5). Noise-induced vibrations become acute at peak sound levels of 110 dB and greater, which we

[34] Ashley Pipkin, 2016. Ebey's Landing National Historical Reserve Acoustical Monitoring Report, Natural Resource Report NPS/ELBA/NRR—2016/1299. U.S. Department of the Interior, National Park Service, Natural Resource Stewardship and Science, Natural Sounds and Night Skies Division, Fort Collins, Colorado.

know many structures are experiencing, based on this NPS study and the JGL Noise Study (see Section 4.2.2 and 4.2.3).

Other impacts on the Reserve include environmental impacts on protected species (e.g., trumpeter swans, eagles, and herons), on migratory bird habitat, and on the scenic viewshed and soundscape enjoyed by visitors. Not disturbing the soundscape of a National Park is essential for visitors and wildlife alike. During the 2014 EIS scoping comment period the Department of the Interior had indicated grave concerns about a wide variety of impacts related to Growler overflights (see Appendix E).

As a result, the NPS conducted a sound study over 31 continuous days in July and August 2015 at two sites in the Reserve. Continuous audio and sound pressure level (SPL) data were recorded for 731 hours at one site and 741 hours at the second site. The data show that the ambient sound level was "*elevated during use of the OLF by military aircraft*," which is a very cautious and conservative statement.[35]

Not subservient to congressional funding but representing the thousands each year who use this national historic reserve, COER is free to assert that the "elevated" sound levels during Growler flyover events unquestionably violate NPS-governing laws, regulations, and orders, as delineated in the NPS sound study report:

> The National Park Service Organic Act of 1916 states that the purpose of national parks is "… to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." The enabling legislation for the Reserve provides the additional mission of "preserving and protecting a rural community" and mandates that all NPS administered land within the Reserve shall be managed in accordance with the NPS' Organic Act (McKinley, 1993). In addition the Redwoods Act of 1978 affirmed that, "the protection, management, and administration of these areas shall be conducted in light of the high value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress.

The wisdom of our forefathers who so diligently codified and enshrined that NPS mission for perpetuity would certainly agree that Growlers are incompatible with "*the high value and*

[35] The Report was based on 417 flyovers at the station recording FCLPs (station 1). The DoD in its draft EIS is seeking to increase FCLPs by about 30% to 600% from 2015 levels, and that would greatly increase noise levels and flyover frequencies presented in the Report.

integrity of the National Park System" and that Growler noise inflicts a significant "*derogation of the values and purposes for which these various areas have been established*." The Report further validates the great importance of quiet for visitors of our national parks:

> A 1998 survey of the American public revealed that 72% of respondents thought providing opportunities to experience natural quiet and the sounds of nature were a very important reason for having national parks, while another 23% thought that it was somewhat important (Haas, G.E., & Wakefield, T.J. 1998. National parks and the American public: A national public opinion survey on the national park system. Washington D.C. and Fort Collins, CO.: National Parks and Conservation Association and Colorado State University). In another survey specific to park visitors, 91% of respondents considered enjoyment of natural quiet and the sounds of nature as compelling reasons for visiting national parks (McDonald, C. D., Baumgarten, R. M., and Iachan, R. 1995. Aircraft management studies: National Park Service Visitors Survey. HMMH Report No. 290940.12; NPOA Report No. 94-2, National Park Service, U.S. Department of the Interior.).

Going on, the Report looks to direction for management of natural soundscapes and notes NPS 2006 Management Policy 4.9:

> The Service will take action to prevent or minimize all noise that through frequency, magnitude, or duration adversely affects the natural soundscape [acoustic resource] or other park resources or values, or that exceeds levels that have been identified through monitoring as being acceptable to or appropriate for visitor uses at the sites being monitored (NPS, 2006a)…The Service will restore to the natural condition wherever possible those park soundscapes that have become degraded by unnatural sounds (noise), and will protect natural soundscapes from unacceptable impacts.

While that policy is appropriate and noble, unfortunately the NPS has little influence on the DoD or Congress to ensure the Reserve is maintained as the historic sanctuary it was enacted to be. Witness this carefully presented conclusion in the Report:

> The presence of military aircraft flying over or near [the Reserve] increases anthropogenic noise at the Reserve. The information in this report should be considered when evaluating impacts to the Reserve and its resources as defined by Federal laws, regulations, and executive orders, and according to policies established by the Director of the National Park Service.

The salient question is whether the sound study information will be seriously respected and adjudicated within the context of the draft environmental impact statement, or whether the above-mentioned "federal laws, regulations, and executive orders" will simply be dismissed by the Navy as a minor obstacle to circumvent.

If the latter, one has to ask, when and how did our country become so petrified of dark shadows in the world that we have to accept the *sound of war* into the few remaining places where we as a people can retreat to our historical heritage and our biological roots in the hope of regaining a sense of peace and sanity?

4.6 Limited Use of OLFC Not Realistic

Back in the 1990s the Navy ran into similar noise concerns with a civilian group wanting to close OLFC. The Navy resolved the issues by assuring the community that its use of OLFC would remain at a minimal level, a commitment that was soon abandoned, as evident in Table 3.

The Navy's claims that it cannot guarantee a maximum fixed number of operations at any outlying field because of the annual variables it must accommodate. At present, the Navy has stipulated that will not exceed 6,120 annual operations at OLFC. Yet, in federal court in Seattle (Judge Zilly presiding, July 2015), the Navy's attorney admitted that there could be no assurances that 6,120 operations would not be exceeded beyond the current year (2015). Clearly, the Navy clearly needs a field able to accommodate Growler FCLP operations without fomenting increased conflict over this outdated, over-encroached upon, and detrimental outlying field.

Table 3.—Operations at OLF from 1990 to 2013. Data sources: 1990 from WNT article by Janis Reed; 1994 to 1999 from Table 3-1 in 2005 AICUZ; 2000 to 2013 from FOIA data from the Navy.

Number of operations by year			Number of operations by year			Number of operations by year	
1990	32,080[a]		2000	6,378		2010	6,476
1991	NA[b]		2001	3,568		2011	9,378
1992	NA		2002	4,100		2012	9,668
1993	NA		2003	7,682		2013	6,872[c]
1994	21,628		2004	4,314		2014	6120[d]
1995	19,954		2005	3,529			
1996	13,066		2006	3,413			
1997	9,736		2007	3,976			
1998	6,808		2008	2,548			
1999	6,752		2009	5,292			

[a]Probably an average of 1981–1990.

[b]NA = not available.
[c]FCLPs were discontinued in May due to COER lawsuit.
[d] Close estimate at this time.

4.7 Sum-up: Action Past Due

National, state, and local politicians need to recognize that the OLFC noise and safety problems can no longer be justified or tolerated and that the worsening problems presented by the OLFC can no longer be avoided. Times have changed and advanced with each decade since the 1960s and the economic, physical, and ecological health of Coupeville are no longer compatible with the burdens imposed by OLFC.

This 1940s airstrip has served the country well for over 70 years, and Coupeville has done its part with principled tolerance and support. But it has endured long enough. It is time to finally end the strife and discord and allow this community to grow and prosper without being hemmed in by noise oppression, and it is time end the denigration of Coupeville's unique historical reserve.

We strongly encourage our representatives to help the Navy come to grips with the problem, find an alternative FCLP venue, and decommission OLFC. Help the Navy understand, OLFC's time has passed.

5. Alternative FCLP Training Options

There are a number of FCLP training alternatives that can end the OLFC-related health, safety, livability, and economic impacts and facilitate its decommissioning. Indeed, NASWI has and continues to utilize sites other than OLFC, reportedly including Fallon AFB in Nevada, Hanford NAS in California, North Island NAS near San Diego, China Lake Naval Air Weapons Station near Los Angeles, and Moses Lake's Grant County International Airport (once Larson AFB) in central Washington State. Some of those sites and other options are discussed below and in further in Appendix F.

However, one important proviso: That is, COER lacks the ability to thoroughly assess the viability of these or other options. Only the Navy has that capability, yet it has inexplicably chosen not engage in this exercise. We therefore proceed with the hope that the Navy—and the national, state, and local politicians who have some sway over the Navy—begin this process in earnest.

One or more of these options, as well as others not included here, are surely viable and would allow necessary FCLP training without continuing and exacerbating community discord and turmoil, which history has shown elsewhere to have led to base closures. So, it seems needlessly stubborn and myopic to cling to an outdated, controversial outlying field when the problems OLFC and its Growlers inflict do not have to continue and worsen and give rise to a possible BRAC—something COER does **not** advocate.

Given the unfixable problems that OLFC presents—weather and wind, density altitude, runway length, acreage shortfalls, encroachment, and most importantly incompatibility with civilian well-being—training at almost any west coast location other than OLFC would make more sense. Indeed, for a "train as we fight" scenario, any western desert location with consistently high temperatures and little developed land would be workable. The options discussed below are more fully explored in Appendix F.

Conduct FCLP training at other airfields. The NASWI aircrews currently deploy to at least three remote locations to perform training: 1) Lemoore NAS California, 2) Fallon NAS Nevada, and 3) Mountain Home AFB Idaho. Another potential venue is China Lake Naval Weapons Center. Probably the best site to avoid deployments would be Yakima. It is less than 10 minutes flight time beyond OLFC and encompasses over 320,000 acres. It is lightly used, primarily by the Army, for artillery training. And there is ample land for a new airfield to be constructed specifically for OLF training if need be.

Contract with an existing civilian airfield. The Navy has contracted with civilian airports and other government agencies for FCLP training elsewhere. For Example, NASA and the U.S. Navy have signed an agreement to conduct FCLPs at the Wallops Flight Facility on the Eastern Shore of Virginia. They have also signed an agreement to conduct FCLP training at Greensville Municipal Airport in Virginia. Grant County International Airport (GCI) at Moses Lake in Eastern Washington is one such alternative FCLP location for NASWI.

Construction of a new FCLP training location at an existing DOD base or training range. The DOD owns thousands of square miles of desert land in both California and Nevada where a new FCLP training facility could be located. For example, the Nellis AFB range facility covers approximately 6000 square miles (3.8 million acres) of unpopulated desert area. The cost to construct an FCLP runway on government land may not even be as much as the cost of even one modern fighter aircraft (e.g., F-35 cost is about $114-$142 million).

Development and use of Growler flight simulators. Growlers do not operate at OLFC during low ceilings, low visibility, and high wind conditions, all of which would be encountered in actual cruise situations. Flight simulators, however, would allow training under such weather conditions. Simulators provide far more exacting carrier landing details than possible at

OLFC. That is, OLFC cannot simulate aircraft carrier movement, severe weather conditions, and emergencies, but simulators can do all of those things at no risk to pilot, aircraft, or resident homes and life (discussed further in Appendix F).

6. Conclusions

Our examination of the arguments surrounding the Navy's use of Outlying Field Coupeville (OLFC) lead inexorably to the following findings and conclusions:

1. That the Navy avoided doing an Environmental Impact Statement for its Prowlers and its Growlers, and the Environmental Assessments that were conducted used unrealistic data making the finding of no significant impact probably fallacious and seemingly contrived.

2. That the Navy's use of OLFC for flight carrier landing practice (FCLP) followed long after development of Coupeville and its surrounding residential, commercial, and public-use areas, making the Navy's argument that it was "here first" nonsensical.

3. That OLFC is far from an ideal training location due to the unfavorable prevailing wind direction, density altitude, and runway length; furthermore, only one of the two designated FCLP paths is usable, and the surrounding acreage is about 29,000 short of standard for an outlying field for Growlers.

4. That Navy guidelines stipulate no residential development in Noise Zone 2 areas around OLFC, but those guidelines have been totally ignored and development continues unabated.

5. That the FAA requires no flights below 500 feet over homes or people, as codified by the U.S. Supreme Court, and is a rule the Navy claims to honor but cannot at OLFC, which requires approach and takeoffs that violate the 500-foot rule. It is an uncompensated taking.

6. That Growler jet noise within the OLF fligthpath area is routinely from 100 to 130 dB, which is medically verified to endanger health and hearing among exposed adults and children. That risk is exacerbated by low-frequency Growler noise, which research has shown to be much more invasive and impactful on body organs than higher frequency noise, like that generated by the Prowler.

7. That those living under the OLF fligthpath experience noise levels that exceed levels the Navy identifies as "Hazardous Noise," requiring those working in such areas use state of art hearing protection devices and undergo routine health monitoring. Yet, the Navy and Island County have provided no such program for residents who experience jet noise at many times over the Navy's "hazardous noise" threshold.

8. That Dr. James Dalgren (UCLA professor on staff at Cedars Sinai Hospital) concluded the jet noise impacts represent a grave health concern for those exposed.

9. That Growler's FA-18 airframe is one of the most accident-prone military airframes in existence. Between 1980 and 2014 the FA-18 sustained 39 incidents, while its predecessor, the EA-6B (Prowler), sustained just 7 incidents. Uncorrected for the far greater number of sorties flown by the Prowler, the FA-18 airframe is minimally 5.5 times more likely to sustain an incident than the Prowler. And the most dangerous aspects of flying—approach and takeoff—occur 6000 to more than 9000 times right over the rooftops of residences within the FCLP zone.

10. That Growler noise is clearly incompatible with Ebey's Landing National Historical Reserve, the first Historical Reserve in the Nation.

Given the above factual findings, COER concludes that the OLFC problem is **not** a problem created by or attributable to dissident citizens of Coupeville. It is a problem created by a Navy that has been allowed to exert its preferences and convenience over civilian damage, by politicians with self-serving agendas, and by multiple failures of local officials to even attempt meaningful land-use planning.

Island County and our state and federal representatives can no longer justify a 1960s ideology intent on keeping the Navy happy while assuming that lip service to critical civilian impacts will suffice or mitigate unmitigatable noise. Times have changed, and land-use needs, economic growth, and the public health of Coupeville cannot continue to be garroted by OLFC. This 1940s airstrip has served the country for over 70 years, but its time has run out. It is time for the Navy to find an alternative FCLP venue and decommission OLFC.

-Appendix A-
MORE RELATED TO THE NOISE IMPACTS

Loudness is human perception of noise, while sound pressure intensity is an objective metric. Both loudness and its empirical counterpart, sound intensity are on a log scale. The scale runs from the faintest sound the human ear can detect, which is labeled 0 dB, to over 180 dB, the noise at a rocket pad during launch. As intensity increases by units of 10, each increase is 10 times the lower figure. So, a 10 dB increase is 10 times (i.e., 10^1) as intense, and a 20 dB increase is 10 × 10 or 100 times (10^2) as intense, etc. Sound intensity may be given in two different units. Actual physical quantification of sound is measured via sound pressure level (SPL) units. SPL is calibrated to a constant sound pressure level that does not vary with frequency. For audiograms, however, sound intensity is calibrated in hearing level (HL), meaning that the reference sound is one that that just barely heard by a normal population. Thus, HL units are relative ones and do not generally correspond to SPL units. Higher intensity decibels of sound causes more damage.

Loudness increases differently because it is perception-driven. Loudness as a general rule doubles with every 10 dB increase. A 10 dB increase is 2 or 2 times (i.e., 2^1) as loud, and a 20 dB increase is 2 × 2 or 4 times (2^2) as loud, etc. The reason that doubling the sound intensity to the ear does not produce a dramatic increase in loudness seems to be due to saturation effects. That is, nerve cells have maximum rates at which they can fire, and it appears that doubling the sound energy to the sensitive inner ear does not double the strength of the nerve signal to the brain (see http://hyperphysics.phy-astr.gsu.edu/hbase/sound/loud.html). The following provides a good analysis of the above <from http://www.sengpielaudio.com/calculator-levelchange.htm >:

Level change	Volume Loudness	Voltage Sound pressure	Acoustic Power Sound Intensity
+60 dB	64	1000	1000000
+50 dB	32	316	100000
+40 dB	16	100	10000
+30 dB	8	31.6	1000
+20 dB	4	10	100
+10 dB	2.0 = double	3.16 = √10	**10**
+6 dB	1.52 times	2.0 = double	4.0
+3 dB	1.23 times	1.414 times = √2	2.0 = double
±0 dB	1.0	1.0	1.0
−3 dB	0.816 times	0.707 times	0.5 = half
−6 dB	0.660 times	0.5 = half	0.25
−10 dB	0.5 = half	0.316	0.1

−20 dB	1/4 = 0.25	0.100	0.01
−30 dB	0.125	0.0316	0.001
−40 dB	0.0625	0.0100	0.0001
−50 dB	0.0312	0.0032	0.00001
−60 dB	0.0156	0.001	0.000001

Noise Impacts on Adults and Children

Because impacts to hearing are the result of physical sound pressure damage to the hair cells, loudness, as a perception, is not relevant per se, but rather is more likely a product of actual sound pressure intensity. And just as loudness is affected by variation between individuals and hence is represents an average, it is also reasonable that impacts of sound intensity vary among individuals. However, it is well established that sensitivity of children to sound is far greater than for adults.

Antiquated noise criteria are being utilized by the Department of Defense (DOD) to place new and louder aircraft in rural areas of growing population. The policies of FAA/DOD (and HUD) all were developed in the early 1970s and earlier (e.g., HUD 1971). Most of the government agencies and boards, standard setting bodies, and international organizations established more informed noise policies after 1995. In particular, the World Health Organization recommendations (WHO 1999) are based on over 25 recent years of worldwide research into noise effects of human health and welfare. Maximum Growler sound levels exceeded hearing protection requirements and surpassed Washington State, U.S. Environmental Protection Agency, and World Health Organization Community Noise Protection Guidelines at all five locations.

According to health experts who examined the JGL data of actual Growlers flying overhead, the citizens of Coupeville and the community has sustained noise levels above “community exposure levels” for State and National guidelines and law. Washington State’s Chapter 70.107 RCW NOISE CONTROL/WAC 173-60 state that the maximum noise in a residential setting should not exceed 55 dBA between 7:00 AM and 10:00 PM and after 10 PM to 7 AM, the maximum noise should not exceed 45 dBA. Maximum Growler sound levels exceeded hearing protection requirements and surpassed Washington State, U.S. Environmental Protection Agency, and World Health Organization Community Noise Protection Guidelines at all five locations in the JGL study.

One of those locations measured noise inside a private to-code residence near the OLFC racetrack. In the 25 minutes between 8:20 and 8:45 PM the L_{max} was between 75 and 81.1 dBA on seven occasions, surpassing state guidelines. The EPA sets noise standards as 70 dBA for a

24-hour L_{eq}. Noise measured by JGL Acoustics under the OLF racetrack were L_{max} = 119.2–113.4 dBA and predicted 24-hour $L_{average}$ = 64.1–75.0, both well above both Washington State's law and the EPA guideline.

The National Institute for Occupational Safety and Health (NIOSH) has determined that above a critical sound intensity, the mechanism of hearing damage changes from one based on cumulative noise exposure (i.e., the combination of magnitude and duration of sound) to a mechanism based on pressure intensity alone, regardless of duration (OSIA regulations for construction: §1926.52 Occupational noise exposure) (http://www.garrison.hawaii.army.mil/sbcteis/feis/Appendices/Appendix%20H1.pdf), as demonstrated below:

> The U.S. Environmental Protection Agency (EPA) identified an annual average 24-hour Leq* (see below) of 70 dBA as a long term noise exposure limit that should protect the general public against hearing damage with an adequate margin of safety (EPA 1974, 28-32). Noise levels obviously vary during the course of a day, but a 24-hour Leq of 70 dBA implies that there would not be any extended periods of exposure to high noise levels. To put a 24-hour Leq of 70 dBA in perspective, each of the following noise exposure conditions would generate a 24-hour Leq of 70 dBA or more:
>
> • an 8-hour work day with an average noise exposure of 74.8 dBA (for example: 21 minutes at 85 dBA, 30 minutes at 80 dBA, 30 minutes at 75 dBA, and 6 hours 39 minutes at 70 dBA) and 16 hours at any noise level below 70 dBA;
>
> • 2 hours 25 minutes at 80 dBA and 21 hours 35 minutes at any noise level below 70 dBA;
>
> • 46 minutes at 85 dBA and 23 hours 14 minutes at any noise level below 70 dBA;
>
> • 15 minutes at 90 dBA and 23 hours 45 minutes at any noise level below 70 dBA;
>
> • 5 minutes at 95 dBA and 23 hours 55 minutes at any noise level below 70 dBA; or
>
> • 1.5 minutes at 100 dBA and 23 hours 58.5 minutes at any noise level below 70 dBA.

The Navy has a similar exposure chart, as below (Table A.1):

Table A.1 — (From the Navy's EIS on the P8's). Noise Level Exposure Standard based on duration per day for unprotected hearing (source: American Conference of Governmental Industrial Hygienists Threshold Limit Values for Noise Exposure}.

In addition, NIOSH estimates 115 to 120 dBA as the critical noise level at which human hearing is subject to instantaneous permanent damage effects. Without adequate hearing protection, any exposure to noise levels above 115 dBA is likely to cause some degree of permanent hearing threshold shift.

Paul Schomer (Standards Director, Emeritus, Acoustical Society of America, Schomer and Associates, Inc.) compiled Table 4.1 from the JGL 2013 study, converting it to 8-hour time weighted average (TWA) doses for each outdoor JGL position and session of flyovers (method explained in Appendix A). That table further examines how exposure time (i.e., dose experienced by someone at that station for the full session) compares with the Navy-defined "hazardous noise zone" threshold requiring designation of a "hearing conservation zone."

For example, at position 1 (Admirals Cove), in just two FCLP sessions of 35 overflights/session,

Allowable Unprotected Sound Level (dBA)	Duration (hours/day)	Allowable Unprotected Sound Level (dBA)	Duration (minutes/day)	Allowable Unprotected Sound Level (dBA)	Duration (seconds/day)
80	24	97	30	115	28.12
82	16	100	15	118	14.06
85	8	103	7.5	121	7.03
88	4	106	3.75	124	3.52
91	2	109	1.88	127	1.76
94	1	112	0.94		

anyone there would have accrued a noise dose equal to 115% of the Navy's permitted 8-hour allowable or threshold dose (as defined above). The 15% exceedance, under Navy requirements, would constitute a hazard risk and make that area a Hearing Conservation Zone. Growlers practices at OLFC, however, often exceed one or two sessions in a single day, and much more in many months. For example on 14 days in July 2012 there were 1122 overflights of position 1, or 80 overflights per 24-hour period of flying activity. Given that 70 overflights (2 sessions) exceeded the Navy threshold by 15%, it is obvious the 1122 overflights at 80/day for 14 days exceeded the threshold by more than 18 times (1.66 × 1122 = 18.6 times the Navy's threshold; see Table A.1).

The Navy's 2005 AICUZ indicates there will be 6120 annual operations (equals 3060 overflights). That would mean, on average, there are to be 255 overflights per month, and 255 overflights would be about 7.3 times (255/35) the exposure recorded by JGL for position 1, or 423% (1.66 × 255; see Table 4.1) of the Navy's threshold for designating a hazardous noise zone. The other positions are all likewise well above the Navy threshold.

Table A.2 shows the related results when the same outdoor 2013 JGL converted to approximate indoor noise levels. While the indoor levels do not cross the hearing conservation zone threshold, Schomer's analysis assumed a 15 dBA decrease from the JGL outdoor readings. That may be realistic for winter when all doors and windows are shut, but in the summer, with windows and doors open, the reduction will be far less. It should be further understood that during numerous sessions, folks will be outdoors frequently and, hence, exposed to a mix of outdoor and indoor levels. In other cases, there is no indoors option. For example, position 1 is close to an outdoor swimming pool used by Admirals Cove residents and another public pool is near position 6. Lifeguards put in a full day outside. Positions 2 and 3 are in agricultural fields, and position 4 is a youth athletic field where families gather for extended periods. Note, it takes relatively just two or a few more exposures to outside sessions to cross the Navy threshold, and the ones indoors or partially indoors put that well over the top.

Table A.1 Analysis of JGL 2013 data converted to 8-hour time weighted averages (TWA), showing time of exposure to noise levels 85 dBA to >115dBA at the four JGL outdoor by recording positions (stations) and how each exposure amount (or dose) relates to the Navy-defined hazardous noise zone (i.e., designation of a hearing conservation zone). The lower table shows the related results when the same outdoor JGL data are reduced by 15 dBA to presumably represent indoor noise levels.

Total time over (s)	Cummulative time in seconds by position (1-4)				Navy full dose time exceeded		Actual percent of full Navy dose exposure by position			
	1	2	3	4	Seconds	Minutes	1	2	3	4
85 dBA	448	855	365	600	28,800	480	0.2	1.1	0.4	0.4
88 dBA	381	538	257	482	14,400	240	0.5	1.7	0.6	0.7
91 dBA	315	299	169	375	7200	120	0.8	2.0	1.0	1.5
94 dBA	254	152	97	267	3600	60	1.9	1.6	0.9	2.0
97 dBA	184	93	63	195	1800	30	3.1	2.4	1.3	3.3
100 dBA	128	50	39	135	900	15	5.6	2.4	2.0	6.6
103 dBA	78	28	21	76	450	7.5	9.1	3.6	3.3	8.9
106 dBA	37	12	6	36	225	3.75	7.1	3.1	1.3	10.2
109 dBA	21	5	3	13	112.5	1.875	11.6	4.4	1.8	10.7
112 dBA	8	0	1	1	56.25	.9375	10.7	0.0	1.8	1.8
115 dBA	2	0	0	0	28.125	0.46875	7.1	0.0	0.0	0.0
Percent of Navy permitted daily noise exposure for one flying session							58	22	14	46
Percent of Navy permitted daily noise exposure for two sessions (×2)							115	45	29	92
Number of flyovers at each position as recorded for that session and position							35	43	26	28
Percent of Navy permitted daily noise exposure dose per flyover							1.66	0.52	0.54	1.64
Percent of Navy permitted daily noise exposure dose for average of 255 overflights/month (i.e., 6120 operations/year = 3060 overflights/year/12 months = 255)							423	133	138	418

Table A.2. Analysis of JGL 2013 data converted to 8-hour time weighted averages (TWA), showing time of exposure to noise levels 85 dBA to >115dBA at the four JGL outdoor by recording positions (stations) and how each exposure amount (or dose) relates to the Navy-defined hazardous noise zone (i.e., designation of a hearing conservation zone). The lower table shows the related results when the same outdoor JGL data are reduced by 15 dBA to presumably represent indoor noise levels.

Total time over (s)	Cummulative time in seconds by position (1-4)				Navy full dose time exceeded		Actual percent of full Navy dose exposure by position			
	1	2	3	4	Seconds	Minutes	1	2	3	4
85 dBA	128	50	39	135	28,800	480	0.2	0.1	0.1	0.2
88 dBA	78	28	21	76	14,400	240	0.3	0.1	0.1	0.3
91 dBA	37	12	6	36	7200	120	0.2	0.1	0.0	0.3
94 dBA	21	5	3	13	3600	60	0.4	0.1	0.1	0.3
97 dBA	8	0	1	1	1800	30	0.3	0.0	0.1	0.1
100 dBA	2	0	0	0	900	15	0.2	0.0	0.0	0.0
103 dBA	0	0	0	0	450	7.5	0.0	0.0	0.0	0.0
106 dBA	0	0	0	0	225	3.75	0.0	0.0	0.0	0.0
109 dBA	0	0	0	0	112.5	1.875	0.0	0.0	0.0	0.0
112 dBA	0	0	0	0	56.25	.9375	0.0	0.0	0.0	0.0
115 dBA	0	0	0	0	28.125	0.46875	0.0	0.0	0.0	0.0
Percent of Navy permitted daily noise exposure for one flying session							2	0	0	1
Percent of Navy permitted daily noise exposure for two sessions (×2)							3	1	1	2
Number of flyovers at each position as recorded for that session and position							35	43	26	28
Percent of Navy permitted daily noise exposure dose per flyover							.057	.012	.019	.036
Percent of Navy permitted daily noise exposure dose for average of 255 overflights/month (i.e., 6120 operations/year)							14.5	3.06	4.85	9.18

Impacts on the Developing Fetus

Literature on the impacts of noise on the developing fetus was extensively examined by the Navy:[36]

> Fetal Sound Exposure Environmental or workplace sound is transmitted to the fetus through body tissues and uterine fluids, and probably within the fetus by bone conduction… Low frequency noise poses the greatest risk since it penetrates to the fetal cochlea more effectively than high frequencies. Most studies suggest attenuation at the cochlea of about 10 to 20 dB for frequencies less than 250 Hz, and over 40 dB at 2000 Hz. However, one study reported sound enhancement at 125 Hz.
>
> The fetal cochlea first demonstrates consistent auditory responsiveness in the 20th week of gestation. There have been no indications of behavioral auditory responses before 19 weeks gestation.Fetal effects of sound may vary with gestational age. Mammalian studies indicate increased susceptibility to damage from sound during the final functional and structural stages of development in young animal cochleas. While there are no data for humans, children in utero could theoretically suffer hearing loss at lower sound levels and after a shorter duration of sound exposure than mature adults. The current auditory risk criteria were formulated for non-pregnant adults.
>
> According to the American Academy of Pediatrics, studies suggest exposure to excessive noise during pregnancy may result in high-frequency hearing loss in newborns, and may be associated with prematurity and intrauterine growth retardation. Studies linking maternal sound exposure during pregnancy to increased incidence of hearing loss in neonates and young children are inconclusive due to inability to control all variables. After the development of the fetal ear (mid-pregnancy), the fetus is able to perceive, and even respond to, external sounds. Sound attenuation from external air to within the uterus has been demonstrated. Exact levels of attenuation have differed (and one study even suggested low frequency sound level augmentation within the uterus), but high frequency sound levels (those thought to pose the most significant hazard to adult hearing) are consistently diminished more than low frequency. Concern remains, however, as to whether maternal exposure to high sound levels, even of low frequencies, may be harmful

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[36] REPRODUCTIVE AND DEVELOPMENTAL HAZARDS: A GUIDE FOR OCCUPATIONAL HEALTH PROFESSIONALS. 2010. NAVY AND MARINE CORPS PUBLIC HEALTH CENTER OCCUPATIONAL AND ENVIRONMENTAL MEDICINE (OEM) DIRECTORATE 620. Navy and Marine Corps Public Health Center Technical Manual NMCPHC-TM-OEM 6260.01C. http://www.med.navy.mil/sites/nmcphc/Documents/policy-and-instruction/oem-reproductive-and-developmental-hazards-a-guide-for-occupational-health-professionals.pdf

to the hearing of the fetus, because the fetus cannot be protected (for example, by earplugs) from the direct effects of such sounds. *A significantly increased rate of loss of hearing at 4000 Hz has been noted in children whose mothers were exposed to high sound levels with both low and high (rather than only high) frequency components.* (However, other risk factors may have been confounders.) *The same study identified a three-fold increase in childhood high-frequency hearing loss among children whose mothers were exposed to occupational sound levels of 85 to 95 dB compared to those whose mothers had lower occupational sound level exposures during pregnancy.* The authors recommended setting a temporary 85 dBA 8 hour sound limit for pregnant women until further research verifies the safety of higher sound level exposures. Some authors feel that any sustained exposure of the developing auditory system to high sound levels represents an increase in the risk of noise-induced hearing loss, although this has not been proven in humans. At least one Navy medical officer has advised that pregnant women not be subjected to noise in excess of 90 dB for an 8 hour work day (Moore).This is the guideline recommended for general consideration, and is without respect to maternal hearing protection, as neither ear plugs nor ear muffs offer any fetal hearing protection…

Low birth weight is the most common non-auditory consequence associated with maternal sound exposure; however, this finding is not consistent across studies summarized by Nurminen in 1995. There has been extended discussion of possible non-auditory consequences to maternal sound exposure, related to stress-induced increase of catecholamine levels and placental vasoconstriction. Shift work in a "noisy" environment was associated with pregnancy-induced hypertension in one study. Whether sound-related, stress-induced increases of catecholamine levels and placental vasoconstriction are causally related to preterm births is unproven. In one study of sound exposure during the first trimester of pregnancy, there was no association with selected structural malformations in infants (orofacial cleft or structural defect of the central nervous system, skeleton, or heart and great vessels).

The above is reinforced in http://oem.msu.edu/userfiles/file/News/Hv6n3.pdf . That report highlights cause for grave concern.

> There has been one study of the hearing of children born to mothers exposed to noise during pregnancy. A study of 131 children ages 4-10 from Quebec showed a 3-fold increased risk of high-frequency hearing loss in children whose mothers had been exposed to 85-95 dB, particularly if these exposures involved a strong component of low-frequency noise.
>
> Animal studies have shown increased sensitivity of the developing cochlea to noise-induced damage. The literature on the adverse effect of noise on pregnant women is more extensive for outcomes of birth defects, shortened gestation and decreased birth weight. These studies were done both on pregnant women exposed to noise at work and in relationship to environmental noise from living near airports. The results of the studies have been mixed, some finding associations and others showing no effect.

> What recommendations should be made to pregnant women? The English abstract of a German article from 1997 states that "Health legislation laws in most countries forbid pregnant women to work in surroundings with a high noise level (80 dB continuous noise and/or rapid impulse noise changes of 40 dB)." There are no such regulations in Michigan or the rest of the United States.
>
> The Committee of the Environment of the American Academy of Pediatrics concluded: "Exposure to excessive noise during pregnancy may result in high frequency hearing loss in newborns, and may be associated with prematurity and intrauterine growth retardation." Their only clinical recommendation was: "Pediatricians are encouraged to consider screening, for noise-induced hearing loss, those infants who were exposed to excessive noise in the uterus . . ." There is no definitive conclusion, and individual recommendations in clinical settings will need to be made in the face of uncertainty.

Although the evidence of the many varied impacts of noise on the fetus may not be "definitive," it does strongly indicate a grave likelihood that cannot be ignored, and in fact OSHA, NIOSH, various medical societies, European countries, and even the DoD are concerned enough to recommend or require noise-exposure avoidance for pregnant women.

Yet many women of reproductive age live under and adjacent to the OLFC flight path and are exposed to levels of Growler noise that modestly to greatly exceed safe levels for their developing fetus (see sound levels in Tables A.1 and A.2 above). Yet, the Navy and Island County have inexplicably dismissed it as a problem.

-Appendix B-

F-18 ACCIDENTS/INCIDENTS 1980-2014

Overview: Between 1980 and 2014 the EA-18/F-18 sustained 39 incidents, while the EA-6B sustained 7 (Total, 46 incidents in 34 years). That equates to 1.15 incidents per year for EA-18/F-18 versus 0.21 incidents per year for the EA-6B.

1980 None

1981

26 May

Grumman EA-6B Prowler, BuNo *159910*, of VMAQ-2 Detachment Y, crash landed on flight deck of USS *Nimitz*, off the Florida coast,[27] killing 14 crewmen and injuring 45 others (some reports say 42, some 48). The crash was the result of the aircraft missing the last arresting cable, while ignoring a wave-off command. Two Grumman F-14 Tomcats struck and destroyed (BuNos. *161138* and *160385*), 3 F-14s, 9 LTV A-7 Corsair IIs, 3 S-3A Vikings, 1 Grumman A-6 Intruder and 1 SH-3 Sea King damaged.[28] Forensic testing conducted found that several members of the deceased flight deck crew tested positive for marijuana (the officers on board the aircraft were never tested, claimed one report). The responsibility for the accident was placed on the deck crew. The official naval inquiry stated that the accident was the result of drug abuse by the enlisted crewmen of the *Nimitz*, despite the fact that every death occurred during the impact of the crash, none of the enlisted deck crew were involved with the operation of the aircraft, and not one member of the deck crew was killed fighting the fire. As a result of this incident, President Ronald Reagan instituted a "Zero Tolerance" policy across all of the armed services—which started the mandatory drug testing of all US service personnel.[29] In another report, however, the Navy stated that pilot error, possibly caused by an excessive dosage of brompheniramine, a cold medicine, in the blood of pilot Marine 1st Lt. Steve E. White, of Houston, Texas, "may have degraded

the mental and physical skills required for night landings." The report described brompheniramine as "a common antihistamine decongestant cold medicine ingredient."[30] "Last October [1981], Rep. Joseph P. Addabbo, (D-N.Y.) said that an autopsy conducted on the pilot's body disclosed up to 11 times the recommended dosage of a cold remedy in his system."[30] This report seems to bely the above account that no testing was done on the flight crew.

28 September or 30 September (sources differ)

During a NAVAIR weapons release test over the Chesapeake Bay, a McDonnell-Douglas F/A-18A-3-MC Hornet, BuNo *160782*, c/n 8, out of NAS Patuxent River, Maryland, drops a vertical ejector bomb rack with an inert Mk. 82 bomb from the port wing, which shears off the outer starboard wing of Douglas TA-4J Skyhawk camera chase plane, BuNo *156896*, c/n 13989, which catches fire as it begins an uncontrolled spin. Two crew successfully eject before the Skyhawk impacts in the bay, the whole sequence caught on film from a second chase aircraft. Video of this accident is widely available on the web.[35][36]

29 October

A United States Navy Grumman EA-6B Prowler, BuNo *159582*, 'AC-604', of VAQ-138, from NAS Whidbey Island, Washington, crashes at 0850 hrs. in a rural field near Virginia Beach, Virginia, killing three crew. Wreckage sprayed onto nearby houses, a barn and a stable with 35 horses, but no fires were sparked and there were no ground injuries. The Prowler had departed NAS Norfolk with three other aircraft at 0832 hrs., bound for the USS *John F. Kennedy*, off the Virginia coast before crashing three miles from NAS Oceana. Navy officials said they did not know if the pilot was trying for Oceana.[37][38]

1982 None

1983 None

1984 None

1985 None

1986 None

1987 None

1989

24 April

Marine Corps Colonel Jerry Cadick, then commanding officer of MAG-11, was performing stunts at the MCAS El Toro Air Show. California, before a crowd of 300,000 when he crashed his McDonnell-Douglas F/A-18 Hornet at the bottom of a loop that was too close to the ground.[20] The aircraft was in a nose-high attitude, but still carrying too much energy toward the ground when it impacted at more than 300 mph (480 km/h). Col. Cadick was subjected to extremely high G forces that resulted in his face making contact with the control stick and sustaining serious injury. He broke his arm, elbow and ribs, exploded a vertebra and collapsed a lung. Col. Cadick survived and retired from the Marine Corps. The F/A-18 remained largely intact but was beyond repair.[152][153]

5 December

A U.S. Navy Grumman EA-6B Prowler, BuNo *163044*, 'NG', of VAQ-139, goes missing over the Pacific Ocean during training exercise 900 miles off San Diego. Search fails to find any sign of the four crew.[163]

1989

19 July

A U.S. Navy McDonnell-Douglas F/A-18 Hornet from Cecil Field, NAS Jacksonville, Florida, loses a 950-pound training bomb over Waldo, Florida, in the afternoon. The ordnance narrowly misses home with four inside, bounces off tree, skips over a second home, and impacts in a field where the spotting charge explodes. No one is injured in the incident. Navy spokesman Bert Byers states that the pilot lost track of the bomb after it fell off the jet.[178]

1990

23 January

Mid-air collision between two Blue Angels McDonnell-Douglas F/A-18 aircraft during a practice session at El Centro. One airplane, Angel Number 2, *161524*, piloted by Capt. Chase Moseley (ejected) was destroyed and the other, Angel Number 1, badly damaged but managed to land safely. Both pilots survived unharmed.[3]

6 November

Crew of an US Navy Grumman A-6E Intruder, '506', of VA-176, suffering engine fire, aim bomber away from Virginia Beach, Virginia oceanfront before ejecting just after take-off from NAS Oceana, Virginia's Runway 5. Bomber comes down at 2215 hrs. in the Atlantic Ocean ~.75 miles offshore, after just clearing the Station One Hotel, on-shore breeze carries crew inland about three blocks from the beach, one landing in a tree, the other in a courtyard of a condominium, suffering only cuts and bruises. Aircraft, on routine training mission, was unarmed. Officials did not identify the crew, but said the pilot was a 29-year old lieutenant, and the bombardier-navigator was a 34-year old lieutenant commander, both assigned to VA-176.[21][22]

1991

5 June

A Royal Australian Air Force McDonnell-Douglas F/A-18A Hornet, *A21-041*, of 75 Squadron, crashes 100 kilometres NE of Weipa, Queensland. The pilot was killed. The wreckage was found in July 1994.

1992

2 November

A United States Navy Grumman EA-6B Prowler crashes in field near NAS El Centro, California. The three crewmen ejected at a very low altitude while inverted, and all were killed. Crew included Lt. Charles Robert Gurley (USN), Lt. Peter Limoge (USMC), and Ltjg. Dave Roberts (USN).

1993 None

1994 None

1995 None

1996

9 March

A Marine Corps McDonnell-Douglas F-18 Hornet went down off Charleston, South Carolina, with two pilots aboard. The search for the Marine pilots was called off 10 March.

1997

23 September

Static test Boeing F/A-18E Super Hornet airframe, *ST56*, being barricade tested at NAES Lakehurst, New Jersey by being powered down a 1.5-mile (2.4 km) track by a Pratt & Whitney J57-powered jet car, flips over and crashes into nearby woods when the steel cable linking the barrier with underground hydraulic engines fails

1998

3 February

Main article: Cavalese cable car disaster (1998)

A U.S. Marine Corps Grumman EA-6B Prowler, BuNo *163045*, coded 'CY-02', callsign *Easy 01*, of VMAQ-2, struck a cable supporting a gondola in Cavalese. The cable was severed and 20 people in the cabin plunged over 80 metres to their deaths. The aircraft had wing and tail damage but was able to return to the base

8 April

A Swiss Air Force McDonnell-Douglas F/A-18 Hornet crashes near Crans-Montana, Switzerland.

1999 None

2000 None

2001

29 May

A US Navy McDonnell-Douglas FA-18C Hornet from VFA-106 crashed near Fort Pierce, Florida, during a ferry flight from NAS Oceana, Virginia, to NAS Key West, Florida. Pilot was killed.

2002

17 February

A USMC McDonnell-Douglas F/A-18D Hornet from VMFA-533 crash lands at Twentynine Palms, California. Both aircrew eject but the WSO, while hospitalized, dies from his injuries.

18 October

Two Boeing F/A-18F Super Hornets collide during air combat manoeuvring off the Southern California coast and crash into Pacific 80 mi SW of Monterey, California. All four crew (two Pilots and two WSOs) are killed while flying (KWF).

3 November

An McDonnell-Douglas FA-18C Hornet from VFA-34 failed to return to USS *George Washington* from a night at sea bombing mission and crashed into Adriatic Sea. Pilot was killed.

2003

17 January

A US Marine Corps McDonnell-Douglas F/A-18D Hornet crashes into the Pacific Ocean off of MCAS Miramar, California, due to a material failure during a functional check flight with one engine shut down. Both crew eject safely and are recovered.

11 September

While landing aboard USS *George Washington*, operating off the Virginia Capes, an McDonnell-Douglas F/A-18D-32-MC Hornet (Lot 13), BuNo *164198*, c/n 961/DO63,[46] 'AD 432', of VFA-106,[47] goes off the angle at ~1600 hrs. when the arresting cable parts, pilot ejects and is recovered. The broken cable, whipping back across the deck, injures eleven deck crew, the most serious of which are airlifted to shore medical facilities.[48] Footage: http://www.youtube.com/watch?v=7OxMox2Kdxs&feature=related

Captain Chris Stricklin ejects from his F-16 at an air show in September 2003.

24 March

US Navy McDonnell-Douglas F/A-18C Hornet, of VFA-82, crashes into the Atlantic Ocean near Tybee Island, Georgia. Pilot ejects safely and is rescued.

21 July

Two US Marine Corps McDonnell-Douglas F/A-18 Hornets of VMFA-134, 3rd Marine Air Wing, based at MCAS Miramar, California, suffer mid-air collision over the Columbia River, 120 miles (190 km) E of Portland, Oregon, shortly after 1430 hrs., killing Marine Reservists Maj. Gary R. Fullerton, 36, of Spartanburg, South Carolina, and Capt. Jeffrey L. Ross, 36, of Old Hickory, Tennessee in F/A-18B, BuNo *162870*, 'MF-00',[56] coming down in the river. Maj. Craig Barden, 38, ejects from F/A-18A, BuNo 163097, 'MF-04',[56] landing nearby on a hillside W of Arlington, Oregon, and is taken to Mid-Columbia Medical Center in The Dalles, suffering minor injuries.[57] All three crew eject but only two parachutes open. The fighters were on their way to the Boardman Air Force Range, where the Oregon Air National Guard trains, when they collided, said one spokesman. Another spokesman told the Associated Press that the aircraft were on a low-altitude training exercise.[

14 September

A US Navy McDonnell-Douglas F/A-18C Hornet of VMFA-212 crashes at Manbulloo Station about 10 M SW of RAAF Tindal, Australia, during a day approach to landing. The pilot ejects and is injured.

9 November

A U.S. Navy McDonnell-Douglas F/A-18C Hornet crashes 15 miles E of Nellis AFB, Nevada, after in flight fire and becoming uncontrollable shortly after takeoff. Pilot ejects safely.

2 December

The pilot of a Blue Angels McDonnell-Douglas F/A-18 Hornet, BuNo *161956*, ejects approximately one mile off Perdido Key, Florida, after reporting mechanical problems and loss of power. Lt. Ted Steelman suffered minor injuries and fully recovered.

2005

29 January

A Boeing F/A-18 Super Hornet crashes into ocean while landing on USS *Kitty Hawk* (CV 63). The No. 3 arresting wire snapped, resulting in the aircraft plunging into the Pacific Ocean 100 miles SE of Yokosuka, Japan, hitting an SH-60F and an EA-6B Prowler en route to the water. Crew LTJG Jon Vanbragt, LCDR Markus Gudmundsson ejected safely.

18 July

A Boeing F/A-18E Super Hornet and a Boeing F/A-18F Super Hornet from NAS Lemoore, California, collide over the China Lake, California, weapons testing ground. The pilot of the E is KWF, while the two crew of F eject with injuries.

2006 None

2007

21 April

Main article: 2007 Blue Angels South Carolina crash

A United States Navy Blue Angels McDonnell-Douglas F/A-18 Hornet, BuNo *162437*, crashes into a residential neighborhood while performing at an airshow in Beaufort, South Carolina, in the United States, killing the pilot. Military investigators blame pilot for his fatal crash. A report obtained by The Associated Press said that Lieutenant Commander Kevin Davis got disoriented and crashed after not properly tensing his abdominal muscles to counter the gravitational forces of a high-speed turn.[9

2008

6 January

A Boeing F/A-18E Super Hornet has a mid air collision with a Boeing F/A-18F Super Hornet over the North Persian Gulf during routine ops from the USS *Harry S Truman*. One pilot ejects and is recovered.

13 June

Two United States Navy jets collided over the NAS Fallon, Nevada high desert training range, killing a pilot of the McDonnell-Douglas F/A-18C Hornet, based at NAS Oceana, Virginia. Two crew aboard the F-5 Tiger ejected safely and were rescued.

8 December

Main article: 2008 San Diego F-18 crash

A USMC McDonnell-Douglas F/A-18D Hornet, BuNo *164017*, crashed into a neighborhood, University City, coming down two miles (3 km) west of MCAS Miramar, California, just after the Marine pilot, Lieutenant Dan Neubauer, from VMFAT-101,[141] ejected. Four fatalities on the ground. The Hornet was being flown from the USS *Abraham Lincoln*.[142] The commander of the fighter squadron involved in the crash, its top maintenance officer and two others have been relieved of duty as a result of the crash investigation. The pilot has been grounded pending a further review, Maj. Gen. Randolph Alles announced in March 2009.[143]

2009

2 April

A Spanish Air Force F/A-18 Hornet crashes in northern Spain. Pilot ejects safely.[167]

16 June

Two Spanish Air Force McDonnell-Douglas F/A-18 Hornets collide in midair near the Canary Islands, Spain. Both pilots eject

safely.[191]

17 October

A United States Marine Corps McDonnell Douglas F/A-18D Hornet (*164729*) from the Marine All Weather Fighter Attack Squadron No. 224 VMFA(AW)-224 based at the Marine Corps Air Station Beaufort, Beaufort, South Carolina experiences a heavy landing at Jacksonville International Airport, Duval County, Florida. The aircraft with two other Marine F/A-18 Hornet aircraft were landing at Jacksonville Airport in preparation for a flyover at the nearby NFL Jacksonville Jaguars game when the aircraft experiences an airborne technical fault and the port landing-gear collapses causing the aircraft to land only on the nose-wheel, starboard undercarriage and the exposed port-side external fuel-tank. The F/A-18 Hornet skidded down the runway with most damage occurring to the grounded external fuel-tank and the 2 Marine crew were uninjured.[237]

2010

24 January

A Finnish Air Force (FinAF) McDonnell-Douglas F-18 Hornet crashed in the south of the country. The fighter crashed in Juuapajoki, north of the southern city of Tampere at about 11:50 local time. The two pilots, who were on a routine training flight, ejected safely and were uninjured.[9]

10 March

A United States Marine Corps (USMC) McDonnell-Douglas F/A-18D Hornet, BuNo *164694*, 'WK-01', from VMFA (AW)-224 crashed into the Atlantic Ocean, app. 35 miles (56 km) east of St. Helena Sound, South Carolina, after a double engine failure and a fire. Both pilots ejected and were floating in an inflatable life raft for about one hour before they were rescued by a USCG helicopter.[30]

11 March

23 July

A Royal Canadian Air Force (RCAF) McDonnell-Douglas CF-18 Hornet, *188738*, of 419 Moose Squadron, based at Cold Lake, crashed at Lethbridge County Airport during a low-speed, low-altitude practice run for the Alberta International Airshow. The pilot, Capt. Brian Bews, 36, ejected in a Martin-Baker seat seconds before the fighter fell off on its starboard wing and impacted on the airfield. He suffered a compression fracture in three vertebrae but is expected to fully recover

2 December

A USN F/A-18C Hornet, BuNo *165184*, 'AD-351', suffered port undercarriage collapse on landing at NAF El Centro, California, at 1615 hrs., and departs runway. The pilot ejects safely

2011

30 March

Ten sailors are injured when an engine of a USMC McDonnell-Douglas F/A-18C Hornet of VMFAT-101 based at MCAS Miramar, California,[80] suffers a catastrophic failure while preparing for launch at 1450 hrs. during routine training exercises from the USS John C. Stennis, ~100 miles off the California coast. USN Cmdr. Pauline Storum said that five of the injured are taken by helicopter to the shore, four to the Naval Medical Center, San Diego, and one to Scripps Research Institute at La Jolla, California. None of the injuries were considered life-threatening but the fighter sustained damages over $1 million. The ensuing fire was quickly extinguished and the carrier itself was not damaged.[81]

2012

24 February

A USN Boeing F/A-18F Super Hornet on a training flight crashed into a dry lake bed 30 miles from Naval Air Station Fallon. The crew was recovered by helicopter.

6 April

A McDonnell Douglas F/A-18 Hornet of the USN crashed on take-off from Naval Air Station Oceana, Virginia Beach, Virginia. Both crew ejected. The aircraft crashed into a block of apartment complexes. No ground injuries were reported.[108] However, another report states that the pilot and one individual on the ground suffered unspecified injuries of unknown severity. CNN U.S. News confirmed that the crew had ejected, but their condition is not specified.[109]

1 September

A USMC McDonnell Douglas F/A-18C Hornet crashed in a remote range area of the Fallon Range Training Complex, The pilot ejected from the aircraft safely.[119]

2013

11 March

A USMC Grumman EA-6B Prowler crashed during a scheduled low-level flight. 3 fatalities.[125]

23 October

A Swiss Air Force (SwAF) McDonnell Douglas F/A-18 Hornet crashed into a mountain side near Alpnachstad. Both pilots died in the crash.[134]

2014

15 January

A USN Boeing F/A-18E Super Hornet of VFA-143 crashed off Virginia, pilot was rescued.

4 June

An F/A-18E Super Hornet of VFA-81 Sun Liners crashed while trying to land on the USS. Carl Vinson off the coast of Southern California .Pilot ejected safely.

In addition to the above, it is likely that hypoxia may be contributing to the accident rate of the F-18 airframe (Growler), as reported below by The Hill:

http://thehill.com/policy/defense/268221-navy-investigating-rise-of-health-issues-among-f-a-18-pilots#.VrTCx-wvX-U.facebook

Navy investigating rise of health issues among fighter jet pilots

By Rebecca Kheel - 02/04/16 12:15 PM EST

The Navy is investigating a rise in health issues among pilots of its fleet of F/A-18 and EA-18G fighter jets, the chairman of a House Armed Services Committee subpanel said Thursday.

“We’ve been informed that the Navy has organized a Physiological Episode Team, to investigate and determine the causes of these physiological episodes in aviators,” Rep. Michael Turner (R-Ohio), chairman of the Subcommittee on Tactical Air and Land Forces, said at a hearing Thursday. “As symptoms related to depressurization, tissue hypoxia and contaminant intoxication overlap, discerning a root cause is a complex process.”

The Navy started noticing a rise in physiological episodes among pilots in 2009, Turner said.

In 2006, the rate of episodes per 100,000 flight hours on the F/A-18 was 3.66, according to written testimony from Navy and Marines leaders.

By the period from Nov. 1, 2014, to Oct. 31, 2015, the rate was 28.23, according to the testimony.

For the EA-18G, the rate was 5.52 from Nov. 1, 2010, to Oct. 31, 2011. From Nov. 1, 2014, to Oct. 31, 2015, it was 43.57.

“While episodes of decompression sickness typically accompany a noticeable loss of cabin pressure by the aircrew, the cause of most physiological episodes is not readily apparent during flight,” the testimony says. “Reconstruction of the flight event is difficult with potential causal factors not always readily apparent during post-flight debrief and examination.”

The testimony was written by Lt. Gen. Jon Davis, deputy commandant of the Marine Corps for aviation; Rear Adm. Michael Manazir, director of the Air Warfare Division of the Navy; and Rear Adm. Michael Moran, program executive officer of tactical aircraft of the Navy.

Of the 273 cases adjudicated so far by the investigation team, 93 involved some form of contamination, 90 involved an environmental control systems (ECS) component failure, 67 involved human factors, 41 involved an on-board oxygen generating system (OBOGS) component failure, 11 involved a breathing gas delivery component failure, and 45 were inconclusive or involved another system failure.

In response to the episodes, the Navy has put in place mandatory cabin pressurization testing, environmental control systems pressure port testing and annual hypoxia awareness training for pilots, among other steps.

“Many other solutions are in the process of being fielded or under development as well,” the testimony says. “Future projects include technology to collect better sample data throughout the ECS and OBOGS, increased capacity for the emergency oxygen bottles, and physiological detection of symptoms.”

-Appendix C-
NASWI Mishaps for Prowlers and Growlers, 1980–2013

Severity-A Mishaps: All A-level mishaps involving Intruders (A006E) or Prowlers (EA006B) and Growlers (EA018G) between January 1980 and September 2013 based out of NASWI.

Jet Type	Date	Severity	Shore Location	Reference No.
EA006B	8/19/1981	A	WDBYI	30358
Narrative: Combat maneuvering mishap. Vertical 7000' descent/crash. Crew ejected safely.				
EA006B	12/13/1984	A	WDBYI	24611
Narrative: Explosion and fire on climb-out. Pilots ejected. Aircraft then exploded.				
A006E	5/5/1988	A	WDBYI	93760
Narrative: Jet crashed 260' below wooded ridge during low-level training. Crew died.				
A006E	8/8/1989	A	WDBYI	2465
Narrative: Jet crashed into ground during day demo practice. Accelerated stall. Crew (2) died.				
A006E	11/6/1989	A	WDBYI	3354
Narrative: System failures = lost control of jet & crashed in water. Crew ejected safely.				
A006E	1/22/1990	A	WDBYI	3966
Narrative: Uncontrolled nose-up pitch on takeoff & crash. Crew ejected too low = injury.				
A006E	10/10/1991	A	WDBYI	34217
Narrative: Low-level training wing touched river water = crash in river. Crew(2) died.				
EA006B	3/19/1992	A	WDBYI	35429
Narrative: Crash into mountains during maneuvers resulting in post-stall gyration. Crew ejected.				
EA006B	11/15/2001	A	WDBYI	82114
Narrative: Aircraft crashed during routing training situation. A lot said but a lot seemed not said.				
EA006B	5/21/2003	A	NUW	84989
Narrative: Problems from damaged wing on takeoff created big issue; crew landed safely				
F018E (?)	4/30/2006	A	NUW	100452
Narrative: Engine fire/failure (blew up) during takeoff, which was aborted. Pilot escaped.				

Severity-B Mishaps: All eight B-level mishaps involving Intruders (A006E) or Prowlers (EA006B) and Growlers (EA018G) between January 1980 and September 2013. (FOD = foreign object damage.)

Jet Type	Date	Severity	Shore Location	Reference No.
A006E	1/23/1980	B	WDBYI	31074
Narrative: Severe vibration at landing. Both engines FODed.				
A006E	1/23/1980	B	WDBYI	31075
Narrative: Engine malfunction and flight abandoned. Engine removed.				
A006E	11/25/1980	B	WDBYI	31906
Narrative: Large flock of birds hit after takeoff. Returned to safe landing. Engine FODed.				
A006E	2/22/1982	B	WDBYI	27347
Narrative: After return from FCLP all three landing gears collapsed on engine turnoff.				
A006E	10/24/1985	B	WDBYI	22228
Narrative: Tire blew on landing and jet spun off runway.				
EA006B	12/1/1996	B	WDBYI	80502
Narrative: Pilot error; landed too fast and went off end of runway. Extensive damage. Crew ok.				

EA006B	2/26/2004	B	NUW	88797
Narrative: Land gear failure on landing; plane veered off runway. No injury. Plane damaged.				
EA006B	4/1/2004	B	NUW	88423
Narrative: Bird strike shut down engine. Pilot returned, landed safely. Engine/other damaged.				

Severity-C Mishaps: Indiscriminate subsample (*n* = 17) of a total of70 Intruder (A006E) or Prowler (EA006B) and 4 Growler (EA018G) Level-C mishaps between January 1980 and September 2013. (FOD = foreign object damage.)

Jet Type	Date	Severity	Shore Location	Reference No.
EA006B	2/4/1981	C	WDBYI	29404
Narrative: Bird ingested sometime during flight.				
EA006B	7/14/1981	C	WDBYI	30167
Narrative: Landing gear malfunction. Parts of wing touched runway.				
EA006B	11/17/1981	C	WDBYI	30851
Narrative: Encountered bird flock that FODed both engines. Uneventful return and landing.				
EA006B	11/23/1981	C	WDBYI	30888
Narrative: FOD damage discovered after flight.				
EA006B	1/28/82	C	WDBYI	27243
Narrative: FOD damage discovered after flight				
EA006B	2/20/1982	C	WDBYI	27340
Narrative: Engine FODed after routine maintenance.				
A006E	2/16/1982	C	WDBYI	27323
Narrative: Engine FODed while landing				
A006E	2/18/1982	C	WDBYI	27334
Narrative: Engine FODed due to icing malfunction.				
EA006B	8/16/2008	C	NUW	98982
Narrative: FOD of tire and failure of tire resulted in aborted takeoff.				
EA006B	10/29/2009	C	NUW	n/a
Narrative: Tire blowout on landing caused much damage to plane underside. Crew okay.				
EA006B	1/19/2011	C	NUW	n/a
Narrative: Landing gear failure on 5th landing run resulted in arrested landing.				
EA006B	8/10/2011	C	NUW	n/a
Narrative: Outboard leading edge of slat on wing came off during flight. Discovered post flight.				
EA018G	9/23/2011	C	NUW	n/a
Narrative: Bird strike causes irreparable dent in radome; discovered post flight.				
EA018G	10/13/2011	C	NUW	n/a
Narrative: Plastic rotator tool left in intake and found after jet returned. Tool eaten up by engine				
EA006B	5/2/2012	C	NUW	n/a
Narrative: Canopy hinge access cover came off and struck fin pod radome in flight at 800’ AGL.				
EA018G	1/16/2013	C	NUW	n/a
Narrative: Arresting gear problems caused damage to landing gear door.				
EA018G	9/6/2013	C	NUW	n/a
Narrative: Bird strike damage to right aileron discovered post flight.				

-Appendix D-

Things Falling Off Aircraft

From there were 41 mishaps involving things coming off aircraft including Intruders (A006E), Prowlers (EA006B) and Growlers (EA018G) between July 1981 and July 2013. Most were hazards (H) but a few were class C or A mishaps. No property damages were reported.

Jet Type	Date	Severity	Shore Location	Reference No.
EA006B	7/27/1981	H	WDBYI	30240
Narrative: Part (4 x 4 in) of wing cover came off in flight. Damage to plane/property possible.				
EA006B	2/24/1982	H	WDBYI	27365
Narrative: Bay door opened in flight. Cable broke loose from fuselage; entered port engine.				
EA006B	10/1/1982	H	WDBYI	28626
Narrative: Parts of blown tire on takeoff damaged parts of aircraft on takeoff.				
A006E	8/17/1983	H	WDBYI	26276
Narrative: Lost wing access control panel during flight. Hinge fatigue suspected.				
A006E	7/11/1985	H	WDBYI	21284
Narrative: Tail pipe door on port engine lost in flight. Fatigue suspected.				
EA006B	1/13/1986	H	WDBYI	16820
Narrative: Lost outboard flap during landing.				
A006E	9/17/1987	H	WDBYI	15978
Narrative: Multiple ejector rack accidentally jettisoned during weapon test. Crew error.				
A006E	4/9/1988	H	WDBYI	8367
Narrative: Tire tread blew off in takeoff and damaged wing.				
A006E	4/14/1988	H	WDBYI	8402
Narrative: Another tire tread blow off. Not known until 70 miles away.				
A006E	4/25/1988	H	WDBYI	8499
Narrative: Inboard forward MK-76 departed aircraft after hitting hawk at 1 mile post departure.				
A006E	7/8/1988	H	WDBYI	9113
Narrative: Tire tread blew off in takeoff and damaged inboard flap.				
EA006B	1/18/1990	H	WDBYI	3932
Narrative: Tire tread blew off in takeoff and damaged landing gear hydraulics.				
A006E	3/7/1990	H	WDBYI	4455
Narrative: LOU-10 rocket pod released in flight; equipment failure. No damage; pod not found.				
A006E	3/12/1990	H	WDBYI	4508
Narrative: Tailpipe door departed aircraft during heavy G-forces exercise.				
EA006B	10/19/1990	H	WDBYI	6865
Narrative: Lost outboard slat (screw failure) during break for landing.				
A006E	11/8/1990	H	WDBYI	7125
Narrative: Just after FCLP takeoff, radome bolt came off & entered engine.				
[a] EA006B	1/16/1991	H	WDBYI	32101
Narrative: RAT hub failure & blades came off; one blade went through RAT door.[a]				
EA006B	2/21/1991	H	WDBYI	32358
Narrative: Striker plate screws & safety wire came off during break roll maneuver.				

A006E	6/5/1991	H	WDBYI	33241 6/5/1991
Narrative: Hose coupling & basket trailing aircraft after refueling.				
EA006B	3/3/1992	H	WDBYI	35281
Narrative: Hose and drogue departed aircraft during low-level flight.				
EA006B	10/26/1992	H	WDBYI	36985
Narrative: Outboard slat/bolts departed wing during break turn.				
EA006B	5/20/1993	H	WDBYI	38346
Narrative: 2 x 3 ft wing panel departed aircraft during check flight.				
A006E		H	WDBYI	
Narrative: Starboard access door fell off during flight including 6 FCLPs.				
A006E	9/20/1994	H	WDBYI	41805
Narrative: UHF antenna departed aircraft during flight with a loud thump.				
EA006B	10/17/1994	H	WDBYI	41619
Narrative: Port engine tailpipe door departed aircraft during flight.				
EA006B	2/20/1996	H	WDBYI	43429
Narrative: Starboard outboard slat departed aircraft during flight. Emergency landing.				
EA006B	4/23/1998	H	WDBYI	81151
Narrative: Brake did not release on landing; tire blew; aircraft skidded off runway.				
EA006B	7/8/1999	H	WDBYI	50158
Narrative: Improper maintenance of external stores jettison.				
EA006B	11/1/1999	H	WDBYI	51340
Narrative: Tailpipe door departed aircraft; located door; found wrong door had been installed.				
EA006B	5/22/2002	H	NUW	66848
Narrative: Nose wheel well locking bolt came off in flight; resulted in multiple damage issues.				
EA006B	5/21/2003	A	NUW	84989
Narrative: ALQ pod bolts failed; pod departed aircraft damaging wing; pilot able to land safely.				
EA006B	11/24/2009	H	NUW	95493
Narrative: Flap gear box panel came off in flight.				
EA018G	4/6/2011	H	NUW	
Narrative: Secondary flap seal broke off in flight & later found in rural area. Turkey hit blamed.				
EA006B	7/20/2011	H	NUW	
Narrative: Port wingtip port cover broke off in flight.				
EA006B	8/10/2011	H	NUW	
Narrative: Right wing outboard leading edge slat departed aircraft in flight.				
EA018G	1/26/2012	H	NUW	
Narrative: Pylon post blank-off plate departed aircraft during flight.				
EA006B	5/2/2012	C	NUW	
Narrative: Canopy Hinge Access Cover departed aircraft and struck Fin Pod Radome in flight				
EA018G	1/5/2013	H	NUW	
Narrative: Variable Exhaust Nozzle Secondary Seal departed aircraft in flight.				
EA018G	1/16/2013	C	NUW	
Narrative: Problem w/ arresting gear caused mishap on takeoff.				
EA018G	7/16/2013	H	NUW	
Narrative: Forward antenna access door of ALQ-99 came off during landing.				
EA018G	7/24/2013	H	NUW	
Narrative: Blank-off panel door departed aircraft during flight.				

[a] The narrative on this incident, indicates this was the "THIRD OCCURRENCE OF RAT BLADES FALLING OFF IN LAST 60 DAYS IN SQD," but no other reports of such RAT incidents were in the data provided and summarized here.

-Appendix E-

NATIONAL PARK SERVICE CONCERNS

The two excerpts below are National Park Service (NPS) letters submitted in 2014 about noise and soundscapes**.**

(1) Andy L. King, NPS Acting Deputy Regional Director, Pacific West Region:

Due to the proximity of the above noted units of the National Park System to NAS Whidbey Island, and because some parks in the region are near or below Military Operations Areas (MOAs) and Military Trailing Routes (MTRs)[1], the National Park Service (NPS) is concerned about the potential of the proposed action to adversely affect the acoustic environment and visitor experience at these parks.

The acoustic environment of a national park, like air, water or wildlife, is a valuable resource that can easily be degraded or destroyed by inappropriate sound levels and frequencies. Intrusive sounds are of concern to the management of national parks because they can impede the ability to accomplish the NPS mission of resource protection. Intrusive sounds may also disrupt ecosystems by interfering with the ability of wildlife to communicate, establish territory or find suitable habitat, reproduce, nurture and protect offspring, find prey, and avoid predators. Further, visitors at many NPS units come with expectations of seeing, hearing, and experiencing phenomena associated with a specific natural or cultural environment, yet in many cases these environments are being increasingly impacted by artificial sounds due to noise associated with aircraft overflights.

(2) Christine S. Lehnertz, NPS Regional Director, Pacific West Region**:**

The NPS Natural Sounds and Night Skies Division (NSNSD) conducted acoustic monitoring at Olympic NP in the winter of 2010 to characterize existing sound levels and estimate natural ambient sound levels in these areas, as well as identify audible sound sources (report and associated data are available upon request). While NPS has not yet completed acoustic monitoring at Ebey's Landing NHR San Juan Island NHP, Mount Rainier NP, or North Cascades National Park, NSNSD has developed a geospatial sound model to estimate existing ambient and existing natural sound levels[2]. Model results for Ebey's Landing NHR, San Juan Island NHP, and Olympic NP are shown in the following table; these metrics may be of use in your analysis. Additional examples of geospatial sound model graphical output can be provided on request.

Modeled Existing Sound Level (dBA)						
Park	**Minimum**	**1st Quartile**	**Median**	**Mean**	**3rd Quartile**	**Maximum**
EBLA	35.2	38.1	39.5	39.3	40.8	43.9
OLYM	28.8	33.2	34.1	34.1	34.5	44.6
SAJH	34.3	35.6	37.4	37.0	38.2	40.2

In addition, in their 2014 scoping comments the NPS clearly expressed its concerns regarding Growler Noise at Ebey's Reserve by requesting that the EIS consider the following:

3. Please analyze the impact to the acoustic environment at NPS units using appropriate metrics for noise-sensitive areas. The day-night average level (DNL) metric is an energy-based noise averaging metric widely used by the Federal Aviation Administration (FAA) and the Department of Defense as the primary means for determining noise impacts from aviation activities. However, since DNL is an averaging metric and assumptions regarding impacts from DNL levels are based on community response data, the DNL metric alone is not adequate to capture other characteristics of noise exposure and the impacts to park resources, values, and visitor experience.

NPS strongly recommends he use of audibility-based and 'time-above' metrics to take into account the duration of aircraft noise events, the number of aircraft noise events, and sound level of events. These metrics correlate better with flight operations that day=night average metrics, which obscure the dynamic range of acoustic events. Other metrics include maximum A- weighted sound levels (Lmax), sound exposure level (SEL), equivalent sound level (Leq), and number-of- events above a specific sound level (NA) as described in the Department of Defense Noise Working Group publication *Improving Aviation Noise Planning, Analysis and Public Communication with Supplemental Metrics*… These metrics and analysis would better satisfy the Requirements under the National Environmental Policy Act to characterize impacts to the environment in terms of intensity, context and duration (40 CFR 1508.27)….

5. Please analyze the impacts of each alternative on wildlife, including any federally listed species that inhabit VPS units, and discuss the impacts in the context of relevant laws such as the Marine Mammal Protection Act, the Migratory Bird Treaty Act, and the Endangered Species Act. We request that the considerable peer reviewed, published literature and data available on this subject (for all vertebrate taxa) is consulted and referenced in the EIS.

6. Please consider the alternative that most minimizes noise impacts at NPS units through aircraft technology/design or modifications to flight routes, timing, or number of operations.

-Appendix F-

ALTERNATIVE FCLP TRAINING OPTIONS

There are many options for FCLP training that do not involve the unconscionable health, safety, economic risks and impacts that OLFC inflicts on the life-scape environment under the Growler shadow. Schematics for the five discrete options discussed below are shown at the end of this appendix. There is no way for COER to validate which of these or other options might prove best for the Navy and the country. But surely any of them would be a wiser and better choice than OLFC, better for the economic and historic community of Coupeville, better for families and children too long ridiculed as NIBMYs, and ultimately better for the County whose culpability needs to be washed clean.

(1) Conduct FCLP training at other airfields where NASWI aircraft deploy for training prior to deployment.

The NASWI aircrews currently deploy to at least three remote locations to perform training: Lamoore NAS California, Fallon NAS Nevada, and Mountain Home AFB Idaho. Fallon is currently seeking to triple their training area[37]. Another potential venue is China Lake Naval Weapons Center.

FCLP training could be conducted at both Fallon and Lemoore while the squadrons are deployed there. Both bases have the facilities, runways, and emergency response capability necessary for successful FCLP training. Further, El Centro NAS is within easy commute time from either Lemoore or Fallon and is lightly used, being home to the Blue Angles in the wintertime. NASWI Squadrons have used El Centro in the past for FCLP training. Use of current training sites would involve only minimal cost.

El Centro has two operating runways. The 9,500-foot (2,900 m) east–west runway handles 96 percent of the traffic. It is equipped with a Fresnel Lens Optical Landing System (FLOLS) at each approach end, as well as lighted carrier flight deck landing areas at both ends so pilots can simulate carrier landings.

Apart from touch and go landings and take-offs, aircrews use the many ranges at El Centro to develop their skills. A remote-controlled target area allows naval aviators and naval flight

[37] https://news.usni.org/2016/10/06/room-top-gun-navy-wants-triple-nevada-training-ranges?utm_source=USNI+News&utm_campaign=78c7abfb29-USNI_NEWS_DAILY&utm_medium=email&utm_term=0_0dd4a1450b-78c7abfb29-231802293&mc_cid=78c7abfb29&mc_eid=1a987b2cbf

officers to practice ordnance delivery. The desert range is used for air-to-ground bombing, rocket firing, strafing, dummy drops and mobile land target training. The target complex uses the Weapons Impact Scoring System that microwaves target images to a range master control building for immediate verification of weapons delivery accuracy.

The addition of the Display and Debriefing Subsystem, known as DDS, expanded the role of NAF El Centro to include air combat training by utilizing remote television, acoustical, and laser scoring systems. The DDS is linked with the Tactical Air Crew Training System (TACTS) to provide a computerized record of the tactics employed by individual aircrews to employ and to evaluate the effectiveness of each maneuver.

China Lake Naval Weapons Center, in a remote part of the Mohave Desert, is an obvious choice. Air traffic is light. Costs to conduct training there would be minimal. El Centro NAF, discussed above, also fits into this category.

(2) Contract with an existing civilian airfield.

The Navy has contracted with civilian airports and other government agencies for FCLP training. For Example, NASA and the U.S. Navy have signed an agreement to conduct FCLPs at the Wallops Flight Facility on the Eastern Shore of Virginia. They have also signed an agreement to conduct FCLP training at Greensville Municipal Airport in Virginia.

Grant County International Airport (GCI) at Moses Lake in Eastern Washington is a viable alternative FCLP location for NASWI. GCI is a deactivated Strategic Air Command base that was built to support the B52 strategic bomber, the largest jet bomber ever fielded by the United States. It is located approximately 180 miles from NASWI, about 25 minutes flight time. With 4,700 acres (1,900 ha) and a main runway 13,500 feet (4,100 m) in length, it is one of the largest airports in the United States. Moses Lake is famous for good flying weather, as it is located on the east side of the Cascade Mountains in the semi-arid desert of central Washington State. It has fuel, secure facilities, and emergency services adequate to support FCLP training. Air traffic is light at GCI and could easily accommodate periodic FCLP training from NASWI. Relocation costs from OLFC would be minimal, primarily the transport of the landing light equipment and the LCO hut.

(3) Construction of a new FCLP training location at an existing DOD base or training range.

DOD owns thousands of square miles of desert land in both California and Nevada where a new FCLP training facility could be located. For example, the Nellis AFB range facility covers approximately 6000 square miles (3.8 million acres) of unpopulated desert area. The

cost to construct a FCLP runway on government land does not approach the cost of even one modern fighter aircraft. Current F-35 cost is estimated to be $114 million to $142 million, depending on the variant.

The China Lake Range in California covers 1.1 million acres and controls 19, 600 square miles of airspace. Both locations are near current deployment locations for air to air and air to ground training.

Naval Weapons Systems Training Facility Boardman (NWSTF) consists of approximately 47, 000 acres of desert land and 490 square miles of airspace in northern Oregon. It is approximately 350 air miles from NASWI and is currently used for training by Whidbey based aircraft as well as by the Oregon National Guard. It is within the NASWI command and a new $4M medical facility was just built here in 2015 by the US Navy. Runways, facilities and support systems would have to be constructed.

Joint Force Lewis McChord's Yakima Training Center is a viable possibility. As the Army's budget is cut by the DOD and the Navy's is expanded in Washington State, this vast unpopulated area could be yet another site for Growler FCLP flight training.

Fairchild, Air Force Base, Spokane, Washington. Located 4 miles east of Spokane, the airstrip has two runway directions, and is 13,899 × 150 feet with a concrete surface.

(4) Development and use of Growler flight simulators.

There are a wide range of military simulators that are dome-based full-mission simulators (FMS) that contain full-motion platforms, visual motion systems, and "G" simulation techniques. Simulators are so accurate in their pilot preparation methods that there is little difference between virtual and reality. As of 2007, the U.S. Air Force had over 400 simulators or training devices, the Navy has 140, and the Marines have 50.

Boeing is one of the simulator manufacturers, and as manufacturer of the EA-18G Growler, it is well suited to develop Growler simulator training. Simulators reduce in-jet training and thereby solve many of the issues attendant to jet noise. Such simulators would, in addition to mitigating the above-mentioned issues, also save significant taxpayer dollars by greatly reducing fuel use ($16,000/Growler hour) and maintenance costs, reduce environmental fuel pollution issues, and lessen military-basing issues with personnel (pilot/family separation concerns)

The Navy refutes and rebuts use of simulators, stating that the pilots need conditions similar to what they would encounter during carrier operations, e.g., temperature, barometric pressure (pressure altitude), elevation, and changing weather conditions.

At OLFC, however, the Growlers do not operate during low ceilings, low visibility, and high wind conditions at OLF. Yet those conditions would be encountered during actual deployment. And OLFC cannot simulate aircraft carrier movement or emergency situations, but simulators can do that with realism that OLFC can never provide. All these conditions can be presented in the simulator in exacting detail without training risks to pilot, aircraft, or civilians.

Simulators are further explored in the following letter from a retired, Northwest Airlines pilot (Captain Mark Harmon, 38 years of experience, totaling 28,000 hours in a variety of jet and propeller powered aircraft; holds licenses in ground instruction for FAA basic, advanced, instructor, and flight engineer certification):

> Dear Congressman Rick Larsen,
>
> My name is Mark Craig Harmon and I have corresponded with your office on several occasions with the dilemma confronting your constituents in the Puget Sound area concerning Naval operations, specifically the EA-18G Growler touch and go carrier activity at OLF Whidbey Island NAS. I don't believe that it is necessary to review in total the pros and cons of such activity; however, it might be reasonable to highlight a solution worthy of consideration.
>
> I am a retired airline captain of 38 years of experience and totaling 28,000 hours in a variety of jet and propeller powered aircraft. I am also a product of hundreds of hours training and instructing in a variety of flight simulators. I also hold licenses in ground instruction for FAA basic, advanced, instructor, and flight engineer certification.
>
> I am promoting the use of high tech simulators that are being used throughout the world, not only for commercial operations, but for military as well. There is a wide range of military simulators that are dome based Full Mission Simulators (FMS) that contain full motion platforms, visual motion systems, and "G" simulation techniques. I personally have had experience with the initial "Link" trainer developed during the late 30's and 40's to the most current advanced aircraft simulators. These simulators are so accurate in their pilot preparation methodology that there is little difference between virtual and reality. My first commercial flights when checking out on new aircraft types were flown with passengers and cargo. The same is true of military mission flights. As of 2007, the U.S. Air Force has over 400 simulators or training devices, the Navy has 140,

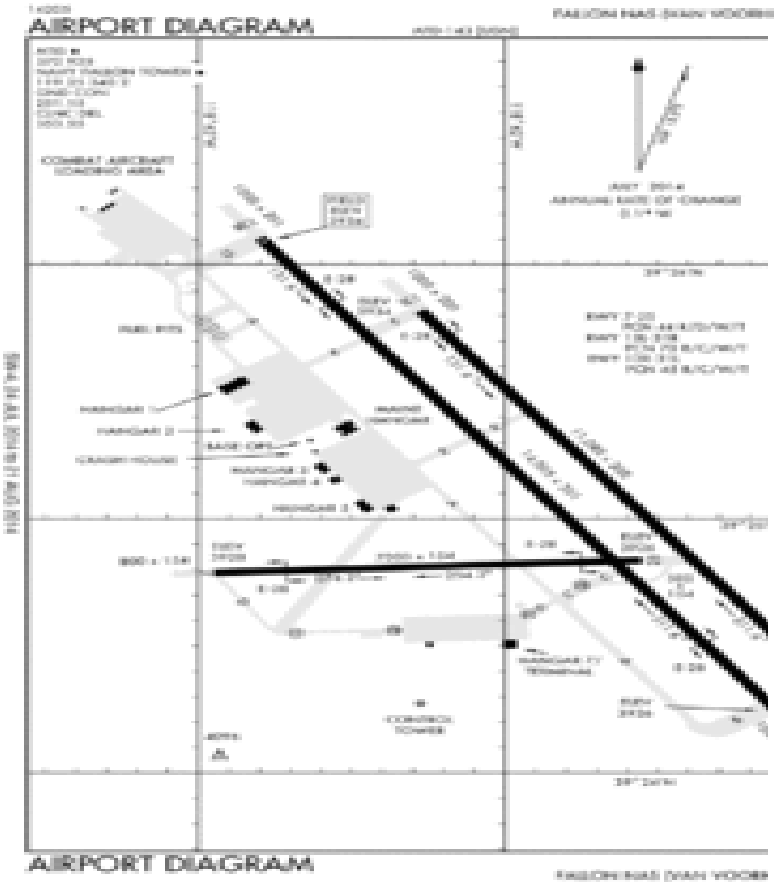
and the Marines have 50. The builders of these simulators are L-3 Link, which is the largest manufacturer, and Boeing with at least 170, amongst others. By the way, Boeing also manufactures the EA-18G Growler (F-18 fuselage) which is at the main point of this presentation and creator of the Whidbey OLF dilemma! Boeing is able to provide the EA-18G aircraft and its simulator training to the Navy if the Armed Services Committee would see the advantages of this proposal to include:

- Saving the U.S. taxpayer's money by greatly reducing fuel and maintenance costs
- Reducing environmental, marine mammal destruction, and fuel pollution issues
- Reducing extreme public health issues (to include electronic radiation warfare)
- Relieving devastating noise issues
- Reducing accident potential (1980 to present there have been 45 accidents; and according to experts, it is 36 times more likely to crash than the previous EA-6B Prowler that preceded the EA-18G)
- Relieves military basing issues/problems with personnel (pilot/family separation concerns)
- And relaxing the demand for alternate field proposals (ex. Moses Lake)

The Navy refutes and rebuts these proposals by stating that they need similar flight conditions located at OLF Whidbey, as they would encounter during carrier operations to include temperature, barometric pressure, (or pressure altitude), elevation, water operations and changing weather conditions. Strangely enough, the Growlers don't operate during low ceilings, low visibility, and high wind conditions at OLF, all of which would be encountered while eventually shipped out during a cruise, and could be presented in the simulator in more exacting detail and sooner than OLF operations. OLF cannot simulate aircraft carrier movement for touch and goes, severe weather conditions, and emergencies . . . simulators can and with far less difficulty than what OLF provides!

The Naval operations at OLF Whidbey are inadequate and inefficient training that stubbornly doesn't allow change to better serve our aviators and the citizens they are suppose to protect.

Thank you for your attention and I hope that you can be a part of a resolution to this matter.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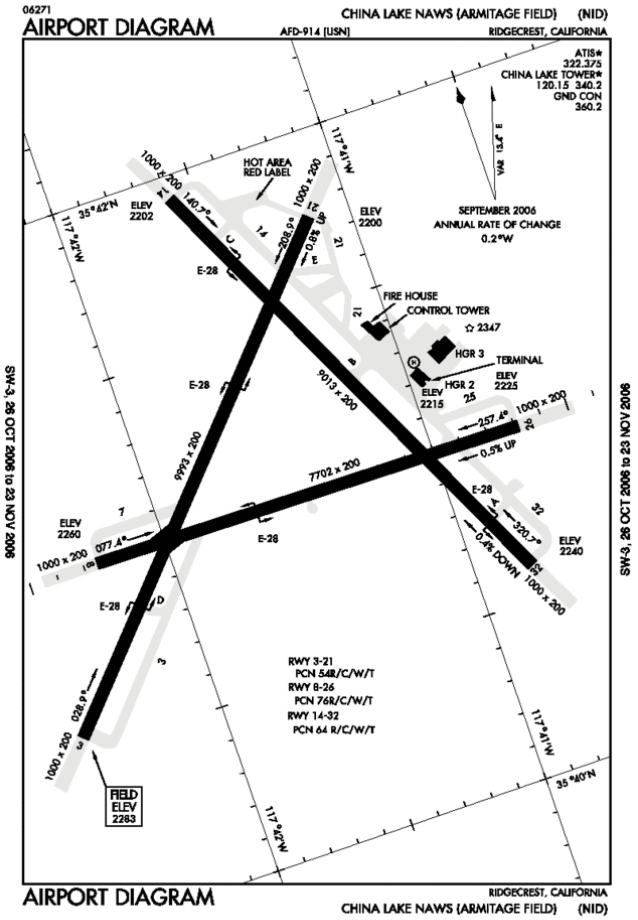
AIRPORT DIAGRAM


06271
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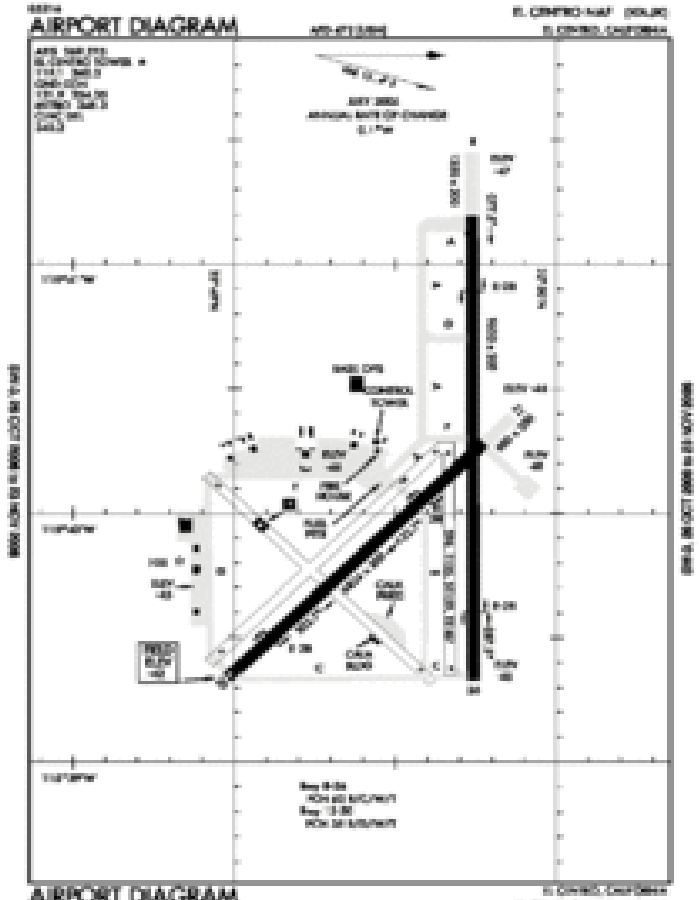
CHINA LAKE NAWS (ARMITAGE FIELD) (NID)
AFD-914 [USN]
RIDGECREST, CALIFORNIA
ATIS* 322.375
CHINA LAKE TOWER* 120.15 340.2
GND CON 360.2
HOT AREA RED LABEL
SEPTEMBER 2006 ANNUAL RATE OF CHANGE 0.2°W
FIRE HOUSE
CONTROL TOWER
HGR 3
TERMINAL
HGR 2
RWY 3-21 PCN 548/C/W/T
RWY 8-26 PCN 76R/C/W/T
RWY 14-32 PCN 64 R/C/W/T
FIELD ELEV 2283
SW-3, 26 OCT 2006 to 23 NOV 2006
AIRPORT DIAGRAM
CHINA LAKE NAWS (ARMITAGE FIELD) (NID)
RIDGECREST, CALIFORNIA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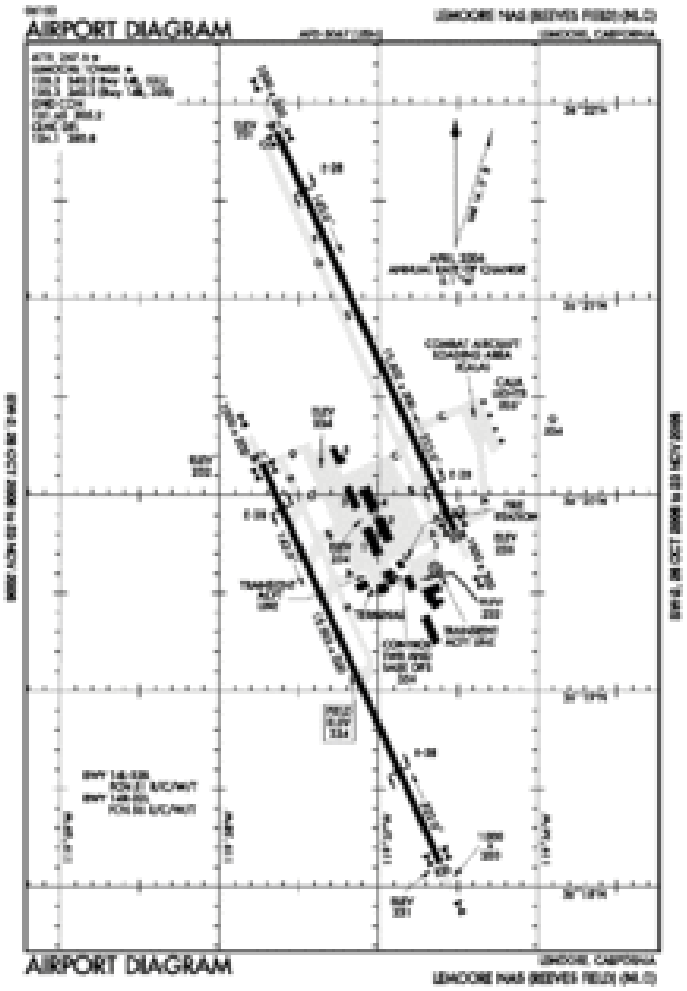
AIRPORT DIAGRAM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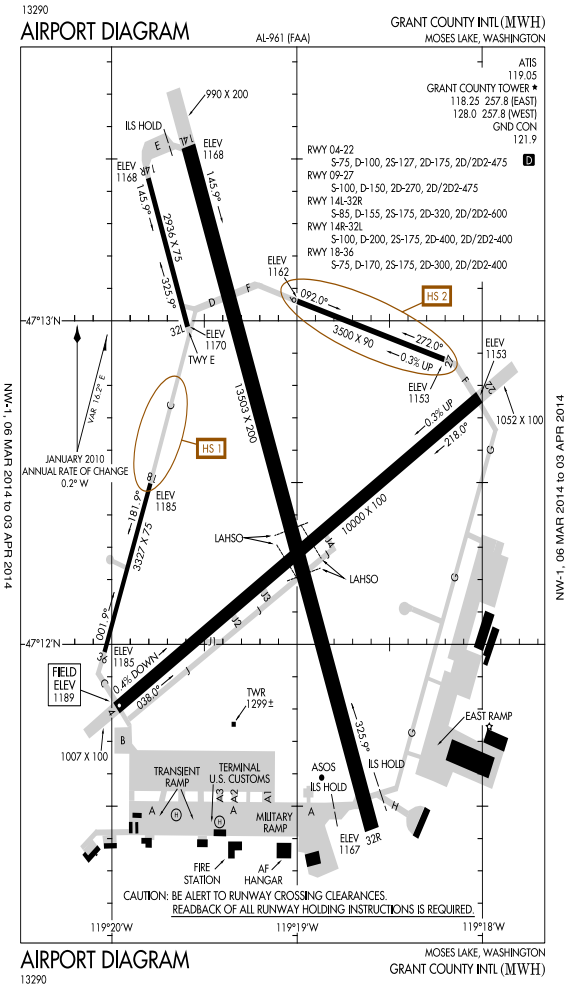
13290
AIRPORT DIAGRAM
GRANT COUNTY INTL (MWH)
AL-961 (FAA)
MOSES LAKE, WASHINGTON
ATIS 119.05
GRANT COUNTY TOWER 118.25 257.8 (EAST) 128.0 257.8 (WEST)
GND CON 121.9
RWY 04-22 S-75, D-100, 2S-127, 2D-175, 2D/2D2-475
RWY 09-27 S-100, D-150, 2D-270, 2D/2D2-475
RWY 14L-32R S-85, D-155, 2S-175, 2D-320, 2D/2D2-600
RWY 14R-32L S-100, D-200, 2S-175, 2D-400, 2D/2D2-400
RWY 18-36 S-75, D-170, 2S-175, 2D-300, 2D/2D2-400
990 X 200
ILS HOLD
ELEV 1168
145.9°
2936 X 75
325.9°
ELEV 1162
092.0°
3500 X 90
272.0°
0.3% UP
HS 2
47°13'N
32L
ELEV 1170
TWY E
13503 X 200
ELEV 1153
1052 X 100
0.3% UP
218.0°
VAR 16.2° E
JANUARY 2010
ANNUAL RATE OF CHANGE
0.2° W
HS 1
ELEV 1185
181.9°
3327 X 75
LAHSO
10000 X 100
LAHSO
47°12'N
0.4% DOWN
038.0°
FIELD ELEV 1189
TWR 1299±
1007 X 100
EAST RAMP
TRANSIENT RAMP
TERMINAL U.S. CUSTOMS
ASOS
ILS HOLD
MILITARY RAMP
ELEV 1167
32R
FIRE STATION
AF HANGAR
CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
119°20'W
119°19'W
119°18'W
AIRPORT DIAGRAM
13290
MOSES LAKE, WASHINGTON
GRANT COUNTY INTL (MWH)
NW-1, 06 MAR 2014 to 03 APR 2014
NW-1, 06 MAR 2014 to 03 APR 2014

COER Technical Committee:

Robert L. Wilbur: Received B.S. and M.S. in Zoology from North Carolina State University. Aquatic research biologist in North Carolina, Florida and Arizona (1965-1976). Salmon enhancement coordinator and planning in Alaska (1976-1985); Alaska Board of Fisheries technical liaison (1985-1988); fisheries research editor and originator and managing editor of scientific research journal, the Alaska Fishery Research Bulletin (1988-2000). Author of numerous scientific publications and editorial guides, regulations writer for the Commercial Fisheries Division, Alaska Department of Fish and Game. For the Council of Science Editors, coauthored *Scientific Style and Format* , a 600+ page a cross-disciplinary manual widely used throughout the physical and biological sciences. Presently, part-time freelance science editor for Taylor Francis Group and the American Fisheries Society. Coupeville resident since 2006.

Maryon Attwood: Received B.A. from Monmouth College and participated in graduate courses in natural biological illustration at the University of New Haven and at the Smithsonian Institution in Washington D.C. Successfully managed non-profit organizations for over 30 years. Assisted in passing state legislation that established an Office of State Archaeology and a Museum of Natural History in Connecticut. Established major state and regional environmental preservation programs, farmer training, and arts education programs across the country. As an environmental, agricultural and community activist has worked on issues that encourage social justice, equity, a healthy environment and sustainable local economies, which lead to being a cofounder of COER. Remains active on local boards and commissions on Whidbey Island, and is currently co-owner of Cook on Clay Ceramic Cookware Company. Was married to a Navy pilot, now deceased, and has been a Coupeville resident since 2005.

Neal Sims: Received B.S. in Economics 1963 from West Texas State College and MPA from Auburn University. Lt Col USAF, retired. Military assignments included Nuclear Weapons Courier Officer, Squadron Commander in Vietnam, and George AFB California. Served as a staff officer at HQ USAF the Pentagon, the Air Force Engineering and Services Center and 17th Air Force Headquarters, Ramstein Germany. After retirement from the Air Force worked at General Dynamics Corporation as Director of Proposal Development. Later, was CEO Sims and Associates. We were expert government contracting consultants to the government and most major military contractors, including General Motors, General Electric, Lockheed, McDonnel Douglas, Siemens, Anser, Boeing, Kewit, Lend lease Actus, Blue Cross, EDS, General Dynamics, Rockwell, Goodyear, Loral, Litton, United States Air Force, NASA, US Army, Honeywell, and many others. Is a single-engine land and single-engine seaplane pilot with instrument ratings, and while living in Alaska was a search and rescue pilot with the Alaska Wing of the Civil Air Patrol, a USAF Auxiliary. Whidbey Island resident since 1993.

Mark C. Harmon: Received a Bachelor of Arts degree in Business Administration (Finance and Accounting) from the University of Washington, Foster School of Business 1967. Employed at the Boeing Company in the Missiles and Information Systems

Division, specifically the Saturn Apollo Booster and Minute Man 3 Missile projects conducting budget and efficiency programs (1967-1969). Employed in 1969 as a FAA ground instructor (Basic and Advanced), FAA flight instructor (Airplanes, Multi-engine, and Instruments). Holds an FAA Pilot's license, Single and Multiengine Land, Commercial, Airline Transport Pilot's Rating (Single and Multi-engine) and Boeing 727, 757, 767 Type Ratings. Type Rated FAA Flight Engineer with an accumulated 28,000 hours of flight time. Worked as a flight instructor, air taxi pilot, commercial pilot out of Arlington, Washington Airport and Boeing Field from 1969 to 1973. In 1973 was employed as a Flight Engineer and Pilot for Braniff International out of Dallas, Texas until May of 1982. Employed in 1982 as a pilot for Northwest Airlines and flew the Boeing 727, 757, and DC- 10 until retirement as a Captain in 2005. From 2005 to 2007 flew a private Siddeley Hawker 125A jet stationed out of Boeing Field, Washington. A full and part time Coupeville resident since 1963.