



UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION MIRAMAR
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CO

JUL 01 2021

From: Commanding Officer, Marine Corps Air Station Miramar
To: Commander, Marine Corps Installations Command
Via: Commanding General, Marine Corps Installations West-Marine
Corps Base Camp Pendleton

Subj: CONTINUING ENVIRONMENTAL REVIEW STATEMENT FOR THE SECOND
REVISED FEDERAL ACTION FOR WEST COAST BASING OF THE F-35
AT MARINE CORPS AIR STATION MIRAMAR

Ref: (a) Record of Decision, U.S. Marine Corps F-35B West Coast
Basing dtd 9 Dec 10
(b) Final U.S. Marine Corps F-35B West Coast Basing
Environmental Impact Statement (October 2010)
(c) Continuing Environmental Review Statement for Basing
Up to Two F-35C Squadrons in Lieu of Two F-35B
Squadrons at Marine Corps Air Station Miramar dtd
28 Feb 18
(d) 40 C.F.R. § 1502.9
(e) MCO 5090.2 Volume 12
(f) U.S. Marine Corps NEPA Manual (2019)

Encl: (1) MCAS Miramar Staff Memorandum of 30 Jun 21

1. Reference (a) recorded the Department of the Navy's decision to assign up to 96 F-35B aircraft to Marine Corps Air Station (MCAS) Miramar, in six operational squadrons, based on the findings of the Environmental Impact Statement (2010 EIS) at reference (b). Reference (c) established that a 2018 revision to the basing plan, incorporating two 10-plane F-35C squadrons in lieu of two 16-plane F-35B squadrons, was not a substantial change relevant to environmental concerns, and therefore did not require supplementation to the 2010 EIS. A 2021 revision to the basing plan (2021 Second Revised Federal Action) would continue with two 10-plane F-35C squadrons but reduce the number of F-35B operational squadrons from four to three, reduce the F-35B aircraft complement from 16 to 10 per squadron, and add a 25-plane F-35B Fleet Replacement Squadron (FRS).

2. The enclosed memorandum establishes that environmental impacts associated with the 2021 Second Revised Federal Action are accounted for in the 2010 EIS. This revision to the F-35 basing plan, therefore, is not a substantial change relevant to environmental concerns. Consistent with reference (d), chapter 3 of reference (e), and section 6.5 of reference (f), I find it is not necessary to prepare a supplement to the 2010 EIS in support of basing two 10-plane F-35C operational squadrons, three 10-plane F-35B operational squadrons, and one 25-plane F-35B FRS at MCAS Miramar. This command is prepared to support the 2021 Second Revised Federal Action.


C. B. DOCKERY

5090
30 Jun 21

MEMORANDUM FOR THE COMMANDING OFFICER

Subj: CONTINUING ENVIRONMENTAL REVIEW STATEMENT FOR THE SECOND
REVISED FEDERAL ACTION FOR WEST COAST BASING OF THE F-35
AT MARINE CORPS AIR STATION MIRAMAR

Ref: (a) Record of Decision, U.S. Marine Corps F-35B West
Coast Basing dtd 9 Dec 10
(b) Final U.S. Marine Corps F-35B West Coast Basing
Environmental Impact Statement (October 2010)
(c) 42 U.S.C. §§ 4321-4370h
(d) 40 C.F.R. Parts 1500-1508
(e) Continuing Environmental Review Statement for Basing
Up to Two F-35C Squadrons in Lieu of Two F-35B
Squadrons at Marine Corps Air Station Miramar dtd
28 Feb 18
(f) 42 U.S.C. §§ 7401-7671q
(g) San Diego Air Pollution Control District,
[https://www.sdapcd.org/content/sdc/apcd/en/air-
quality-planning/attainment-status.html](https://www.sdapcd.org/content/sdc/apcd/en/air-quality-planning/attainment-status.html)
(h) Page 29,522 of Vol. 86, Federal Register, June 2,
2021 (86 FR 29,522), U.S. EPA: San Diego County Ozone
Nonattainment Status
(i) MCO 5090.2 Volume 12
(j) U.S. Marine Corps NEPA Manual (2019)

Encl: (1) Noise and Air Quality Modeling Report dtd 30 Jun 21

1. Reference (a) recorded the Department of the Navy's 2010 decision to base six F-35B operational squadrons at Marine Corps Air Station (MCAS) Miramar, with up to 16 aircraft per squadron. That decision was based on an Environmental Impact Statement (2010 EIS), reference (b), prepared in accordance with the National Environmental Policy Act (NEPA) and its implementing regulations, references (c) and (d) respectively. The 2018 Continuing Environmental Review Statement (2018 CERS) at reference (e) established that a 2018 revision to the basing plan (2018 Revised Federal Action), incorporating two 10-plane F-35C squadrons in lieu of two 16-plane F-35B squadrons, was not a substantial change relevant to environmental concerns, and therefore did not require supplementation to the 2010 EIS. This 2021 CERS examines whether a second revision to the basing plan (2021 Second Revised Federal Action), when compared to the 2010 Federal Action, represents a substantial change relevant to

ENCLOSURE (1)

Subj: CONTINUING ENVIRONMENTAL REVIEW STATEMENT FOR THE SECOND
REVISED FEDERAL ACTION FOR WEST COAST BASING OF THE F-35
AT MARINE CORPS AIR STATION MIRAMAR

environmental concerns requiring supplementation to the 2010
EIS. We conclude that supplementation is not required.

2. Summary and Status of the Federal Action. The first F-35C
squadron commenced operations at MCAS Miramar in 2020. The
second F-35C squadron and four F-35B squadrons are scheduled to
arrive between fiscal years 2022 and 2032. The 2021 Second
Revised Federal Action would continue with the plan for two 10-
plane F-35C squadrons, decrease the number of F-35B operational
squadrons from four to three, reduce the F-35B aircraft
complement from 16 to 10 per operational squadron, and
incorporate a 25-plane F-35B Fleet Replacement Squadron (FRS).

2010 Federal Action

F-35B squadrons: 6 (16 aircraft each)
Total squadrons: 6
Total aircraft: 96 (96 F-35B)

2018 Revised Federal Action

F-35C squadrons: 2 (10 aircraft each)
F-35B squadrons: 4 (16 aircraft each)
Total squadrons: 6
Total aircraft: 84 (20 F-35C, 64 F-35B)

2021 Second Revised Federal Action

F-35C squadrons: 2 (10 aircraft each)
F-35B squadrons: 3 (10 aircraft each)
F-35B FRS: 1 (25 aircraft)
Total squadrons: 6
Total aircraft: 75 (20 F-35C, 55 F-35B)

3. Baseline for Comparison. The 2010 EIS was an exhaustive
evaluation of the environmental impacts associated with the 2010
Federal Action. Those impacts were the relevant point of
comparison, or baseline, for the 2018 CERS, and they remain the
appropriate baseline for this 2021 CERS. By comparing the
latest plan to the original plan, we identify whether the 2010
EIS appropriately covers the environmental impacts associated
with the federal action as it has evolved.

4. Resource Areas Examined. As was the case with the 2018
Revised Federal Action, the 2021 Second Revised Federal Action
would not alter the number of F-35 squadrons based at MCAS
Miramar, and the total number of assigned aircraft (75) would be
less than the 2010 Federal Action (96). Personnel numbers would
not increase, and infrastructure requirements would not change.

Subj: CONTINUING ENVIRONMENTAL REVIEW STATEMENT FOR THE SECOND
REVISED FEDERAL ACTION FOR WEST COAST BASING OF THE F-35
AT MARINE CORPS AIR STATION MIRAMAR

The 2021 Second Revised Federal Action, therefore, presents no realistic potential for changed impacts to 13¹ of the 15 resources evaluated in the 2010 EIS. Two resources, Noise and Air Quality, warrant further consideration because of the potential that the decision to reduce total aircraft load and reconfigure from an operational squadron to an FRS could result in a different environmental impact than that studied in 2010.

5. Modeling and Results. Aircraft noise and air quality impacts are a function of the number and type of aircraft operations flown as well as, in the case of noise, the time of occurrence. Enclosure (1) and its attachment present and explain the estimated operations for the three 10-plane F-35B operational squadrons and the F-35B FRS. Air quality modeling of this data produced estimates of F-35B emissions. For purposes of noise modeling, this data was combined with the 2018 estimated operations for two 10-plane F-35C squadrons and the estimated operations of other assigned aircraft that are unaffected by the 2021 Second Revised Federal Action.² Modeling results were then compared to the noise and air quality impacts previously covered by the 2010 EIS.

a. Noise Impacts

(1) The Federal Aviation Administration and the State of California recognize the Community Noise Equivalent Level (CNEL) as the appropriate metric for evaluating impacts from aircraft noise. The CNEL reflects a person's cumulative exposure to sound over a 24-hour period, expressed as the noise level for the average day of the year on the basis of annual aircraft operations. The noise model analyzes many individual aircraft flight trajectories presented as flight profiles assigned to specific flight tracks that describe altitude, airspeed, power setting and other flight conditions that vary over time and distance from the airfield. These characteristics, along with time of day, are input into a sophisticated modeling program to generate 5-decibel (dBA) noise contours that can be mapped to

¹ Unaffected resources are Airfields & Airspace; Safety & Environmental Health; Land Use; Infrastructure & Utilities; Socioeconomics; Community Facilities & Services; Ground Traffic & Transportation; Environmental Justice; Hazardous Materials & Waste; Biological Resources; Topography, Geology & Soils; Water Resources; and Cultural & Traditional Resources.

² While modeling noise for F-35C operations, the 2018 CERS incorporated updated noise data for the F-35B, CH-53E, MV-22B, and KC-130J. The modeling in enclosure (1) likewise incorporated this updated noise data in order to document expected overall noise impacts based on the best available information.

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REVISED FEDERAL ACTION FOR WEST COAST BASING OF THE F-35
AT MARINE CORPS AIR STATION MIRAMAR

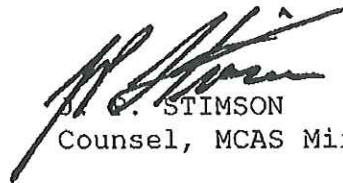
Second Revised Federal Action would reduce CO₂ equivalent (CO₂e)⁴ emissions by 87,527 TPY relative to emission estimates in the 2010 EIS.

(3) The SDAB is in attainment with the NAAQS for CO, and the estimated 256 TPY increase in emissions would not cause the air basin to fall out of attainment; as such, this increase is neither substantial nor significant. Moreover, the increase in CO emissions is relative to estimates in the 2010 EIS; when compared to the F/A-18 aircraft being replaced, CO emissions associated with the 2021 Second Revised Federal Action would be 1,371 TPY less than those of legacy F/A-18s as documented in Table 4.4-4 of the 2010 EIS. Similarly, the minute increases in PM₁₀ and PM_{2.5} emissions associated with the 2021 Second Revised Federal Action still represent a reduction of more than 200 TPY respectively as compared to the legacy F/A-18s being replaced.

6. Conclusion. For the reasons discussed above, and as demonstrated by enclosure (1), the 2021 Second Revised Federal Action would not represent a substantial change relevant to environmental concerns. Consistent with section 1502.9(d) of reference (d), it is not necessary to supplement the 2010 EIS to support basing two 10-plane F-35C operational squadrons, three 10-plane F-35B operational squadrons, and one 25-plane F-35B FRS at MCAS Miramar. Per chapter 3 of reference (i), and section 6.5.2 of reference (j), we recommend approval of this determination that no further NEPA documentation is necessary to support the 2021 Second Revised Federal Action.



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⁴ CO₂e expresses the relative impact of various greenhouse gases in terms of the amount of global warming potential created by the same amount of CO₂.



30 June 2021

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Subject: Final Noise and Air Quality Analysis for 2021 Second Revised Federal Action - F-35 Basing at MCAS Miramar

On December 9, 2010, the Department of the Navy signed a Record of Decision (ROD) implementing Alternative 1 to base six operational squadrons at Marine Corps Air Station (MCAS) Miramar and five operational squadrons plus one operational test and evaluation (OT&E) squadron at MCAS Yuma based upon the Environmental Impact Statement (EIS) (Navy 2010a,b). Since the ROD was issued, changes to the Joint Strike Fighter Program have occurred, including changes to the aircraft series, number of aircraft, and construction requirements. A Continuing Environmental Review Statement analyzed the potential for impact from such changes, as well as updated noise signatures for several aircraft types that became available after the ROD (Navy 2018). This analysis of the 2018 Revised Federal Action found that the changes would not result in substantial changes to applicable environmental resource areas.

This document presents the results of a second revised basing plan (2021 Second Revised Federal Action) that would reduce the number of F-35B aircraft in each operational squadron and replace one operational squadron with a Fleet Replacement Squadron (FRS) relative to the 2018 Revised Federal Action. This analysis supports the deliberative process intended to aid decision-makers in determining the need for supplemental National Environmental Policy Act (NEPA) analysis in accordance with Title 40 Code of Federal Regulations (CFR) 1502.9(c)(1)(i), Marine Corps Order (MCO) P5090.2 Section 12201.6.k, and United States (U.S.) Marine Corps (USMC) NEPA Manual Section 6.5.

1 Description of Scenarios Compared

This report summarizes the results of noise and air quality studies based on 2021 Second Revised Federal Action, referred to as "Revised" throughout this report. The Revised condition would include a total of 75 aircraft from 6 squadrons comprised of:

- 3 F-35B operational squadrons – 10 aircraft each
- 1 F-35B FRS squadron – 25 aircraft each
- 2 F-35C operational squadrons – 10 aircraft each

The 2010 ROD describing the basing of 6 squadrons of F-35B totaling 96 aircraft serves as the baseline for comparison to the Revised condition for the determination of impact for both Noise and Air Quality.

2 Methodology

2.1 Introduction to Noise and the Primary Noise Metric

Noise is defined as unwanted sound that interferes with or disrupts normal human activities; the primary human response to aircraft and other transportation noise is annoyance. The response of different individuals to similar noise events is diverse and is influenced by the type of noise, the perceived importance of the noise, its appropriateness in the setting, the time of day, the type of activity during which the noise occurs, and the sensitivity of the individual to noise.

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ENCLOSURE (1)

Per Department of Defense (DoD) Instruction 4165.57, the DoD prescribes the Community Noise Equivalent Level (CNEL) noise descriptor to describe the aircraft noise environment around air installations in California, consistent with the State of California guidelines. Aircraft operations are modeled using an annual average day (yearly operations divided by 365 days/year). For CNEL, average daily operations are further divided into three distinct time bands: daytime (7:00 a.m. to 7:00 p.m.), evening (7:00 p.m. to 10:00 p.m.), and night (10:00 p.m. to 7:00 a.m.). Operations that occur during the evening period are multiplied by 3 (equivalent to 4.77 decibel [dB] increase) while night operations are multiplied by 10 (equivalent to 10 dB increase). This adjustment gives individual noise events more weight during times when human observers are likely to be more sensitive and therefore more highly annoyed by individual noise events. It is worthy of noting that the timeframes for day, evening, and night do not change, and are therefore irrespective of the seasonal fluctuation in daylight. Therefore, it is possible for some evening operations to occur prior to the actual sunset, and for some night operations to occur after sunrise, depending on the season.

2.2 Noise Modeling Parameters

This study uses the DoD's NOISEMAP suite of computer programs for aircraft noise modeling and analysis (Wyle 1998; Wasmer Consulting 2006). The core computational programs are called "NMAP," version 7.3, and Rotorcraft Noise Model (RNM) version 7.2.4. NOISEMAP accounts for the effects of sound propagation and includes consideration of terrain elevation, taken from the U.S. Geological Survey National Elevation Dataset, and ground impedance conditions, taken from U.S. Geological Survey Hydrography data. In this case, "soft ground" (e.g., grass-covered ground) is modeled with a flow resistivity of 225 kilopascal-seconds per square meter (kPa-s/m²) and "hard ground" (in this case, water) is modeled with a flow resistivity of 100,000 kPa-s/m². The modeling does not include the effect of shielding of on-base buildings. Consistent with the 2018 Continuing Environment Review Supplemental (CERS) analysis, this study modeled ambient atmospheric temperature at 63 degrees Fahrenheit (°F), 45 percent relative humidity (%RH), and barometric pressure of 30.02 inches, as described in Table 1.

Table 1 Noise Modeling Parameters

Software	Analysis	Version
NMAP	Fixed-wing aircraft	7.3
RNM	Rotorcraft	7.2.4
Parameter	Description	
Receiver Grid Spacing	500 feet in x and y	
Metric	CNEL	
Basis	AAD Operations	
Topography		
Elevation Data Source	U.S. Geological Survey 30 meters NED	
Elevation Grid Spacing	500 feet in x and y	
Impedance Data Source	U.S. Geological Survey Hydrography DLG	
Impedance Grid spacing	500 feet in x and y	
Flow Resistivity of Ground (soft/hard)	225 kPa-s/m ² / 100,000 kPa-s/m ²	
Modeled Weather (Monthly Averages 2012-2016; November selected)		
Temperature	63 °F	
Relative Humidity	45%	
Barometric Pressure	30.02 in Hg	

Notes: CNEL = Community Noise Equivalent Level; AAD = Average Annual Day; NED = National Elevation Dataset; DLG = Digital Line Graph; kPa-s/m² = kilopascal-seconds per square meter; °F = degrees Fahrenheit; in Hg = inches Mercury.

NOISEMAP combines the above information with flight tracks (departure, arrival, closed pattern), flight profiles (altitude, power, airspeed), and the number of aircraft operations for each flight profile (number of times each type of operation occurs by aircraft/track/profile), and data related to ground maintenance run-up of aircraft engines (location/power setting/time in mode) to predict the total noise energy experienced on an average annual day at each of the grid of points on the ground. In this case, as indicated in Table 1, that grid spacing was 500 feet. Noise

exposure is presented in terms of contours, i.e., lines of equal value, of CNEL. CNEL contours of 65 to 85 dB, presented in 5-dB increments, provide a graphical depiction of the cumulative aircraft noise environment.

Because noise data specific to the F-35C is not available, F-35C operations are modeled using the latest noise data for the F-35A (measured by U.S. Air Force in 2013). The engines are nearly identical, and the F-35C profiles modeled herein are F-35C-specific, per the Karnes Profiles version 3.2, which allow for the F-35C to use slightly different (greater) power settings and speeds that are appropriate for the airframe and its greater weight, wingspan, etc. (Wyle 2015).

2.3 Modeling Changes Since Prior Action

In addition to the changes in number of based aircraft at MCAS Miramar, the following refinements to the modeling conditions have been implemented to account for updated training information:

- Increased evening departures and the corresponding evening and night arrivals needed for FRS training requirements.
- Changed F-35B FRS departure type breakdown to conventional Military takeoff 95 percent, Short Takeoff Military power 3 percent, and Afterburner 2 percent to reflect FRS training syllabus.
- F-35B static operations scaled by the change in flight operations and modeled at two new ramp locations consistent with updated hanger layouts.
- F-35C static operation location moved to a representative location on the ramp near the anticipated F-35C hangar.
- Adjusted the modeled location of the landing helicopter dock (LHD) to match aerial imagery, a difference in heading of two degrees. This is not a proposed physical change to the runway, but instead a refinement to the input parameters brought about by more easily obtainable georeferencing information since the 2010 ROD.

A data validation package detailing these changes was submitted to operators for confirmation in April of 2021 and additional changes were captured in a follow-on data validation package in May of 2021 (Cardno 2021a,b). The attached MCAS Miramar memorandum and Data Validation Package operations table describe the potential move of the FRS Marine Fighter Attack Training Squadron (VMFAT) 502 to MCAS Miramar, providing additional details on the methodological development of the 2021 Revised operations analyzed within this study (Navy 2021a,b).

3 2021 Second Revised Federal Action

3.1 Noise

3.1.1 Modeling Data

The 2021 Revised condition for the basing of 75 F-35 aircraft at MCAS Miramar would result in 29,283 F-35B, 12,256 F-35C, and 118,842 total flight operations from all aircraft types, as described in Table 2. F-35B/C operations would account for the largest share of airfield operations at 35 percent followed by MV-22B at 33 percent. Approximately 20 percent of flight operations would occur during evening and 5 percent during nighttime CNEL periods.

Consistent with the 2010 ROD, rotary-wing aircraft (CH-53E) are modeled with the RNM software module and fixed-wing aircraft with NMAP (refer to Section 2). The MV-22B, a tilt-rotor aircraft, not operating at Miramar until after publication of the 2010 ROD, have been modeled with the RNM software. The outputs of those software modules were then combined into one overall resulting grid to generate the noise contours and other analyses for the 2021 Revised condition.

Figure 1 depicts the modeled static run-up locations, including three F-35 locations (JSF-FL1, JSF-FL2, and JSF-FL3) that reflect the latest hangar locations updated from prior analyses. Table 3 presents only the modeled F-35B/C static operations because no changes were made to other aircraft for the 2021 Revised condition.



Table 2. 2021 Second Revised Federal Action – Annual Flight Operations at MCAS Miramar

Aircraft	Notes	Departure				Departure to EAF				Arrival from EAF				Instrument Straight-In Arrival			
		Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total
F-35B - 3 Sqns (10 A/C each)	2	5,193	648	60	5,901	105	15	-	120	105	16	-	120	261	33	3	297
F-35B - 1 FRS (25 A/C)	2	4,918	1,168	61	6,147	108	15	-	123	108	15	-	123	231	74	3	308
F-35C - 2 Sqns (10 A/C each)	1	3,531	442	39	4,012	-	-	-	-	-	-	-	-	173	22	2	197
Assigned Based and Transients	3,4	16,841	6,209	1,438	24,488	76	39	12	127	76	39	12	127	2,499	689	183	3,371
Based		26,754	8,062	1,439	36,255	289	69	12	370	289	69	12	370	1,738	680	153	2,572
Transient		3,729	405	159	4,293	-	-	-	-	-	-	-	-	1,425	138	38	1,601
TOTAL		30,483	8,467	1,598	40,548	289	69	12	370	289	69	12	370	3,164	818	191	4,173

Group	Notes	Overhead Break Arrival to RUNWAY				Overhead Break Arrival to PADS				Non-Break Visual Arrival to RUNWAY				Non-Break Visual Arrival to PADS			
		Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total
F-35B - 3 Sqns (10 A/C each)	2	3,549	72	36	3,657	348	6	-	354	945	486	45	1,476	78	39	-	117
F-35B - 1 FRS (25 A/C)	2	3,240	457	114	3,811	523	74	18	615	676	516	37	1,229	101	77	6	184
F-35C - 2 Sqns (10 A/C each)	1	2,665	74	3	2,742	-	-	-	-	692	346	35	1,073	-	-	-	-
Assigned Aircraft and Transients	3,4	10,456	4,632	1,024	16,112	-	-	-	-	1,114	197	148	1,459	2,489	782	283	3,554
Based		17,860	5,042	1,123	24,025	871	80	18	969	3,319	1,515	245	5,079	2,506	852	258	3,616
Transient		2,050	193	54	2,297	-	-	-	-	108	30	20	158	162	46	31	239
TOTAL		19,910	5,235	1,177	26,322	871	80	18	969	3,427	1,545	265	5,237	2,668	898	289	3,855

Group	Notes	Visual Touch and Go (Conventional) ¹				Visual Touch and Go (Non-conventional) ¹				FCLP at NKX ²				GCA Box ³			
		Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total
F-35B - 3 Sqns (10 A/C each)	2	261	36	-	297	570	78	-	648	561	561	-	1,122	237	-	-	237
F-35B - 1 FRS (25 A/C)	2	246	61	-	307	541	135	-	676	584	584	-	1,168	246	-	-	246
F-35C - 2 Sqns (10 A/C each)	1	554	76	-	630	-	-	-	-	2,083	1,285	78	3,446	156	-	-	156
Assigned Aircraft and Transients	3,4	17,721	4,285	1,714	23,720	-	-	-	-	-	-	-	-	3,894	448	3	4,345
Based		14,230	3,222	1,148	18,600	1,111	213	-	1,324	3,228	2,430	78	5,736	4,533	448	3	4,984
Transient		4,552	1,236	566	6,354	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL		18,782	4,458	1,714	24,954	1,111	213	-	1,324	3,228	2,430	78	5,736	4,533	448	3	4,984

Group	Notes	TOTALS			
		Day	Eve	Night	Total
F-35B - 3 Sqns (10 A/C each)	2	12,213	1,989	144	14,346
F-35B - 1 FRS (25 A/C)	2	11,522	3,176	239	14,937
F-35C - 2 Sqns (10 A/C each)	1	9,854	2,245	157	12,256
Assigned Aircraft and Transients	3,4	55,166	17,320	4,817	77,303
Based		78,729	22,682	4,489	103,900
Transient		12,026	2,048	868	14,942
TOTAL		88,755	24,730	5,357	118,842

Notes:

- 1) F-35C modeled with most recent 2013 A variant acoustical data and C variant flight profiles
- 2) F-35B modeled with most recent 2013 B variant acoustical data; 2010 ROD utilized A acoustical data because production model B aircraft noise data were not available
- 3) Includes Based KC-130, C-12, CH-53E, MV-22B; Transient Air Carrier (UC-35), Heavy Transport (KC-135R), Military Fixed Wing (FA-18E/F) and Military Rotary-Wing (H-60)
- 4) C-12 and UC-35 operations modeled consistent with prior actions; H-60 and other helos modeled as CH-53E; Heavy Transport modeled as C-17
- 5) Green highlight reflects changes to operations since the 2018 CERS

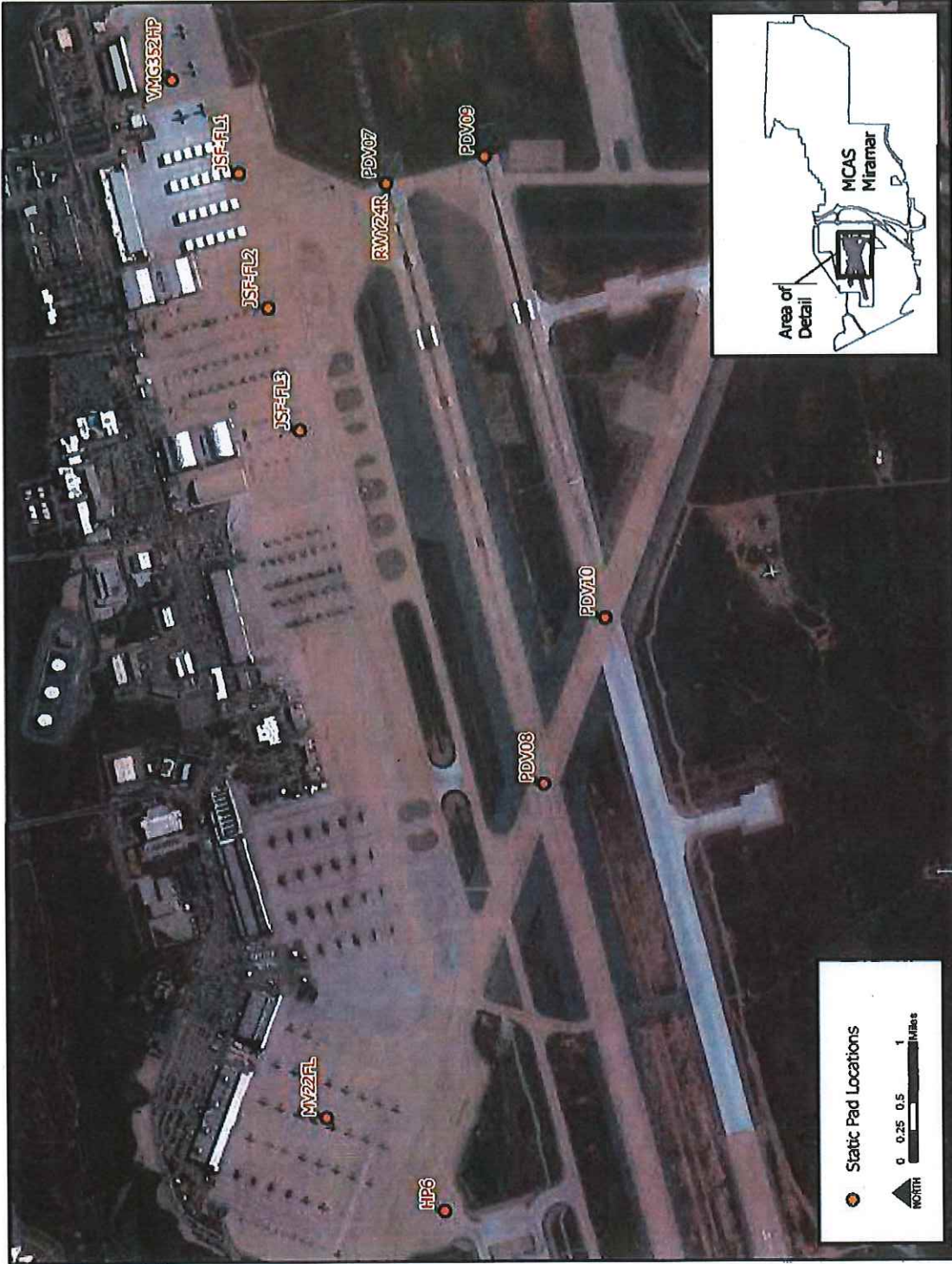


Figure 1. 2021 Second Revised Federal Action - Modeled Run-up Locations at MCAS Miramar

Table 3. 2021 Second Revised Federal Action – Modeled F-35B/C Static Run-up Profiles

Aircraft	Engine	Description	Pad	Heading (deg)	Power	Units	Duration (sec)	Annual Events		
								Day	Eve	Night
F-35B	F-135PP	Run-up low power	JSF-FL2 JSF-FL3	240 (90%) 60 (10%)	32	% ETR	1800	718	0	718
		MBIT-Expeditionary			10		300	460	0	52
					31		180			
		MBIT-Drive Shaft			10		300	42	0	4
					10		300			
					10		180			
					10		300			
		MBIT-Post			10		180	64	0	8
					10		300			
		F-35C			F-135PP		Run-up low power	JSF-FL1	240 (90%) 60 (10%)	32
MBIT-Expeditionary	10		300	153		0	17			
	31		180							
MBIT-Lift Fan	10		300	0		0	0			
	31		180							
MBIT-Drive Shaft	10		300	14		0	1			
	10		300							
	10		180							
MBIT-Post	10		180	21		0	2			
	10		300							

3.1.2 Noise Exposure

Figure 2 shows the resultant 65 dB to 85 dB CNEL contours in 5 dB increments for the 2021 Revised condition compared to the 2010 ROD. The Revised contours would generally result in decreases to off-station exposure of 65 dB CNEL or greater with the largest reduction occurring to the northwest along primary departure paths. The largest increase in the 65 dB CNEL would extend off station by 31 acres to the southwest between Interstate 805 and Highway 52 in an area zoned for commercial, industrial, or open space land uses. The nearest noise sensitive receptor is the Kearny Lodge mobile home park located 800 feet beyond the Revised 65 dB CNEL contour. A nearby Kaiser Permanent Medical Office Center is an out-patient facility and not considered a noise sensitive receptor. Smaller increases in the Revised 65 dB CNEL of 1 to 4 acres would occur south of the station boundary along Highway 52 west of Highway 163 where land use also comprises commercial and industrial uses without noise sensitive receptors in the area. Because no off-station areas that would be newly exposed to 65 dB CNEL include noise sensitive receptors and the existing use in these areas is compatible with CNEL between 65 and 70, the Revised condition would not cause a substantial change to noise impacts relative to the 2010 ROD.

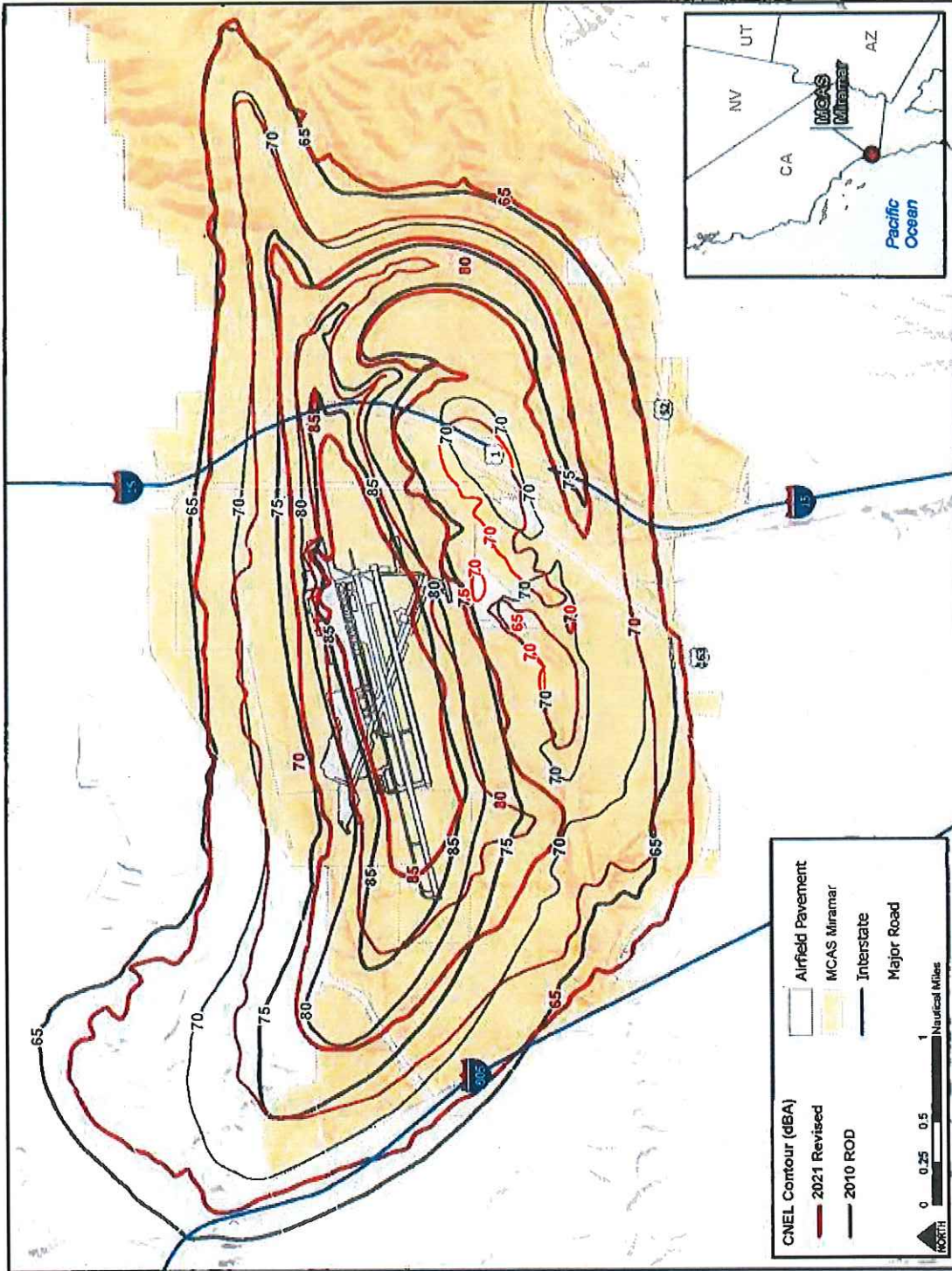


Figure 2. 2021 Second Revised Federal Action Compared to 2010 ROD CNEL Contours at MCAS Miramar



3.2 Air Quality

Air emissions associated with F-35 aircraft based at MCAS Miramar were examined to identify the net emissions resulting from implementing the 2021 Revised condition as compared to the original emissions estimated for Alternative 1 in the 2010 EIS, which was adopted in the 2010 ROD.

3.2.1 Setting

The San Diego Air Basin (SDAB) is in attainment with Federal Clean Air Act National Ambient Air Quality Standards (NAAQS) for all criteria pollutants except ozone (O₃). The U.S. Environmental Protection Agency recently designated the SDAB a severe nonattainment area for O₃ (U.S. Environmental Protection Agency 2021). O₃ in the troposphere, which is the atmosphere closest to the earth's surface, results from the reaction of volatile organic compounds (VOC) with oxides of nitrogen (NO_x) in the presence of sunlight.

The 2010 EIS showed that Alternative 1 (adopted in the 2010 ROD) would improve air quality relative to the legacy F/A-18 baseline, reducing carbon monoxide (CO) emissions by 1,627 tons per year (TPY), NO_x emissions by 55 TPY, VOC emissions by 573 TPY, particulate matter (PM₁₀) emissions by 211 TPY, and particulate matter (PM_{2.5}) emissions by 206 TPY. San Diego County is designated unclassifiable for PM₁₀ under the National Ambient Air Quality Standards (NAAQS) because it has never been declared nonattainment for this pollutant (40 CFR § 81.305).

3.2.2 Methodology

Prior analyses relied upon comparing flight profiles of engine power and mode to corresponding emissions factors available at the time of the 2010 ROD. This study utilizes the latest emission estimates for the F-35B and F-35C models provided by the Aircraft Environmental Support Office (AESO), which describe the emissions from each of the specific Karnes 3.2 flight profiles for a single operation (AESO 2019a,b). Emissions data for static engine run-ups in the AESO documents describe the emissions rates for a year of maintenance operations per aircraft active during the year.

3.2.3 Results

Table 4 presents the emissions estimates for the 2021 Revised condition compared to the 2010 ROD. NO_x, VOCs, and sulfur dioxide (SO₂) would decrease. PM₁₀ and PM_{2.5} emissions would each increase less than 1 TPY and CO emissions would increase up to 256 TPY. Carbon dioxide equivalent (CO_{2e}) is a measure of greenhouse gases, and the 2021 Revised condition estimate indicates CO_{2e} emissions would be reduced by 87,527 TPY relative to the 2010 ROD.

Table 4. Summary of Comparison of 2021 Second Revised Federal Action to 2010 ROD, MCAS Miramar Annual Emissions

Activity	Tons Per Year						
	CO _{2e}	CO	NO _x	VOCs	SO ₂	PM _{2.5}	PM ₁₀
55 F-35B	77,087	288.11	135.75	0.54	11.68	3.24	3.24
20 F-35C	18,717	52.40	50.88	0.10	1.79	0.75	0.75
Proposed 55 F-35B + 20 F-35C	95,804	340.51	186.63	0.64	13.88	3.99	3.99
2010 ROD F35B Operations	183,331	84.82	346.40	3.19	36.35	3.12	3.12
Net Change	(87,527)	255.69	(159.77)	(2.55)	(22.47)	0.87	0.87
<i>de minimis</i> ¹	NA	NA	25	25	NA	NA	NA
Exceedance?	-	-	No	No	-	-	-

Notes: CO₂ = carbon dioxide; CO_{2e} = carbon dioxide equivalent; CO = carbon monoxide; SO₂ = sulfur dioxide; PM_{2.5} = particles with diameter less than 2.5 micrometers; PM₁₀ = particles with diameter less than 10 micrometers; NO_x = nitrogen oxides; VOCs = volatile organic compounds; NO_x and VOCs are ozone precursors.

¹*de minimis* thresholds for the 2008 and 2015 ozone standards were reduced to 25 tons per year on June 2, 2021 based on the redesignation of San Diego County to "severe" nonattainment for ozone (Federal Register Vol. 86, No. 104, pp. 29522 – 29526).

MCAS Miramar
30 June 2021



If you have any questions regarding this analysis, please do not hesitate to contact me at the email or phone number provided below.

Very Respectfully,

A handwritten signature in black ink that reads "Patrick Kester".

Patrick Kester

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Attachment: MCAS Miramar Memorandum and Data Validation Package Operations Table

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