Aircraft Operations

As an active, combat-ready unit, F-22 aircrews would conduct operational training at the base's airfield and in the associated training airspace. Aircraft taking off and landing, as well as performing training activities, generate noise and emit exhaust; therefore, they can affect the noise and air quality environment, both at the base and in the training airspace. Maintenance activities, construction, and vehicles also produce emissions that can affect air quality at the base. All training and other ground-based activities must be performed safely and with regard for all other users at the base as well as in the airspace. Because these activities have the potential to affect safety and airspace management, the Air Force has analyzed them in this Draft EIS. Aircraft Operations addresses airspace management and use, noise, air quality, and safety.

Description of the factors used to define the affected environment are presented in Appendix AO-1. This appendix also presents details on the methods used to perform the analysis. For this Draft EIS, the best available data were used for this new generation of advanced fighter aircraft. However, there are limitations to the extent of the data since this aircraft is new and there are only four prototype aircraft flying. Noise, air quality, and safety data specific to F-22 aircraft have been collected to the greatest extent possible.

The affected environment for aircraft operations at Mountain Home AFB includes the base, the airspace surrounding the airfield, and associated training airspace.

Noise data have been collected on these F-22s; however, none of them have flown the full range of maneuvers and engine power settings needed to develop the complete noise database required for noise analysis. Although the Air Force used the current F-22 aircraft for data collection, it is still possible these developmental test engines may be further modified as a result of ongoing testing. Therefore, a composite approach was used to model noise for the F-22. Current data on the prototype aircraft were used, as well as information on comparable turbofan engines and other similar fighter aircraft power settings, speed, and maneuvering.

As a new, developing aircraft, the F-22 and its systems (e.g., engines, avionics) have evolved since the first flight in 1997 and will continue to evolve in the future. Acquisition of detailed knowledge of the outputs (such as noise levels and emissions) resulting from F-22 operations has followed a similar evolutionary pattern. Basically, this information will improve in precision the more the F-22 flies and undergoes evaluation.

This evolution in knowledge of F-22 outputs (especially noise) has clearly evolved over the past few years. In the environmental analysis performed on the F-22, *F-22 Force Development Evaluation and Weapons School Beddown, Nellis AFB* (Air Force 1999a), the best available information was used (at the time only one F-22 prototype had been flown). This information indicated that the noise profile of the F-18A Hornet formed the most appropriate surrogate for the F-22 at that time.

By 2000, when the F-22 *Conversion of Two F-15 Fighter Squadrons to F-22 Fighter Squadrons at Tyndall AFB, Florida* (Air Force 2000a) environmental analysis was completed, the Air Force Research Laboratory had collected additional F-22 noise data. Correlating these data to the known noise signatures for other aircraft led the Air Force to continue to use the F-18 as the best available surrogate for the F-22.

As noted above, further actual noise data on the F-22 has been collected. Although these data do not provide a complete noise database, they demonstrate the evolution of information on the aircraft. These data further establish that a composite of comparable engines and fighter aircraft best characterize the noise profile for the F-22.

For air quality, the best available data were also used. The F-22 uses a new propulsion-style system—the F119-PW-100—a low-bypass ratio turbofan built by Pratt & Whitney. This engine is still under test and evaluation and may require changes depending on the test program. Many operational parameters of this new engine are classified or competitively sensitive. In an effort to approximate the fuel emissions that would be expected for this F119 engine, the F100 series of engines were evaluated. These series of engines were chosen because they most closely represent the function of the F119 engine and the power settings anticipated to be used by the F-22.

Safety data are unavailable for the F-22 because there are only four test and evaluation prototype aircraft flying. There have not been enough flight hours to accurately depict the safety record for this new aircraft. Therefore, similar fighter aircraft safety records have been used and conclusions drawn based on their flight history.

Although some F-22 data for noise, air quality, and safety are currently incomplete or unavailable, this Draft EIS provides a thorough analysis of known parameters. The Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA) recognizes that such a situation may occur. This situation is managed in accordance with 40 Code of Federal Regulations (CFR) § 1502.22, *Incomplete or Unavailable Information*, which provides the following guidance:

> When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an Environmental Impact Statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking.
>
> (a) If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the Environmental Impact Statement.
>
> (b) If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the Environmental Impact Statement the following:
>
> 1. A statement that such information is incomplete or unavailable;

2. A statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment;

3. A summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and

4. The agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this Section, "reasonably foreseeable" includes impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.

As indicated above, data for the F-22 aircraft that are necessary to model the aircraft's noise, air quality, and safety are incomplete. While the costs to obtain complete data are not exorbitant, those data cannot be obtained at this time due to limitations on aircraft performance during its developmental stage, the need for further testing of operational aircraft, analyses during normal (versus developmental) flying conditions, and time to develop a flight safety record [40 CFR §§ 1502.22(b); 1502.22(b)1]. The data and factors used in this analysis are presented in the body of this Draft EIS and further detailed in Appendix AO-1 through AO-3.

No-Action Alternative

Under the no-action alternative, ongoing Air Force and interagency programs and activities at Mountain Home AFB would continue operating at planned levels as reflected in current Air Force management plans. These plans include recent activities that have been approved by Air Force and have existing NEPA documentation.

Under the no-action alternative, Mountain Home AFB would continue to operate the 366th Wing. Aircraft operations and airspace management and use would continue at current levels. There would be no change in the use of any existing airspace. Under the no-action alternative, existing noise levels would not change, either in the vicinity of the base or under the affected airspace. Impacts to air quality would reflect current and ongoing activities in the region; pollutant emissions would stay the same. Mountain Home AFB would continue to operate under conditions in its current air permit and comply with all applicable state and federal laws and regulations. There would be no change in aircraft operations, therefore, there would be no new or unique safety issues. Operation and maintenance activities conducted at Mountain Home AFB would continue in accordance with all applicable safety directives.

MH3.1 Airspace Management and Use

MH3.1.1 Base

Affected Environment

The picture is of a World War II P-47 at Mountain Home AFB. Aircraft at Mountain Home AFB have flown in this airspace environment for nearly 60 years without conflict with civil or commercial aviation.

Airspace currently supporting aircraft operations at Mountain Home AFB includes the airspace surrounding the base for sorties and the larger airspace that encompasses the Mountain Home AFB radar approach control area. The airspace extends upward from the airfield surface to and including 3,000 feet AGL within a 5.9-statute-mile radius of the airfield. The airspace is under the control of the Mountain Home AFB control tower for airfield arriving/departing aircraft operations. A total of 14,758 sorties are currently conducted at Mountain Home AFB and represent the baseline and no-action alternative.

Airspace around Mountain Home AFB is controlled by the Mountain Home Approach Control. The only other airfield in the Mountain Home AFB region is the Mountain Home Municipal Airport (about 10 statute miles from Mountain Home AFB). The other airfields in the Mountain Home AFB region include the Glenns Ferry Municipal Airport (almost 30 statute miles from Mountain Home AFB) and two private-use airports at Owen and Grasmere (approximately 20 and 45 statute miles from base, respectively).

Due to the rural location and low density of aircraft operations at these airfields, as well as in the overlying airspace, there is little likelihood of conflicts between military and civilian aircraft operations in the Mountain Home approach control area.

Environmental Consequences

Beddown of the Initial F-22 Operational Wing at Mountain Home AFB would not adversely affect airspace use and management within the local air traffic environment. The replacement of F-15C operations by the F-22 would result in a 58 percent net increase in sorties or 33 additional sorties per flight day (260 flight days per year) over baseline conditions. Considering the current runway and taxiway configuration at Mountain Home AFB, this beddown would require construction of an additional 10,000-foot parallel runway to more efficiently support the increased airfield activities generated by the F-22 Operational Wing. Construction of an additional runway may require minor changes to the local air traffic patterns and arrival and departure procedures, but would not likely result in any changes to the local airspace. The increased operations would not exceed the Mountain Home AFB Approach Control or control tower capabilities for handling air traffic within the airspace.

Comparative Summary of the Five Potential Basing Locations

Management of the airspace in the vicinity of Mountain Home, as well as all other bases, is adequate to support the additional sorties associated with the proposed beddown. Mountain Home, however, with construction of an additional runway and associated minor adjustments to local air traffic

patterns, would affect airspace management procedures slightly more than at other bases. Increases in annual sorties at Mountain Home (+58 percent), Langley (+7 percent), Eglin (+16 percent), Elmendorf (+26 percent), and Tyndall (+43 percent) would negligibly affect airspace management procedures.

MH3.1.2 Airspace

Affected Environment

The MOA airspace affected under the Mountain Home AFB alternative is depicted in Figure MH3.1-1. Used on a consistent basis for training, this airspace receives 100 percent of current F-15C use and would continue at the same levels for the F-22s under this alternative.

Use of the MOA airspace is required on occasion by the Bureau of Land Management (BLM) and Idaho Department of Fish and Game (IDFG) for management flights for fire spotting/response, game surveys, and other such activities. Mountain Home AFB airspace management assists in coordinating these flights when contacted by the agencies to help make both agency and military aircrews aware of the timing, duration, location, and altitudes of each other's flight activities.

Environmental Consequences

At scoping there was concern that additional airspace would be needed to support F-22 training. No additional airspace is needed.

Selection of Mountain Home AFB for the Initial F-22 Operational Wing beddown would not have adverse effects on airspace use and management. No new airspace or reconfiguration of existing airspace would be required just as none would be required at the other basing locations. Projected F-22 operations in the Owyhee MOA would result in average daily increases of about 12 additional sortie-operations (based on 260 flying days/year). An increase of 7 to 10 daily sortie-operations would characterize use of the Paradise MOAs. Use of the Jarbidge MOA would increase by about 8 sortie-operations per flying day, and use of Saddle MOA would increase by about 5 sortie-operations per flying day.

Comparison of Total Daily Sortie-Operations by All Aircraft

MOA	*Baseline*	*Projected*
Jarbidge	32	40
Owyhee	30	42
Paradise East	13	20
Paradise West	17	27
Saddle	8	13

Overall, the projected increases in individual MOA and overlying ATCAA use would have no effect on civilian/commercial air traffic along the adjacent airways and jet routes and would have little effect on the low-density general-aviation operations throughout this area. Continued coordination between Mountain Home AFB and agencies (BLM and IDFG) conducting land and wildlife management flights would minimize any impacts military operations could have on these agency flights. Considering that this alternative represents a continuation of current activities, no adverse impacts on airspace use or management would be expected, despite increases in sortie-operations within each MOA.

A number of Military Training Routes (MTRs) overlap three of the MOAs. Paradise East and West have six MTRs that coincide with the MOAs; Saddle has five; and Owyhee has one MTR

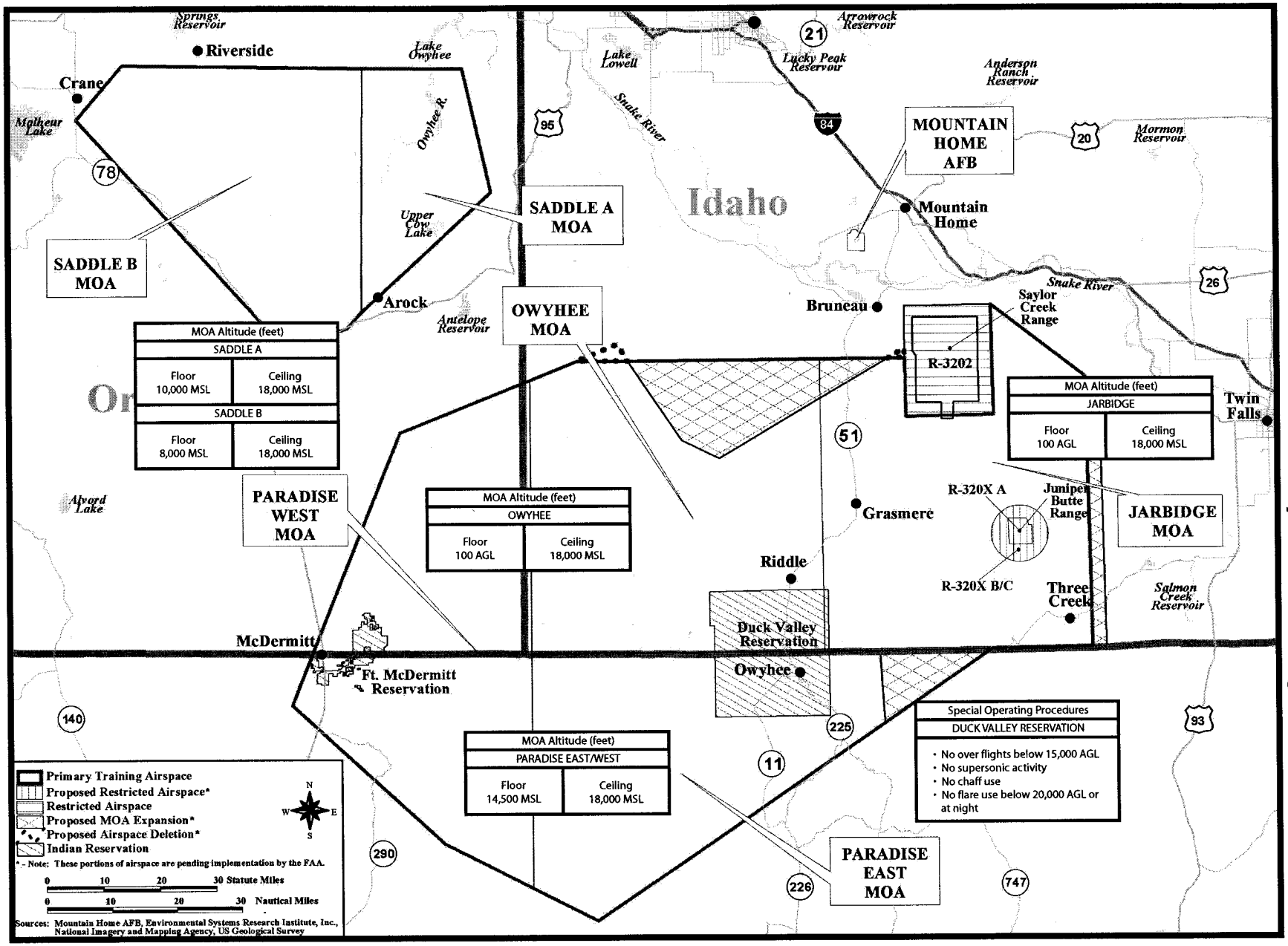


Figure MH3.1-1
Mountain Home AFB Affected Airspace Environment

overlapping this MOA (refer to Appendix AO-1). Close coordination of scheduling and use of these MOAs and MTRs by the respective agencies ensures safe transit throughout this region. Therefore, air traffic traveling in this area should not be adversely affected by military flight activities.

Native American Concerns

Representatives of the Shoshone-Paiute Tribes have expressed concerns that MOA airspace currently in existence near the Duck Valley Reservation would one day be changed to restricted airspace, thus limiting access by general aviation to the reservation for medical emergencies, visits by tourists, and other uses.

Emergency medical flights between Owyhee, Nevada, and Boise, Idaho, would not be adversely affected by this alternative. Current procedures ensure that if an emergency flight through MOA airspace is necessary while training operations are taking place, the pilot notifies Mountain Home AFB to ensure that training activities in the vicinity are halted or redirected.

MOAs are used by civilian aircraft. They are not designated for the exclusive use of the military. Civilian aircraft operating under Visual Flight Rules (VFR) can and do use MOAs jointly with the military, applying the see-and-avoid concept. The Air Force cannot control or prohibit civil air traffic operating under VFR. The Air Force has no proposal to change the airspace to restricted airspace. In fact, the Air Force, as part of the Juniper Butte Range, has substantially reduced restricted airspace in southwest Idaho.

The Federal Aviation Administration (FAA) has overall responsibility for managing the nation's airspace. This agency reviews and coordinates civil and military airspace needs to ensure that all interests are met. The FAA must approve all requests for creating new, or modifying existing, military training airspace.

Comparative Summary of the Five Potential Basing Locations

Training airspace associated with Mountain Home generally differs from that associated with the other locations because it consists of fewer total airspace units and all but one are physically adjacent. However, there would be no difference in management of this or the other training airspace associated with any of the five installations. All the airspace units that the F-22 would use, irrespective of the location, operate under the same FAA regulations and procedures.

MH3.2 Noise

Within this Draft EIS, noise is described by the sound level. Sound level is the amplitude (level) of the sound that occurs at any given time. When an aircraft flies by, the level changes continuously, starting at the ambient (background) level, increasing to a maximum as the aircraft passes closest to the receptor, and then decreasing to ambient as the aircraft flies into the distance. Sound levels are on a logarithmic decibel scale; a sound level that is 10 decibels (dB) higher than another will be perceived as twice as loud. More specific noise metrics include Maximum Sound Level (L_{max}), the Sound Exposure Level (SEL), Day-Night Average Sound Level (DNL), and Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}). A-weighted levels are used for subsonic aircraft

noise, and C-weighted levels are used for sonic booms and other impulsive noises. A "C" is included in the symbol to denote when C-weighting is used. Each of these metrics is summarized below and discussed in detail in Appendix AO-1.

- Maximum Sound Level (L_{max}) is used to define maximum noise levels. L_{max} is the highest sound level measured during a single aircraft overflight. For an observer, the noise level starts at the ambient noise level, rises up to the maximum level as the aircraft flies closest to the observer, and returns to the ambient level as the aircraft recedes into the distance.

- Sound Exposure Level (SEL) accounts for both the maximum sound level and the length of time a sound lasts. SEL does not directly represent the sound level heard at any given time. Rather, it provides a measure of the total sound exposure for an entire event averaged over 1 second.

- Day-Night Average Sound Level (DNL) is a noise metric combining the levels and durations of noise events and the number of events over an extended time period. It is a cumulative average computed over a 24-hour period to represent total noise exposure. DNL also accounts for more intrusive night time noise, adding a 10 dB penalty for sounds after 10:00 pm and before 7:00 am. DNL is the appropriate measure to account for total noise exposure around airfields such as Mountain Home.

- Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}) is the measure used for subsonic aircraft noise in military airspace (MOAs or Warning Areas). This metric accounts for the fact that when military aircraft fly low and fast, the sound can rise from ambient to its maximum very quickly. Known as an onset-rate, this effect can make noise seem louder due to added "startle" effects. Penalties of up to 11 dB are added to account for this onset-rate.

- C-Weighted Day-Night Sound Level (CDNL) is day-night sound levels computed for areas subject to sonic booms. These areas are also subjected to subsonic noise assessed according to L_{dnmr}.

Comments received during scoping placed special emphasis on a comprehensive presentation of noise effects. Aircraft noise effects can be described according to two categories: annoyance and human health considerations. Annoyance, which is based on perception, represents the primary effect associated with aircraft noise. Far less potential exists for effects on human health. Appendices AO-1 and AO-2 provide detail on these effects and the studies used to identify them.

Studies of community annoyance to numerous types of environmental noise show that DNL correlates well with effects, and Schultz (1978) showed a consistent relationship between noise levels and annoyance. A more recent study reaffirmed and updated this relationship (Fidell *et al.* 1991). The updated relationship, which does not differ substantially from the original, is the current preferred form.

In general, there is a high correlation between the percentages of groups of people highly annoyed and the level of average noise exposure measured in DNL. The correlation is lower for the annoyance of individuals. This is not surprising considering the varying personal factors that influence the manner in which individuals react to noise. The inherent variability between individuals makes it impossible to predict accurately how any individual will react to a given noise event. Nevertheless, findings substantiate that community annoyance to aircraft noise is represented quite reliably using DNL.

Relation Between Annoyance and DNL

DNL	*% Population Highly Annoyed*
65	12.3
70	22.1
75	36.5
80	53.7
85	70.2

In addition to annoyance, the effect of noise on human health was raised during the public scoping process for this Draft EIS. Other factors that can be used to evaluate a noise environment are noise-induced hearing loss, speech interference, and sleep disturbance. Effects on speech and sleep also contribute to annoyance.

A considerable amount of data on hearing loss have been collected and analyzed. It has been well established that continuous exposure to high noise levels (like in a factory) will damage human hearing (USEPA 1978). Hearing loss is generally interpreted as the shifting to a higher sound level of the ear's sensitivity to perceive or hear sound (sound must be louder to be heard). This change can be either temporary or permanent. Federal workplace standards for protection from hearing loss allow an A-weighted time-average level of 90 dB over an 8-hour work period, or 85 dB averaged over a 16-hour period. As shown later in this section, noise levels associated with the activities of the F-22s would be more than 30 dB below these standards. In the MOA, the operations are random and widely dispersed. The random nature of operations and the wide altitude structure within the MOA make it unlikely that any one location would be repeatedly overflown over a short duration.

Studies on community hearing loss from exposure to aircraft flyovers near commercial airports showed that there is no danger, under normal circumstances, of hearing loss due to aircraft noise (Newman and Beattie 1985). Commercial airport traffic is much more continuous and frequent than at a military airfield and also commonly lower in altitude than flights in MOAs. In MOAs, military aircraft fly at varied altitudes, rarely fly over the same point on the ground repeatedly during a short period, and occur sporadically over a day. These factors make it unlikely that any hearing loss would occur (Thompson 1997). Other factors, described in Appendix AO-1, demonstrate the lack of potential hearing loss from the F-22 beddown.

Another non-auditory effect of noise is disruption of conversations. Speech interference associated with aircraft noise is a primary cause of annoyance to individuals on the ground. Aircraft noise can also disrupt routine activities, such as radio listening, television watching, or telephone use. The disruption generally lasts only a few seconds, and almost always less than 10 seconds. It is difficult to predict speech intelligibility during an individual event, such as a flyover, because people automatically raise their voices as background noise increases. A study (Pearsons *et al.* 1977) suggests that people can communicate acceptably in background A-weighted noise levels of 80 dB, but some speech interference occurs when background noise levels exceed 65 dB. Typical home insulation reduces the noise levels experienced by 20 dB or more and decreases speech interference.

Noise-related awakenings form another issue associated with aircraft noise. Sleep is not a continuous, uniform condition but a complex series of states through which the brain progresses in a cyclical pattern. Arousal from sleep is a function of a number of factors including age, gender, sleep stage, noise level, frequency of noise occurrences, noise quality, and presleep activity. Quality sleep is recognized as a factor in good health. Although considerable progress has been made in understanding and quantifying noise-induced annoyance in communities, quantitative understanding of noise-induced sleep disturbance is less advanced.

Studies (Fidell *et al.* 1994; Pearsons *et al.* 1995; Kryter 1984) of the effects of nighttime noise exposure on the in-home sleep of residents near military airbases, civil airports, and in several households with negligible nighttime aircraft noise exposure, revealed the SEL as the best noise metric predicting noise-related awakenings and a strong influence of habituation on susceptibility to noise-induced sleep disturbance.

To date, no exact quantitative dose-response relationship exists for noise-related sleep interference; yet, based on studies conducted to date and the USEPA guideline of a 45 DNL to protect sleep interference, useful ways to assess sleep interference have emerged. If homes are conservatively estimated to have a 20-dB noise insulation, an average of 65 DNL would produce an indoor level of 45 DNL and would form a reasonable guideline for evaluating sleep interference. This also corresponds well to the general guideline for assessing speech interference.

MH3.2.1 Base

Affected Environment

Mountain Home AFB has supported operations by a variety of aircraft since its development in the early 1940s. Aircraft and missions have ranged from World War II bombers to the current AEW (formerly the composite wing) of KC-135s (aerial refuelers), F-16s (multi-role fighters), F-15Es (air-to-ground fighters), B-1Bs (bombers), and F-15Cs (air-to-air fighter). These variations of missions and aircraft have formed the shape and extent of areas affected by aircraft operations and associated noise over the years.

Since 1996, with the beddown of the B-1Bs at Mountain Home AFB, noise conditions have been similar to the baseline noise environment discussed below. Baseline noise levels, expressed as DNL, were modeled based on aircraft types, runway use patterns, engine power settings, altitude profiles, flight track locations, airspeed, and other factors. Appendices AO-1 and AO-2 detail the methods used for defining airfield noise levels and present further information on noise modeling metrics.

DNL, or Day-Night Average Sound Level, is the most widely accepted metric for assessing airfield noise.

To identify the areas affected by noise levels around the base, contours were used to depict noise levels ranging from 65 to 85 DNL or greater in 5 dB increments. Table MH3.2-1 and Figure MH3.2-1 present the baseline noise conditions for Mountain Home AFB.

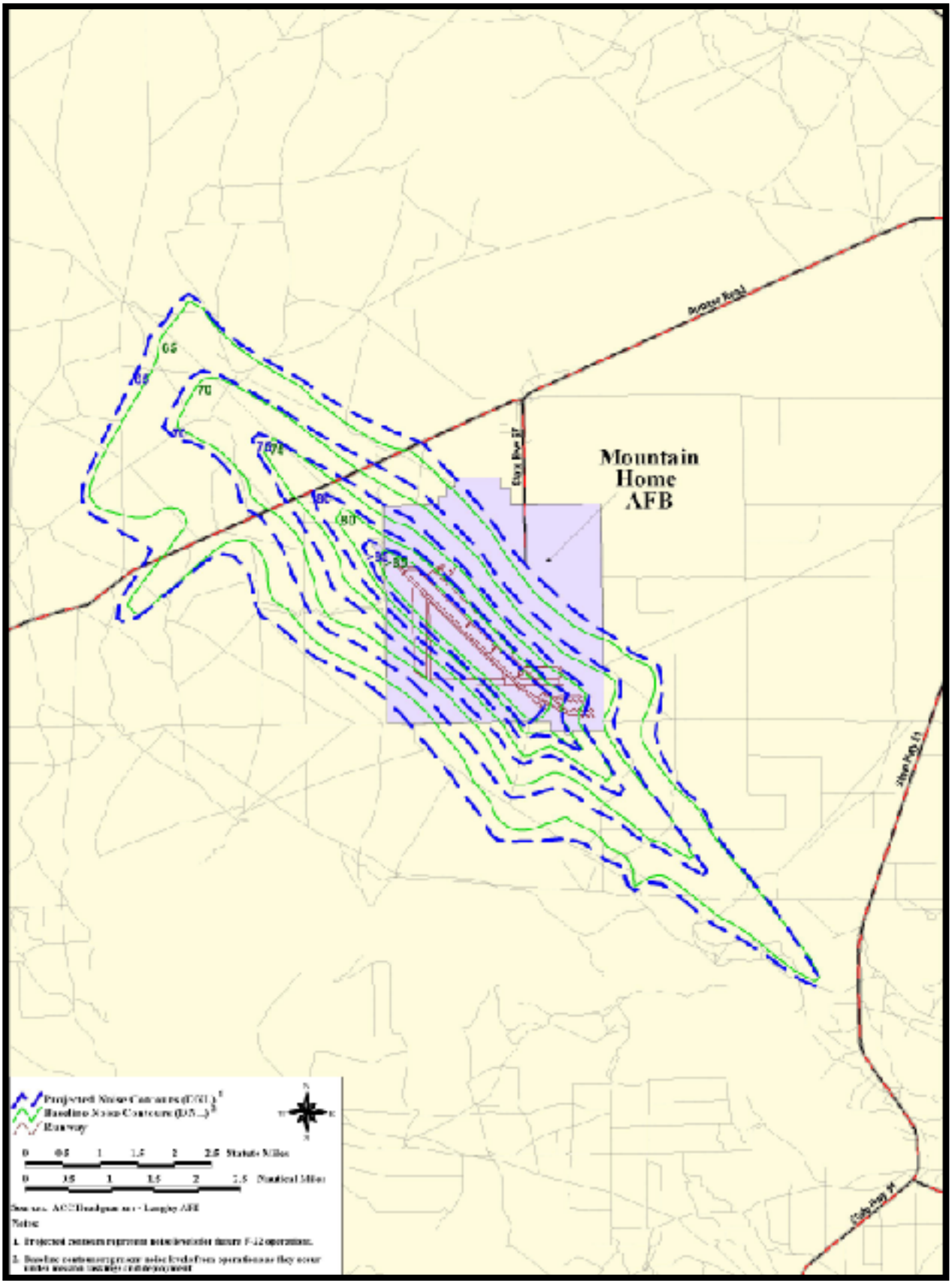


Figure MH3.2-1
Baseline and Projected Noise Contours at Mountain Home AFB

Table MH3.2-1. Acreage Under Baseline Noise Contours in the Vicinity of Mountain Home AFB

Noise Contour (DNL)	*Acres Affected: On Base*	*Acres Affected: Off Base*	*Acres Affected: Total*
65-70	1,068	7,609	8,677
70-75	1,125	2,892	4,017
75-80	864	979	1,843
80-85	595	240	835
>85	850	2	852
Total	4,502	11,722	16,224

Noise levels of 65 DNL or greater affect both on-base and off-base lands. Most of the affected area (72 percent) lies off base; only two off-base acres are subject to noise levels greater than 85 DNL, and no residences are located within this contour. The remaining off-base lands are used for agriculture and grazing with rare scattered residences. Section MH3.12, Human Resources, describes the land use implications of these noise levels.

Aircraft at Mountain Home AFB generally operate according to established flight paths and overfly the same areas surrounding the base. There is a quiet-hours program at Mountain Home AFB, where takeoffs, landings, and engine run-ups are limited between 10:30 pm and 6:30 am. At Mountain Home AFB, noise exposure from airfield operations typically occurs beneath main approach and departure corridors and in areas immediately adjacent to parking ramps and aircraft staging areas. The nearest town to Mountain Home AFB is 10 miles outside the 65 DNL noise level.

Noise due to construction and maintenance equipment, as well as general vehicle traffic, is a common ongoing occurrence in the base environment. Existing, continuing military construction projects are currently in progress at Mountain Home AFB. Trucks, as well as heavy equipment, are usually found in the base environment on a daily basis to support these existing facility and infrastructure upgrades.

Environmental Consequences

Under this alternative, the area affected by noise levels of 65 DNL or greater would increase by 2,831 acres. Approximately one-third of the area affected by the increase in noise would be off base (Table MH3.2-2 and Figure MH3.2-1). Section MH3.12 describes the land use implications for the changes in areas affected by noise.

Table MH3.2-2. Acreage Under Noise Contours in the Vicinity of Mountain Home AFB Comparison of Baseline and Projected Conditions

	BASELINE			PROJECTED			CHANGE		
Noise Contour (DNL)	*Acres Affected: On Base*	*Acres Affected: Off Base*	*Acres Affected: Total*	*Acres Affected: On Base*	*Acres Affected: Off Base*	*Acres Affected: Total*	*Acres Affected: On Base*	*Acres Affected: Off Base*	*Acres Affected: Total*
65-70	1,068	7,609	8,677	1,050	8,706	9,756	-18	+1,097	+1,079
70-75	1,125	2,892	4,017	1,125	3,664	4,789	0	+772	+772
75-80	864	979	1,843	1,002	1,326	2,328	+138	+347	+485
80-85	595	240	835	703	442	1,145	+108	+202	+310
>85	850	2	85	998	39	1,037	+148	+37	+185
Total	4,502	11,722	16,224	4,878	14,177	19,055	+376	+2,455	+2,831

Noise effects around the base would be somewhat ameliorated (improved) because the F-22 accelerates more quickly to climb speed and is able to set a lower power level sooner than the F-15C on take off. The F-22 would generate more noise closer to the runway and less noise further from the runway (i.e., over areas surrounding the base). In addition, the F-22 (as compared to the F-15Cs) would perform fewer maintenance activities where the engine is run at varying speeds along the flightline.

Short-term noise increases due to construction and renovation, as well as infrastructure (stormwater and electric lines) installment and realignment would occur. Construction occurs in stages; the earlier stage entails trucks, bulldozers, and other heavy construction equipment for the major construction projects (e.g., hangars, dormitories, housing units, runway). This stage of construction would be temporary and isolated. Most of these projects would be undertaken adjacent to the flight line, occupy industrial areas, and be isolated from any off-base communities. In addition, construction would take place during daylight hours and would follow best management practices to minimize noise to any off-base receptors. Construction noise would be contained within base environs since most heavy construction would occur near the flight line, where noise would be compatible with ongoing activities. At Mountain Home AFB, construction of the runway and housing units would occur at opposite sides of the base boundaries. There are no homes located immediately outside the base environs and noise is not anticipated to affect any sensitive receptors such as churches or schools.

Comparative Summary of the Five Potential Basing Locations

Although the total off-base area affected by noise levels of 65 DNL or greater would increase more at Mountain Home (2,455 acres) than any other base, the effects would be minimal. All the affected area consists of grazing/agricultural lands. In comparison, only Langley and Elmendorf would have less potential effects. The off-base area affected by noise levels of 65 DNL or greater would decrease by 521 acres at Langley and would increase by 607 acres at Elmendorf, but for both alternatives the impacts would all be over water. At Tyndall, the 2,141 additional off-base acres affected by noise would mostly be over water, but 23 acres of residential land use would be newly

subject to 65 DNL or greater. Eglin, with the highest potential for impacts, would experience an increase of 1,623 off-base acres affected by noise, including 122 acres of residential lands.

MH3.2.2 Airspace

Affected Environment

Within the MOAs and overlying ATCAAs used by Mountain Home AFB aircraft, subsonic flight is dispersed and often occurs randomly or, due to either airspace configuration or training scenarios, it may be concentrated or channeled into specific areas or corridors. The Air Force has developed the MR_NMAP (MOA-Range NOISEMAP) computer program (Lucas and Calamia 1996) to calculate subsonic aircraft noise in these areas. MR_NMAP can calculate noise for both random operations and operations channeled into corridors. It is supported by measurements in several military airspace units (Lucas *et al.* 1995). The affected airspace for the Mountain Home AFB alternative includes MOAs where random aircraft operation is the norm.

The primary noise metric calculated by MR_NMAP for this assessment is DNL (also known as L_{dn} or, by extension, L_{dnmr}). This quantity has been computed for each of the five MOAs (Jarbidge, Owyhee, Paradise East and West, and Saddle) potentially affected by the Mountain Home AFB alternative and compared to the baseline or no-action alternative. As discussed in Appendices AO-1 and AO-2, this cumulative metric represents the most widely accepted method of quantifying noise impact. However, people often desire to know what the loudness of an individual aircraft will be; MR_NMAP and its supporting programs can provide the L_{max} (Table MH3.2-3), and SEL (Table MH3.2-4) that accounts for both the duration and intensity of a noise event for individual aircraft at various distances and altitudes. The L_{max} indicates the noise that would be heard by an individual the instant an aircraft flies overhead. SELs reflect the noise levels of a flyover, including the maximum level, averaged over 1 second as the aircraft approaches and departs. Both measures are described in Appendix AO-2.

L_{dnmr} is the monthly average of the Onset-Rate Adjusted Day-Night Average Sound Level (DNL). Noise levels are interpreted the same way for both DNL and L_{dnmr}. The annual sortie-operations for a MTR is MOA are divided by 12 to define monthly average sortie-operations. For this Draft EIS, all noise levels were calculated using L_{dnmr}. However, to enhance readability, these noise levels will be referred to as DNL throughout the document.

Table MH3.2-3. Representative A-Weighted Instantaneous Maximum (L_{max}) in dB Under the Flight Track for Aircraft at Various Altitudes in the Primary Airspace[1]

Aircraft Type	*Airspeed*	*Power Setting*[2]	ALTITUDE IN FEET ABOUT GROUND LEVEL						
			300	*500*	*1,000*	*2,000*	*5,000*	*10,000*	*20,000*
F-15C	520	81% NC	119	114	108	99	86	74	57
F-22[3]	520	70% ETR	120	116	108	99	85	71	54
F-16A	450	87% NC	112	108	101	93	80	67	50
F-18A	500	92% NC	120	116	108	99	85	71	54
F-14A	530	100% NC	115	111	103	94	80	67	51
B-1B	550	101% RPM	117	112	106	98	86	75	61

Notes: 1. Level flight, steady high-speed conditions.
2. Engine power setting while in a MOA. The type of engine and aircraft determines the power setting: RPM = rotations per minute; NC = percent core RPM; ETR = engine throttle ratio.
3. Projected based on F-22 composite aircraft.

Table MH3.2-4. Sound Exposure Level (SEL) in dB Under the Flight Track for Aircraft at Various Altitudes in the Primary Airspace[1]

Aircraft Type	*Airspeed*	ALTITUDE IN FEET ABOVE GROUND LEVEL						
		300	*500*	*1,000*	*2,000*	*5,000*	*10,000*	*20,000*
F-15C	520	116	112	107	101	91	80	65
F-22[2]	520	118	114	108	101	89	77	62
F-16A	450	110	107	101	95	85	74	59
F-18A	500	118	114	108	101	89	77	62
F-14A	530	112	109	103	96	84	73	58
B-1B	550	116	112	108	101	92	82	70

Notes: 1. Level flight, steady high-speed conditions.
2. Projected based on F-22 composite aircraft.

Figure MH3.2-2 provides the baseline and projected noise levels for the five MOAs. As these data show, noise levels in the Paradise East and West and Saddle MOAs under baseline conditions are below 45 DNL. In the Jarbidge MOA, cumulative noise levels are 52 DNL and in the Owyhee MOA, they are 50 DNL.

Supersonic flight for fighter aircraft is primarily associated with air combat training. This occurs in the MOAs, generally above 10,000 feet MSL. The amplitude of an individual sonic boom is measured by its peak overpressure, in pounds per square foot (psf). The amplitude of a boom depends on the fighter aircraft's size, weight, geometry, Mach number, and flight altitude. Table MH3.2-5 shows sonic boom peak overpressures for two fighter aircraft in level flight at various

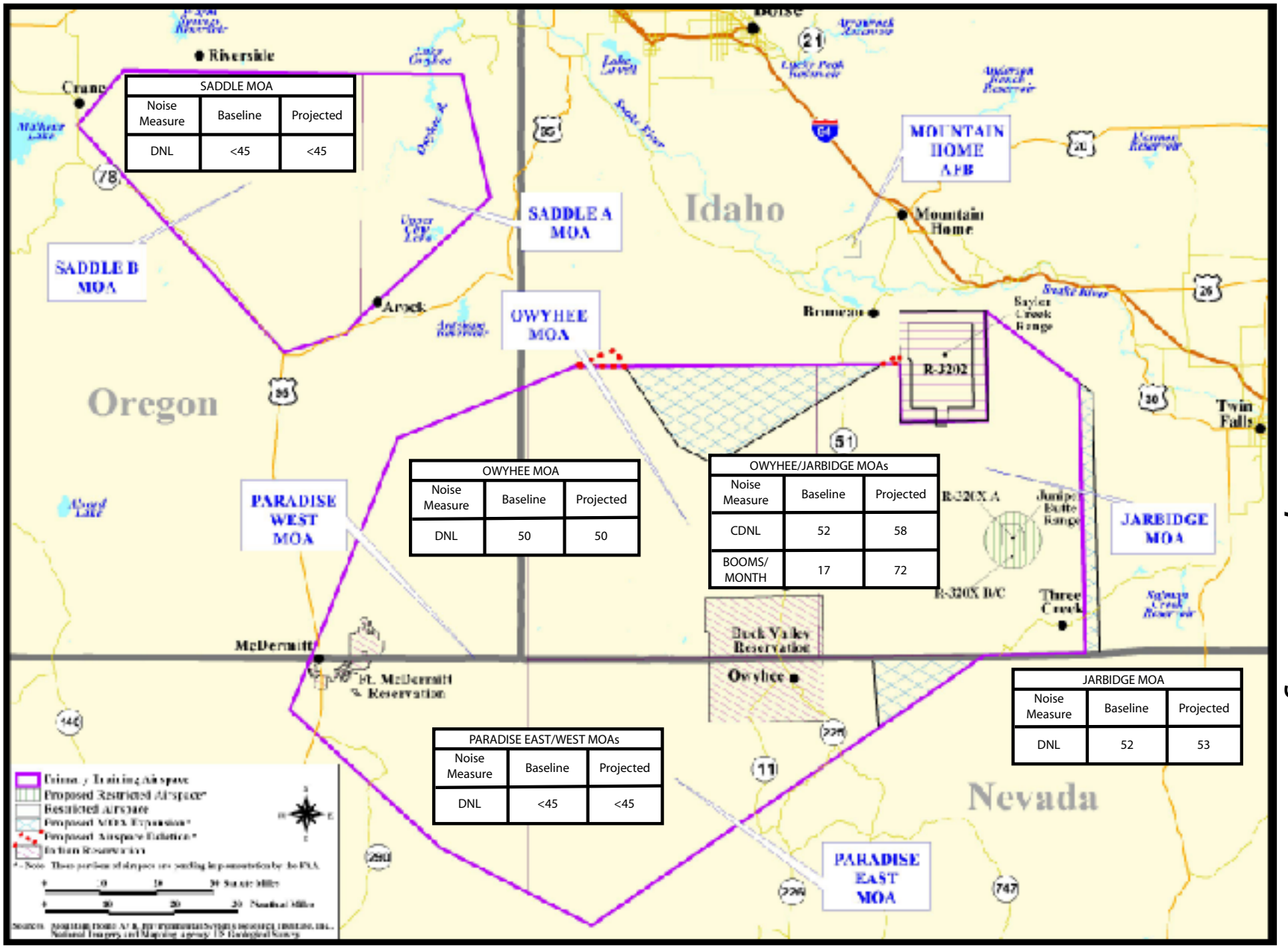


Figure MH3.2-2
Baseline and Projected Noise Environment for Mountain Home AFB Airspace

altitudes. The biggest single condition affecting these amplitudes is altitude. Maneuvers can also affect boom amplitude, increasing or decreasing overpressures from those shown in Table MH3.2-5.

Table MH3.2-5 Sonic Boom Peak Overpressures (psf) for F-15 and F-22 Aircraft at Mach 1.2 Level Flight

Aircraft	ALTITUDE (FEET)			
	10,000	***20,000***	***30,000***	***40,000***
F-15	5.40	2.87	1.90	1.46
F-22	5.68	3.00	1.97	1.50

Aircraft exceeding Mach 1 always create a sonic boom; however, not all supersonic flight activities will cause a boom at the ground. As altitude increases, air temperature decreases, and the resulting layers of temperature change cause booms to be turned upward as they travel toward the ground.

A sonic boom at the surface occurs about once for every 10 supersonic events.

Depending on the altitude of the aircraft and the Mach number, many sonic booms are bent upward sufficiently that they never reach the ground. This same phenomenon, referred to as "cutoff," also acts to limit the width (area covered) of the sonic booms that reach the ground (Plotkin *et al.* 1989).

When a sonic boom reaches the ground, it impacts an area which is referred to as a “footprint” or (for sustained supersonic flight) a “carpet.” The size of the footprint depends on the supersonic flight path and on atmospheric conditions. Sonic booms are loudest near the center of the footprint, with a sharp “bang-bang” sound. Near the edges, they are weak and have a rumbling sound like distant thunder.

Sonic booms from air combat training activity have an elliptical pattern. Aircraft will set up at positions up to 100 nautical miles apart, before proceeding toward each other for an engagement. The airspace used tends to be aligned, connecting the setup points in an elliptical shape. Aircraft will fly supersonic at various times during an engagement exercise. Supersonic events can occur as aircraft accelerate toward each other, during dives in the engagement itself, and during disengagement. The long-term average (CDNL) sonic boom patterns also tend to be elliptical.

Long-term sonic boom measurement projects have been conducted in four airspace units: White Sands, New Mexico (Plotkin *et al.* 1989); the eastern portion of the Goldwater Range, Arizona (Plotkin *et al.* 1992); the Elgin MOA at Nellis AFB, Nevada (Frampton *et al.* 1993); and the western portion of the Goldwater Range (Page *et al.* 1994). These studies included analysis of schedule and air combat maneuvering instrumentation data and supported development of the 1992 BOOMAP model (Plotkin *et al.* 1992). The current version of BOOMAP (Frampton *et al.* 1993; Plotkin 1996) incorporates results from all four studies. Because BOOMAP is directly based on long-term

measurements, it implicitly accounts for such variables as maneuvers, statistical variations in operations, atmosphere effects, and other factors.

A variety of aircraft conducting training perform flight activities that include supersonic events. Predominantly, these events occur during air-to-air combat, often at high altitudes. Roughly 3 to 10 percent of air combat maneuvering flight activities, depending upon aircraft type, result in supersonic events within the supersonic region of the Jarbidge and Owyhee MOAs, where supersonic activity is authorized above 10,000 feet AGL. On average, F-15Cs fly supersonic 7.5 percent of the time spent in air combat training with Mach numbers usually 1.1 or less, but occasionally up to about 1.3. This is typical of all the current-generation supersonic aircraft studied in the development of BOOMAP.

Figure MH3.2-2 shows baseline supersonic noise levels and sonic booms (CDNL) in affected airspace. In addition to CDNL, the estimated number of booms per month generated at an average location in the center of the supersonic region of the Jarbidge and Owyhee MOAs are also provided in Figure MH3.2-2. Individual sonic boom footprints would affect areas from about 10 square miles to 100 square miles, which is a small portion of the area under the airspace. The booms-per-month values account for the total number of booms and the average area affected by each.

Environmental Consequences

Two questions raised at scoping were: Will there be an increase in the number of sonic booms? Will a noise increase affect the surrounding communities?

Despite increases in sortie-operations, subsonic (DNL) noise levels from proposed F-22 flight activities would remain low and not increase perceptibly in the airspace used for training. In the Owyhee MOA, the noise level would not change. In the Saddle MOA and Paradise East and West MOAs, noise levels would increase above baseline levels but remain below 45 DNL. In the Jarbidge MOA the noise level would increase minimally (about 1 dB) (refer to Figure MH3.2-2), as a result of the increase in the number of F-22 sortie-operations in this MOA. The relative lack of change in noise levels results from the higher altitudes used by the F-22s in comparison to the F-15Cs. F-22s would fly, on average, 80 percent of the time above 10,000 feet MSL; 30 percent of total time would be above 30,000 feet MSL. Despite the increases, the overall noise levels would remain low; therefore, the noise environment would not change perceptibly.

Refer to Table MH3.2-3 for SELs for subsonic noise of several aircraft, including the F-22. Current data indicate that F-22 noise levels (SELs) would be higher at altitudes below 5,000 feet AGL than most other aircraft commonly using the airspace units. Given that most F-22 flight activity would occur above 10,000 feet AGL, no noticeable difference is expected.

The F-22 has enhanced supersonic capability relative to the current-generation of fighter aircraft. It is projected that its supersonic time would be more than three times that of aircraft such as the F-15C (25 percent versus 7.5 percent of time spent in combat training). For example, during a typical 14-minute air-to-air engagement, the F-22 would be supersonic 3 to 4.5 minutes, while the F-15C would be supersonic 1 to 2 minutes. It would also commonly achieve Mach numbers up to about 1.3, versus 1.1 for the F-15C. The combination of more supersonic time and a higher Mach number would result in a sonic boom environment six to seven times that of a similar number of F-15Cs. There are, however, two mitigating factors.

First, the majority of F-15C supersonic activity is below 30,000 feet, while 60 percent of F-22 supersonic activity would be above 30,000 feet. Booms generated at high altitude are weaker than those at low altitude. Applying the boom amplitudes shown in Table MH3.2-4 to the altitude distributions for the two aircraft types, impact per boom for the F-22 would be about 60 percent that of the F-15C, for an enhanced boom factor (i.e., potential to generate booms) of about four.

The second mitigating factor is that not all F-22s would always fly at full capability. In a typical combat training mission of 2 versus 2 or 4 versus 4, aircraft on one side fly as F-22s, while aircraft on the other side limit their performance to emulate enemy aircraft, which are current-generation technology. Thus, half of the F-22 sorties would have the enhanced boom factor, while the others would fly as non-F-22s and would not have an enhanced boom factor.

In the analysis of supersonic activity, the enhanced factor has been applied to half of the F-22 sorties, while the other aircraft follow the BOOMAP model as originally developed. This corresponds to an increase to CDNL of 4 dB. If the enhanced boom factor were applied to all of the F-22 sorties, the CDNL would be 6 dB. Individual sonic boom amplitudes would be approximately the same as current fighters such as the F-15C. Refer to Figure MH3.2-2 for projected F-22 CDNL.

Application of the enhanced boom factor to one-half the F-22 sorties results in a change in CDNL from 52 dB to 58 dB. Sonic booms felt at the surface, in the center of the combined (Owyhee/Jarbidge MOAs) airspace, would increase from 17 to 72 per month.

Native American Concerns

The Shoshone-Paiute have expressed three primary concerns about military aircraft noise.

- Noise from aircraft operations over or near the Duck Valley Reservation itself;
- Aircraft noise that interferes with ceremonies or disturbs the solitude of traditional cultural resources; and
- Effects of aircraft noise on native wildlife that are important as traditional cultural resources.

Supersonic flight is not authorized above the Duck Valley Reservation at the south edge of the Owyhee and Jarbidge MOAs.

Subsonic noise levels under this alternative would remain similar to baseline conditions. Supersonic activities and accompanying sonic booms would increase substantially. Although restrictions exist prohibiting supersonic activity over the reservation, the possibility exists that sonic booms would be felt by Native Americans and be perceived as interfering with their culture.

Comparative Summary of the Five Potential Basing Locations

Noise effects from increased flight activities in the training airspace represent the most prominent factor in assessing the differences among the basing locations. Subsonic noise would not change perceptibly as a result of the beddown at Mountain Home or for any of the other basing locations. Emphasis on use of higher altitudes by the F-22 would offset the effects of increases in sortie-

operations. Supersonic activity and accompanying sonic booms would increase substantially in some airspace units. In Mountain Home airspace, an increase of 55 sonic booms per month would be concentrated in two adjacent overland MOAs, resulting in greater potential effects than the other alternatives. Impacts for Elmendorf, also with overland MOAs, would be less than Mountain Home because the increase in sonic booms in any individual airspace unit would be less (1 to 28 per month) and the supersonic activity would be dispersed over several MOAs. All of the supersonic activity and sonic booms would occur over water for Langley, Eglin and Tyndall, and the effects of these increases would be minimal.

MH3.3 Air Quality

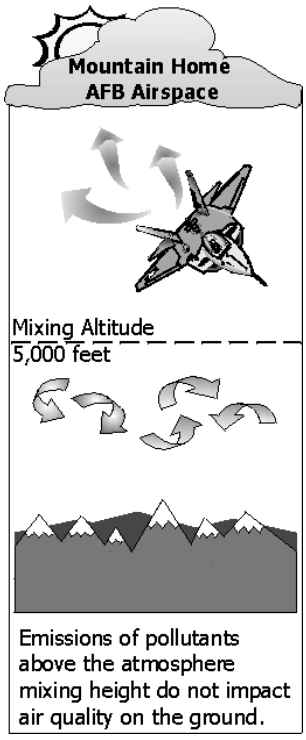
Air quality in a given location is described by the atmospheric concentration of six pollutants: ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter equal to or less than 10 microns in diameter (PM_{10}), and lead. As part of the Clean Air Act (CAA), the USEPA has established criteria for these pollutants. These criteria, set forth as national ambient air quality standards (NAAQS) represent maximum levels of background pollution that are considered safe, with an adequate margin of safety to protect the public health and welfare. Based on measured ambient criteria pollutant data, the USEPA designates areas of the United States as having air quality better than (attainment) or worse than (nonattainment) the NAAQS. Individual states are delegated the responsibility to regulate air quality in order to achieve or maintain air quality in attainment with these standards. States are required to develop a state implementation plan (SIP) that sets forth how the CAA provisions will be implemented within the state. The SIP is the primary means for the implementation, maintenance, and enforcement of the measures needed to attain and maintain the NAAQS in each state. Details of the NAAQS and specific regulatory requirements for sources of these emissions in attainment and nonattainment areas are included in Appendix AO-1.

The CAA also establishes a national goal of preventing degradation or impairment in federally designated Class I areas. Class I areas are defined as those areas where any appreciable degradation in air quality or associated visibility impairment is considered significant. As a part of the Prevention of Significant Deterioration (PSD) Program, congress assigned mandatory Class I status to all national parks, national wilderness areas (excluding wilderness study areas or wild and scenic rivers), and memorial parks greater than 5,000 acres. In Class I areas, visibility impairment is defined as atmospheric discoloration (such as from an industrial smokestack) and a reduction in regional visual range. Visibility impairment or haze results from smoke, dust, moisture, and vapor suspended in the air. Very small particles are either formed from gases (sulfates, nitrates) or are emitted directly into the atmosphere from sources like electric utilities, industrial fuel burning processes, and vehicle emissions. Stationary sources, such as industrial areas, are typically the issue with impairment of visibility in Class I areas so the permitting process under the PSD program requires a review of all Class I areas within a 62-mile (100 kilometer) radius of a proposed industrial facility. Mobile sources, including aircraft and their operations at Mountain Home AFB, are generally exempt from review under this regulation. While the review under the PSD permit program does not apply directly to base operations at Mountain Home AFB, this analysis assessed the 62-mile radius area as a screening tool for reviewing potential visibility impacts.

Pollutants considered in this Draft EIS include volatile organic compounds (VOCs), which are precursors to (indicators of) O_3, nitrogen oxides (NO_x), which are also precursors to O_3, as well as

CO, SO_2, and PM_{10}. Airborne emissions of lead are not addressed because the affected areas contain no significant sources of this criteria pollutant.

MH3.3.1 Base



Affected Environment

The affected environment varies according to pollutant. For pollutants that do not undergo a chemical reaction after being emitted from a source (PM_{10}, CO, and SO_2), the affected area is generally restricted to a region in the immediate vicinity of the base. However, the region of concern for O_3 and its precursors (NO_x and VOCs) is a larger regional area because they undergo a chemical reaction and change as they disperse from the source. This change can take hours, so depending upon weather conditions, the pollutants could be some distance from the source.

Another factor used in defining the affected environment is mixing height. Mixing height is the upper vertical limit of the volume of air in which emissions may affect air quality. Emissions released above the mixing height become so widely dispersed before reaching ground level that any potential ground-level effects would not be measurable. Emissions of pollutants released below the mixing height may affect ground-level concentrations. The portion of the atmosphere that is completely mixed begins at the earth's surface and may extend up to heights of a few thousand feet. Mixing height varies from region to region based on daily temperature changes, amount of sunlight, and other climatic factors. An average mixing height of 5,000 feet conservatively characterizes the conditions at Mountain Home AFB and the vicinity. This mixing height was derived from historical data (USEPA 1972) and a detailed analysis of morning and afternoon mixing heights at a nearby upper air monitoring station in Boise (USEPA 2000a).

Base Environment

The IDEQ has primary jurisdiction over air quality and stationary source emissions at Mountain Home AFB. Stationary source emissions at Mountain Home AFB include jet engine testing (off the aircraft), external and internal combustion sources, degreasing operations, storage tanks, fueling operations, solvent usage, surface coating, asphalt production, and miscellaneous general process operations (Table MH3.3-1). Actual emissions of criteria pollutants from the base are less than 100 tons per year, the major stationary source threshold.

Table MH3.3-1. Baseline Emissions for Mountain Home AFB Affected Environment

Source Category	POLLUTANTS (TONS PER YEAR)				
	CO	***VOCs***	***NO_x***	***SO_2***	***PM_{10}***
Stationary Sources	35.2	34.1	54.8	2.1	12.9
Mobile Sources	684.1	89.6	208.2	8.1	18.6
TOTAL Base Emissions	719.3	123.7	263.0	10.2	31.5

Sources: Air Force 2000b.

Mobile source emissions include aircraft operations (takeoffs and landings), aerospace ground equipment (AGE), ground support equipment (GSE), and maintenance aircraft operations performed with the engines still mounted on the aircraft (engine run-ups and trim checks). Emissions from aircraft takeoff and landing operations, as well as other flight operations at the base, considered all based and transient aircraft. Aircraft emissions were calculated for all flight activities below the mixing height (5,000 feet). These emissions, combined with those from the other mobile sources, account for the majority of the emissions from the base.

Regional Environment

Mountain Home AFB is located in Elmore County, Idaho, and is under the jurisdiction of the IDEQ. Mountain Home AFB is within the Idaho Intrastate Air Quality Control Region (AQCR) #63. AQCR #63, which was developed for planning purposes, consists of 22 counties in central Idaho including Elmore County. The affected environment for base-generated emissions includes Mountain Home AFB, the area surrounding the base, and the airspace surrounding the base. Air quality in the vicinity of Mountain Home AFB, the city of Mountain Home, and Elmore County is generally considered as very good. Due to the large extent of the AQCR, emissions from Mountain Home AFB are compared to Elmore County, which encompasses the base and a four-county area. Air quality within this area is either in "attainment" or "unclassifiable/attainment." Table MH3.3-2 summarizes the regional emissions (stationary and mobile) of criteria pollutants and precursor emissions for this affected area. Baseline Mountain Home AFB emissions are incorporated into these totals for the affected area. For the criteria pollutants, Mountain Home AFB contributes 16 percent NO_x to Elmore County emissions and 1 percent of regional emissions (4-county area); 7 percent CO to Elmore County, 1 percent regionally; 6 percent VOCs to Elmore County, less than 1 percent regionally; 3 percent SO_2 to Elmore County, less than 1 percent regionally; and less than 1 percent PM_{10}, both to Elmore County and regionally.

Table MH3.3-2. Regional Emissions for Mountain Home AFB Affected Environment

Regional Emissions	Pollutants (tons per year)				
	CO	VOCs	NO_x	SO_2	PM_{10}
Elmore County	9,662	1,989	1,602	372	11,966
Owyhee County	28,485	2,046	2,070	154	14,083
Twin Falls	38,147	4,465	4,911	1,079	32,546
Ada County	104,318	6,512	13,977	1,930	37,029
Total 4-County Area	180,612	15,012	22,560	3,535	95,624

Source: USEPA 2000b.

There are few sources of air pollution in Elmore County and the area is well removed from any metropolitan centers (Boise is over 50 miles away). Consequently, the ambient air quality has rarely been monitored in the county, and the IDEQ has designated the area as unclassifiable. Idaho has submitted to the USEPA its recommendations for the proposed 8-hour O_3 attainment status. Currently, the new 8-hour O_3 standard is pending a decision from the United States Supreme Court; it is expected sometime in 2001. While future implementation of this standard is still uncertain, it should be noted that since Idaho has no O_3 monitoring data, the state has recommended to USEPA that the entire state be designated as unclassifiable (IDEQ 2000).

The nearest nonattainment area is the metropolitan Boise area, which includes Ada and Canyon counties. Northern Ada County has been designated as nonattainment with the NAAQS for both CO and PM_{10}. These violations of the federal standards are due to localized urban and agricultural sources of air pollution and are not representative of conditions at Mountain Home AFB or Elmore County (refer to Table MH3.3-2).

The majority of emissions from permitted stationary sources in Elmore County are from commercial/ institutional combustion of coal. Emissions from on-road mobile sources dominate the emission inventory. This category includes the contribution of off-base use of private and government vehicles associated with military and civilian personnel at Mountain Home AFB. Aircraft emissions also contribute to the mobile source inventory. Area source emissions include sources of emissions from residential wood burning, solvent/coating use, vehicle refueling, as well as combustion emissions from heating of industrial, commercial, and residential facilities. Fugitive dust contributes the majority of PM_{10} emissions.

Environmental Consequences

The air quality analysis at Mountain Home AFB quantifies the changes (increases and decreases) due to the Initial F-22 Operational Wing beddown. Since Mountain Home AFB is located in an "attainment" area for all pollutants, the action would not interfere with any SIP measures or budgets established in order to achieve or maintain the NAAQS. Thus, there are no federal conformity requirements for the beddown (See Appendix AO-1).

The F-22 would require fewer maintenance activities wherein engines are run at varying speeds along the flightline, thereby reducing emissions.

Information on projected aircraft operations incorporated F-22-specific data on maintenance run-up procedures, uninstalled engine

cell testing, and typical ground run-up times (taxi, idle-in and idle-out times) for each landing-takeoff cycle (personal communication, McGettrick and Myers 2000, 2001). Time-in-modes for take-off, climb-out, and approach were based on default time-in-modes developed for comparable jet aircraft. Modal-specific emission factors and fuel flow rates are not currently available for the F-22 engines. The advanced design of the F-22 includes the development of a new propulsion system, the F119-PW-100, a low-bypass turbofan engine. The engine is still under test and evaluation and many operational parameters are classified and sensitive. Therefore, according to NEPA guidance, *Incomplete and Unavailable Information* 40 CFR §1502.22, the analysis used the best available data.

A composite set of emission factors and fuel flow rates for each pollutant at each power setting was developed based on recently published modal emission factors for the F100 series of engines (Air Force 1999b) using JP-8 as a fuel. The F100 series engines are the power plants of both the F-15 and F-16 aircraft. Details of the emission factors and time-in-modes used for the analyses are included in Appendix AO-3.

Direct emissions that would be generated by both stationary and mobile sources at Mountain Home AFB are detailed in Table MH3.3-3 below. Stationary sources include external and internal combustion sources, engine cell testing, and other aircraft maintenance operations. Mobile sources include aircraft operations (takeoffs and landings), aircraft maintenance run-ups, and exhaust emissions from aircraft ground support equipment. This analysis reflects the changes associated with drawdown of F-15Cs and the overall increase of aircraft and sorties associated with the beddown of F-22s.

Table MH3.3-3. Projected Direct Emissions for Mountain Home AFB Affected Environment

	POLLUTANTS (TONS PER YEAR)				
Source Category	***CO***	***VOCs***	***NO_x***	***SO_2***	***PM_{10}***
Projected Stationary Sources	38.9	34.8	63.0	2.1	12.9
Projected Mobile Sources	1,071.2	137.0	356.4	14.4	30.6
Baseline Stationary Sources	35.2	34.1	54.8	2.1	12.9
Baseline Mobile Sources	684.1	89.6	208.2	8.1	18.6
Stationary Sources Change	3.7	0.7	8.2	0.0	0.0
Mobile Sources Change	387.0	47.3	148.2	6.3	12.0
TOTAL Change in Base Emissions	390.7	48.0	156.4	6.3	12.0

Direct emissions at the base would increase for three criteria pollutants (CO, VOCs, and NO_x). Emissions of SO_2 and PM_{10} would not change perceptibly. Criteria pollutant emissions from mobile sources result from increased F-22 aircraft operations. Emissions would increase due to added takeoff and landing operations at the base, as well as AGE and GSE operations associated with each takeoff and landing operation. Minimal emissions would result from maintenance run-ups since the F-22 has eliminated the need to run trim checks (as compared to the many needed for the F-15C). In summary, increases in emissions and addition of new stationary sources would be subject to air quality regulations and permitting review by IDEQ. There would be no new categories of stationary source emissions from the base and increases in stationary source emissions would not be significant.

The emission increases from the Mountain Home alternative would be small in comparison to the Mountain Home AFB baseline and insignificant compared to countywide totals. The increases in emissions of CO, VOCs, SO_2, and PM_{10} would represent less than a 5 percent contribution to countywide emissions and would be insignificant. Emissions of NO_x (an O_3 precursor) would represent approximately a 9 percent increase over Elmore County totals; however, there are few sources of air pollution, and ambient air quality for both NO_x and O_3 is good in Mountain Home and Elmore County. Moreover, the region influenced by NO_x emissions would not be limited to the local area of Elmore County. Typically, O_3 precursors cover the entire affected airbasin and would include local counties such as Ada and Owyhee counties. Since NO_x reacts photo-chemically with VOCs on a larger regional scale to form O_3, several parameters, including wind flow patterns and regional topography, would define the affected area for O_3 formation and transport.

Indirect emissions are those not generated from sources at the base but which contribute to the regional inventory such as emissions from vehicles of commuting personnel and construction workers. Table MH3.3-4 provides total regional (direct and indirect) contribution from the proposed F-22 beddown at Mountain Home AFB.

Table MH3.3-4. Regional Emissions for Mountain Home AFB Affected Environment

	POLLUTANTS (TONS PER YEAR)				
Source Category	***CO***	***VOCs***	***NO_x***	***SO_2***	***PM_{10}***
Base Emissions (Direct)	390.7	48.0	156.4	6.3	12.0
F-22 Commuting Contribution (Indirect)	33.9	4.3	6.2	0.3	0.3
TOTAL F-22 Projected Contribution	424.6	52.3	162.6	6.6	12.3
County-wide Emissions (Elmore County)	9,662	1,989	1,602	372	11,966
TOTAL Percent F-22 Projected to Countywide Emissions Contribution	4%	3%	10%	2%	0.1%

Emissions from the F-22 beddown, including indirect commuting emissions, are also evaluated in the context of regional emissions. Emissions from the beddown would be insignificant in relation to regional sources of emissions and contribute less than 5 percent to the local region (Elmore County area emissions) for all pollutants except NO_x. The emission increases from oxides of nitrogen which result primarily from aircraft operations (takeoffs and landings) would be 10 percent of Elmore County reported totals. However, NO_x is an O_3 precursor, which reacts on a regional (airshed) scale to form O_3. There are no local or regional problems meeting the O_3 or NO_x NAAQS, and the entire state of Idaho is in attainment or unclassified for O_3, including the proposed 8-hour standard.

Temporary Construction Emissions		
	Tons per Year	***% Regional Contribution***
CO	230	2
VOCs	118	6
NO_x	635	40
SO_2	46	12
PM_{10}	168	1

While construction activities are of temporary nature and short duration, emissions during the construction period were quantified to determine their impacts on regional air quality. The construction phase would span a 3-year period from 2002 to 2004. Construction emissions are maximum during 2002, the year during which the majority of the construction occurs. Sources of emissions considered during the construction phase include exhaust from internal combustion engines, exhaust from diesel-powered construction equipment, and fugitive dust from the construction sites. The emission increases from NO_x result primarily from mobile (off-road) construction equipment and would be 40 percent of Elmore County reported totals. However, NO_x is an O_3 precursor and reacts on a regional (airshed) scale to form O_3.

There are no local or regional problems meeting the NAAQS O_3 or NO_x and the entire state of Idaho is in attainment or unclassified for O_3, including the proposed 8-hour standard. Similarly, SO_2 emissions during the construction phase are estimated as 12 percent of the countywide inventory. However, there are relatively few sources of emissions in Elmore County, and air quality for SO_2 is well below the NAAQS. The projected increase of 46 tons during the maximum construction phase would not adversely affect air quality.

Temporary Construction Worker Commuting Emissions

	4-County Area Total	*Tons per Year*	*% Regional Contribution*
CO	180,612	1,093	<1
VOCs	15,012	137	<1
NO_x	22,560	277	1
SO_2	3,535	10	<1
PM_{10}	95,624	9	<0.01

Indirect emissions from construction worker commuting were also estimated. Since the beddown would encompass a considerable amount of construction, including the addition of a new runway, construction worker trips are considerable. In addition, since there are limited labor forces in nearby Mountain Home to provide the labor, it was assumed that a large fraction of the workers would commute from surrounding communities in a four-county area (Elmore, Ada, Owyhee, and Twin Falls). When comparing construction worker commuting emissions in the four-county area, there would be no more than 1 percent in total contributions for any one of the criteria pollutants, and the impact may be considered regionally insignificant.

Visibility impairment due to base emissions from the beddown would not be of concern since there are no PSD Class I areas within the 62-mile (100-kilometer) standard review distance radius of Mountain Home AFB.

Comparative Summary of the Five Potential Basing Locations

There would be negligible differences in air quality impacts at any of the five installations. No base would exceed regulatory thresholds. The F-22 beddown at Mountain Home would result in the greatest increases in contributions to regional emissions (0.1 to 10 percent), but this is due to the lack of other emission sources and low overall regional emissions. The contribution to annual regional emissions of criteria pollutants would be less than .01 percent at Langley, Eglin, and Elmendorf; and between .01 percent and 1 percent at Tyndall.

MH3.3.2 Airspace

Affected Environment

The likelihood for air quality impacts to the airspace was evaluated based on the floor altitude of the MOAs relative to the mixing height for pollutants. The affected environment for airspace used by F-15Cs from Mountain Home AFB includes MOAs with floors below the average mixing height of 5,000 feet AGL (i.e., higher than that at the base). Emissions from aircraft in the Paradise East and West and Saddle MOAs are unlikely to impact air quality because the floor altitudes (14,500 feet MSL and 10,000 feet MSL, respectively) are well above the mixing height. Only activities in the Jarbidge and Owyhee MOAs below 5,000 feet AGL could affect air quality. None of these airspace units overlie designated nonattainment areas. In fact, the lands under the MOAs have good air quality and lack substantial population centers or industry to serve as sources of pollution.

Table MH3.3-5 includes baseline emissions for aircraft operating in the Jarbidge and Owyhee MOAs. Appendices AO-1 and AO-3 provide details of the calculations used to estimate aircraft emissions in these airspace units.

Table MH3.3-5. Baseline and Projected Emissions for Mountain Home AFB Affected Airspace

	POLLUTANTS (TONS/YEAR)				
Affected Airspace[1]	*CO*	*VOCs*	*NO_x*	*SO_2*	*PM_{10}*
Jarbidge MOA	17.96	5.24	306.65	0.73	5.41
Owyhee MOA	6.09	1.92	143.27	0.29	1.55
	PROJECTED EMISSIONS (TONS/YEAR)				
Jarbidge MOA	17.86	5.24	303.09	0.73	5.46
Owyhee MOA	5.93	1.91	137.64	0.29	1.63

Note: 1. Airspace units with a floor below 5,000 feet AGL (mixing height).

Of the five airspace units associated with the Mountain Home AFB alternative, the Jarbidge MOA is the only unit located near a PSD Class I area—the Jarbidge Wilderness. The Jarbidge Wilderness is located approximately 20 miles south of the MOA's boundary in Nevada. However, since emissions would be dispersed over millions of acres, they would not measurably affect air quality in the PSD Class I areas.

Environmental Consequences

Emission changes in the affected airspace units due to the beddown of F-22s at Mountain Home AFB are provided in Table MH3.3-5. Emission concentrations associated with aircraft operations would decrease for CO, VOCs, and NO_x. These emission decreases result from the lower number of F-22 operations at altitudes below the mixing height as compared to the F-15Cs (5 percent versus 17 percent). Emission increases for SO_2 and PM_{10} would be negligible. Since the airspace units are

so large and emissions would be dispersed over millions of acres, any changes in air quality would not be significant.

Comparative Summary of the Five Potential Basing Locations

Emissions from aircraft operations would be transitory and dispersed over extensive areas. Overall emissions in the airspace would be minimal and no substantive difference exists among the basing alternatives relative to air quality impacts.

MH3.4 Safety

MH3.4.1 Base

Affected Environment

Aircraft safety addresses aircraft mishaps and bird-aircraft strikes. Aircraft mishaps and their prevention represent a paramount concern for the Air Force. Class A mishaps, associated with a loss of life, loss of an aircraft, or costs in excess of $1 million, provide an indicator of aircraft safety. The F-15C has a lifetime historical Class A mishap rate of 2.65 or one mishap every 37,736 flying hours (Air Force 2000a). Using this mishap rate and comparing it to the number of annual flying hours logged by the 366th Wing in the past five years, 31,253 hours, a Class A mishap at Mountain Home AFB would be predicted to occur once about every five years. There has been one Class A accident in the last five years involving F-15C aircraft from Mountain Home AFB. This equates to an accident rate of 3.19 mishaps per 100,000 flying hours; just slightly above the F-15C historical lifetime rate. It must be noted that at these low mishap rates, an increase or decrease of one mishap can double or halve the accident rate (personal communication, Graffee 2000).

Data on mishaps within 10 nautical miles of an airfield reveal that 75 percent of aircraft accidents occur on or adjacent to the runway and in a corridor extending out from the end of a runway for 15,000 feet. Three zones within this corridor are established based on aircraft mishap patterns: the Clear Zone (CZ), Accident Potential Zone (APZ) I, and APZ II. Within the CZ, which covers a 3,000-by-3,000-foot area at the end of each runway, the overall accident risk is highest. APZ I, which extends for 5,000 feet beyond the CZ, is an area of reduced accident potential. In APZ II, which is 7,000 feet long, accident potential is the lowest among the three zones. At Mountain Home AFB, the CZ does not include housing or any other incompatible land uses. The land use within the APZs is predominantly range land.

Bird-aircraft strikes and the hazards they present form another safety concern for aircraft operations. The Air Force Bird Aircraft Strike Hazard (BASH) Reduction Program was established to reduce bird strikes through awareness, bird control, bird avoidance, and aircraft design. Air Force Pamphlet 91-212, 1 April 1997, provides guidance for implementing an effective bird aircraft strike hazard reduction program. Appendix AO-1 of this Draft EIS contains additional information on the Air Force BASH Program.

Mountain Home AFB maintains an aggressive program to minimize BASH potential in the airfield environment. The BASH program employs pyrotechnic and noise-making devices at the sewage lagoons to dissuade birds (particularly waterfowl) from using the site. Historically, Mountain Home

AFB F-15C aircraft have experienced approximately two bird-aircraft strikes per year. Most of the incidents resulted in little or no damage to the aircraft, and none resulted in a Class A mishap (personal communication, Graffee 2000).

Environmental Consequences

Aircraft safety conditions would change as a result of the F-22 beddown; new CZs and APZs would need to be established for the new runway. Historically, when new military aircraft first enter the inventory, the accident rate is higher. However, it is impossible to predict the potential mishap level. Historical trends do, however, show that mishaps of all types decrease the more an aircraft is flown. Over time, operations and maintenance personnel learn more about the aircraft's capabilities and limitations. Some of this experience has already been gained for the F-22.

The F-22 design incorporates the most modern technology, and knowledge is constantly being gained about the safe operating envelope of the aircraft. The F-22 will be flown by the most experienced pilots, and it will operate as safely as any aircraft in the Air Force inventory.

By the time F-22 operations at Mountain Home AFB would begin, the testing and pilot training phases of the aircraft's integration into the operational force would have progressed substantially. Significant knowledge would have been gained about the aircraft's safest flight regime. As the overall F-22 program proceeds from 2002 onward, the potential for mishaps would likely decrease to low levels comparable to other fighter aircraft.

Since the F-22 would operate in the same airfield environment at the F-15C, the overall very low potential for F-22 bird-aircraft strikes could increase because of the increase in the number of F-22 aircraft assigned compared to the number of F-15Cs assigned. The potential increase in bird-aircraft strikes would be mitigated to some degree because the F-22 would more rapidly reach altitudes above where the majority of strikes occur.

Comparative Summary of the Five Potential Basing Locations

No substantive difference exists among the bases relative to safety. For the additional runway at Mountain Home, new safety zones would extend off base but would not be incompatible with existing land use. Existing BASH program and other safety programs would remain in place. Some incompatible development encroaches into safety zones at Langley, but does not occur at the other bases.

MH3.4.2 Airspace

Affected Environment

As noted above, the F-15Cs at Mountain Home AFB have an accident rate of 3.19, slightly above the historic rate found for the F-15C worldwide (personal communication, Graffee 2000). Most mishaps occur in the airfield environment rather than training airspace. Additionally, the potential for bird-aircraft strikes is very low for the F-15Cs in the airspace because most flight activities are conducted well above the altitude (0 to 3,000 feet AGL) where most strikes occur. The use of flares as defensive countermeasures is described in section MH2.2.2.

Environmental Consequences

Aircraft mishaps would potentially increase in the airspace at the same levels and for the same reasons as discussed above for the base. It is unlikely that bird-aircraft strikes would increase because the F-22 would fly at higher altitudes more of the time. This would reduce the potential for interactions between aircraft and birds, which normally fly at low altitudes. An additional 17,190 flares would be used in overland airspace. Restrictions on flare use would apply.

Native American Concerns

Members of the Shoshone-Paiute Tribes have expressed concerns about the likelihood of an aircraft mishap on or near Duck Valley Reservation. Current Air Force policy restricts overflights over the Reservation. As discussed above, the statistical probability of an aircraft mishap underneath the affected airspace is currently very low.

The use of chaff and flares was a concern expressed at scoping.

The Shoshone-Paiute have also expressed concerns about the risks associated with the Air Force's current use of flares. While flares are approved for use in the MOAs, their use constitutes minimal risk. When used anywhere except over the target areas of Saylor Creek Range, flares are released no lower than 2,000 feet AGL in accordance with a coordinated agreement with the BLM. This altitude is more than double the normally approved safe-release altitude designated by the Air Force for flare use. The Air Force agreed that, absent compelling national security circumstances or military contingencies or hostilities, they will not use flares at night at any altitude, or use flares during the day below 20,000 feet AGL, for training operations over the present boundaries of the Duck Valley Reservation.

In spite of its low risk, members of the Shoshone-Paiute Tribes have expressed the opinion that chaff used by the Air Force has littered the environment. Chaff is an inert substance and has not been shown to create any health or safety risks to persons or animals. The Air Force has agreed that, absent compelling national security circumstances or military contingencies or hostilities, they will not use chaff for training operation over the present boundaries of the Duck Valley Reservation.

The Shoshone-Paiute have also expressed concern about ground safety in the immediate area around State Highway (SH) 51. In general, traffic volume on SH 51 is not expected to change as a result of the Mountain Home alternative.

Comparative Summary of the Five Potential Basing Locations

Mountain Home, along with Elmendorf, would have a minor increase in flare use in overland airspace units. Both would continue to implement restrictions on flare use designed to minimize fire risks. Otherwise, no substantive difference exists among the bases or training airspace units relative to potential safety impacts.

Natural Resources

Natural resources include native and exotic biota, their habitats, and the physical medium necessary for these resources to function. Biota are plant and animal life and are typically referred to as vegetation and wildlife respectively. When groups of plant and animal species in a given area are linked by ecological processes they are referred to as communities. A special community designation discussed in this document is Threatened, Endangered and Special Status Species/Communities. This designation refers to those plant and animal species or areas that are afforded special regulatory status (i.e., Endangered Species Act). The term *habitat* is also used to describe natural resources and refers to the necessary physical and biological features to sustain plant and animal species. Physical medium, as discussed in this section, include the soil and water that provide the foundation for all biota. Description of the components used to define the affected environment and methods used to evaluate baseline conditions are presented in Appendix NR-1.

Designations of special status species protection are generally in accordance with specific acts (i.e., ESA, Marine Mammal Protection Act [MMPA]) as established by specific agencies (i.e., United States Fish and Wildlife Service, National Marine Fisheries Service). Due to the overlapping jurisdiction of some agencies and acts, individual species often exhibit multiple state and federal status designations. For example, species identified as federal threatened or endangered in accordance with the ESA are often, but not always, also designated as threatened or endangered in accordance with state statutes. To avoid confusion and ensure clarity in the Draft EIS, please refer to Appendix NR-2 when counting special status species or determining the special status designations of species potentially occurring on base and under the affected airspace.

No-Action Alternative

Under the no-action alternative, Mountain Home AFB would continue to manage its natural resources in accordance with state and federal regulations and in accordance with the Mountain Home AFB Integrated Natural Resources Management Plan. Although considered negligible, on-going impacts to natural resources would continue under the no-action alternative. The no-action alternative would result in no change to threatened, endangered, or special status species/communities. There would be no planned construction and no additional impacts to soil or water resources.

MH3.5 Soil and Water

MH3.5.1 Base

Affected Environment

The original soils underlying Mountain Home AFB have been physically altered (i.e., cut, excavated, or covered) to create large, level areas with high load support capabilities designed to accommodate aircraft and support operations (Air Force 1996).

The majority of soils on Mountain Home AFB consist of the Bahern Silt Loam, with the exception of the extreme north and northeast portions, which include silt loams, stony silt loams, and sandy loams. Most soils are characterized by 0 percent to 4 percent slopes, except along the eastern boundary where slopes range from 0 percent to 8 percent.

Located within the C.J. Strike reservoir watershed, Mountain Home AFB is situated in a small, very shallow basin with approximately 55-square miles of drainage area. Surface water tends to flow from northeast to southwest into Canyon Creek, which ultimately drains into the Snake River.

No significant drainages or natural impoundments occur on Mountain Home AFB. During spring snowmelts and rainfall, the small amount of surface water on Mountain Home AFB either flows into two ephemeral (intermittent) streams or into the four man-made drainage ditches (Air Force 1998c).

According to Federal Emergency Management Agency maps, no 100-year floodplains have been identified in the area.

Environmental Consequences

Construction would disturb 440 acres of soil in areas on the base with a history of ground disturbance. This is the largest total area of all the basing locations. Approximately 5,378 tons of soil have the potential to erode due to F-22-related construction activities. Since more than 5 acres would be disturbed by construction, a NPDES storm water permit would be required. Under the permit, the base must develop a Storm Water Pollution Prevention Plan (SWPPP) that describes best management practices to be implemented to eliminate or reduce sediment and non-storm water discharges. With proper design and implementation of the SWPPP, impacts from erosion and offsite sedimentation would be negligible. There are no floodplain impacts, but relocation of the sewage lagoon would be required and would disturb additional area. No groundwater resources or water rights would be impacted.

Native American Concerns

The Shoshone-Paiute consider water to be a crucial resource that has several spiritual aspects in their traditions. The Initial F-22 Operational Wing beddown would not result in impacts on surface water, floodplains, groundwater, or water rights; therefore, there should be no adverse impacts to water resources in terms of Shoshone-Paiute concerns.

Comparative Summary of the Five Potential Basing Locations

At Mountain Home AFB, 440 acres would be disturbed by construction. The potential impacts to soils and water at Mountain Home are the greatest. Tyndall (73 acres) has the second greatest potential for consequences. Langley (16 acres) would have a negligible potential for consequences and be comparable to Eglin (10 acres) and Elmendorf (46 acres).

MH3.6 Terrestrial Communities (Wildlife and Vegetation)

MH3.6.1 Base

Affected Environment

In pre-settlement times, land that now encompasses Mountain Home AFB was relatively continuous expanses of open sagebrush steppe. In the vicinity of Mountain Home AFB, a regional history of grazing, agriculture conversion, exotic annual plant species invasion, and human-modified fire regimes have greatly altered vegetation communities and wildlife. Most of the area has been converted to an intensely fragmented landscape of invading exotic species, seeded areas, and agricultural fields. Few remnant stands of native pristine habitat persist.

The majority of the 5,825-acre (excluding the Small Arms Range) Mountain Home AFB is developed and consists of landscaped areas, buildings, landfills, rubble piles, and areas paved with asphalt or concrete. In general, open areas are either landscaped or dominated by exotic weed species. Native habitat areas comprise less than 7 percent of the base; none of these are in a pristine state. Common plant and animal species and habitats characteristic of the base are summarized in Appendix NR-3.

Most wildlife and vegetation species occurring on the base are common, widespread species that are habitat generalists or tolerant of human disturbance, noise, and pollutants.

Environmental Consequences

Construction and ground-disturbing activities would occur on 440 acres, the largest disturbance of any basing location; approximately 218 of those acres would be associated with the construction of a new runway, taxiway, and apron. The proposed disturbance area is previously disturbed, virtually devoid of native habitats, and dominated by weedy annual grasses and forbs. Construction in this area would displace disturbance-tolerant wildlife species occupying marginal habitat. Despite the marginal habitat quality, the large size of the disturbance zone will increase the number of displaced wildlife competing for habitat on adjacent lands.

An increase of about 2,831 acres would occur under the projected noise contours (i.e., above 65 DNL) with the Mountain Home AFB alternative. Wildlife species inhabiting the area under noise contours associated with the base have likely habituated to aircraft noise, and the proposed changes in noise levels are not expected to represent biologically significant changes for these species (see Appendix NR-4 for a discussion of the effects of noise on wildlife).

Comparative Summary of the Five Potential Basing Locations

Impacts to the terrestrial community on base were determined from an analysis of the quantity and diversity of habitat and species in the proposed construction zone and under the noise contours for the F-22. Construction at Mountain Home would affect disturbed habitat dominated by exotic species; however, the sheer size (440 acres) of the construction area would have an effect greater than Langley or Eglin and similar to Elmendorf. Construction at Elmendorf would affect a larger (46 acres), more naturally diverse area than either Langley or Eglin. Construction at Tyndall would affect 73 acres of habitat supporting a diversity of species; areas adjacent to the construction area and under the base noise contours support the highest diversity of habitat and species relative to any of the base alternatives. Construction at Langley would affect 16 acres of previously developed area; much of the remaining base is similarly developed and exhibits marginal habitat and relatively low species diversity. The amount (10 acres) and quality of habitat in the construction area at Eglin is similar to Langley.

MH3.6.2 Airspace

Affected Environment

As shown on Figure MH3.1-1, overland airspace includes five MOAs over three states and over 7,500,000 acres (see Appendix NR-3). This airspace occurs over the Intermountain Semidesert Province/Sagebrush Steppe ecoregion of southwestern Idaho, northern Nevada, and eastern Oregon (Bailey 1995). Rangeland, which includes various types of semi-desert shrublands and grasslands, covers the largest area under all five MOAs and accounts for 86.7 percent of the land cover. Sagebrush is the most extensive rangeland cover type. Agricultural land covers the second largest area under the MOAs (6.7 percent), followed by forest cover (4.3 percent). Aquatic habitat and wetlands cover 0.1 percent and 2.2 percent of the land, respectively (see Appendix NR-3). Over 200,000 acres of special use areas occur under the MOAs and most of these are Wilderness Study Areas. Other special use areas include wild and scenic rivers, national forest, and Native American lands.

Environmental Consequences

Scoping comments expressed concerns about potential noise impacts on wildlife.

Based on projected aircraft operations and review of the literature on the effects of noise on wildlife (see Appendix NR-4), subsonic noise impacts to wildlife under airspace used by Mountain Home AFB would not be significantly different from baseline conditions and are not expected to adversely affect wildlife populations for the following reasons: (1) many wildlife species have habituated to subsonic noise associated with jet aircraft and there would be no perceptible increase in subsonic noise levels; (2) the percent of F-22 flight time (5 percent) below 5,000 feet AGL would be less than half current F-15C use (11 percent); and (3) existing airspace restrictions over certain sensitive areas such as sensitive habitats would continue.

Average monthly supersonic flight activity in Jarbidge and Owyhee MOAs would increase from 17 to 72 events (booms). All F-22 supersonic flights would be conducted above 10,000 feet AGL. The same supersonic restrictions currently in effect would apply to F-22 training activities. Increases in boom frequency under this alternative could adversely effect some populations of wildlife species

(see Appendix NR-4). Habituation may occur, but species that are rare or already declining have a potential to be more at risk.

F-22s consistently fly at higher altitudes than F-15Cs. Typically, 80 percent of aircraft operations are above 10,000 feet AGL. Thirty percent of proposed F-22 aircraft operations would be above 30,000 feet AGL, whereas, only a small percentage of F-15C operations are at those altitudes. The greater number of F-22s would fly more total night aircraft operations, resulting in a 50 percent net increase in night aircraft operations.

Native American Concerns

Native plants and animals are considered by members of the Shoshone-Paiute Tribes to be essential to the maintenance and practice of their culture. Some Tribal members believe that past aircraft overflights and other military activity in southwestern Idaho may have contributed to a decline in the populations of California bighorn sheep, sage grouse, and other native species. These species are very important to the Tribes and are considered by Tribal members to be traditional cultural resources (see section MH3.11). As part of an ongoing effort to work with the Shoshone-Paiute Tribes, the Air Force has sponsored a study of ethnobotanical and ethnozoological resources in southwestern Idaho and adjacent areas. The Tribes and the Air Force have agreed that the results of the study are to remain confidential.

Comparative Summary of the Five Potential Basing Locations

Because proposed differences in subsonic noise levels under airspace are not expected to be biologically significant, impacts to the terrestrial community were primarily determined from an analysis of the number and altitude of sonic booms relative to the size, type, and diversity of habitat underneath airspace. Increases in sonic booms in the airspace associated with Mountain Home would be substantial. This factor, in combination with the number and nature of wildlife species underlying the Mountain Home airspace, suggests that potential consequences would be greater than those associated with any of the other locations. Supersonic activity would occur only over-water Warning Areas for Langley, Eglin, and Tyndall and only above 10,000 feet MSL. Because Eglin and Tyndall airspace covers a larger, more biologically diverse area, impacts to the terrestrial community are expected to be relatively greater at these bases than at Langley. Because Elmendorf overland airspace includes a diversity of species and special habitat areas that would be subject to sonic booms, impacts would be similar to Eglin and Tyndall.

MH3.7 Wetland and Freshwater Aquatic Communities

MH3.7.1 Base

Wetland areas, such as the sewage lagoon, will likely not meet criteria for jurisdictional status but may need to be examined for potential rare plant habitat.

Affected Environment

Thirty-three potential wetland areas have been identified at Mountain Home AFB. (Air Force 1996a). Only two are considered to possess "qualities of jurisdictional wetlands," both of which are in association with drainage ditches. One area is located on the east side of the

installation. The second occurs with sewage lagoons on the west side of the base. Ten small playettes have been identified on base. No temporary or permanent streams cross Mountain Home AFB.

Environmental Consequences

Construction of the new runway and supporting taxiway and apron would affect aquatic habitat occurring at Mountain Home AFB. Runway placement within the current boundaries of the installation would require the relocation of an existing sewage treatment facility and lagoons. Within this area is a site identified by two sources (Air Force 1998a, Air Force 1996c) as containing a jurisdictional wetland. Two areas associated with drainage ditches may also have jurisdictional status within the proposed construction area; however, the recent United States Supreme Court ruling may result in isolated wetlands no longer being under the jurisdiction of the Corps of Engineers.

Several small desert playas would be affected by runway construction. These features are seasonally saturated and often support unique desert plant communities and rare plants. These and other impact areas would be delineated for wetlands. A Clean Water Act Section 404 permit may be required prior to any construction. As may be required by Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands), the appropriate designee of the Secretary of the Air Force will publish a "finding of no practicable alternative" for any activities impacting floodplains and wetlands, respectively.

Comparative Summary of the Five Potential Basing Locations

Impacts to wetlands and freshwater aquatic communities were determined from the extent of filling, draining, and sedimentation anticipated during construction. Construction at Mountain Home could impact aquatic communities (including wetlands) although a jurisdictional wetland delineation would be required to make a final determination. Potential impacts to wetlands (26 acres) and the need for a Section 404 permit are greatest at Tyndall although a jurisdictional wetland delineation would be required to determine the precise acreage of wetland impact. Direct impacts to wetlands would not occur at Langley, Eglin, or Elmendorf.

MH3.7.2 Airspace

Affected Environment

Within the semi-desert landscape beneath MOAs associated with Mountain Home AFB, wetlands are rare but essential features. Typically, they exist in the context of shallow wet upland depressions, seeps, springs, and drainages associated with canyons. Of the 7.5 million acres of area beneath the airspace, 2.2 percent are classified as potential wetlands (Air Force 1998a).

Environmental Consequences

The Mountain Home AFB alternative will not fill or otherwise directly impact wetlands under associated airspace. The potential for consequences to wetlands would be negligible. Impacts to wildlife that use these habitats are discussed under sections MH3.6 and MH3.8.

Comparative Summary of the Five Potential Basing Locations

Direct impacts to wetlands and freshwater aquatic communities underlying airspace are not anticipated as a result of the proposed action and alternatives. Indirect impacts to species comprising these communities would not be appreciably different among locations and are expected to be negligible.

MH3.8 Threatened, Endangered, and Special Status Species/Communities

MH3.8.1 Base

Affected Environment

Thirty-one special status species (1 lichen, 6 plants, 3 invertebrates, 1 fish, 3 amphibian, 2 reptile, 9 birds, and 6 mammals) occur, or have the potential to occur, within the county where Mountain Home AFB is located. Scientific names and areas of occurrence for each special status species and communities are provided in tables found in Appendix NR-2.

One federally listed (bald eagle) and one federal candidate species (slickspot peppergrass) have been identified as having the potential to occur at Mountain Home AFB, but that potential is very low. Bald eagles may range onto base from the nearby Snake River Canyon but would find no appropriate habitat. Intact sodic playettes within quality sagebrush steppe are absent from Mountain Home AFB, thus slickspot peppergrass has no suitable habitat.

Sixteen state species of concern (3 amphibians, 2 reptiles, 7 birds, 4 mammals) occur or have the potential to occur on Mountain Home AFB (Appendix NR-2) (Air Force 1998c). The status of many of these species on base is not known, but it is believed that the majority do not occur on base (Air Force 1998c).

Environmental Consequences

No impacts to federally listed threatened or endangered species or critical habitat are expected to occur on Mountain Home AFB.

Burrowing owls are known to occur in an area north of the current flightline (Air Force 1998c). Building construction and development activities under this alternative would remove a portion of the on-base habitat for burrowing owls, a BLM sensitive species.

Mountain Home AFB supports no critical habitat for federally listed threatened or endangered species.

Comparative Summary of the Five Potential Basing Locations

Impacts to threatened, endangered, and special status species/communities were determined by the potential of these species/communities to be impacted during construction or from aircraft operations under the base noise contours. Mountain Home has a potential for impacts because habitat of the burrowing owl, a special status species, may be affected. Tyndall has the greatest potential for impacts because the threatened flatwoods salamander uses habitat similar to that found

in the construction zone. Langley has the lowest potential for adverse consequences because construction and aircraft operations would have no effect on special status species/communities. Construction and aircraft operations at Eglin and Elmendorf are also unlikely to affect special status species/communities; however, the proximity of protected species (least tern at Eglin and Beluga whale and six state species at Elmendorf) result in a slightly higher potential for impacts at these bases than at Langley. Additional surveys and species information at Eglin and Elmendorf could result in a no effect determination for these species.

MH3.8.2 Airspace

Affected Environment

Ten federally listed threatened (Ute ladies'-tresses, Bliss Rapids snail, bull trout, bald eagle), endangered (Bruneau hotspring snail, Idaho spring snail, Snake River physa, Utah valvata), and candidate (Slickspot peppergrass, Columbia spotted frog [Great Basin sub-population]) species have been identified as occurring beneath MOAs associated with Mountain Home AFB (see Appendix NR-2).

No bald eagle nests or breeding habitat occur in areas beneath the airspace. The closest nests are along the South Fork of the Boise River, well outside the area of potential effect. Wintering bald eagles have been observed occasionally along the Owyhee River. (Air Force 1998a).

Twenty-two state species of concern (3 amphibians, 3 reptiles, 9 birds, 7 mammals) have been identified as occurring or having the potential to occur beneath MOAs associated with Mountain Home AFB (see Appendix NR-2). Because of the remote nature of the area, the status and distribution of many of these species is not well known (Air Force 1998a).

Greater sage grouse (synonymous with "sage grouse") and California bighorn sheep, although not protected under the Endangered Species Act, are BLM Sensitive species of great interest to resource agencies in southwestern Idaho. Each has narrow habitat requirements and apparently declining or unstable populations. Sage grouse inhabit broad expanses of sagebrush steppe habitat. This species is locally migratory and seasonally gregarious, employing complex visual and auditory communication during breeding. California bighorn sheep inhabit rugged canyon habitat.

Environmental Consequences

Subsonic noise-related impacts to special status plant and animal species are not expected to be significantly different from baseline conditions (see Appendix NR-4). Under this alternative, the frequency of sonic booms would increase by more than four times current levels in the Owyhee and Jarbidge MOAs. The effects of sonic booms on wildlife species are complex and include effects related to audible components of sound, pressure waves, and high-energy low-frequency sound (infrasound). Although startle effects are most readily observed and presumed to be short-lived and of little consequence, the effects of artificial impulsive infrasound are not well understood. There is increasing evidence that many vertebrate species, across a variety of taxa use natural environmental infrasound for such things as communication, navigation, timing or synchronizing daily or seasonal behaviors, predator or prey detection, and avoiding physical or weather-related obstacles. Little research has been done in this area; virtually no research has been done on the effects of

anthropogenic infrasound on wildlife. The substantial increase in sonic booms resulting from the number of F-22 sortie-operations within Mountain Home airspace has the potential to affect special status wildlife species, including sage grouse and California bighorn sheep. However, the nature and magnitude of this effect is not documented.

Comparative Summary of the Five Potential Basing Locations

The bases with only overland training airspace, Mountain Home and Elmendorf, tend to have a greater potential for impacts to special status species due to supersonic activity and associated increases in sonic booms. Because the Mountain Home airspace is essentially one unit, the effects of sonic booms would be less dispersed, and the potential for impact greater, than at Elmendorf. Training airspace associated with Langley, Eglin, and Tyndall that is used for supersonic activity consists entirely of over-water Warning Areas and therefore the potential for impacts to special status species/communities at these bases are lowest for the five locations.

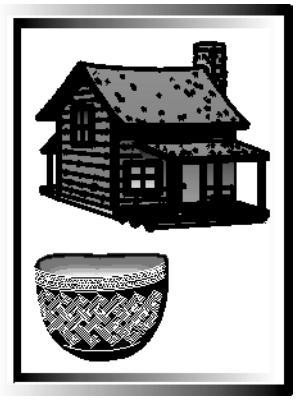
MH3.9 Marine Communities

No marine communities are associated with Mountain Home AFB or associated airspace.

Comparative Summary of the Five Potential Basing Locations

Because training airspace for Mountain Home and Elmendorf do not overlie marine communities there would be no potential for impacts. The potential for impacts to the marine community under Langley, Eglin, and Tyndall airspace is low due to current restrictions on flying below 5,000 feet MSL and the absence of supersonic flight below 10,000 feet MSL.

Cultural and Traditional Resources



This section identifies the affected environment and environmental consequences for both cultural and visual resources. Cultural and visual resources are grouped for this analysis because they often address similar visual landscape issues.

Cultural resources (section MH3.11) are any prehistoric or historic district, site, or building, structure, or object considered important to a culture, subculture, or community for scientific, traditional, religious, or other purposes. Cultural resources include archaeological resources (both prehistoric and historic), historic architectural resources, and traditional resources. Significant cultural resources are considered for potential adverse impacts. Significant resources are those that are eligible for inclusion in the National Register of Historic Places (NRHP) or that are identified as important to traditional groups. Significant traditional resources are identified by Native American or other traditional groups. Department of Defense (DoD) *American Indian and Alaska Native Policy* (November 21, 1999) requires an assessment, through consultation, of the effect of proposed DoD actions that may have the potential to significantly affect protected tribal resources, tribal rights, and Indian lands, before decisions are made by military services.

Visual resources (section MH3.10) are usually defined as areas with unique features that are a result of the combined characteristics of the natural and human aspects of land use. Examples of the natural aspects of land include wild and scenic rivers, topography, and geologic landforms. Examples of human aspects of land use include scenic highways and historic districts. The assessment of visual and aesthetic value involves a characterization of visual features in the study area.

The area of analysis for cultural resources considers both the immediate location of ground action on Mountain Home AFB, as well as areas under the associated airspace. For visual resources, analysis focuses on construction-related visual impacts within the base itself. Outside the base, aircraft are visually common and this action would not represent a change. A detailed description of impact analysis methods for cultural and visual resources is provided in Appendix CR-1.

No-Action Alternative

The no-action alternative would have low to negligible impacts to cultural resources because of the nature of the ongoing activities at Mountain Home AFB. In the event that cultural features are discovered during any activity, Mountain Home AFB would implement the standard Air Force procedures in Air Force Instruction 32-7065 for unanticipated archaeological discoveries and maintain compliance with applicable regulations and established procedures for the protection and conservation of cultural resources.

Under the no-action alternative, base visual resources would not be impacted. Mountain Home AFB would continue to operate as an active air base. There would be no change in the overall scenic perspectives on base or any changes that would obscure views of the base. Under the airspace, no-action would continue to result in unwanted visual intrusions identified by the Shoshone-Paiute Tribes.

MH3.10 Visual

MH3.10.1 Base

Affected Environment

On-base buildings include aircraft hangers, maintenance buildings, administrative buildings, firehouses (pictured here), a chapel, dining halls, dormitories, and family housing.

Mountain Home AFB is located in the Basin and Range physiographic province within the Snake River Plain, an area of low topography. The base occupies an approximate 9-square-mile area surrounded by a three-strand barbed-wire metal post fence.

Structures and facilities on base are fairly dispersed, with numerous trees and open spaces that help break up the developed areas. Given the relatively flat character of the base, intervening trees or buildings often screen views of nearby structures and facilities. Outside the flightline, shops, and other operations facilities, Mountain Home AFB exhibits a town-like visual setting. The tallest structures on base are the two water towers located in the northern part of the base. The tower near the industrial area is approximately 100 feet tall, and the tower near the residential area is over 140 feet tall. Other tall structures on base include the aircraft control tower, power and telephone lines, and the runway light poles. On-

base development is primarily single story, but a few two- and three-story structures do exist (Air Force 1992).

The area of Mountain Home AFB to be developed for deployment of the F-22 is largely grassland, with a high proportion of exotic weeds. Constraints to construction of a new airstrip include a sewage lagoon (west of the existing runway) and ordnance disposal areas that are also located west of the current runway. There are no paved public roads or highways in sight of the area where construction would take place. Because of the lack of visual barriers, the proposed construction would be visible from BLM and private land to the west of the base; however, the primary use of the land is for agriculture.

Environmental Consequences

Determination of the significance of the impact on visual resources is based on the level of visual sensitivity in the area (see Appendix CR-1).

The transitory nature of an aircraft and the accompanying noise make impacts on the visual environment difficult to identify.

Mountain Home AFB is currently exposed to military aircraft overflights. As a result of using the base daily for takeoffs and landings, military aircraft have become a common and expected aspect of the visual environment. Although the use of the F-22 aircraft would increase overall aircraft sorties by 58 percent, which may seem substantial, it would most likely not affect visual resources locally as visual sensitivity on base is low and aircraft overflights are common.

Military aircraft move very quickly and would not be visually evident for more than a minute. The visual impact would, therefore, be very short in duration, especially when natural screening landscapes, such as mountains and wooded areas are present.

Construction projects included in this alternative would be designed and constructed to be visually consistent with the existing environments and compatible with existing facilities and structures. The addition of new structures to previously undeveloped areas would not alter the visual character of the area, because these types of buildings would be expected in an airfield environment.

Native American Concerns

Although representatives of the Shoshone-Paiute Tribes have not expressed dissatisfaction with the Mountain Home AFB environment, they have identified various unwanted visual intrusions near the Duck Valley Reservation. These include both commercial and military facilities, such as the Air Force's existing 5-acre Grasmere electronic combat emitter site and the small town of Grasmere on Highway 51. Visual intrusions can potentially degrade the solitude and naturalness that are important to certain Shoshone-Paiute ceremonial activities. Many Shoshone-Paiute also believe that such intrusions may have negative effects on spirits, plants, and animals that are important to their traditional culture. All construction associated with this alternative is contained within the boundaries of Mountain Home AFB.

Comparative Summary of the Five Potential Basing Locations

The potential for visual impacts is low at all bases because of the preexisting military character and industrial uses. Mountain Home is currently exposed to military aircraft overflights. Langley has the greatest potential for visual impacts because of the presence of numerous historical resources. Eglin has less likelihood of impacts compared to Langley and Elmendorf and is similar to Tyndall and Mountain Home.

MH3.11 Cultural

MH3.11.1 Base

Affected Environment

Archaeological Resources

Mountain Home AFB has been surveyed for archaeological resources (SAIC 1991). Survey identified five historic archaeological sites, none of which are considered eligible for listing on the NRHP (Air Force 1998c). There are no NRHP-listed archaeological sites at Mountain Home AFB (NRIS 2000).

Architectural Resources

There are no NRHP-listed architectural resources at Mountain Home AFB. Six World War II structures and five Cold War structures at the base are eligible for listing on the NRHP. These include buildings that may lie within the area of affected environment such as Building 211, a 1943 Aircraft Maintenance Dock/Hangar. Other buildings from the Cold War-era also may be eligible for the NRHP, but have not yet been evaluated (Air Force 1998c). Appendix CR-2 lists NRHP-eligible buildings at Mountain Home AFB.

Eleven of the base's World War II or Cold War structures are eligible for listing on the National Register.

Traditional Resources

No traditional resources have been identified at Mountain Home AFB (Air Force 1998c). Coordination with the Shoshone-Paiute Tribes of the Duck Valley Reservation regarding traditional resources issues at Mountain Home AFB is ongoing.

Environmental Consequences

No impacts to archaeological, architectural, or traditional resources are expected under this alternative. Most of the area of affected environment has been surveyed for archaeological resources. No NRHP-eligible resources lie within this area. Archaeological survey, in compliance with Section 106 of the National Historic Preservation Act (NHPA), would be completed in unsurveyed portions of the area of affected environment prior to construction. No traditional resources have been identified at the base to date.

Comparative Summary of the Five Potential Basing Locations

The potential for impacts to archaeological resources is low at all bases. No known NHRP- eligible resources are located on Mountain Home; therefore, Mountain Home has the lowest potential for impacts on base.

MH3.11.2 Airspace

Affected Environment

Four NRHP-listed properties have been identified under Mountain Home AFB airspace. In addition, many more eligible or potentially eligible cultural resources associated with the history of the region are likely to underlie airspace. Appendix CR-2 contains the NRHP-listed resources under Mountain Home AFB airspace.

Five traditional cultural resources in southwestern Idaho have been recommended as eligible for the NRHP as Traditional Cultural Properties (TCPs) (Air Force 1998a). In addition, it is likely that other resources in the area could qualify as TCPs, and there are many archaeological sites and natural features that may be considered traditional resources (Air Force 1998a). The exact location of all traditional resources is confidential.

Jarbidge MOA. This airspace lies above Owyhee County in southwestern Idaho. One NRHP-listed historic property, the remains of a stage station, lies under Jarbidge MOA (NRIS 2000). No federally recognized Native American lands underlie this airspace (BIA 1998).

Owyhee MOA. This airspace lies above Owyhee County in southwestern Idaho. One NRHP-listed property, an archaeological district, lies under the Owyhee MOA. Part of the Duck Valley Reservation underlies this MOA in Idaho (BIA 1998).

Paradise East and West MOAs. This airspace lies above Malheur County in southeastern Oregon, and Humboldt and Elko counties in northern Nevada. There are no NRHP-listed properties under airspace in this MOA. Fort McDermitt Reservation lies under Paradise West MOA in Nevada and Oregon (BIA 1998). A portion of the Duck Valley Reservation also underlies the Paradise East MOA in Nevada (BIA 1998).

Saddle A and B MOAs. This airspace lies above Malheur County in southeastern Oregon. Two NRHP-listed properties associated with local ranching underlie Saddle A MOA. No federally recognized Native American lands underlie the Saddle MOAs (BIA 1998).

Environmental Consequences

Projected F-22 airspace use under this alternative would increase by about 27 to 61 percent over existing F-15C use. Subsonic noise would increase slightly under the Saddle, Paradise, and Jarbidge MOAS, but this increase would not be discernible to the human ear. Supersonic events (sonic booms) are expected to increase from 17 per month to 72 per month. Supersonic flights are expected to take place above 10,000 feet MSL.

No impacts to significant historic properties under Mountain Home AFB associated airspace are expected under this alternative. Ongoing use of airspace by F-15C aircraft has not impacted significant historic properties. Although there would be a slight increase in subsonic noise under all but the Owyhee MOA, it would not be of sufficient magnitude to impact historic properties under airspace. F-22s will typically operate at higher altitudes than the F-15Cs and impacts to historic properties from noise are not expected. Chaff and flare use is not expected to impact significant historic properties under airspace. Existing use of chaff and flares by F-15C aircraft is not known to have impacted these resources. Increased use by F-22 aircraft also is not expected to result in impacts. About 80 percent of flare release by F-22 aircraft is expected to occur above 10,000 feet.

Native American Concerns

During scoping, residents of the Duck Valley Reservation were concerned about noise impacts on cultural resources and Native American religious practices, in addition to human and wildlife exposure to aircraft noise and sonic booms.

Native Americans are likely to be concerned about potential impacts to traditional resources under the airspace. Two Native American reservations underlie Mountain Home AFB-associated airspace. TCPs and other traditional resources are known to underlie this airspace. In previous studies, representatives of the Shoshone-Paiute Tribes have expressed concern regarding past and present Air Force use of airspace, including potential interference in tribal ceremonies and rituals by noise and visual impacts of Air Force overflights; disturbance to the solitude of certain TCPs; and the possible adverse effects of aircraft noise on wildlife resources in the region (Air Force 1998a).

Although there would be a slight increase in subsonic noise under several MOAs, it would not be discernable to the human ear. The relative lack of change in subsonic noise levels is due to the performance of the F-22 which will fly at higher altitudes more often than the F-15C. The increased number of supersonic events and associated sonic booms, as well as increased chaff and flare use, are likely to be considered by the Native Americans to be an impact to traditional use of the area. Air Force consultation with interested Native American groups regarding airspace actions is ongoing.

Comparative Summary of the Five Potential Basing Locations

The potential for impacts to archaeological and architectural resources under airspace is low for all bases. The potential for impacts to traditional resources under airspace is higher for Mountain Home AFB than for the other bases.

Human Resources

The proposed F-22 operational beddown and related training activities would create changes in aircraft operations and overflights which would, in turn, affect noise levels associated with Mountain Home AFB. Proposed activities that could potentially affect existing human resources also include construction of new facilities on base.

The region of influence for human resources includes areas on base and the surrounding vicinity, specifically, those jurisdictions whose economies are

closely associated with activities at the base. For the land use and environmental justice resources, the effects on areas underlying the airspace are also presented.

No-Action Alternative

The no-action alternative would have no negative consequences to land use or socioeconomics and no change to environmental justice. Land use and existing land use patterns would remain the same. Mountain Home AFB would continue to cooperate with the local communities in developing its Air Installation Compatible Use Zones (AICUZ) programs. Mountain Home AFB would continue to operate and contribute to the economic health of the region. Under the no-action alternative, demographic patterns associated with low-income populations and children would remain the same. Native American concerns regarding current Air Force overflights would be expected to continue.

MH3.12 Land Use

MH3.12.1 Base

Affected Environment

Mountain Home AFB is located in Elmore County, Idaho. The installation comprises 5,825 acres approximately 10 miles southwest of the city of Mountain Home.

Land uses on base are grouped by function in different geographic areas. The runway complex bisects the base from the northwest to the southeast. Lands to the southwest are largely undeveloped; however, wastewater treatment facilities are located in this area. The developed areas occur in the central and northeastern portions of the base. Community facilities, including schools, medical facilities, and housing are located to the northeast, while administrative and operational facilities are located near the center and along the flight line.

The predominant regional land use is livestock grazing.

The base is surrounded by unincorporated areas of Elmore County, lands managed by the BLM, and private lands. Mountain Home is the largest community in the vicinity of the base. The city of Mountain Home and Elmore County maintain comprehensive plans and have adopted implementing ordinances.

Table MH3.12-1 presents a list of land uses within the vicinity of the installation situated within the existing 65 DNL noise contour line depicted on Figure MH3.2-1.

Table MH3.12-1. Land Uses within the Mountain Home AFB Baseline 65 DNL Noise Contour

Land Use	*Percentage*
Low-density Residential/Agricultural Lands	72
Commercial	0.5
Mountain Home AFB	27.5

Source: Air Combat Command Headquarters n.d.

Base plans and studies present factors affecting both on- and off-base land use and include recommendations to assist on-base officials and local community leaders in ensuring compatible development. In general, land use recommendations are made for areas affected by both the potential for aircraft accidents (refer to section MH3.4, Safety) and aircraft noise (refer to section MH3.2, Noise). There are safety zones defined for each end of the runway based on the analysis of historic mishap data that defines where most aircraft accidents occur. There are no incompatible land uses within the safety zones at Mountain Home AFB.

Noise contours in these plans are generated by the modeling program NOISEMAP. These noise contours are used to describe noise exposure around the base and support compatible land use recommendations. Noise is one of the major factors used in determining appropriate land uses since elevated sound levels are incompatible with certain land uses. When noise levels exceed a DNL of 65 dB, residential land uses are normally considered incompatible. Further, the percentage of persons highly annoyed by noise can be estimated based upon varying noise levels. Noise exposure (depicted with contours) from operations occurring today at Mountain Home AFB is shown in Figure MH3.2-1. These contours provide the baseline against which to measure the projected change should the F-22 be based at Mountain Home AFB. No noise-sensitive receptors (hospitals, schools, or churches) occur off base within the vicinity of Mountain Home AFB.

Environmental Consequences

The Initial F-22 Operational Wing beddown would require construction and modification of facilities on base, a large increase in personnel, and an increase in flight operations. However, this would not adversely affect land uses on base. Proposed development would be consistent with base plans because they would occur in proximity to other similar land uses.

In order to accommodate the proposed second runway, adjustments to land uses in the south and western portions of the installation are anticipated. This would include the relocation of the wastewater treatment facility and delineation of new safety zones. A modification of this magnitude would affect on-base land use patterns and potential off-base development opportunities.

The city of Mountain Home and Elmore County have experienced large growth fluctuations due to the importance of Mountain Home AFB to their local economies. The anticipated growth associated with the additional personnel would affect housing levels and would likely increase

development activity in the area (see section MH3.13). Due to the healthy growth experienced by the community in recent years, renewed planning efforts would be required to ensure that appropriate services were in place to ensure orderly future growth patterns.

Figure MH3.2-1 depicts the projected NOISEMAP contours should the F-22s replace the F-15Cs at Mountain Home AFB. For areas in the vicinity of Mountain Home AFB, the amount of acreage exposed to 65 DNL and above would increase by about 2,400 acres off base. This acreage is predominantly agricultural or rangeland with scattered residences. Residential density in these areas may be characterized as about one dwelling unit per 100 acres. No new sensitive receptors will be exposed under the proposed action. Should the decision be made to place the F-22 at Mountain Home AFB, and once flying operations have commenced, a detailed data collection effort would occur and existing noise studies and land use recommendations would be updated.

Amount of Off-Base Land Area Change from Baseline to Projected at Mountain Home AFB

Noise Contours (DNL)	*Total Land Area (acres)*	*Total Residential Area (Acres)*
65-70	1,096.9	0.0
70-75	771.4	0.0
75-80	347.9	0.0
80-85	202.4	0.0
>85	37.2	0.0
Totals	2,455.8	0.0

In order to better understand the effects of aircraft noise on individuals in the vicinity of airfield and underlying other aircraft use areas, numerous studies have been undertaken. Aircraft noise effects can be described according to two categories: annoyance and human health considerations. Annoyance, which is based on a perception, represents the primary effect associated with aircraft noise. Far less potential exists for effects on human health. Studies of community annoyance to numerous types of environmental noise show that DNL correlates well with effects. Schultz (1978) showed a consistent relationship between noise levels and annoyance. A more recent study reaffirmed this relationship (Fidell *et al.* 1991).

A number of studies have been conducted analyzing the effects of aircraft noise on people. These studies focus on effects in two categories: annoyance and human health. A complete discussion of this topic may be found in Appendix AO-2.

In general, there is a high correlation between the percentages of groups of people highly annoyed and the level of average noise exposure measured in DNL. The correlation is lower for the annoyance of individuals. This is not surprising considering the varying personal factors that influence the manner in which individuals react to noise. The inherent variability between individuals makes it impossible to predict accurately how any individual will react to a given noise event. Nevertheless, findings substantiate that group or community annoyance to aircraft noise is represented quite reliably using DNL. Table MH3.12-2 presents the relation between annoyance and DNL.

Table MH3.12-2. Relation Between Annoyance and DNL

DNL	*Percent of Population Highly Annoyed*
65	12.3
70	22.1
75	36.5
80	53.7
85	70.2

Source: Finegold *et al.* 1994.

Appendices AO-1 and AO-2 include additional information regarding aircraft noise effects. For purposes of the land use analysis, it is important to note that human effects is one of the factors used to determine appropriate land uses for areas in proximity to airfields. Assessments of land use compatibility may then be used to develop community land use plans, guidelines, and regulations.

As stated above, the change in area affected under the F-22 beddown increases by about 2,400 acres. However, due to the low-density rangeland uses, a relatively small number of additional people would be affected by aircraft noise (65 DNL and above) under the F-22 beddown. Furthermore, no change is expected in the number of persons highly annoyed at Mountain Home AFB. No adverse impacts to land use are anticipated in either the on- or off-base environments. The potential for consequences at Mountain Home AFB and Elmendorf AFB are comparable and both low.

Residential property values in the vicinity of airfields in general are affected by a variety of non-noise factors such as national, regional, and community economic conditions; national and regional trends in employment, inflation, and interest rates; local population changes and real estate development (Fidell *et al.* 1996). While property values in the vicinity of Mountain Home AFB may be affected by local perceptions of environmental issues such as noise exposure, the complex interaction of multiple economic and real estate factors makes the estimation of such effects highly speculative. A study, *Effects of Military Aircraft Noise on Residential Property Values,* indicates that there is no reliable correlation between aircraft noise and residential property sale prices at Langley AFB and concludes that the number of variables and confounding factors at Davis-Monthan AFB obviate a conclusion of a direct relationship between noise and residential property sale prices (Fidell *et al.* 1996).

Comparative Summary of the Five Potential Basing Locations

Land use impacts stem from changes in noise levels for off-base areas. Despite an increase of about 2,500 acres affected by noise, the off-base land uses at Mountain Home consist of grazing/agricultural. For this reason, potential impacts would be less than at Eglin and Tyndall where noise would affect 123 and 23 acres of residential land use, respectively. The potential effects of noise would be the least at Elmendorf since only the off-base areas affected are over water. Impacts at Langley (where the off-base area affected by noise would decrease with beddown of the

F-22), would be greater than at Elmendorf or Mountain Home because residential lands would continue to be affected.

MH3.12.2 Airspace

Affected Environment

This section summarizes land uses underlying MOAs for the Mountain Home AFB alternative. As illustrated in Figure MH2.2-1, the MOAs overlie a multi-state area in the northwestern United States. Although most of the affected airspace is located in Idaho, some areas extend into portions of Nevada and Oregon.

The general land use patterns underlying this airspace may be characterized as rural. Agricultural uses include farms, ranches, and rangeland. There are also a number of small towns throughout the area that occur along area roads and highways. Two Native American reservations are situated under the airspace. Duck Valley Reservation underlies parts of Owyhee and Paradise East MOAs in Idaho and Nevada. The Fort McDermitt Reservation lies under part of Paradise West MOA in Nevada and Oregon (BIA 1998). A wide variety of land use types occur within populated areas, including residential, commercial, industrial, and public land uses. Areas of cultural significance also occur under the airspace; Appendix CR-2 identifies properties that have been placed on the NHRP. An analysis of these cultural resources is provided in section MH3.11.

Members of the public identified noise impacts to recreationalists in primitive areas as an issue of concern.

Special use areas have been identified under the MOAs. Appendix HR-2 contains tables summarizing special use areas for each state under the airspace. They are considered special use areas because they provide recreational opportunities (trails and parks) and/or provide solitude or wilderness experiences (parks, forests and wilderness areas). Recreational areas include large public land areas, such as state or national parks, forests and reserves, which may include individual campgrounds, trails, and visitor centers.

Special use areas underlying the airspace include wilderness areas, a wild and scenic river, and other primitive recreation areas. For example, five Wilderness Study Areas (WSA) underlie the Jarbidge MOA in Owyhee County. The BLM in Idaho, in accordance with Sections 603 of the Federal Land Policy and Management Act, performed wilderness reviews on roadless public lands of 5,000 or more acres and roadless islands to determine which were suitable for wilderness designation. Wilderness designation is intended to preserve areas in a primitive state that have little evidence of human activity. The Wilderness Act of 1964 identified criteria for evaluating those areas and gave direction on how designated wilderness should be managed. Subject to certain exemptions, use of motor vehicles or other motorized equipment, landing of aircraft, and construction of structures and roads is prohibited in wilderness area.

The result of the BLM inventory was the identification of a number of WSAs that were considered to possess some of the wilderness attributes, including naturalness, opportunities for solitude, opportunities for primitive and unconfined recreation, special features, and size. The BLM submitted their recommendations for wilderness designation to the Secretary of the Interior for eventual Congressional action. Until the Congressional review process is completed, WSAs are

managed under BLM's Interim Management Policy so as to not impair their suitability for wilderness designation. A WSA possessing the greatest number of these attributes is more likely to be recommended suitable for wilderness designation.

The Humboldt National Forest underlies portions of the Paradise MOAs. It is managed by the Forest Service and consists of 2.5 million acres separated into nine different units. Also in this area of northeastern Nevada, the Wilderness Act of 1964 designated the 65,000-acre Jarbidge Wilderness, which includes over 100 miles of hiking trails. The Nevada Wilderness Protection Act of 1989 added six new wilderness areas and enlarged the Jarbidge Wilderness by 401,400 acres. The Owyhee Wild and Scenic River underlies the Saddle A and B MOAs. As part of the National Wild and Scenic Rivers System (created by Congress, Public Law 90-542:16 USC 1271 *et seq*.) rivers and their immediate shorelines that are so designated are intended to be preserved and enhanced. These rivers are in a free-flowing condition and include natural, cultural, or recreational features. For any river segment to be eligible for potential suitability as a designated wild, scenic, or recreational river, it must meet certain classifications. To be considered a scenic and wild river, it must possess one or more outstandingly remarkable values as defined by Section 1(b) of the Wild and Scenic Rivers Act, including scenic, recreation, geology, fish and wildlife, historic, cultural, or other similar value. A number of rivers under the Idaho airspace are considered potentially eligible by the BLM for this designation.

Environmental Consequences

An increase in sorties represents the element of the proposed action with a potential to affect land use within and under the airspace. Such impacts would be indirect, stemming from aircraft overflights and aircraft noise.

Under this alternative, subsonic noise would increase very slightly. In most cases, the increase would overlap the existing noise levels for ongoing airspace use (refer to section MH3.2, Noise). Most noise levels are expected to remain below 45 DNL, the level below which aircraft noise cannot generally be detected above background noise. Where noise levels are higher than 45 DNL, they are expected to remain the same or increase by no more than 1 dB under this alternative compared to existing conditions. Therefore, it is unlikely the land use patterns, ownership, or management practices would be affected by F-22 use of the airspace.

At scoping there was concern that increased noise will have an impact on recreational activities.

The F-22 supersonic activities in the Jarbidge and Owyhee MOAs have the potential to more than quadruple supersonic events currently experienced. This shift would cause a perceptible change in the noise environment in remote areas. Residents in isolated areas, as well as visitors and recreationists to pristine primitive areas would likely be annoyed by the increase in supersonic activities. Although the booms do not constitute a physical or permanent effect, they would be perceived by some as an unwanted intrusion that may interfere with management goals for special use areas under the MOAs.

Native American Concerns

Members of the Shoshone-Paiute Tribes of the Duck Valley Reservation continue to use their historic territory surrounding the Reservation and underlying the airspace for a variety of traditional

subsistence and religious activities. These lands are managed for the most part by the BLM. This alternative would not affect Tribal members' access to lands for traditional uses.

Representatives of the Shoshone-Paiute Tribes have expressed concerns regarding some forms of recreational use of the region. A few recreational users in Owyhee County have reportedly disturbed archaeological sites and other cultural resources important to the Shoshone-Paiute. Often this disturbance is unintentional, but willful vandalism does occur and is of great concern to the Tribes. Such purposefully destructive vandalism can include "pot hunting" (unauthorized excavation and artifact theft); defacement of rock art; and driving off-highway vehicles over fragile cultural resources. The Initial F-22 Operational Wing beddown will not require new construction of roads or facilities outside of Mountain Home AFB. However, the additional population could increase visits in the area.

The Shoshone-Paiute Tribes continue to claim lands in southwestern Idaho that fall outside the Duck Valley Reservation. These claims are based on the Treaty of Ruby Valley (1863), the Boise River Treaty (1864), and the Bruneau Treaty (1866). The resolution of land claims is beyond the control of the Air Force and is not addressed in this Draft EIS.

Comparative Summary of the Five Potential Basing Locations

The potential for impacts to land use as a result of airspace use at Mountain Home and Elmendorf would be greater than at Langley, Eglin, and Tyndall, because supersonic activity would increase noticeably at these two bases. In both cases, all supersonic activity for Mountain Home and Elmendorf occurs over land. At Mountain Home, increases in sonic booms over special use areas would make the potential for consequences greater than any other location. Potential for impacts to Langley, Eglin, and Tyndall would be negligible, because supersonic activity would occur mainly over water.

MH3.13 Socioeconomics

MH3.13.1 Base

Affected Environment

Employment and Earnings

Information regarding employment and earnings is presented for Ada, Elmore, and Owyhee counties, whose economies are closely associated with activities at Mountain Home AFB. Comparisons are also presented with conditions for the state of Idaho.

In the region, total full- and part-time employment increased from 153,958 jobs in 1990 to 214,467 in 1997, at an average rate of 4.8 percent annually. The largest contributions to employment in 1997 were made by services (28.0 percent), retail trade (17.3 percent), and manufacturing (11.7 percent). For the years 1980, 1990, and 1997, the contribution of the military decreased from 4.8 percent to 3.3 percent and 2.7 percent, respectively. The sectors of the economy exhibiting the greatest addition of jobs over the period 1990-1997 were services, retail trade, and manufacturing (United States Department of Commerce, Economics, and Statistics Administration [USDCESA] 2000).

In Idaho, military employment declined from 2.6 percent of total employment in 1980, to 2.1 percent in 1990, and 1.4 percent in 1997. The sectors of the economy exhibiting the greatest addition of jobs in the state over the period 1990-1997 were services, retail trade, and manufacturing.

Non-farm earnings in the three-county region totaled over $6.5 billion in 1997. The major contributions were made by manufacturing (21.2 percent), services (21.0 percent), construction (10.1 percent), and state and local government (10.1 percent). In Idaho, non-farm earnings totaled over $17.0 billion in 1995, with the major contributions made by services (23.1 percent), manufacturing (18.2 percent), state and local government (13.7 percent), and retail trade (10.6 percent) (USDCESA 2000).

The number of military personnel stationed at Mountain Home AFB stood at about 4,120, with an additional 880 civilian workers in 1999. The value of payroll associated with government personnel at Mountain Home AFB reached over $185 million in 1999 (Air Force 1999c).

Mountain Home AFB also purchases significant quantities of goods and services from local and regional firms. In 1999, annual expenditures by the base were over $49 million. The Air Force estimates that the economic stimulus of Mountain Home AFB created approximately 1,571 secondary jobs in the civilian economy (Air Force 1999c).

Population

Information describing population is presented for Ada, Elmore, and Owyhee counties and municipalities within them. Comparisons are also presented with conditions for the state of Idaho. The population of the three-county region increased by almost 35 percent between 1990-1999, reaching 319,435 in 1999. This increase took place at an average annual rate of 3.4 percent. By comparison, the population of Idaho increased by 24 percent during the same period, reaching 1,251,700 in 1999 at an average annual rate of 2.4 percent (U.S. Census Bureau 2000b).

Military retirees in the vicinity of Mountain Home AFB comprise 1.3 percent of the total regional population and a higher percentage in the city of Mountain Home.

Approximately 70 percent of the 1998 population of the three counties reside in incorporated communities. These cities and towns range in size from Boise (with a population of 157,452) to Grand View (with a population of 423). The largest cities are Boise, Meridian (25,377 persons), and Mountain Home (10,202 persons).

The combined population of the three counties is projected to increase from about 326,521 in 2000, to 510,932 by the year 2025, at an average annual rate of 1.8 percent.

Based on information provided by Mountain Home AFB concerning the place of residence (by zip code) of personnel assigned to the installation, it is possible to derive an estimate of the number of personnel residing in each of a number of communities in the vicinity of the base. The overwhelming majority of military personnel reside in the city of Mountain Home, with a sizeable number residing in Boise. Other communities have small numbers of active-duty military residents. Compared to the general population, however, military personnel have a greater than average

propensity to reside especially in the city of Mountain Home and are noticeably under-represented in Boise.

Housing

Detailed information describing the housing contained in the region is presented in the 1990 United States Census of Population and Housing. This is the most comprehensive source of information describing the housing stock in detail. Information depicting the magnitude and type of residential construction activity over the period 1990-1999 is also presented at the county level.

There were a total of 92,611 housing units in the region in 1990, with a vacancy rate of about 5.6 percent. Of the vacant units, 16.2 percent were for seasonal and recreational use. Of the total number of housing units, 10.5 percent were mobile homes (U.S. Census Bureau 1991).

Over the period 1990-1999, an average of 3,691 building permits for residential units were issued annually. The number of units permitted on an annual basis varied from a high of 5,372 units in 1994 to a low of 2,636 units in 1991. The majority (79 percent) of these units were comprised of single-family homes. The proportion of units contained in structures with five or more units comprised 12 percent of the new units. The number of such multi-family units permitted varied from a high of 1,182 in 1994 to a low of 69 in 1996 (U.S. Census Bureau 2000b).

Of the active-duty personnel assigned to Mountain Home AFB in fiscal year (FY) 1999, almost 54 percent reside on-base in government family and unaccompanied housing.

Environmental Consequences

F-22 induced construction activity would peak in FY 2002, with the expenditure of over $238 million. It is estimated that these expenditures will support 3,941 construction jobs and 2,880 secondary jobs for a total employment effect of 6,821. This number of jobs comprises 3.2 percent of the 1997 level of regional employment. Earnings associated with both the direct and secondary jobs would total over $177 million or about 2.7 percent of total non-farm earnings in the region in 1997. It is estimated that a total of 682 workers would temporarily relocate and take up residency in the region during the construction phase.

The operations phase would experience an increase in base personnel of 1,201 (1,122 active-duty personnel and 79 civilian/contractor personnel) and a secondary employment of 359 jobs. Total employment in the region would increase by 1,560 jobs by FY 2007. Such increases comprise 24.1 percent of the 1999 base personnel and 0.7 percent of regional employment. The increase in earnings associated with the personnel buildup is estimated at over $57 million or about 0.9 percent of the total regional non-farm earnings in 1997.

The arrival of active-duty personnel and their dependents (2,492 persons), civilian workers and contractors (185 persons), and those associated with secondary jobs (84 persons) results in a net addition of 2,761 persons to the region by FY 2007. This increase represents under 1.0 percent of the regional population total in 1999. Such an increase would represent 10.8 percent of the 1999 population of Elmore County.

Unaccompanied active-duty military members and members with their families would occupy newly constructed on-base housing (unaccompanied and family units). It is estimated that the number of on-base residents would increase by 43 percent.

Of the over 760 persons expected to relocate to the region by FY 2007 and reside off the base, the largest number (about 390 persons) are expected to reside in the city of Mountain Home, with about an additional 100 persons in Boise.

There could be a cumulative demand for 1,004 housing units (both owner-occupied and rented) off base by persons entering the area over the period FY 2002 through FY 2007.

During scoping people asked how the beddown will affect the city of Mountain Home economy.

Of the 1,122 military personnel estimated to move to the region, 331 would be unaccompanied personnel; the remaining 791 would have family members. Included in the construction projects associated with the conversion, are proposals to construct 252 dormitory rooms and 600 military family housing units. With the addition of government-funded housing for both accompanied and unaccompanied personnel, the demand for housing units in the surrounding communities would total 278 units. Although this number of new housing units comprises a very small portion of annual construction in the region (7.5 percent), its share of historic annual construction in Elmore County is much larger (almost 200 percent). Such a demand for additional housing, if concentrated in Elmore County and specifically in the city of Mountain Home, could decrease vacancy rates substantially and create growth pressures and stresses in the housing market in the short term.

Comparative Summary of the Five Potential Basing Locations

Based on differences in both personnel changes and construction projects, the socioeconomic influence of the F-22 beddown would vary among the bases. Mountain Home would increase employment by 1,560 direct and secondary jobs and earnings by $57 million. Langley is the only base where a decrease in operations employment and earnings would occur. Operations employment would decrease by 358 direct and secondary jobs and earnings would decrease by $12 million. It is also the only base that would create a reduction in project-related population and housing demand. Eglin would create the smallest increase in operations employment and earnings and no substantive impacts. Operations employment would increase by 325 direct and secondary jobs and earnings by $10 million. Elmendorf, with an increase of 390 direct and secondary jobs and earnings by $13 million, would experience a greater increase in operations employment and earnings than Eglin. Tyndall would have the greatest increase in operations employment and earnings, creating 2,392 direct and secondary jobs and earnings of $80 million.

MH3.14 Environmental Justice

MH3.14.1 Base

Affected Environment

Executive Order 12898, *Environmental Justice*, requires analysis of the potential for federal actions to cause disproportionate health and environmental impacts on minority and low-income populations.

Elmore County comprises the region of comparison for the Mountain Home AFB alternative. It contains 21,205 persons, of whom 13.8 percent are minority, 12.7 percent are low-income, and 31.6 percent are children. Appendix HR-4 contains information on minority and low-income populations. The information regarding minority and low-income population groups is derived from the 1990 United States Census of Population. This is the latest source of information containing data at the required level of detail.

To satisfy the requirements of Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, locations of off-base schools exposed to aircraft noise levels of 65 DNL or above were identified. Currently, no off-base schools in the vicinity of Mountain Home AFB are exposed to aircraft noise levels of 65 DNL or greater.

Environmental Consequences

The analysis of environmental justice for the base and vicinity considers changes in noise levels created by the Mountain Home AFB alternative in Elmore County. Off-base lands expected to be exposed to 65 DNL or greater noise levels were identified, and the affected population under this contour was estimated. For Mountain Home AFB, an additional 39 persons could potentially be affected by noise levels of 65 DNL or greater. Approximately 12.8 percent of the potentially affected additional population could be minority and 12.8 percent could be low income. This compares to a 13.8 percent minority population in the region of comparison and a 12.7 percent low-income population in the region of comparison. There would not be disappropriate noise impact on minority populations or low-income populations within the noise contours.

Under the Mountain Home AFB alternative, no off-base schools would be exposed to aircraft noise levels of 65 DNL or above and therefore, there would be no change in exposure of school children to noise impacts as a result of the project.

Comparative Summary of the Five Potential Basing Locations

The potential for disproportionate impacts to minority or low-income populations is low at all bases. No substantive difference exists among the bases relative to environmental justice. Eglin has the greatest potential for impacts from noise and therefore may have a slight, but not substantial disproportionate impact on children.

MH3.14.2 Airspace

Affected Environment

The rural population under the airspace includes the Duck Valley and Fort McDermitt Reservations. There are no other concentrations of minority or low-income populations. During scoping, individuals from the Tribes expressed annoyance with existing military aircraft overflights and with potential F-22 aircraft overflights. Native American groups within the project region are discussed in section MH3.11, Cultural and Traditional Resources.

Environmental Consequences

Subsonic noise would not generate environmental justice issues affecting minority populations, low-income populations, or children living under the airspace. Increases in supersonic flight could increase the number of sonic booms in two MOAs from approximately 17 sonic booms per month, to 72 sonic booms per month. Native American groups in the area have expressed concerns related to military aircraft noise impacts. These individuals will likely be annoyed by additional sonic booms. Baseline data on minority populations and low-income populations in counties under the airspace are presented in Appendix HR-4.

Comparative Summary of the Five Potential Basing Locations

No substantive difference exists among the base's airspace relative to potential environmental justice concerns. Concerns were raised during scoping about overflights and sonic booms over traditional use land areas at Mountain Home and Elmendorf.

Community and Infrastructure

The Community and Infrastructure resource includes public services such as potable water, wastewater treatment, electric and natural gas utilities, solid waste management, and hazardous materials and waste. It also includes public schools and transportation. These resources are typically impacted by fluctuations in population and generally occur at the base and environs. Airspace and ranges are not addressed for community and infrastructure, as they are not applicable to this resource. Pertinent regulatory and methodological information can be found in Appendix CI-1. Additional information can be found in Appendix CI-2.

No-Action Alternative

The no-action alternative would not affect current demands on public services or infrastructure. There would be no change in base population and, therefore, no changes to demands on schools and other social services. Under the no-action alternative hazardous material use and waste generation at Mountain Home AFB would continue at current trends. Current environmental restoration projects (ERPs) at the base would continue, and Mountain Home AFB would continue to manage its hazardous materials and wastes in accordance with all applicable laws and regulations.

MH3.15 Public Services

MH3.15.1 Base

Affected Environment

Potable Water

Groundwater is the sole source of potable water for Mountain Home AFB. It is acquired through six deep groundwater wells owned by and located at the base. The wells range in capacity from 575 gallons per minute (gpm) to 2,000 gpm and vary in depth from 380 feet to more than 600 feet. A seventh deep well, also located at the base, is used infrequently. Recent modifications to the potable water system include installation of three of the seven wells and two of the four reservoirs. These modifications occurred in FY 1996 and FY 2000. The water system contains a 1-million-gallon reservoir, a 500,000-gallon reservoir, and two elevated storage-tanks of 200,000 and 250,000 gallons. (Air Force 1996b; personal communication, Schleicher 2000).

Peak water demand at the base is approximately 0.6 mgd during the winter and 5.3 mgd during the summer. Total pumping capacity is estimated at about 11 mgd. Water demand during the summer is substantially higher than the winter time, primarily because of housing/grounds maintenance irrigation requirements that account for approximately 90 percent of the total demand. The remaining 10 percent of water demand during the summer is used for personal consumption and industrial operations (Air Force 1996b).

The city of Mountain Home draws potable water from 14 active municipal groundwater wells, of which only 8 are reliable as year-round sources. Five wells are deep, of good quality, and are dependable during peak demand periods. Three other wells are used primarily to offset peak demands for golf course irrigation and to serve as emergency standby.

Two reservoirs (one concrete tank with a 2-million-gallon capacity and one steel tank with a 500,000-gallon capacity) comprise the city's storage facilities, which are used primarily for fire protection and for meeting peak day demands (City of Mountain Home 1992; Air Force 1996b). The pumping capacity of the wells is 13 mgd with a current pumping rate of 7 mgd (personal communication, Mountain Home Public Works 2000).

Preliminary investigations by the city have revealed that an additional well should be drilled to meet long-term population growth expected in the city; however, the water system is considered adequate to serve the existing and near-term city population. Storage capacity for fire protection was deemed sufficient for the present population (City of Mountain Home 1992).

Wastewater Treatment

Wastewater generated at the base is currently treated at the base's new Sequencing Batch Reactor system, a fill-and-draw activated-sludge treatment process. Resulting clean sludge meets all waste treatment criteria. The capacity of the new treatment plant is 2.3 mgd with a current utilization rate of 0.5 mgd (personal communication, Schleicher 2000).

The city of Mountain Home treats its municipal wastewater in an overflow lagoon treatment system that provides complete pollutant removal for the wastewater flow generated by the city of Mountain Home and the surrounding area. Portions of the treated wastewater effluent are used for irrigating farmland. The wastewater treatment system has adequate capacity to accommodate additional growth. The treatment plant capacity is 1.7 mgd with a current utilization rate of 0.9 mgd (personal communication, Mountain Home Public Works 2000). The city owns property necessary for expansion of the treatment plant, if required in the future (City of Mountain Home 1992; Air Force 1996b).

Electric Power and Natural Gas

Electricity at Mountain Home AFB, the city of Mountain Home, and most of Elmore County is provided by Idaho Power Company. The Mountain Home District for power distribution extends from Glenns Ferry in the east, Bruneau in the south, the Tipanuk area to the north, and the Oregon border to the west. The district has excess capacity and no plans have been identified for service expansion in the near future. No restrictions to provision of electricity have been experienced or are anticipated at the base or in the community (Air Force 1996b).

Intermountain Gas Company distributes natural gas to the base, the city of Mountain Home, and all of Elmore County. Mountain Home AFB is situated along a main pipeline which has excess natural gas capacity. No limitations to natural gas provision have been experienced or are anticipated at the base or in the community (Air Force 1996b).

Solid Waste Management

The Mountain Home AFB-operated Saylor Creek Range (SCR) has a conditional use permit and variances for an industrial solid-waste landfill from the IDEQ. This permit allows the disposal of spent training ordnance casings and concrete filler material and precludes this site from receiving waste not generated at the range. The current SCR landfill occupies two acres, with the capacity to support continuing operations (Air Force 1998a).

In the future, Mountain Home AFB would like to begin transporting household waste to the city of Mountain Home's municipal landfill located in Elmore County. This new landfill is privately owned by Idaho Waste Systems and is a 1,000-ton-per-day subtitle D facility (personal communication, Schleicher 2000). It should be noted, however, that Mountain Home AFB's landfill has sufficient capacity, and a decision to transport waste to the municipal landfill would, therefore, be an administrative decision as opposed to a capacity-based decision (personal communication, Schleicher 2000).

Municipally generated solid waste is transported to the 800-acre Bennett Road Landfill, a construction and demolition landfill. This landfill is located approximately 8 miles from the city of Mountain Home in Elmore County. Once at the Bennett Road Landfill, the municipal waste is transported to and disposed of at a privately owned Idaho Waste Systems landfill. At present rates, this landfill has a projected life of 30 years. Solid waste collected in unincorporated areas is transported from transfer stations to the landfill (Air Force 1998a).

Schools

Public education at Mountain Home AFB, the city of Mountain Home, and most of southwestern Elmore County is provided by the Mountain Home School District 193. The district operates 10 schools: 5 in Mountain Home, 3 on base, and 2 in remote county locations. Military dependents residing on base receive kindergarten through eighth grade education at these base schools: Air Base Primary (K-2), Air Base Elementary (3-5), and Stevenson Middle School (6-7). The majority of enrollment at these three schools comprises military dependents residing on base; however, some district-wide programs, such as the gifted-and-talented and special education programs, are offered at these schools. Four other elementary schools (North, East, and West elementaries, all K-4, and Hacker Middle School, grades 5-7) provide primary education for civilians and military dependents living in the community (Air Force 1996b).

For ninth through twelfth grades, dependents of military personnel who reside on base attend Mountain Home Junior High (8-9) and Mountain Home High (10-12) in the city of Mountain Home.

As of November 1995, district-wide enrollment totaled 4,244 students, with 1,768 students (or 42 percent) being dependents of Mountain Home AFB military personnel residing either on or off base. As of October 2000, district-wide enrollment totaled 4,483 students. Presently, there is capacity for approximately 250 students on-base and another 300 students within the city of Mountain Home (personal communication, LeFever 2000). Enrollment growth within the district averages about 3 percent per year, independent of base-related actions. Historically, overcrowding in classrooms and schools within the Mountain Home School District has not been an issue of concern (Air Force 1996b).

Environmental Consequences

Potable Water

There is little likelihood of environmental consequences to public services under the airspace.

The increase in population, both on-base and within the city of Mountain Home, will result in increased demand for water from existing groundwater systems. It is estimated that the additional daily demand will be 0.4 mgd on base and 0.15 mgd off base (assuming a 200 gallon/capita/day increase). The consumptive rate of 200 gallons/capital day is conservative in that it is a "high" average consumptive usage rate. The usage rate accounts for sanitary and general-purpose usage, industrial usage, public services (including fire fighting and system maintenance), landscape irrigation, and unaccounted system losses and leakage (Metcalf & Eddy 1991). The pumping capacity of the base's system is 11 mgd, and the city's current capacity is 13 mgd.

Under the proposed alternative, the peak on-base demand is expected to be 5.7 mgd. The peak demand on the city's system is expected to be 7.2 mgd. Given that the capacities of the Mountain Home AFB system and the Mountain Home municipal system are 11 mgd and 13 mgd, respectively, pumping capacities of the wells themselves are not an issue. However, the long-term capacity of the supporting aquifer is an issue of concern as it is being depleted at a rate of approximately 2 feet per

year. In the long term, water conservation practices and the installation of new wells would be necessary.

Wastewater Treatment

Under this alternative, it is assumed that population impacts will be incurred on and off base. Given an on-base population increase of 1,998 over three years, the additional demand on the base's wastewater treatment plant is estimated at 0.4 mgd (assuming 200 gallons/capita/day). With this increase, the total wastewater treatment plant loading would be 0.9 mgd, well within the 2.3 mdg capacity of the system. As a result, no significant impact is expected.

Assuming that the off-base population increase of 763 individuals will reside in the city of Mountain Home, an additional demand of 0.15 mgd will be made on the city's wastewater treatment plant. The capacity of the city's wastewater treatment plant is 1.7 mgd; it is capable of easily handling the additional demand. Accordingly, no significant impact is expected.

The Mountain Home F-22 Site Survey report, dated July 2000, indicated that in order to keep the runway on base property, it would have to be shifted northwesterly. This shift would place the current wastewater treatment plant under the northwest end of the runway and, therefore, would require relocation of the treatment plant and reconfiguration of all the supporting infrastructure (i.e., sewer lines). It is assumed that the resulting wastewater treatment plant would have the same treatment capacity as the existing plant. Therefore, this alternative would not result in a significant impact to the capacity of the treatment plant, but it would result in a construction and ground disturbance impact.

Electric Power and Natural Gas

Since there is excess capacity of both electrical power and natural gas for Mountain Home AFB and the city of Mountain Home, impacts associated with this alternative are not anticipated.

Solid Waste Management

Under this alternative, an additional 6.9 tons per day of waste could be generated both on and off base. Since both the on-base and municipally run landfills have excess capacities, no impacts associated with this alternative are anticipated.

Schools

Current enrollment in Mountain Home School District 193 is 4,483 students. Given the current capacity of existing schools within the district, an additional 250 students can be accommodated on base, with another 300 accommodated off base (personal communication, LeFever 2000). Over the three-year life of this phased project, it is estimated that 686 school age children will enter District 193. Assuming that one-third of the student influx will occur each year, classroom overcrowding would likely occur by the second year, given the accompanying growth rate of 3 percent per year.

Comparative Summary of the Five Potential Basing Locations

The potential for impacts to public services is low for all installations. However, due to its relatively remote location and small associated community, Mountain Home would be the least able to absorb the large influx of personnel and their families. Demand for other public services such as water would be similar to Eglin and Elmendorf; however, Mountain Home has the greatest potential for impact. There would be no increased demand for public services at Langley. There would be a decrease in demand for utilities and a reduction in number of students by 150 in local schools. Comparatively, Mountain Home would increase school enrollment by 686 students; Eglin would increase school enrollment by 121 students; Elmendorf would increase school students by 161. Tyndall would have the largest increase in student population, estimated to be 1,063 new students.

MH3.16 Transportation

MH3.16.1 Base

Affected Environment

For transportation resources, the roadway networks on Mountain Home AFB, in the city of Mountain Home, and those likely to be used for base access were analyzed. The transportation network also extends to the Boise area (a 50-mile drive northwest of the base). A portion of Mountain AFB personnel commute from this area, and to SCR (15 miles southeast of the base), where the range requires occasional transportation of groundcrews. The primary components of the roadway network in the Mountain Home include Interstate 84 (I-84), its associated business loop through the city of Mountain Home, SH 51, SH 67 (Airbase Road), and collector streets. The overall condition of this network is good, having few problems with level-of-service (LOS) or high-accident locations.

I-84 is a four-lane, limited access, divided road. Three exits from I-84 provide access to Mountain Home: Exit 90, the I-84 Business Loop to West Mountain Home; Exit 95, United States Highway 20 (U.S. 20) to Mountain Home and Fairfield; and Exit 99, Bennett Road to East Mountain Home. I-84 between Boise and the city of Mountain Home is characterized by relatively low traffic volumes. The LOS rating on I-84 west of Mountain Home is A.

SH 67 is a modern four-lane highway between the base and the city of Mountain Home.

Three U.S. Highways (U.S. 20, 26, and 30) also traverse the Mountain Home area. U.S. 30 separates from the interstate to provide a business loop (I-84B) through the central business district of the city of Mountain Home. The Idaho Department of Transportation characterizes the business loop with an LOS A; however, because essentially all of Mountain Home AFB commuter traffic uses this segment of I-84B, congestion occurs during peak traffic hours. U.S. 20 enters the region co-assigned with I-84 and splits from the Interstate at Exit 95. The section of this highway immediately northeast of I-84 operates at LOS A. U.S. 26 coincides with I-84 within the region of influence; therefore, this segment is accounted for in the analysis of I-84.

SH 51 is one of the most heavily used roads because it provides the shortest route from the center of the city to I-84 and also provides access to many residential areas. The heaviest volume of traffic, however, is found on the section of highway that SH 51 shares with SH 67, which is part of the access route from the city of Mountain Home to the base. SH 67 (Airbase Road) begins in Mountain Home at I-84B and extends 10 miles to the base. This highway is a four-lane undivided road designed for maximum speed access to the base and operates at LOS A. Despite the relatively heavy use of SH 51, LOS A is characteristic of the entire highway.

The most notable circulation conflict occurs in the area where I-84B and SH 67 meet. Virtually all base commuter traffic must travel through this signalized "T" intersection. As a result, this intersection experiences heavy traffic volumes during the afternoon peak hour (4:00 to 5:00 p.m.) and, consequently, it becomes congested. This problem is compounded by a Union Pacific railroad underpass located on I-84B several hundred feet north of the intersection. A project has begun to rework the intersection of traffic from and to SH67 from the city of Mountain Home. The traffic light is to be replaced with an overpass going north and an underpass going south relative to the railroad. Each will allow two lanes of traffic to pass unhindered by a traffic light.

Primary base access occurs through the Main Gate on the northern boundary of the base.

The roads at Mountain Home AFB essentially form a network completely independent from the city of Mountain Home. Of the approximately 3,640 personnel assigned to the base, 2,097 reside on base, and 1,543 (approximately 42 percent) commute from off base (Air Force 1996b). The Main Gate provides two inbound lanes to service traffic during peak periods, while one lane is provided during off-peak periods. Average vehicle occupancy for vehicles entering the base during the morning peak period (6:00-7:30 a.m.) is 1.158 persons per vehicle. Once commuters enter the base from SH 67, they must either merge right onto Aardvark Avenue or continue straight on Main Avenue. The intersection of Gunfighter Avenue and Hope Street (near the main gate) operates at an unacceptable level of service during midday and the afternoon peak hour.

In general, traffic volumes on the base network are low and congestion is rare. The heaviest vehicular volumes occur during the morning and afternoon peak periods when personnel are entering and exiting the base. Occasionally, a small queue of cars may occur as drivers attempt to exit on-base residential areas. These problems have not yet warranted any signalization of intersections, although intersection improvements are recommended (see below). The only signalized intersection on base is at the entrance/exit to the base hospital on Main Avenue.

A Traffic Engineering Study for Mountain Home AFB was conducted to provide a base-wide traffic engineering overview and an analysis of problems at specific locations (Air Force 1996b). The results of this study concluded that all studied intersections currently operate at acceptable levels of service. However, due to projected personnel increases by 1997 and trip generations of proposed capital projects, a number of the intersections will provide inadequate capacity to accommodate the additional traffic volumes. Therefore, intersection improvements are recommended at the following four locations: Gunfighter Avenue at Hope Street, Gunfighter Avenue at Aardvark Avenue, Gunfighter Avenue at Phantom Avenue/School Access Drive, and Aardvark Avenue at Desert Street.

Environmental Consequences

Under this alternative, an on-base employment increase of 1,201 jobs is anticipated, with the potential to generate up to 220 additional vehicle trips to and from the installation each work day during the am and pm peak travel periods. Current employment on the installation is 4,993 jobs with the potential for 2,400 to or on-base vehicle trips during the peak travel periods. The proposed increase in employment and associated travel demand would increase peak period travel to or from the base by approximately 9.2 percent. This increase in travel demand is not considered a significant impact except in the already impacted I-84B and SH 67 "T" intersection.

Comparative Summary of the Five Potential Basing Locations

The potential for impacts to transportation is low for all installations. Mountain Home would have an approximate 9.2 percent increase in traffic and Elmendorf would have an approximate 6 percent increase. Langley would have a decrease of 243 peak hour vehicle trips and an approximate 2.7 percent decrease in travel demand. Eglin would have an increase of 218 peak hour trips but this would have little impact on congestion. Tyndall would have the highest potential impact with an increase of 1,500 peak hour trips and one-third increase in base worker travel.

MH3.17 Hazardous Materials and Waste

MH3.17.1 Base

Affected Environment

The majority of the non-weapon hazardous materials used by Air Force and contractor personnel on Mountain Home AFB are controlled through the HAZMART pollution prevention process. This process provides centralized management of the procurement, handling, storage, and issuing of hazardous materials and the turn-in, recovery, reuse, recycling, or disposal of hazardous wastes. The HAZMART process includes review and approval by Air Force personnel to ensure users are aware of exposure and safety risks.

Existing Mountain Home AFB hazardous materials and hazardous waste management programs will be retained and used to manage any F-22 hazardous materials and wastes. Refer to Appendix CI-1 for more information on these materials and wastes.

The Mountain Home AFB Hazardous Material Emergency Planning and Response Plan, addresses on-base storage locations and proper handling procedures of all hazardous materials to minimize potential spills and releases. The plan further outlines activities to be undertaken to minimize the adverse effects of a spill, including notification, containment, decontamination, and cleanup of spilled materials. The Spill Prevention Control and Countermeasures guidance is attached to the Plan (personal communication, Miller 2000). The asbestos management plan provides guidance for the identification of asbestos contaminated materials and the management of asbestos wastes which are disposed of in an on-base permitted landfill (personal communication, Miller 2000). An asbestos facility register is maintained by base Civil Engineering.

Mountain Home AFB is a large-quantity hazardous waste generator. Hazardous wastes are generated during operations and maintenance activities. Types of waste include combustible

solvents from parts washers, fuel filters, metal-contaminated spent acids from aircraft corrosion control, painting wastes, battery acid, spent x-ray fixer, corrosive liquids from boiler operations, washracks sludge, aviation fuel from tank cleanouts, and pesticides. Hazardous wastes are managed in accordance with the Mountain Home AFB Hazardous Waste Management Plan (1997). Hazardous wastes are initially stored at waste accumulation points near work locations. A licensed contractor transports these wastes to the less than 90-day storage facility where they are stored until disposal is economically practicable or before 90 days have expired, whichever comes first.

DoD developed the ERP to identify, investigate, and remediate potentially hazardous material disposal sites on DoD property prior to 1984. Thirty-one ERP sites have been identified since the ERP began at Mountain Home AFB. The recommended remediation alternative for all but one site was the "No Remedial Action." The remediation recommendation for the one site is "Limited Action," which includes Notice of Restriction, water quality evaluation prior to being used as a drinking water source, and regional groundwater monitoring. In October 1995, a Record of Decision was signed by the Air Force, IDEQ, and USEPA establishing the Limited Action as the selected final remediation for this site (personal communication, Schleicher 2000).

Environmental Consequences

The amount of hazardous and toxic materials used during F-22 operations and maintenance would increase by approximately 50 percent over the amounts used to support the F-15C. The types of materials would include some of those described above. F-22 materials that are hazardous would require the same special-handling procedures already in place at Mountain Home AFB. Existing procedures for the centralized management of the procurement, handling, storage, and issuing of hazardous materials through the existing HAZMART plan would be adequate to handle the changes and would be retained and used. The increased use of hazardous materials is not expected to cause adverse impacts.

Mountain Home AFB would generate hazardous wastes during various construction, operations, and maintenance activities. The volume of materials and likely associated amounts of hazardous wastes generated during Mountain Home AFB construction activity are likely to be larger than for any other basing location. The amount of hazardous waste may increase by 50 percent during operations and maintenance activities. The base Hazardous Waste Management Plan would be updated to reflect any changes of hazardous waste generators and waste accumulation point monitors. The number of hazardous waste accumulation sites would be augmented to handle the increase, and there would be no adverse impacts. F-22 maintenance activities that could present unique hazards beyond those generated by the F-15C would already have been addressed at Mountain Home AFB, as the base would have implemented appropriate hazardous waste control procedures to minimize potential risks to personnel and the environment.

The Mountain Home F-22 Site Survey (July 11-13, 2000), indicated that a second runway would be required if the proposed alternative is implemented at Mountain Home AFB. The proposed location of the new runway would result in impacts to ERP Site LF-01, the lagoon landfill site. A detailed study of the impacts on ERP sites in and around the proposed runway location would have to be evaluated.

Comparative Summary of the Five Potential Basing Locations

The potential for impacts to hazardous waste management is low for all installations. Mountain Home would increase hazardous waste generation by 50 percent and Tyndall would have a 100 percent increase. Eglin would increase hazardous waste by 30 percent over baseline; Elmendorf would increase by 40 percent over baseline; Langley would generate the smallest increase in hazardous waste. No change in current operations would be required for any of the bases.