AIRPORT LAND USE COMPATIBILITY PLAN

COUNTY OF KERN

November 13, 2012

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COUNTY OF KERN

City of Bakersfield
City of California City
City of Delano
City of Shafter
City of Taft
City of Tehachapi
City of Wasco

1996 Adoption

This document was prepared using the materials entitled "Kern County Airport Land Use Compatibility Plan," dated June 1994. This document was provided by the Kern Council of Governments to Kern County, the incorporated cities and airports within Kern County for use as an Airport Land Use Compatibility Plan. It includes material prepared by Hodgest and Shutt, a Santa Rose, California, aviation consulting firm under contract to the Kern County Council of Governments. The "1993 Airport Land Use Planning Handbook" prepared for the California Department of Transportation, Division of Aeronautics was also used as a guidance and reference document.

2003 Amendment

The "2002 California Airport Land Use Compatibility Handbook" prepared by the State of California, Department of Transportation, Division of Aeronautics was used as a guidance and reference document.

2004 Amendment

Addition of Compatibility Criteria Zone E to text of the Airport Land Use Compatibility Plan to accommodate special circumstance land uses that provide public benefits within an airport influence area. A Zone E was added to the text and Comprehensive Land Use Plan of the Mojave Airport in order to accommodate the future expansion of the Mojave-Rosamond Sanitary Landfill.

2006 Amendment

The East Kern Airport District gained approval for an extension to Runway 12/30 from the Federal Aviation Administration. These changes to Chapter 4.9 Mojave Airport, Airport Land Use Compatibility Plan include replacement of the Airport Plan graphics with the current approved plan; amendment of Table 4-27 Forecast Airport Activity for the most current data; expansion of the B-1 (Approach/Departure Zone) zone for Runway 8/26 southwest of the airport and the resulting changes to the C (Common Traffic Pattern) zone.

2008 Amendment

The Taft-Kern County Airport gained approval for the deletion of secondary Runway 3-21. These changes to Chapter 4.14 include replacement of the airport plan graphics; amendment to Table 4-40, Table 4-41, and Table 4-42 with updated data; and adjustment of the B-1 (Approach/Departure Zone and Adjacent to Runway) zone, C (Common Traffic Pattern) zone, and D (Other Airport Environs) zone to the west of Runway 7-25.

2011 Amendment

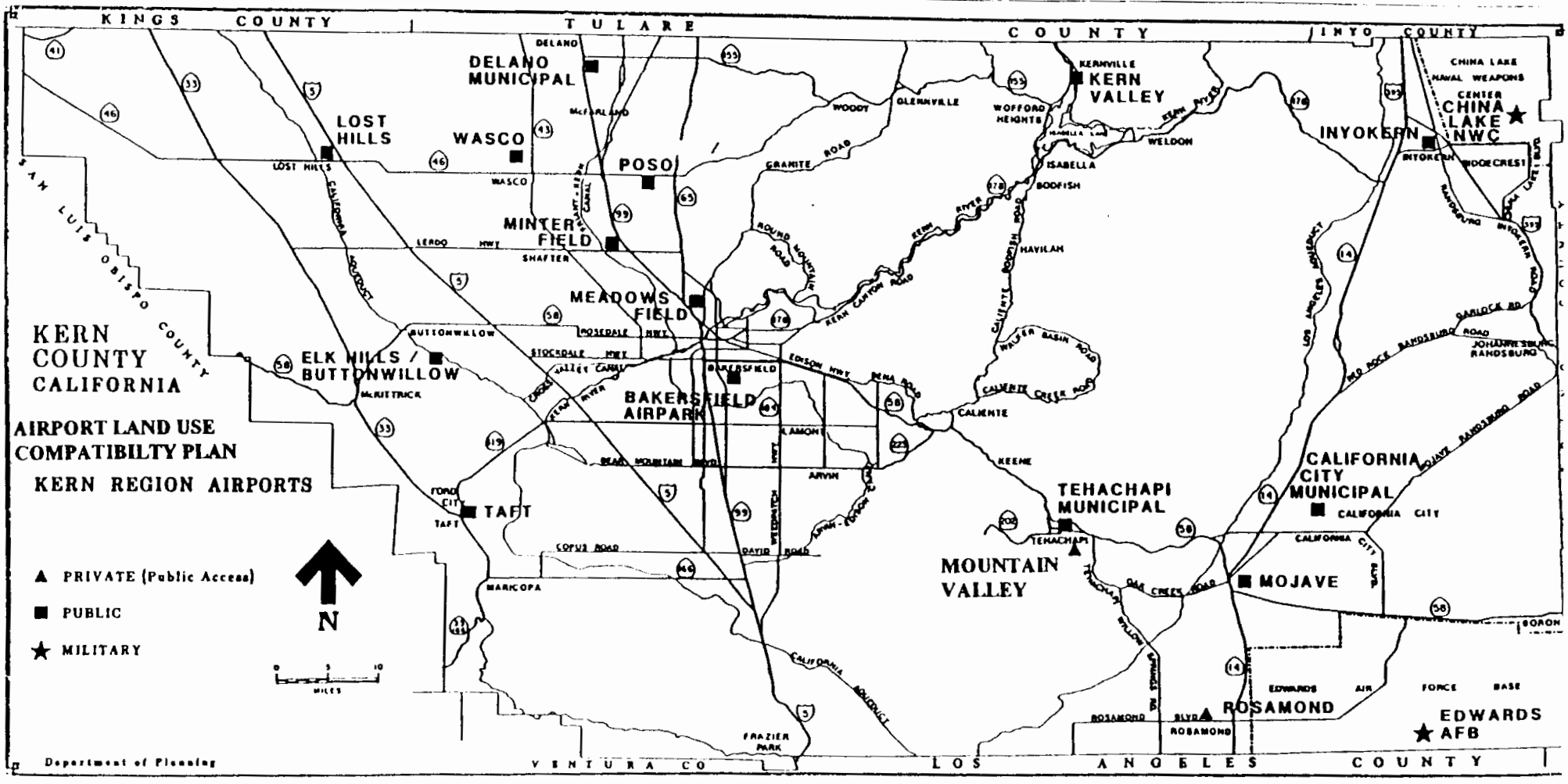
The East Kern Airport District gained approval for the creation of the E-1 and E-2 Compatibility Criteria Zones, and policies governing uses within them. Changes were also made to Chapter 4.9 with a new Figure 4-41 showing the expanded E-1 and new E-2 zones, and text changes describing the policies of the new zones.

2012 Amendment

Addition of the 2011 Air Installation Compatible Use Zones (AICUZ) Study as Appendix G. Updated the text of Chapter 4.18 - Naval Air Weapons Station (NAWS) China Lake, to reference the addition of the AICUZ Appendix.

SUMMARY OF BOARD OF SUPERVISORS ACTIONS

RESOLUTION NUMBER	DATE ADOPTED	DESCRIPTION
1996-408	September 23, 1996	Original adoption of Kern County Airport Land Use Compatibility Plan
2003-271	June 24, 2003	Amended for Mojave Airport, China Lake NAWS, Edwards AFB, and the R-2508 Complex
2004-053	March 9, 2004	Amend to add Zone E to the ALUCP, and to the text and to the Comprehensive Land Use Plan of the Mojave Airport
2006-224	June 13, 2006	Amended Table 4-27 and Amended Figure 4-41, the Comprehensive Land Use Plan of the Mojave Airport
2008-390	September 23, 2008	Amended Chapter 4.14 (Taft-Kern County Airport), Pages 4-126 through 4-134
2011-075	March 29, 2011	Amended Figure 4-41 and Page 4-79
2012-	November 13, 2012	Amended Chapter 4.18 and added Appendix G


KERN COUNTY CALIFORNIA
AIRPORT LAND USE COMPATIBILTY PLAN
KERN REGION AIRPORTS
PRIVATE (Public Access)
PUBLIC
MILITARY
N
MILES
KINGS COUNTY
TULARE COUNTY
INYO COUNTY
SAN LUIS OBISPO COUNTY
VENTURA CO
LOS ANGELES COUNTY
DELANO MUNICIPAL
LOST HILLS
WASCO
POSO
MINTER FIELD
MEADOWS FIELD
ELK HILLS / BUTTONWILLOW
BAKERSFIELD AIRPARK
TAFT
KERN VALLEY
INYOKERN
CHINA LAKE NWC
CHINA LAKE NAVAL WEAPONS CENTER
TEHACHAPI MUNICIPAL
MOUNTAIN VALLEY
CALIFORNIA CITY MUNICIPAL
MOJAVE
ROSAMOND
EDWARDS AFB
EDWARDS AIR FORCE BASE
Department of Planning

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PART I

REQUIRED INFORMATION

INTRODUCTION

AIRPORT LAND USE COMPATIBILITY PLANNING BACKGROUND

Preparation of this Kern County AirportLand Use Compatibility Plan is the result of the California State Legislature amending in 1994 the Aeronautics Law, State Aeronautics Act, Airport Land Use Commission, Public Utilities Code (Chapter 4, Article 3.5) (Appendix B). The legislative intent of this statue is expressed as ". . . to provide for the orderly development of each public use airport in this state and the area surrounding these airports so as to promote the overall goals and objectives of the California airport noise standards . . . and to prevent the creation of new noise and safety problems. It is the purpose of this article to protect public health, safety and welfare by ensuring the orderly expansion of airports and the adoption of land use measures that minimize the public's exposure to excessive noise and safety hazards within areas around public airports to the extent these areas are not already devoted to incompatible uses."

Various alternative processes have been defined in the statute for adopting and implementing processes that counties can use to help ensure that proposed land use development in the vicinity of public use airports will be evaluated and designed for compatibility with airport activities. These alternatives range from establishment of an airport land use commission to adoption by the county and affected cities of an Airport Land Use Compatibility Plan.

LOCAL AGENCY IMPLEMENTATION

This Kern County Airport Land Use Compatibility Plan will be adopted by the County of Kern and the incorporated cities of Bakersfield, California City, Delano, Shafter, Taft, Tehachapi, and Wasco as a guidance document for the regulation of land uses around the various public use airports found in the County and those cities. The initial action will be each affected agency's governing body adopting a resolution that states their intention to participate in the alternative process detailed in this Compatibility Plan as their compliance with the statute. Once each agency's governing body has adopted a resolution, it must be determined by those agencies how each will implement, amend, and update the document. The adoption and amendment process must include notification of interested parties and provisions for a public hearing.

The County and affected cities have several options for implementation of this Compatibility Plan:

- Adopt a Stand-Alone Document - One choice is to adopt this plan (Chapters 1, 2, 3, 5, 6 in entirety. Chapter 4: Introduction and Relevant Airports) as a stand-alone document separate from the General Plan. The specific method by which this action could be taken would be decided by each agency, with some modification of the General Plan for cross-referencing.

- Adopt as an Element of General Plan - Another option is to adopt the applicable sections of this plan, primarily Part I - Required Information, Chapters 1, 2, 3 and Chapters 1, 2, 3: Introduction and Relevant Airports, as an Airport Element of the General Plan. Some revisions to other elements of the General Plan may also be necessary.

- Incorporate into Existing Elements of General Plan - A third alternative is to incorporate the various components of this plan into existing elements of the General Plan. For example, noise policies could be inserted into the Noise Element, safety policies could be placed into a Safety Element, and

the primary compatibility criteria and associated maps plus the procedural policies might fit into the Land Use Elements.

Further implementation could also be identified at this time by the agencies in regards to the use of such devices as: Zoning Ordinances, airport overlay zones or combining districts, easement and deed notices, and specific land use compatibility matrixes. Examples of these materials are included in Chapter 5: References.

Finally, upon adoption by the County and cities of the relevant version of the Compatibility Plan, each jurisdiction must undertake a review of their General and Specific Plans and, within 180 days, bring them into conformity with the Compatibility Plan.

USING THIS DOCUMENT

This Kern County Airport Land Use Compatibility Plan is divided into two parts:

- Part 1 - Required Information
- Part 2 - Supporting Information

After choosing the appropriate option for implementation, the agency would modify this plan for adoption. The essential portions of this plan are Part I: Required Information, Chapter 4: Individual Airports: Policies, Compatibility Maps, Background Data (introduction and jurisdictionally relevant airports), and Chapter 6: References, Appendix A: FAR Part 77 regulations. Chapter 5 and the remainder of Chapter 6 can be incorporated, eliminated, or modified at the agencies' discretion.

This modular approach allows jurisdictions to easily modify the document for adoption by their method of choice and remain current by obtaining updates from the airport within their jurisdiction. As detailed in Chapter 2 if, over time, the individual airport plans change, the County or affected city is responsible for amending whatever vehicle (stand-alone document, General Plan incorporation, or separate element) they used to implement the Compatibility Plan. The agency must then forward copies of the amended individual airport plans to the California Department of Transportation, Division of Aeronautics. That agency can then maintain a complete updated set of the Countywide plan.

POLICIES

CHAPTER 1

1.0 GENERAL APPLICABILITY

1.1 Purpose

The purpose of this Kern County Airport Land Use Compatibility Plan is to establish procedures and criteria by which the County of Kern and the affected incorporated cities can address compatibility issues when making planning decisions regarding airports and the land uses around them.

This Airport Land Use Compatibility Plan is adopted by the County of Kern and the affected incorporated cities of Bakersfield, California City, Delano, Shafter, Taft, Tehachapi, and Wasco as a guidance document for the regulation of land uses around the various public use airports found in the County and those cities.

1.2 Adoption and Amendment

The County and the affected cities shall each establish necessary processes and procedures for the preparation, adoption, amendment, update, and implementation of the Compatibility Plan within their own jurisdictions. The procedures shall include:

(a) Processes for the notification of the general public, land owners, interested groups, and other public agencies regarding the preparation, adoption, amendment and implementation of the Airport Land Use Compatibility Plan.

(b) Processes for the mediation of disputes arising from the preparation, adoption, amendment, and implementation of the Airport Land Use Compatibility Plan.

1.2.1 Consistency Review

Upon adoption, each jurisdiction must undertake a review of their General and Specific Plans and, within 180 days, bring them into consistency with the Compatibility Plan.

1.2.2 Updating the Plans

Upon adoption of the relevant Compatibility Plan by the County and affected cities, each separate jurisdiction shall be responsible for updating the individual airport policies, compatibility maps, and background data as it pertains to the airport(s) within each separate jurisdiction. The agency will forward copies of the amended individual airport plans to the Department of Transportation, Division of Aeronautics.

1.3 Geographic Scope

These policies apply within the following areas of Kern County:

1.3.1 Airport Influence Areas

a. All properties on which the land uses could be affected by present or future aircraft operations at the following airports in Kern County and properties on which the land uses could affect said airports:

(1) Bakersfield Municipal Airport

(2) California City Municipal Airport

(3) Delano Municipal Airport

(4) Elk Hills-Buttonwillow Airport

(5) Inyokern Airport

(6) Kern Valley Airport

(7) Lost Hills Airport

(8) Meadows Field Airport

(9) Mojave Airport

(10) Mountain Valley Airport

(11) Poso Airport

(12) Rosamond Airport

(13) Shafter Airport

(14) Taft Airport

(15) Tehachapi Municipal Airport

(16) Wasco Airport

b. The specific limits of the influence area for each airport are depicted on the respective Compatibility Map for that airport as presented in Chapter 3.

c. China Lake NAWS, Edward Air Force Base, and Joint Service Restricted R-2058 Complex

All properties underlying the Joint Service Restricted R-2058 Complex on which the land uses could be affected by present or future military aviation flights, including testing military aircraft and weapons. Compatibility issues are detailed in Section 4.17.

1.3.2. Countywide Impacts on Flight Safety

Those lands, regardless of their location in the county, on which the uses could adversely affect the safety of flight in the county. The specific uses of concern are identified in Paragraph 1.4.

1.3.3. New Airports and Heliports

The site and environs of any proposed new public-use or special-use airport or heliport (as defined by the California Department of Transportation) anywhere in the county.

1.4 Types of Airport Impacts

1.4.1. Principal Compatibility Concerns

The principal airport land use compatibility concerns regarding the airports in Kern County fall into four categories:

a. Exposure to aircraft noise;

b. Land use safety with respect both to people and property on the ground and the occupants of aircraft;

c. Protection of airport airspace; and

d. General concerns related to aircraft overflights.

1.4.2. Other Airport Impacts

Other impacts sometimes created by airports (e.g., air pollution, automobile traffic, etc.) are not acknowledged by these compatibility policies, but are addressed through other programs.

1.5 Relationship to Local General Plans and Zoning

1.5.1 Land Use Designations

The airport land use compatibility criteria included herein are intended to ensure that local general plans, specific plans, and zoning ordinances take into account factors which influence compatibility between airports and the surrounding land uses.

a. Airport-vicinity land uses designated in general plans,specific plans, and zoning ordinances should be made consistent with the airport land use compatibility criteria to the extent that the affected areas are not already extensively developed.

b. At the time of adoption of this plan, all existing land uses fall into one of three categories: (1) consistent with the airport compatibility criteria; (2) approved with conditions after a review of the previous Airport Land Use Commission; or (3) approved by an override by a local governing body of a previous Airport Land Use

Commission decision. All existing land uses are, therefore, consistent with this plan.

1.5.2 Relationship to CEQA

For projects subject to CEQA, this document can be considered a source document and used as a reference and guidance in evaluating impacts and designing mitigation. This document is not to take the place of required notification and consultation with affected airports, but as a supplemental source of information.

1.6 Review of Individual Development Actions

1.6.1 Types of Actions Reviewed

In addition to those items noted in Public Utilities Code Section 21676, proposals for major public or private land use developments which have the potential to substantially affect nearby airport activities or be substantially affected by those activities shall be subject to compatibility review. Except as noted under special conditions(Section 2.1.3), the compatibility review process shall apply to the following types of land use development located within the airport influence areas defined in Section 1.3.1:

a. Any project requiring the adoption or amendment of a general plan, specific plan, zoning ordinance, or building regulation.

b. Proposed residential development, including land divisions, consisting of five or more dwelling units or five or more parcels.

c. Requests for variance from the height limits established by a local zoning ordinance.

d. Amendment or adoption of airport master plans.

e. Any proposed land use action, as determined by the respective local planning agency, involving a question of compatibility with airport activities.

1.6.2 Project Submittal Information

When review of a land use development proposal is required under these airport land use compatibility policies(that is, the proposed development falls within an airport influence area and is of a type listed in Paragraph 1.6.1), the following information shall be provided by the applicant in addition to the information otherwise required by the county or city:

a. An accurately scaled map showing the relationship of the project site to the airport boundary and runways.

b. If applicable, a detailed site plan showing ground elevations, the location of structures, open spaces, and water bodies, and the heights of structures and trees.

c. A description of permitted or proposed land uses and requirements of said uses.

d. For residential uses, an indication of the potential or proposed number of dwelling units per acre; or, for non-residential uses, the number of people potentially occupying the total site or portions thereof at any one time.

1.6.3 Required Findings

a. Prior to the approval of a proposal involving any of the above types of land use development, specific findings shall be made that such development is consistent with the primary compatibility criteria and/or the supporting criteria for noise, safety, airspace protection, and overflight.

b. Airport land use compatibility also should be considered during local processing of other proposed land use development actions of types not listed in Paragraph 1.6.1 if the proposals involve an airport influence area. However, significant compatibility concerns are not likely to result from such actions and adoption of specific findings will not normally be necessary.

1.7 Relationship to Airport Operations and Plans

1.7.1 Existing Public-Use Airports

These compatibility policies are intended to help promote compatibility between the airports and land uses in the vicinity of each.

a. The compatibility policies and maps included in Chapter 3 are based upon and are consistent with currently known plans or assumptions regarding the future development and use of each airport.

b. Nevertheless, to the extent that any proposals to further develop the airports or change the character of their use are subject to city or county permits or other approval, such proposals should be reviewed for consistency with these compatibility policies.

c. Prior to the approval of a proposal involving any type of land use development, as stated in section 1.6.1, or other review as required by a Specific Plan, specific findings shall be made that such development is compatible with the training and operational missions of the military aviation installations. Incompatible land uses that result in significant impacts to the military mission of Department of Defense installations or to the Joint Service Restricted R-2058 Complex that can not be mitigated, shall not be considered consistent with this plan.

1.7.2 Project Submittal Information

Any application for construction of a new airport or heliport for which a state airport permit is required shall include sufficient information to enable adequate assessment of the proposal's noise, safety, height restriction, and overflight impacts. At a minimum, information to be submitted shall include:

a. A layout plan drawing of the proposed facility showing the location of: (1) property boundaries; (2) runways or helicopter takeoff and landingareas; and (3) runway protection zones or helicopter approach/departure zones.

b. Airspace surfaces in accordance with Federal Aviation Regulations, Part 77.

c. Activity forecasts, including the number of operations by each type of aircraft proposed to use the facility.

d. Proposed flight track locations and projected noise contours or other relevant noise impact data.

e. A map showing the existing and planned land uses in the vicinity of the proposed airport or heliport.

f. Identification and proposed mitigation of impacts on surrounding land uses.

1.7.3 Required Findings

Prior to approval of a development plan for an existing or proposed public-use or special-use airport or heliport, specific findings shall be made regarding the compatibilityof that development with existing and planned land uses in the vicinity. Specific factors to be considered are defined in Section 2.2.

1.7.4 Airport Operations

These compatibility policies are not intended to restrict the aircraft activity or other uses of the airports currently allowed by federal and state laws and any applicable local ordinances or permits.

1.8 Relationship to Other Local Agencies

1.8.1 Notification of Other Agencies

In addition to internal review, the primary agency involved (the County of Kern or affected incorporated cities) shall refer information on certain actions involving airport land use compatibility issues to other involved agencies, including the appropriate airport, for review and comment.

1.8.2 Types of Actions Involved

Actions for which notification shall be provided include any proposed land use plan amendment or individual development action which affects the airportinfluence area described in Section 1.3.1 and is of a type listed in Section 1.6. The specific portions of the airport influence areas for which project referral shall be made are as follows:

a. Where the County is the lead agency for project approval and incorporated lands of an affected/effected city fall within the airport influence area, the County shall notify the affected/effected city of the application.

b. Where an affected/effected city is the lead agency for project approval and unincorporated lands are located within the airport influence area, the city shall notify the County.

1.8.3 Responsible Agency

Notification of other local agenciesdoes not shift the primary responsibility for action on a proposed land use or airport development proposal from the jurisdiction within which the development would occur.

1.8.4 Discretionary Projects

Projects requiring a public hearing prior to approval shall provide notification to the public as required by the specific type of action.

CHAPTER 2

2.0 COMPATIBILITY REVIEW POLICIES

2.1 Land Use Actions

2.1.1 Primary Criteria

The compatibility of land uses in the vicinity of the airports covered by this plan shall be evaluated in terms of: (1) the Primary Compatibility Criteria table (Table 2A) and accompanying notes; (2) the Land Use Compatibility Plan map for each airport (Chapter 4); and (3) specific policies established for individual airports (Chapter 4). The Primary Compatibility Criteria table defines six zones and related limitations on uses labeled Zone A, B_1, B_2, C, D, and E.

2.1.2 Function of Supporting Criteria

The Primary Compatibility Criteria matrix (Table 2A) represents a compilation of compatibility criteria associated with each of the four types of airport impacts listed in Section 1.4. For the purposes of preparing or amending community land use plans and zoning ordinances, as well as in the review of most individual development proposals, the criteria in the matrix are anticipated to suffice. However, certain complex land use actions may require more intensive review. The additional supporting compatibility criteria outlined in Chapter 3 are provided for use in those circumstances.

2.1.3 Existing Plans

Existing land use designations, as of the time of adoption of this Compatibility Plan, have been adopted in accordance with Section 21670 of the California Public Utilities Code.

Implementation of those land use designations through adoption of land use zone classifications, approval of tentative tracts, and similar actions are consistent with the intent of Section 21670 of the California Public Utilities Code of this plan.

2.1.4 Infill

Where substantial incompatible development already exists, additional infill development of similar land uses may be allowed to occur even if such land uses are to be prohibited elsewhere in the zone as detailed in Airport Specific Policies in Chapter 4. This exception does not apply within the Compatibility Zone A.

Table 2A

Compatibility Criteria

Kern County Airport Land Use Compatibility Plan

Zone	Location[1]	Impact Elements	Maximum Densities		Required Open Land[4]
			Residential[2] (du/ac)	Other Uses (people/ac)[3]	
A	Runway Protection Zone or within Building Restriction Line	• High risk • High noise levels	0	10	All Remaining
B1	Approach/Departure Zone and Adjacent to Runway	• Substantial risk — aircraft commonly below 400 ft. AGL or within 1,000 ft. of runway • Substantial noise	0.1	60	30%
B2	Extended Approach/Departure Zone	• Significant risk — aircraft commonly below 800 ft. AGL • Significant noise	0.5	60	30%
C	Common Traffic Pattern	• Limited risk — aircraft at or below 1,000 ft. AGL • Frequent noise intrusion	15	150	15%
D	Other Airport Environs	• Negligible risk • Potential for annoyance from overflights	No Limit	No Limit	No Requirement
E	Special Land Use	• Compatibility Issues	15	150	No Requirement

Zone	Additional Criteria		Examples	
	Prohibited Uses[5]	Other Development Conditions[8]	Normally Acceptable Uses[9]	Uses Not Normally Acceptable[10]
A	• All structures except ones with location set by aeronautical function • Assemblages of people • Objects exceeding FAR Part 77 height limits • Hazards to flight[6]	• Dedication of avigation easement	• Aircraft tiedown apron • Pastures, field crops, vineyards • Automobile parking	• Heavy poles, signs, large trees, etc.
B1 and B2	• Schools, day care centers, libraries • Hospitals, nursing homes • Highly noise-sensitive uses (e.g. amphitheaters) • Storage of highly flammable materials[7] • Hazards to flight[6]	• Locate structures maximum distance from extended runway centerline • Dedication of avigation easement	• Uses in Zone A • Any agricultural use except ones attracting bird flocks • Warehousing, truck terminals • Two-story offices • Single-family homes on an existing lot	• Residential subdivisions • Intensive retail uses • Intensive manufacturing or food processing uses • Offices with more than two stories • Hotels and motels
C	• Schools • Hospitals, nursing homes • Hazards to flight[6]	• Dedication of overflight easement for residential uses	• Uses in Zone B • Parks, playgrounds • Most retail uses • Duplexes and medium-density apartments • Two-story motels	• Large shopping malls • Theaters, auditoriums • Large sports stadiums • Hi-rise office buildings with more than four stories
D	• Hazards to flight[6]	• Deed notice required for residential development	• All except ones hazardous to flight	
E	• Hazards to flight[6]	• Special development conditions	• Unique circumstance land use development[11]	

Table 2A Continued

Compatibility Criteria

Kern County Airport Land Use Compatibility Plan

NOTES

1 Zones may also apply elsewhere if an airport has atypical operational procedures or specialized aircraft activities.

2 Residential parcels should not contain more than the indicated number of dwelling units per gross acre. Clustering of units is encouraged as a means of meeting the Required Open Land requirements.

3 The land use should not attract more than the indicated number of people per acre at any time. This figure should include all individuals who may be on the property (e.g., employees, customers/visitors, etc.). These densities are intended as general planning guidelines to aid in determining the acceptability of proposed land uses. Special short-term events related to aviation (e.g., air shows), as well as non-aviation special events, are exempt from the maximum density criteria.

4 Open land requirements are intended to be applied with respect to the entire zone. This is typically accomplished initially as part of the community's general plan or a specific plan.

5 May be modified by airport-specific policies or decision of local governing body with appropriate adopted findings based upon evidence in the record.

6 See Policy Section 3.3.

7 Within the B1 and B2 zones, only the following flammable materials are permitted: aviation fuel, other aviaticn-related materials, and up to 2,000 gallons of nonaviation materials.

8 These conditions do not apply to ministerial actions.

9 These uses typically can be designed to meet the density requirements and other development conditions listed.

10 These uses typically do not meet the density and other development conditions listed. They should be allowed only if a major community objective is served by their location in this zone and no feasible alternative location exists.

11 The E zone accommodates land uses with special characteristics that are not normally allowed in the C Zone. Each E zone is unique to the requested land use and each individual airport. Special conditions of development may be formulated in order to minimize flight hazards.

Source: Comprehensive Airport Land Use Plan (1996)

a. Projects can be considered "infill" if they meet *all* of the following criteria:

(1) The infill area is bounded by uses similar to those proposed.

(2) The infill area would not extend the perimeter of the area developed with incompatible uses.

(3) Development of the infill area does not otherwise increase the intensity and/or incompatibility of use through use permits, density transfers or other means.

b. Areas which qualify as infill will be determined during the review of local plans and policies.

2.1.5 Land Use Conversion

The compatibility of uses in the airport planning areas shall be preserved to the maximum feasible extent. The conversion of land from existing or planned agricultural, industrial or commercial use to residential uses within any airport's traffic area (Compatibility Zones A, B, and C) is discouraged.

2.2 Airport Development Plans

2.2.1 Airport Improvement Plans

When reviewing future master plans or other plans for improvement of existing public-use airports covered by these policies, land usecompatibility issues should be evaluated with respect to potential changes in noise, overflight, and safety impacts or height restrictions which would result from the plans' implementation. Inconsistencies between such plans and the compatibility policies herein may occur if the airport improvement plans include:

a. New activity forecasts which are (1) significantly higher than those used in developing the Compatibility Maps in Chapter 4 or (2) assume a higher proportion of larger or noisier aircraft.

b. Proposals for facilities or procedures not assumed herein; specifically:

(1) Construction of a new runway or helicopter takeoff and landing area.

(2) Change in the length, width, or landing threshold location of an existing runway.

(3) Establishment of an instrument approach procedure.

(4) Modification of the flight tracks associated with existing visual or instrument operations procedures.

2.2.2 New Airports and Heliports

When reviewing plans for a new airport, heliport, or other permanent aircraft landing site, the review should examine the relationships between existing and planned land uses in the vicinity of the proposed facility and the impacts that the facility would have upon these land uses. Questions to be considered include:

a. Would the existing or planned land uses be considered incompatible with the airport of heliport if the latter were already in existence?

b. What measures are included in the airport or heliport proposal to mitigate the noise, safety, and height restriction impacts on surrounding land uses? Such measures might include:

(1) Location of flight tracks so as to minimize the impacts.

(2) Other operational procedures to minimize impacts.

(3) Acquisition of property interests (fee title or easements) on the impacted land.

CHAPTER 3

3.0 SUPPORTING COMPATIBILITY CRITERIA

3.1 Noise

3.1.1 Projected Noise Levels

The evaluation of airport/land use noise compatibility shall consider the *future* Community Noise Equivalent Level (CNEL) contours of each airport. These contours are calculated based upon aircraft activity forecasts which are set forth in an airport master plan or which are considered by the local agency to be plausible (refer to activity data and noise exposure maps for individual airports in Chapter 4). The county and cities should periodically review the projected noise level contours and update them if appropriate.

3.1.2 Application of Noise Contours

The locations of CNEL contours are one of the factors used to define compatibility zone boundaries and criteria. It is intended that noise compatibility criteria be applied at the general plan, specific plan, or other broad-scale level. Because of the inherent variability of flight paths and other factors that influence noise emissions, the depicted contour boundaries are not absolute determinants of the compatibility or incompatibility of a given land use. Noise contours can only quantify noise impacts in a general manner; except on large parcels or blocks of land, they should *not* be used as site design criteria.

3.1.3 Noise Exposure in Residential Areas

The maximum CNEL considered normally acceptable for residential uses outside the influence areas of the airports covered by this plan is 65 dB.

3.1.4 Noise Exposure for Other Land Uses

Noise level compatibility standards for other types of land uses shall be applied in the same manner as the above residential noise level criteria. Examples of acceptable noise levels for other land uses in an airport's vicinity are presented in Table 3A.

3.1.5 Other Noise Factors

The extent of outdoor activity associated with a particular land use is an important factor to be considered in evaluating its compatibility with airport noise. In most locations, noise level reduction measures (such as installation of sound insulation or noise barriers) are only effective in reducing interior noise levels.

Table 3A

Noise Compatibility Criteria

LAND USE CATEGORY	CNEL, dBA 50-55	55-60	60-65	65-70	70-75
Residential					
single family, mobile homes	++	+	o	— —	— —
multi-family, apartments, condominiums	++	+	o	— —	— —
Public					
schools, libraries, hospitals	+	o	—	— —	— —
churches, auditoriums, concert halls	+	o	o	—	— —
transportation, parking, cemeteries	++	++	++	+	o
Commercial and Industrial					
offices, retail trade	++	+	o	o	—
service commercial, wholesale trade, warehousing, light industrial	++	++	+	o	o
general manufacturing, utilities, extractive industry	++	++	++	+	+
nursing homes	++	++	+	—	—
Agricultural and Recreational					
cropland	++	++	++	++	+
livestock breeding	++	+	o	o	—
parks, playgrounds, zoos	++	+	+	o	—
golf courses, riding stables, water recreation	++	++	+	o	o
outdoor spectator sports	++	+	+	o	—
amphitheaters	+	o	—	— —	— —

LAND USE AVAILABILITY		INTERPRETATION/COMMENTS
++	Clearly Acceptable	The activities associated with the specified land use can be carried out with essentially no interference from the noise exposure.
+	Normally Acceptable	Noise is a factor to be considered in that slight interference with outdoor activities may occur. Conventional construction methods will eliminate most noise intrusions upon indoor activities.
o	Marginally Acceptable	The indicated noise exposure will cause moderate interference with outdoor activities and with indoor activities when windows are open. The land use is acceptable on the conditions that outdoor activities are minimal and construction features which provide sufficient noise attenuation are used (e.g., installation of air conditioning so that windows can be kept closed). Under other circumstances, the land use should be discouraged.
—	Normally Unacceptable	Noise will create substantial interference with both outdoor and indoor activities. Noise intrusion upon indoor activities can be mitigated by requiring special noise insulation construction. Land uses which have conventionally constructed structures and/or involve outdoor activities which would be disrupted by noise should generally be avoided.
— —	Clearly Unacceptable	Unacceptable noise intrusion upon land use activities will occur. Adequate structural noise insulation is not practical under most circumstances. The indicated land use should be avoided unless strong overriding factors prevail and it should be prohibited if outdoor activities are involved.

Source: Hodges & Shutt (1993)

3.1.6 Single-Event Noise Levels

Single-event noise levels should be considered when evaluating the compatibility of highly noise-sensitive land uses such as schools, libraries, and outdoor theaters. Single-event noise levels are especially important in areas which are regularly overflown by aircraft, but which do not produce significant CNEL contours. Flight patterns for each airport should be considered in the review process. Acoustical studies or on-site noise measurements may be required to assist in determining the compatibility of sensitive uses.

3.2 Safety

3.2.1 Objective

The intent of land use safety compatibility criteria is to minimize the risks associated with an off-airport aircraft accident or emergency landing.

a. Risks both to people and property in the vicinity of an airport and to people on board the aircraft shall be considered.

b. More stringent land use controls shall be applied to the areas with greater potential risk.

3.2.2 Risks to People on the Ground

The principal means of reducing risks to people on the ground is to restrict land uses so as to limit the number of people who might gather in areas most susceptible to aircraft accidents. A method for determining the concentration of people for various land uses is provided in Appendix B.

3.2.3 Land Uses of Particular Concern

Land uses of particular concern are ones in which the occupants have reduced effective mobility or are unable to respond to emergency situations. Children's schools, hospitals, nursing homes, and other uses in which the majority of occupants are children, elderly, and/or handicapped are inappropriate within Compatibility Zones A, B, and C.

a. This general policy may be superseded by airport specific policies (see Chapter 4).

b. This general policy may be superseded by decision of local governing body with appropriate adopted findings.

c. Hospitals are medical facilities which include provision for overnight stays by patients. Medical clinics are permitted in Compatibility Zones B and C provided that these facilities meet the maximum density standards found in Table 2A, Primary Compatibility Criteria.

3.2.4 Other Risks

Storage of fuel or other hazardous materials shall be prohibited in Compatibility Zone A and subject to restrictions in the B zones as identified in Table 3A.

3.2.5 Open Land

In the event that an aircraft is forced to land away from an airport, the risks to the people on board can best be minimized by providing as much open land area as possible within the airport vicinity. This concept is based upon the fact that the majority of aircraft accidents and incidents occurring away from an airport runway are controlled emergency landings in which the pilot has reasonable opportunity to select the landing site.

a. To qualify as open land, an area must be:

   (1) Free of structures and other major obstacles such as walls, large trees or poles, and overhead wires.

   (2) Have minimum dimensions of at least 75 feet by 300 feet.

b. Roads and automobile parking lots are acceptable as open land areas if they meet the above criteria.

c. Open land requirements for each compatibility zone are to be applied with respect to the entire zone. Individual parcels may be too small to accommodate the minimum-size open area requirement. Consequently, the identification of open land areas must initially be accomplished at the general plan or specific plan level or as part of large-acreage projects.

d. Clustering of development and providing contiguous landscaped and parking areas is encouraged as a means of increasing the size of open land areas.

e. Building envelopes and the airport compatibility zones should be indicated on all development plans and tentative maps within an airport's planning area in order to assure that individual development projects provide the open land areas identified in a general plan, specific plan, or other large-scale plan.

3.3 Airspace Protection

3.3.1 Height Limits

The criteria for limiting the height of structures, trees, and other objects in the vicinity of an airport shall be set in accordance with Part 77, Subpart C, of the Federal Aviation Regulations and with the United States Standard for Terminal Instrument Procedures (TERPS). Airspace plans for each airport which depict the critical areas for airspace protection are provided in Chapter 4.

3.3.2 Avigation Easement Dedication

The owner of any property proposed for development within Compatibility Zones A and B may be required to dedicate an avigation easement to the jurisdiction owning the airport.

a. In cases where the airport is privately owned, the avigation easement may be dedicated to the county or city in the name of the airport. An easement dedicated for the benefit of a private airport shall remain in force only as long as the airport remains open for public use. An airport shall be considered to be a public-use airport only if it has a current state airport permit in either the public-use or special-use category.

b. The avigation easement shall:

(1) Provide the right of flight in the airspace above the FAR Part 77 imaginary surfaces above the property;

(2) Restrict the height of structures, trees and other objects; and

(3) Permit access to the property for the removal or aeronautical marking of objects exceeding the established height limit. An example of an avigation easement is provided in Appendix E.

c. Within Compatibility Zones A and B, height restrictions of less than 35 feet may be required. See the airspace plan for the specific airport or review FAR Part 77.

3.3.3 Minimum Restriction

Other than within Compatibility Zones A and B, no restrictions shall be set which limit the height of structures, trees, or other objects to less than 35 feet above the level of the ground on which they are located even if the terrain or objects on the ground may penetrate Federal Aviation Regulations Part 77 surfaces.

a. In locations within Compatibility Zone C where the ground level exceeds or comes within 35 feet of a Part 77 surface, dedication of an avigation easement limiting heights to 35 feet shall be required in accordance with Paragraph 3.3.2. (This policy may be applicable to future airports; there are no such locations near the existing airports in Kern County.)

3.3.4 FAA Notification

Proponents of a project which may exceed a Part 77 surface must notify the Federal Aviation Administration as required by FAR Part 77, Subpart B, and by the California State Public Utilities Code Sections 21658 and 21659. (Notification to the Federal Aviation Administration under FAR Part 77, Subpart B, is required even for certain proposed construction that does not exceed the height limits allowed by Subpart C of the regulations. Refer to Appendix A for the specific Federal Aviation Administration notification requirements.)

a. Local jurisdictions shall inform project proponents of the requirements for notification to the Federal Aviation Administration.

b. The requirement for notification to the Federal Aviation Administration shall not necessarily trigger an airport compatibility review of an individual project by the

local agency (county or city) if the project is otherwise in conformance with the compatibility criteria established herein.

c. Any project submitted for airport land use compatibility review for reason of height-limit issues shall include a copy of FAR Part 77 notification to the Federal Aviation Administration.

3.3.5 Other Flight Hazards

Land use characteristics which may produce hazards to aircraft in flight shall not be permitted within any airport's influence area. Specific characteristics to be avoided include:

a. Glare, distracting lights, or light patterns which could be mistaken for airport lights;

b. Sources of dust, steam, or smoke which may impair pilot visibility;

c. Sources of electrical interference with aircraft communications or navigation; and

d. Any use, especially landfills and certain agricultural uses, which may attract large flocks of birds.

e. Any light or series of lights which may cause visual discomfort or loss of orientation during critical phases of flight.

3.3.6 Special Land Use Development

a. The Compatibility Criteria Zone E will accommodate a project that has the potential to create one or more flight hazards.

b. The airport operator will be consulted to consider and comment on issues affecting the airport, including height limitations, lighting, dust, and bird hazards and recommend developmental conditions to ensure the airport is not affected.

c. The Zone E will be created only within the boundaries of the Zone C.

3.4 Overflights

3.4.1 Nature of Impact

All locations within an airport influence area are regarded as potentially subject to routine aircraft overflight. Although sensitivity to aircraft overflights varies from one person to another, overflight sensitivity is particularly important within residential land uses.

a. The County of Kern and the affected incorporated cities may establish a zoning district or overlay zone for all properties located within the influence area of the public-use airport(s) within their jurisdiction. One function of such an ordinance would be to provide constructive notice as to: (1) what real property is within an airport influence area; and (2) the obligations of a seller of real property to disclose information regarding the airport's proximity to any prospective buyer.

a. The conversion of land from existing or planned agricultural, industrial, or commercial use to residential uses within Compatibility Zones A and B is discouraged.

b. In Compatibility Zone C, general plan amendments (as well as other discretionary actions such as rezonings, subdivision approvals, use permits, etc.) which would convert land to residential use or increase the density of residential uses should be subject to careful consideration of overflight impacts.

CHAPTER 4

4.0 INDIVIDUAL AIRPORTS: POLICIES, COMPATIBILITY MAP AND BACKGROUND DATA

GENERAL INFORMATION

The Airport Land Use Compatibility Plan maps contained in this chapter are to be used in conjunction with the Compatibility Criteria set forth in Table 2A. The Compatibility Zones shown on each map represent areas in which the land use compatibility concerns are similar in character. The zone boundaries reflect consideration of both noise and safety concerns.

The boundaries of the six compatibility zones were initially set according to the methodology described below. These boundaries were then modified to take into account aircraft traffic pattern restrictions, distinct geographic features, and other factors unique to each airport.

Zone A: The building restriction lines were used to define the lateral limits of this zone. Building restriction lines are commonly set so that structures up to 35 feet in height remain below the airspace surfaces defined by Federal Aviation Regulations Part 77. The length of this zone is defined by the runway protection zones (formerly called clear zones). Runway protection zone dimensions are set in accordance with Federal Aviation Administration standards for the proposed future runway location, length, width, and approach type. Building restriction line and runway data were taken from the approved Airport Layout Plan for each airport.

Zone B1: The outer boundary of the Approach/Departure Zone is defined as the area where aircraft are commonly below 400 feet above ground level. For visual runways, this location encompasses the base leg of the traffic pattern as commonly flown. For instrument runways, the altitudes established by approach procedures are used. Zone B1 also includes areas within 1,000 feet laterally from the runway centerline. This zone should include the 65 CNEL noise contour; its dimensions may need to be expanded in some cases.

Zone B2: The Extended Approach/Departure Zone includes areas where aircraft are commonly below 800 feet above ground level on a straight-in approach or straight-out departure. It applies to runways with more than 500 operations per year by large aircraft (i.e, over 12,500 pounds maximum gross takeoff weight) and/or runway ends with more than 10,000 total annual takeoffs. The 60 CNEL contour should be encompassed within this zone.

Zone C: The outer boundary of the Common Traffic Pattern Zone is defined as the area where aircraft are commonly below 1,000 feet above ground level (i.e., the traffic pattern and pattern entry points). This area is considered to extend 5,000 feet laterally from the runway centerline. Length along the runway's axis will vary from 5,000 to 10,000 feet from the end of the runway's primary surface. The length depends upon the runway classification (visual versus instrument), and the type and volume of aircraft accommodated. For runways having an established track solely on one side, the shape of the zone is modified accordingly.

Zone D: This zone will be within the boundaries of Zone C for the purpose of accommodating development of schools, hospitals, and nursing homes.

Zone E: This zone will be within the boundaries of Zone C for the purpose of accommodating Special Land Use Development.

INDIVIDUAL AIRPORT POLICIES

The policies listed in Chapters 1, 2, and 3 are intended to apply broadly to all of the airports within Kern County. In some instances, however, policies addressing concerns specific to a single airport are necessary. Such policies are presented on the pages which follow. Also, specific factors which affected the shape of the compatibility map are noted.

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4.1 Bakersfield Municipal Airport

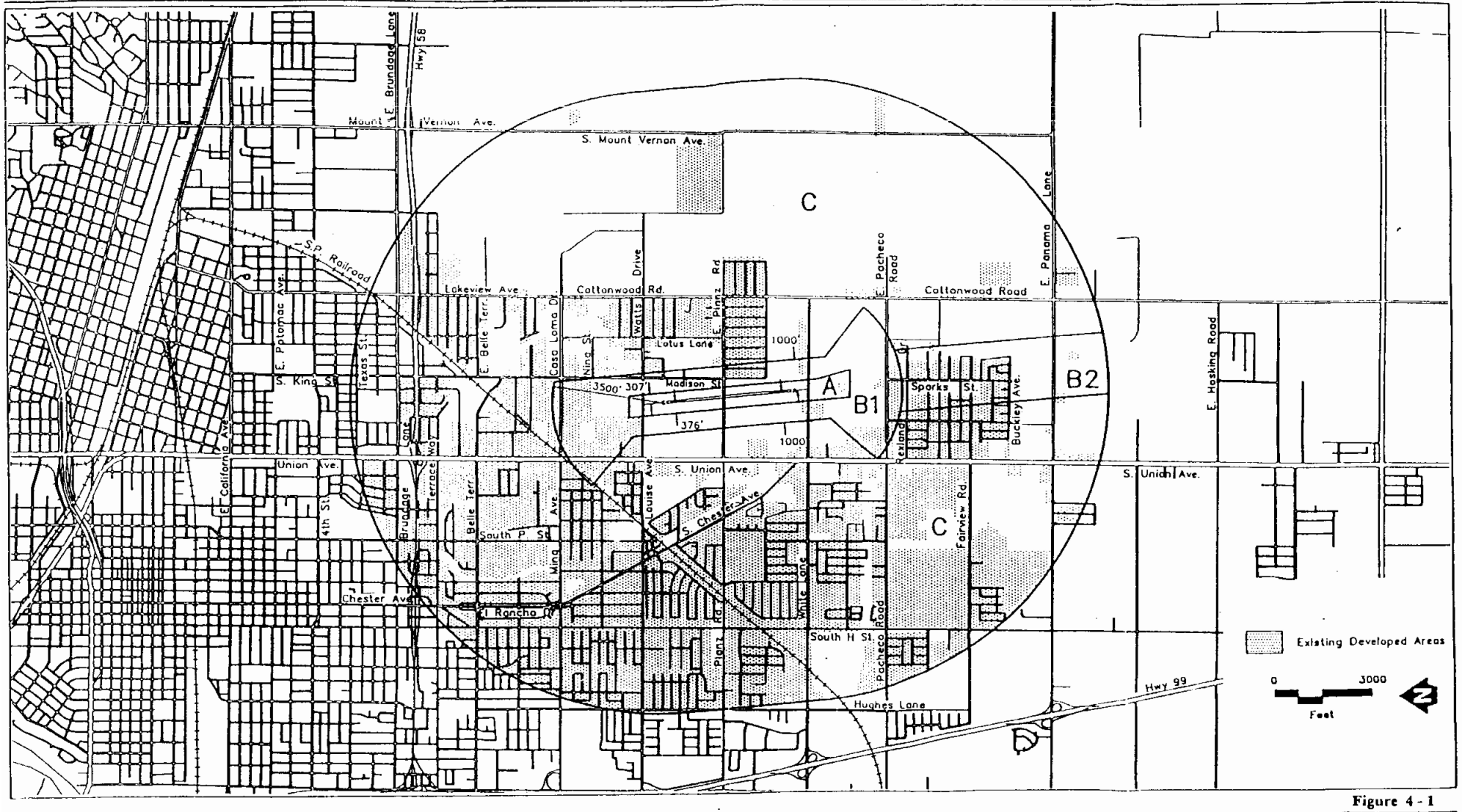


Figure 4 - 1

Comprehensive Land Use Plan

Bakersfield Municipal Airport

Table 4-1

Airport Environs

Bakersfield Municipal Airport

AIRPORT LOCATION AND ACCESS

- Located 3 miles south of the central business district of city.
- Airport and approaches in city jurisdiction.
- Airport access via State Highway 128/South Union Avenue.

EXISTING AIRPORT AREA LAND USES

General Character

- Fully urbanized except for agricultural uses to the southeast.
- Commercial/industrial uses to the west. Mixture of residential and open land north, east and south.

Runway Approaches

- *Runway 16 (north) Approach* — Open land within the runway protection zone continuing out to 1/2 mile from the runway end.
- *Runway 34 (south) Approach* — Open land within the runway protection zone continuing out to 1/2 mile from the runway end.

Traffic Pattern

- A mixture of commercial/industrial and residential uses.
- No pattern on east side.

LOCAL LAND USE PLANS AND ZONING

- *2010 Plan* — Adopted in March 1990 with subsequent amendments; Kern County *General Plan* adopted in 1982.
- *Casa Loma Specific Plan* — Joint City/County plan.

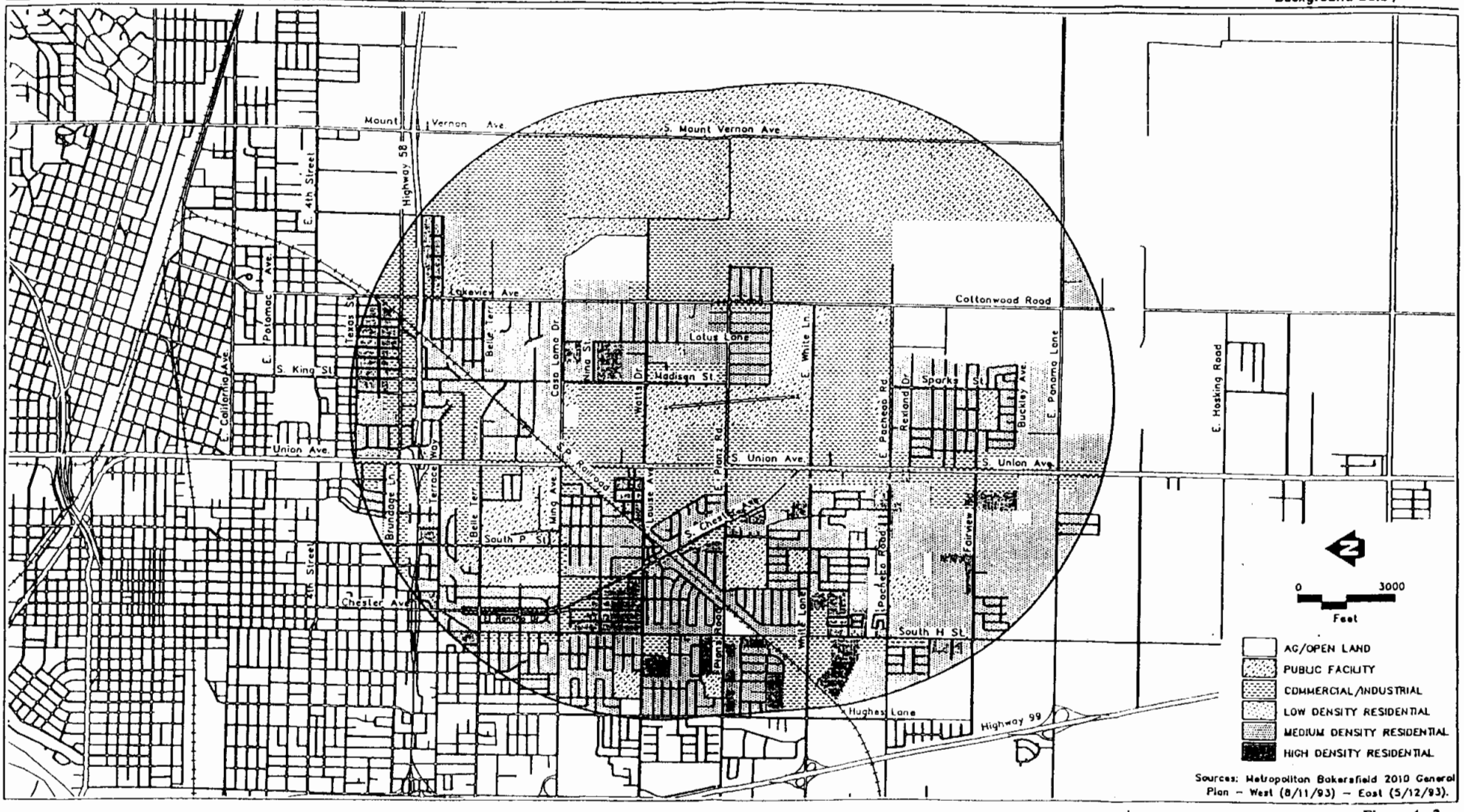
PLANNED LAND USES IN AIRPORT AREA

- Continued infill of commercial and industrial uses.
- No major development proposals currently active.

ESTABLISHED APPROACH PROTECTION MEASURES

- The Kern County Height Zoning Ordinance restricts the height of objects in the Kern County portion of the Airport's vicinity.

Source: Hodges & Shutt (October 1993)



Sources: Metropolitan Bakersfield 2010 General Plan – West (8/11/93) – East (5/12/93).

Figure 4 - 2

Land Use Designations

Bakersfield Municipal Airport

Table 4-2

Airport Features

Bakersfield Municipal Airport

AIRPORT PROPERTY

- *Ownership* — City of Bakersfield.
- *Size* — 190 acres in fee.
- *Elevation* — 378 feet MSL.

AIRPORT PLANNING

- *Adopted Plans*
  - Master Plan adopted in 1988.
- *Planned Improvements*
  - No change in runway dimensions or capacities.
  - Possible future nonprecision instrument approach.

BUILDING AREA

- *Location* — Transient and principal based building area in northeast corner. Secondary building area midfield west of runway. Future corporate hangars will be located to the east.
- *Aircraft Parking Capacity* — 80 based and transient tiedowns; 29 box hangars; 28 T-hangars.
- *Other Major Facilities* — Fixed base operators hangars and offices; fuel island; airport manager's office; restaurant.
- *Services* — Fixed base operators provide a wide range of general aviation services including: instruction, rental, major repairs, charter, painting, and propeller overhaul.

RUNWAY SYSTEM

Runway 16-34

- *Critical Aircraft* — Medium business jet.
- *Classification* — Airport Reference Code B-II.
- *Dimensions* — 4,000 feet long, 75 feet wide.
- *Lighting* — Medium intensity runway lighting.
- *Surface* — Asphalt, very good condition.
- *Taxiways* — Full-length parallel on west side; Taxiway F provides access to northwest building area.

RUNWAY APPROACHES

Runway 16

- *Approach Type* — Visual.
- *Runway Protection Zone* — About half is currently on airport property; balance is to be acquired.
- *Approach Obstacles* — No penetrations of approach surface.

Runway 34

- *Approach Type* — Visual.
- *Runway Protection Zone* — About half is currently on airport property; balance is to be acquired.
- *Approach Obstacles* — No penetrations of approach surface.

Traffic Pattern

- *Location* — Established pattern west of runway only.
- *Altitude* — 800 feet above airport elevation.
- *Approach Procedure* — None.

Source: Hodges & Shutt (October 1993)

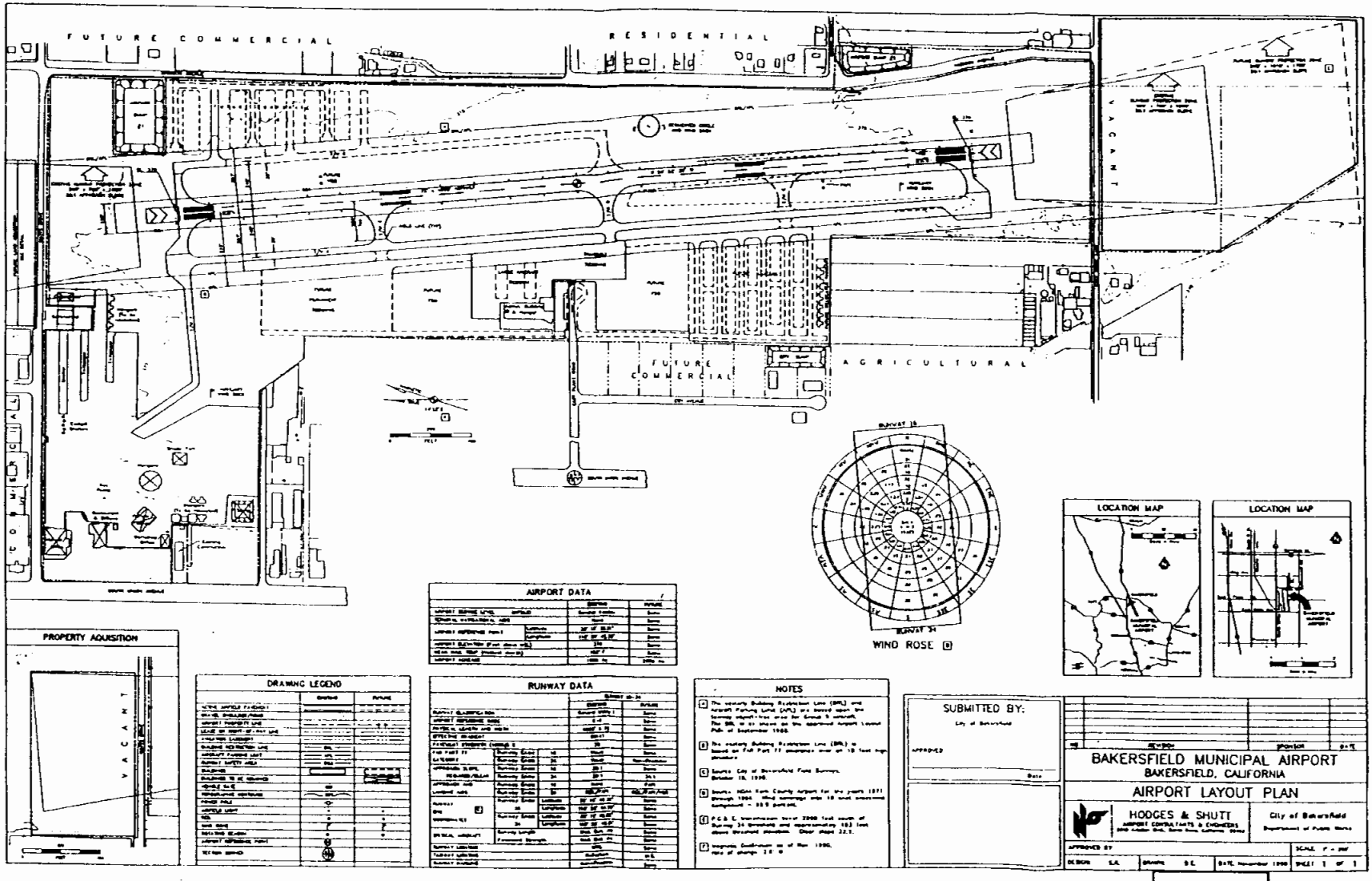

FUTURE COMMERCIAL
RESIDENTIAL
VACANT
FUTURE COMMERCIAL
AGRICULTURAL
WIND ROSE
LOCATION MAP
LOCATION MAP
AIRPORT DATA
PROPERTY AQUISITION
VACANT
DRAWING LEGEND
RUNWAY DATA
NOTES
SUBMITTED BY:
BAKERSFIELD MUNICIPAL AIRPORT
BAKERSFIELD, CALIFORNIA
AIRPORT LAYOUT PLAN
HODGES & SHUTT
City of Bakersfield

Figure 4 - 3

Table 4-3

Forecast Airport Activity

Bakersfield Municipal Airport

AIRCRAFT OPERATIONS

Data Not Available

TIME OF DAY DISTRIBUTION

Data Not Available

RUNWAY USE DISTRIBUTION

Data Not Available

FLIGHT TRACK DATA

- Pattern Altitude – 800 feet AGL.
- Right traffic on Runway 16 (no east side pattern).

Source: State airport inventory (1993)

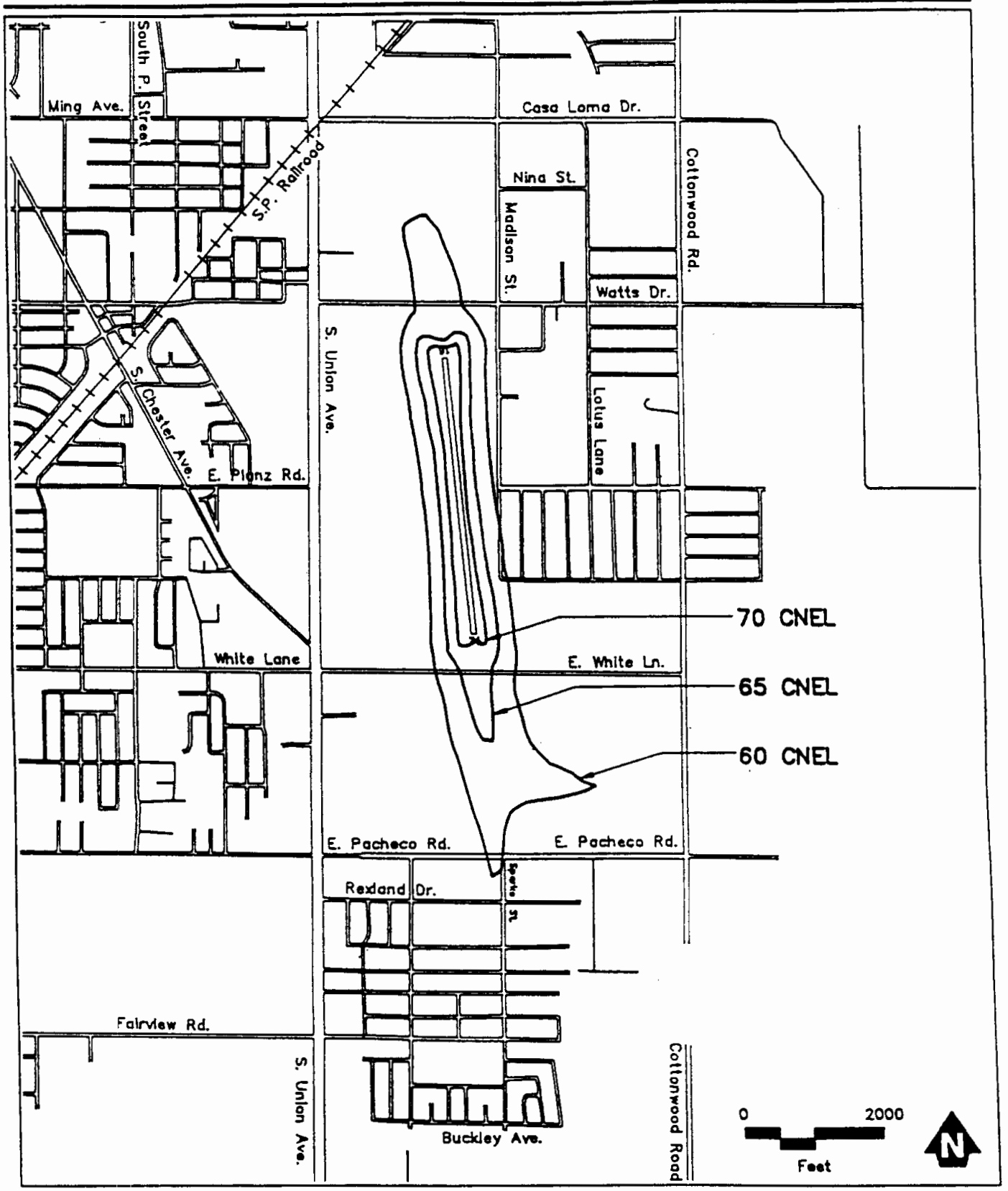


Figure 4 - 4

Noise Contours

Bakersfield Municipal Airport

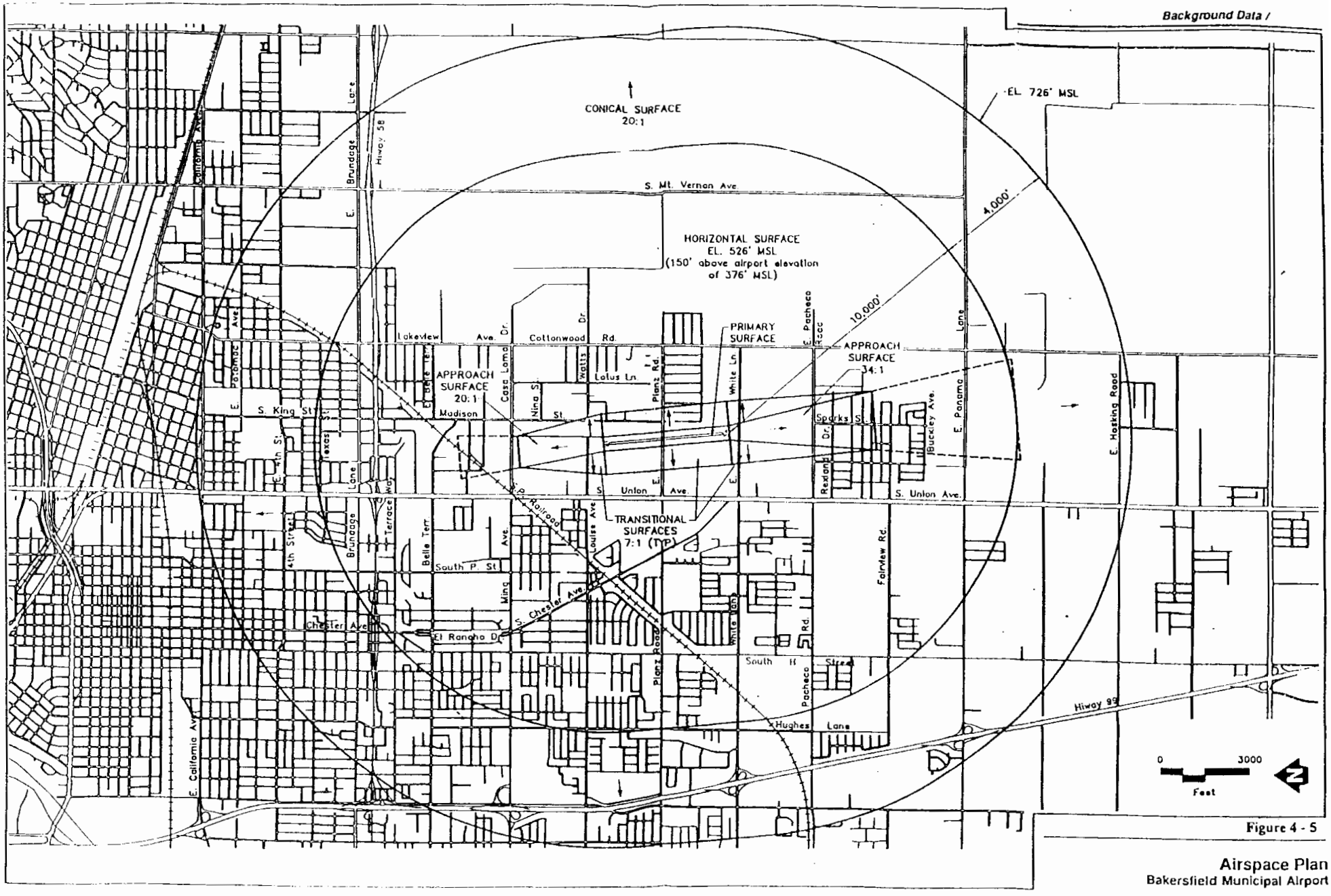


Figure 4 - 5

Airspace Plan
Bakersfield Municipal Airport

4.2 California City Municipal Airport

4.2.1

This map is based upon the current airfield layout. The Airport Master Plan study currently underway may result in significant changes. This may necessitate revision of the Comprehensive Land Use Plan for this airport.

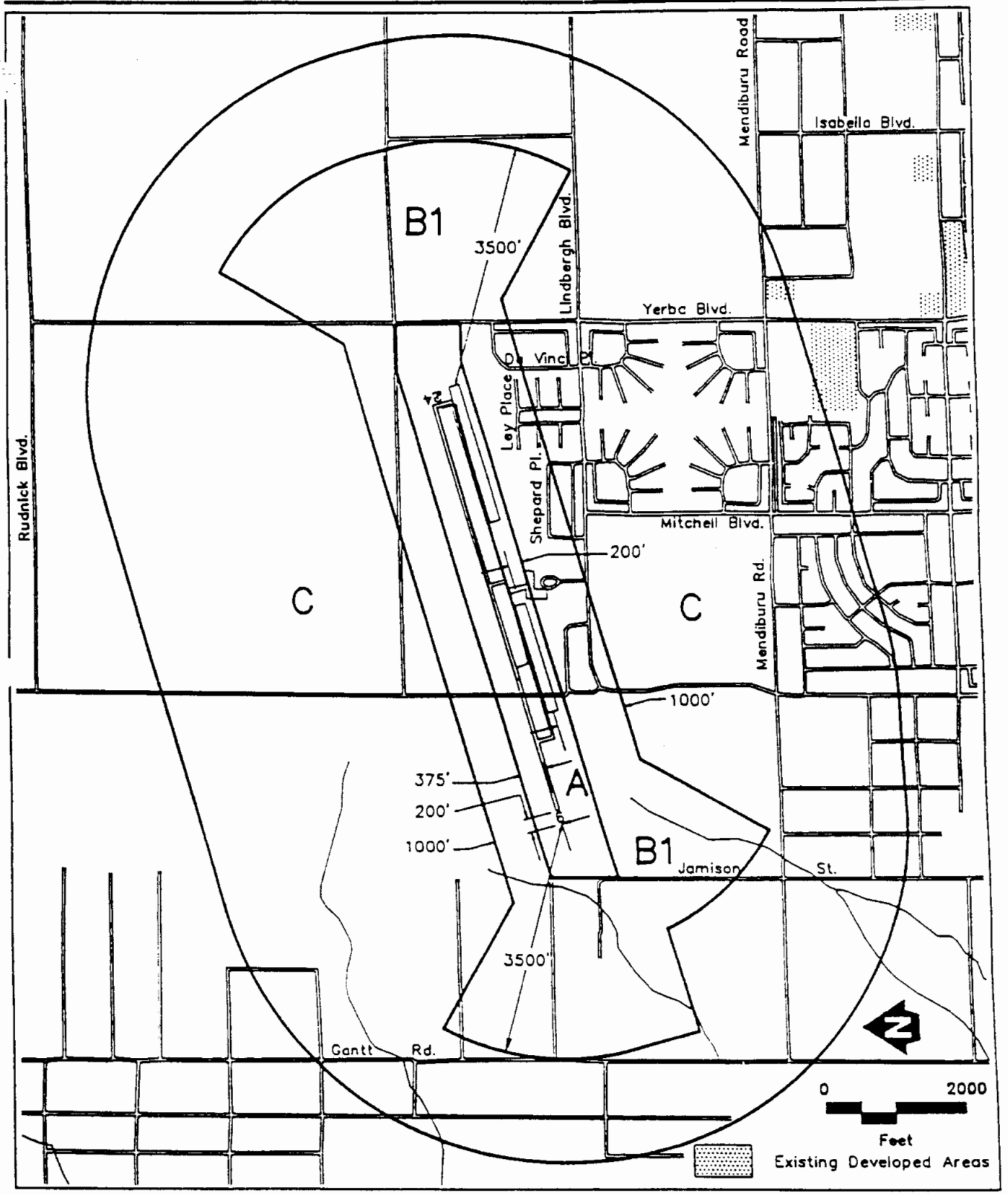

Mendiburu Road
Isabella Blvd.
B1
3500'
Lindbergh Blvd.
Yerba Blvd.
Da Vinci Pl.
Ley Place
Shepard Pl.
Rudnick Blvd.
Mitchell Blvd.
200'
C
C
Mendiburu Rd.
1000'
375'
200'
1000'
A
B1
Jamison St.
3500'
Gantt Rd.
N
0
2000
Feet
Existing Developed Areas

Figure 4 - 6

Table 4-6

Forecast Airport Activity

California City Municipal Airport

AIRCRAFT OPERATIONS

Total	
Annual	39,440
Average Day	109
Distribution	
Single-Engine	93.6%
Twin-Engine	5.5%
Business Jets	0.9%

TIME OF DAY DISTRIBUTION

All Aircraft		
Day	(0700-1900)	98.0%
Evening	(1900-2200)	2.0%
Night	(2200-0700)	0%

RUNWAY USE DISTRIBUTION

All Aircraft	
All Operations	
Runway 6	18.0%
Runway 24	82.0%

FLIGHT TRACK DATA

- Pattern Altitude – 1,000 feet AGL.
- Right traffic on Runway 24 (no south side pattern for powered aircraft).
- All sailplane traffic south of Airport.
- Two landing strips south of parallel taxiway used for sailplane landings.

Source: Aries (1989) for then current year.

Table 4-4

Airport Environs

California City Municipal Airport

AIRPORT LOCATION AND ACCESS

- Approximately 1 mile northeast of the central business district of California City.
- Airport and most of approaches within city limits; portion of approaches to north in unincorporated portion of County.
- Access from State Route 14 via California City Boulevard then Mitchell Boulevard.

EXISTING AIRPORT AREA LAND USES

General Character

- Most of the vicinity is undeveloped with scattered residential subdivisions to the south.

Runway Approaches

- *Runway 6 (west) Approach* — Undeveloped.
- *Runway 24 (east) Approach* — Undeveloped.

Traffic Pattern

- Powered aircraft pattern only on north side; undeveloped.
- Sailplane pattern only on south side; widely scattered suburban residential.

LOCAL LAND USE PLANS AND ZONING

- *California City General Plan* — Adopted by City 1993; sets land use policies for environs.
- *Kern County General Plan* — Adopted 1982.

PLANNED LAND USES IN AIRPORT AREA

- Continuing infill of area south of the Airport with residential uses. Balance of area designated for agricultural or recreational uses.
- No major projects currently under consideration.

ESTABLISHED APPROACH PROTECTION MEASURES

- Kern County Height Zoning Ordinance restricts the height of objects in the Airport's vicinity.

Source: Hodges & Shult (October 1993)

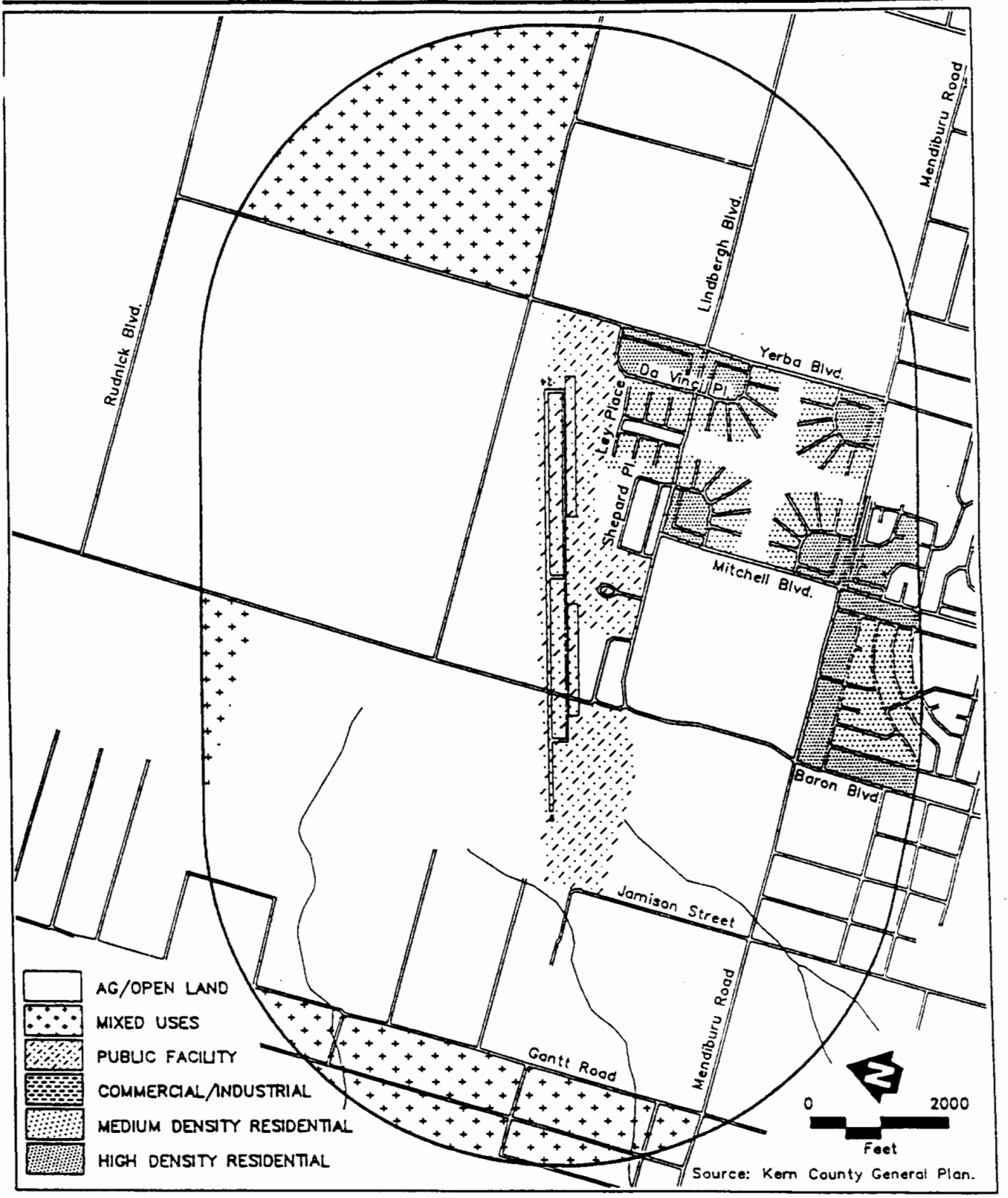


Figure 4 - 7

Land Use Designations

California City Municipal Airport

Table 4-5

Airport Features

California City Municipal Airport

AIRPORT PROPERTY

- *Ownership* — California City.
- *Size* — About 145 acres fee title.
- *Elevation* — 2,437 feet MSL.

AIRPORT PLANNING

- *Adopted Plans*
  - Airport Layout Plan adopted in 1976.
- Airport Master Plan study underway.
- *Planned Improvements*
  - Master Plan pending.

BUILDING AREA

- *Location* — South of runway.
- *Aircraft Parking Capacity* — 62 based and 12 transient tiedowns.
- 27 small hangars.
- *Other Major Facilities* — Fuel island, fixed base operator, and skydiving club hangars and offices.
- *Services* — City staff provides fueling services; one fixed base operator provides sailplane instruction and rental; a skydiving club provides instruction and equipment rental.

RUNWAY SYSTEM

Runway 6-24

- *Critical Aircraft* — Light twin-engine propeller.
- *Classification* — Airport Reference Code B-I, small aircraft.
- *Dimensions* — 6,035 feet long, 55 feet wide.
- *Lighting* — Medium-intensity runway edge lighting.
- *Surface* — Asphalt, good condition.
- *Taxiways* — Partial parallel taxiway south of runway.
- *Sailplanes* - Sailplanes launched from parallel taxiway. Landings made on landing strips south of parallel taxiway.

RUNWAY APPROACHES

Runway 6

- *Approach Type* — Visual.
- *Runway Protection Zone* — About 1/3 is within airport property line.
- *Approach Obstacles* — No penetrations of approach surface.

Runway 24

- *Approach Type* — Visual.
- *Runway Protection Zone* — About 3/4 is on airport property.
- *Approach Obstacles* — No penetrations of approach surface.

Traffic Pattern

- *Location* — Powered-aircraft pattern north of runway only. Sailplane pattern south of runway only.
- *Altitude* — 1,000 feet above airport elevation

Source: Hodges & Shutt (October 1993)

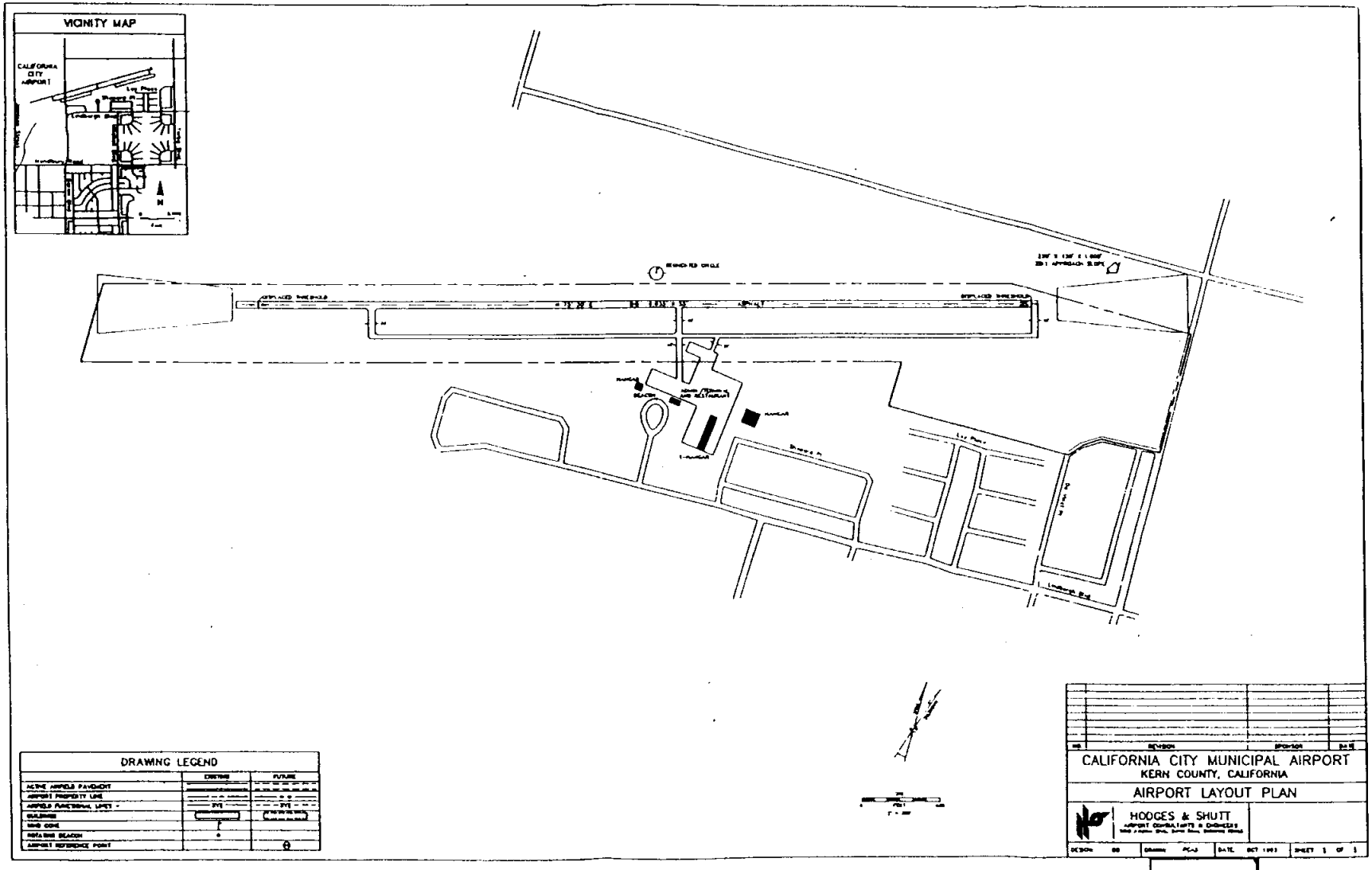

VICINITY MAP
CALIFORNIA CITY AIRPORT
DRAWING LEGEND
CALIFORNIA CITY MUNICIPAL AIRPORT
KERN COUNTY, CALIFORNIA
AIRPORT LAYOUT PLAN
HODGES & SHUTT

Figure 4 - 8

Table 4-6

Forecast Airport Activity

California City Municipal Airport

AIRCRAFT OPERATIONS

Total	
Annual	39,440
Average Day	109
Distribution	
Single-Engine	93.6%
Twin-Engine	5.5%
Business Jets	0.9%

TIME OF DAY DISTRIBUTION

All Aircraft		
Day	(0700-1900)	98.0%
Evening	(1900-2200)	2.0%
Night	(2200-0700)	0%

RUNWAY USE DISTRIBUTION

All Aircraft	
All Operations	
Runway 6	18.0%
Runway 24	82.0%

FLIGHT TRACK DATA

- Pattern Altitude – 1 000 feet AGL.
- Right traffic on Runway 24 (no south side pattern for powered aircraft).
- All sailplane traffic south of Airport.
- Two landing strips south of parallel taxiway used for sailplane landings.

Source: Aries (1989) for then current year.

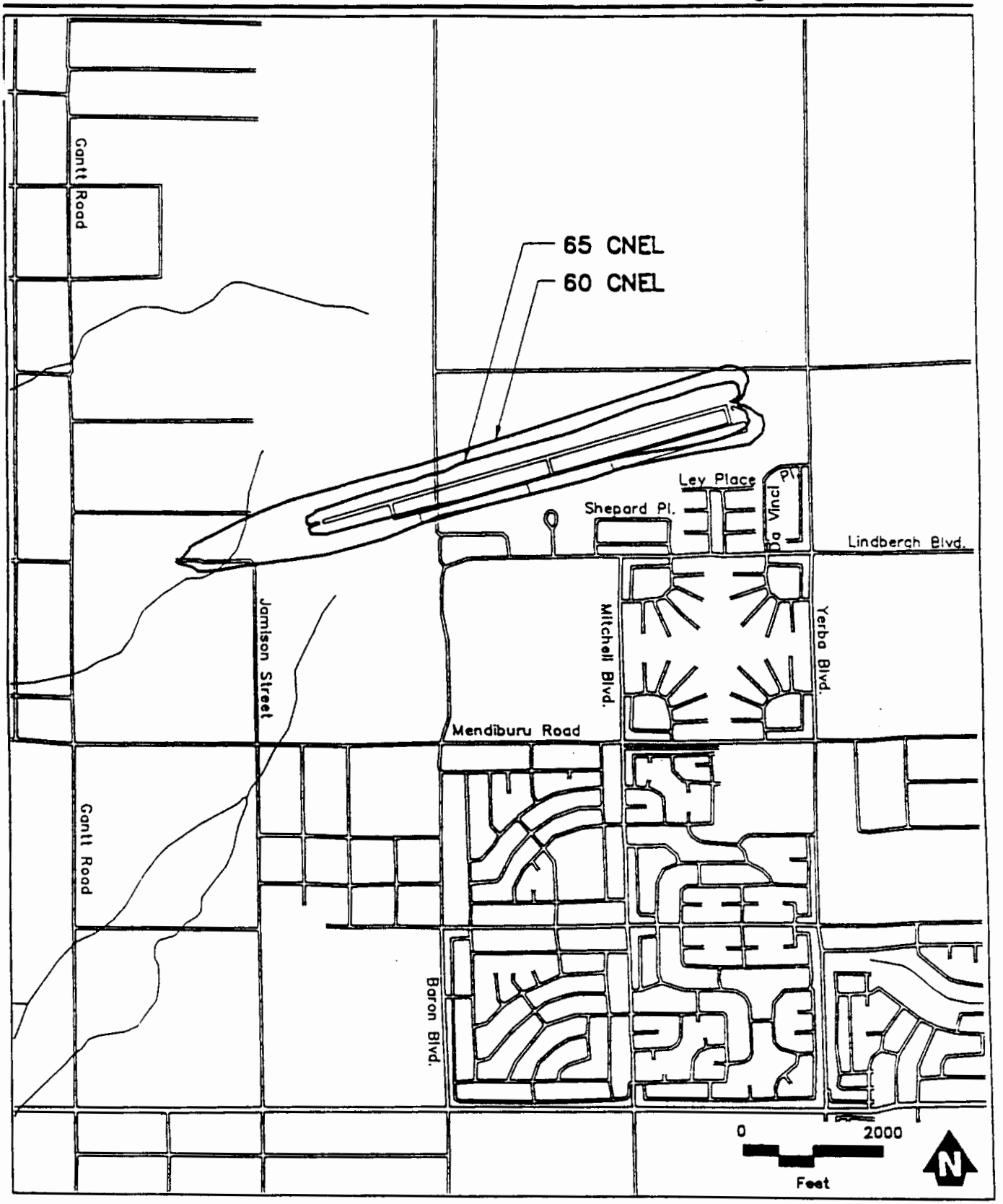


Figure 4 - 9

Noise Contours

California City Municipal Airport

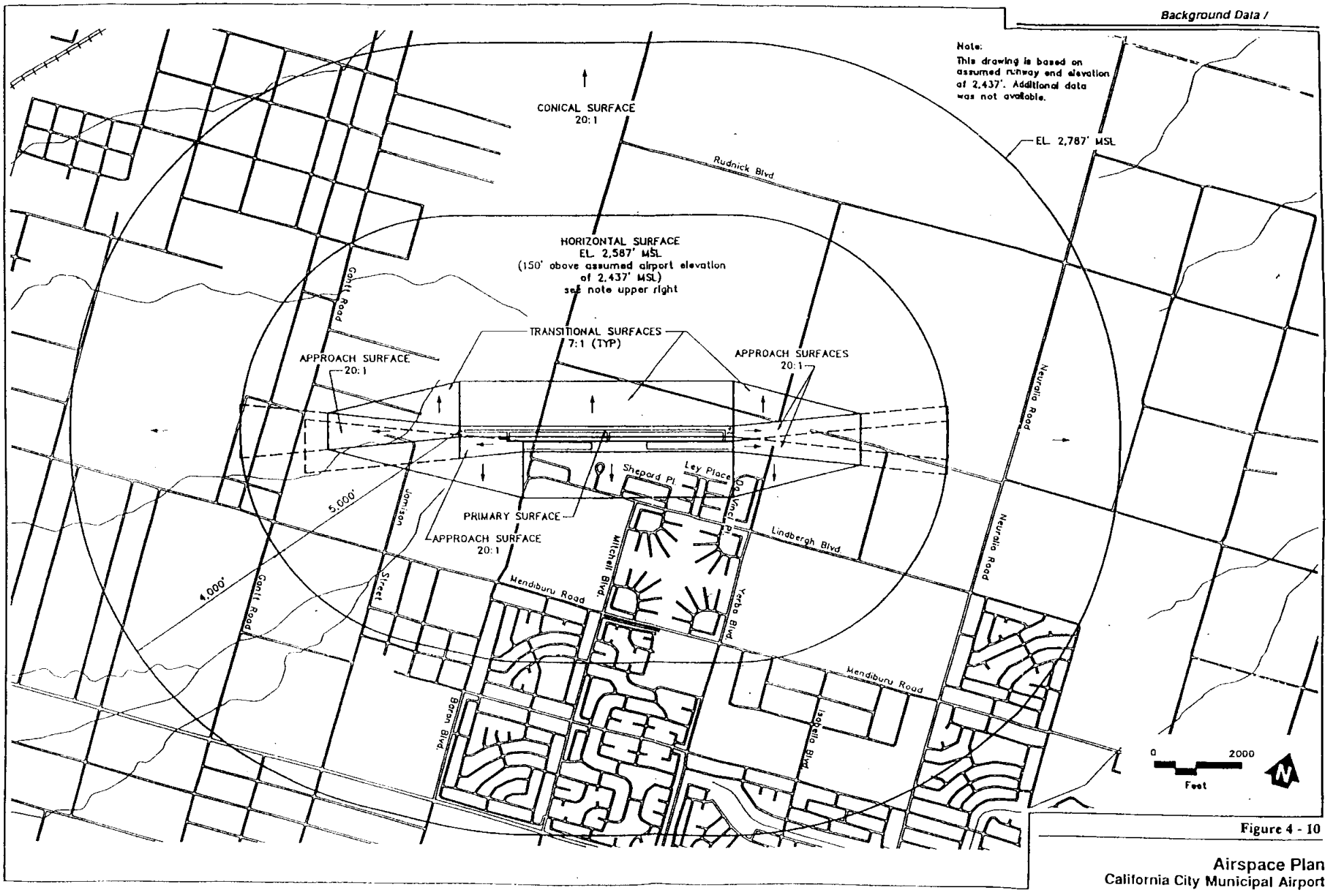


Figure 4 - 10

Airspace Plan
California City Municipal Airport

4.3 Delano Municipal Airport

4.3.1

The compatibility zones are designed to protect the planned relocation and 100-foot extension of Runway 14R-32L (the main runway) and Runway 14L-32R (the restricted runway).

4.3.2

A rectilinear planning area boundary is used in this compatibility plan. It is somewhat larger in area than the horizontal surface used at other airports. This plan was developed as a part of the Airport Master Plan for this airport.

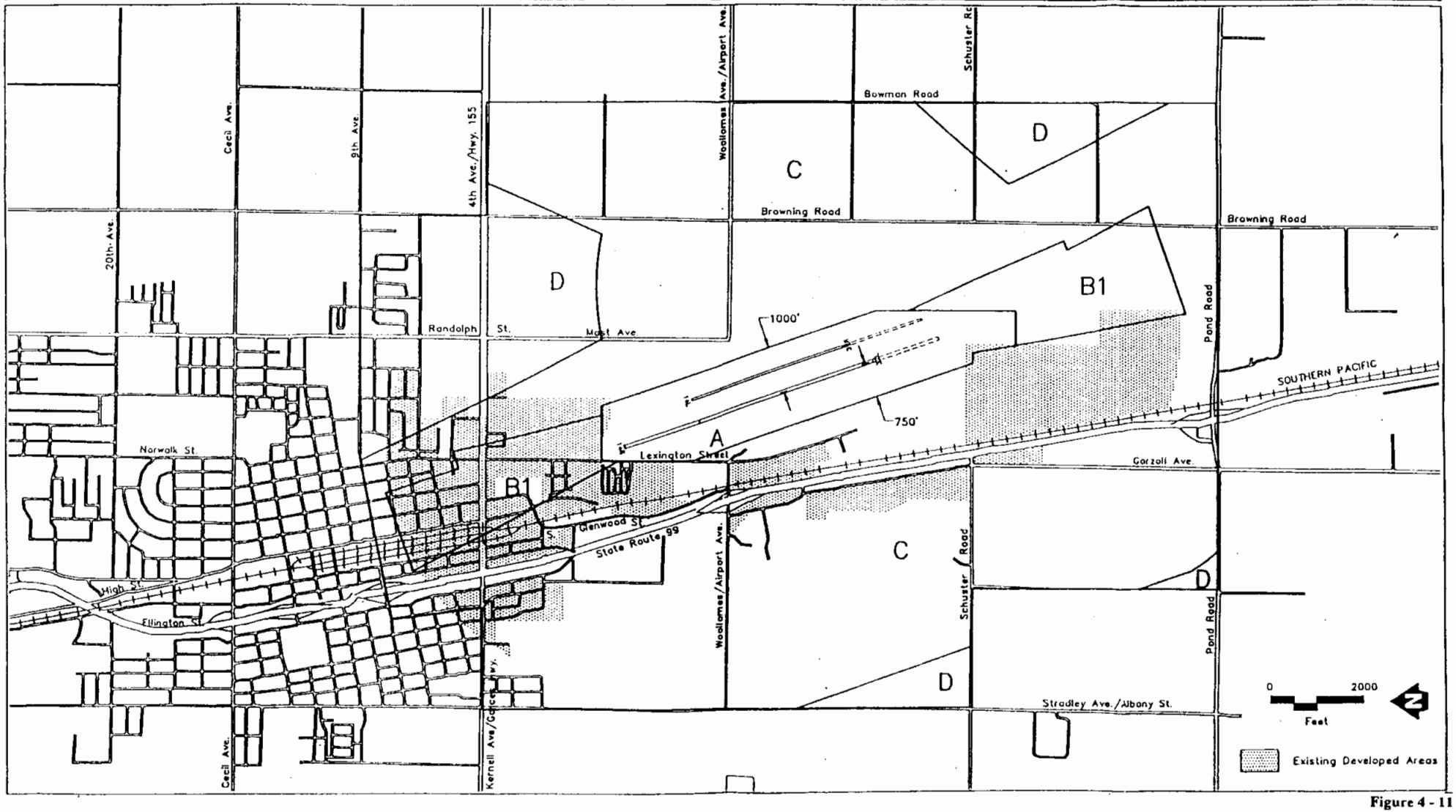

Cecil Ave.
9th Ave.
4th Ave./Hwy. 155
Woollomes Ave./Airport Ave.
Schuster Rd
Bowman Road
Browning Road
Browning Road
20th Ave.
Randolph St.
Mast Ave
Pond Road
SOUTHERN PACIFIC
Norwalk St.
Lexington Street
Gorzoli Ave.
Glenwood St.
State Route 99
High St.
Ellington St.
Schuster Road
Pond Road
Stradley Ave./Albany St.
Cecil Ave.
Kernell Ave/Garces Hwy.
A
B1
B1
C
C
D
D
D
D
1000'
750'
0
2000
Feet
Existing Developed Areas

Figure 4 - 11

Table 4-7

Airport Environs

Delano Municipal Airport

AIRPORT LOCATION AND ACCESS

- Located just south of the city of Delano, in the far-north, central portion of Kern County.
- Airport and approaches totally in city jurisdiction.
- Access from State Highway 99 via Airport Avenue.

EXISTING AIRPORT AREA LAND USES

General Character

- City of Delano is directly north. Remainder of area is mostly agricultural with scattered rural residential.

Runway Approaches

- *Runway 14R (north) Approach* — Open land within the runway protection zone. Trailer park approximately 1/4 mile from runway end.
- *Runway 32L (south) Approach* — Open land within the runway protection zone. Schuster Road approximately 2,500 feet from end of runway; agriculture beyond.
- *Runway 14L (north) Approach* — Open land within the runway protection zone. Memorial park approximately 1/4 mile from runway end.
- *Runway 32R (south) Approach* — Open land within the runway protection zone. Schuster Road approximately 2,500' from end of runway; agriculture beyond.

Traffic Pattern

- Mostly agricultural uses; a mixture of commercial, industrial, and residential uses to the north; downwind leg generally follows Highway 99.

LOCAL LAND USE PLANS AND ZONING

- *City of Delano General Plan* — Adopted in 1982 with subsequent amendments. Remains current land use plan for area.
- *Kern County General Plan* — Adopted 1982.

PLANNED LAND USES IN AIRPORT AREA

- Industrial development to the south.
- Additional residential and commercial development east of the Airport.

ESTABLISHED APPROACH PROTECTION MEASURES

- City of Delano and County of Kern Height Zoning Ordinances limit the height of objects in the vicinity of the Airport.

Source: Hodges & Shutt (October 1993)

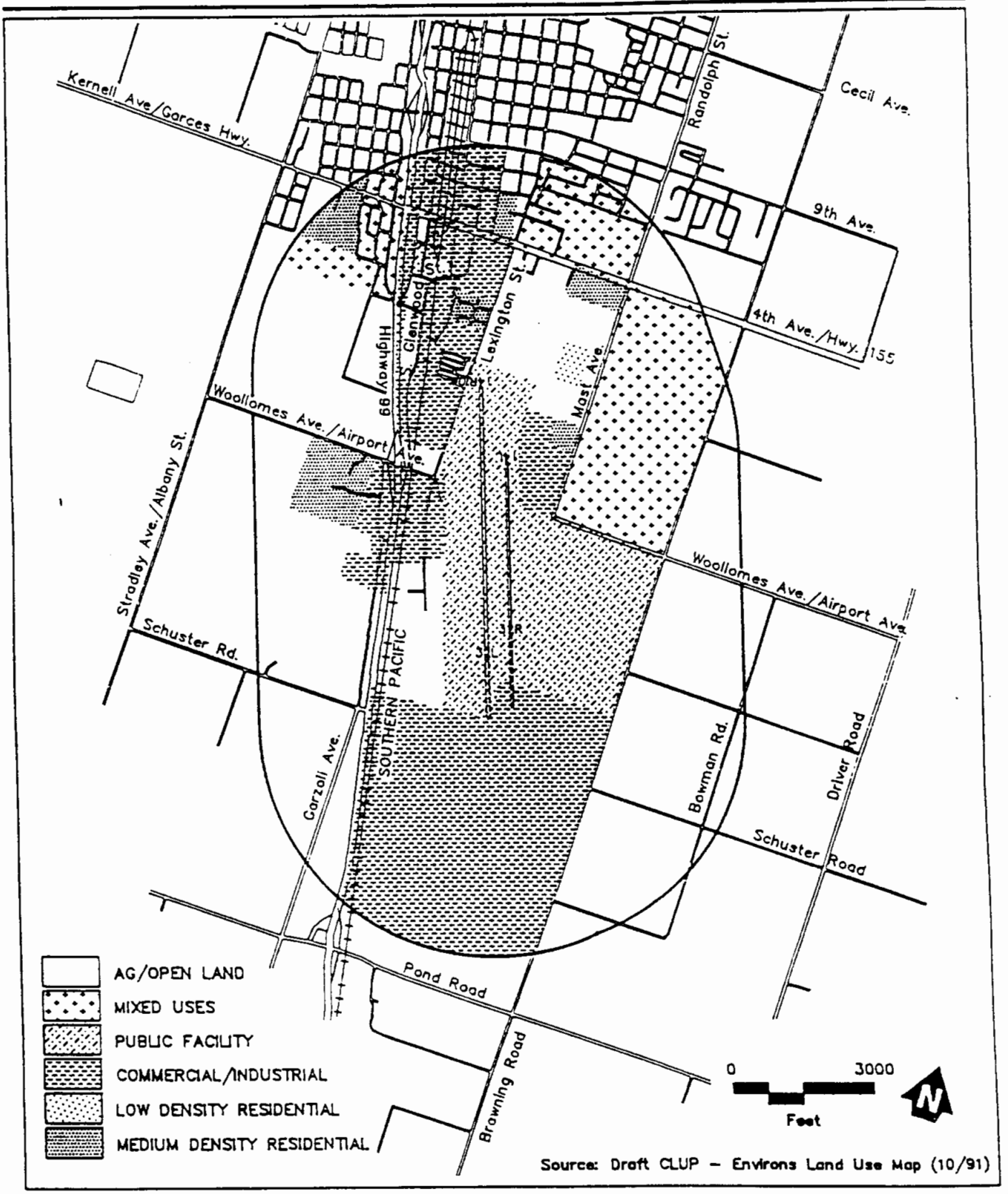


Figure 4 - 12

Land Use Designations

Delano Municipal Airport

Table 4-8

Airport Features

Delano Municipal Airport

AIRPORT PROPERTY

- *Ownership* — City of Delano.
- *Size* — 546 acres in fee.
- *Elevation* — 313 feet MSL.

AIRPORT PLANNING

- *Adopted Plans*
  - Airport Master Plan Update adopted 1991.
  - Airport Layout Plan adopted July 1975.
- *Planned Improvements*
  - Runway 14R-32L is planned to be extended to the southeast 1,560 feet to an ultimate length of 5,670 feet.
  - 100 acres are planned to be acquired to protect the extended runway and runway protection zones.
  - Runway 14L-32R is planned to be widened to 60 feet.
  - A helipad is planned on the parallel taxiway for Runway 14R-32L southeast of the terminal building.

BUILDING AREA

- *Location* — On west side of runway.
- *Aircraft Parking Capacity* — 94 tiedown spaces, and 28 T-hangars.
- *Other Major Facilities* — Fixed base operations maintenance hangar; offices; fuel facilities.
- *Services* — General aviation services include aircraft maintenance and repairs, 80 and 100LL fuel, restaurant, and car rental.

RUNWAY SYSTEM

Runway 11-29

- *Critical Aircraft* — Light business jet.
- *Classification* — Airport Reference Code B-II.
- *Dimensions* — 5,650 feet long, 75 feet wide; Runway 14R displaced 1,640 feet.
- *Lighting* — Medium-intensity runway edge lighting on Runway 14R-32L. Runway 14L-32R not lighted.
- *Surface* — Asphalt both runways.

RUNWAY APPROACHES

Runway 14R

- *Approach Type* — Non-precision.
- *Runway Protection Zone* — Entirely on airport property.
- *Approach Obstacles* — Fence located 2,200 feet from runway end, 130 feet right from centerline. Threshold has been displaced to provide adequate clearance.

Runway 32L

- *Approach Type* — Non-precision.
- *Runway Protection Zone* — On airport property and land covered by approach protection easement.
- *Approach Obstacles* No penetration of approach surfaces.

Runway 14L

- *Approach Type* — Visual.
- *Runway Protection Zone* — Entirely on airport property.
- *Approach Obstacles* — No penetration of approach surfaces.

Runway 32R

- *Approach Type* — Visual.
- *Runway Protection Zone* — Entirely on airport property.
- *Approach Obstacles* — No penetration of approach surfaces.

Source: Hodges & Shutt (October 1993)

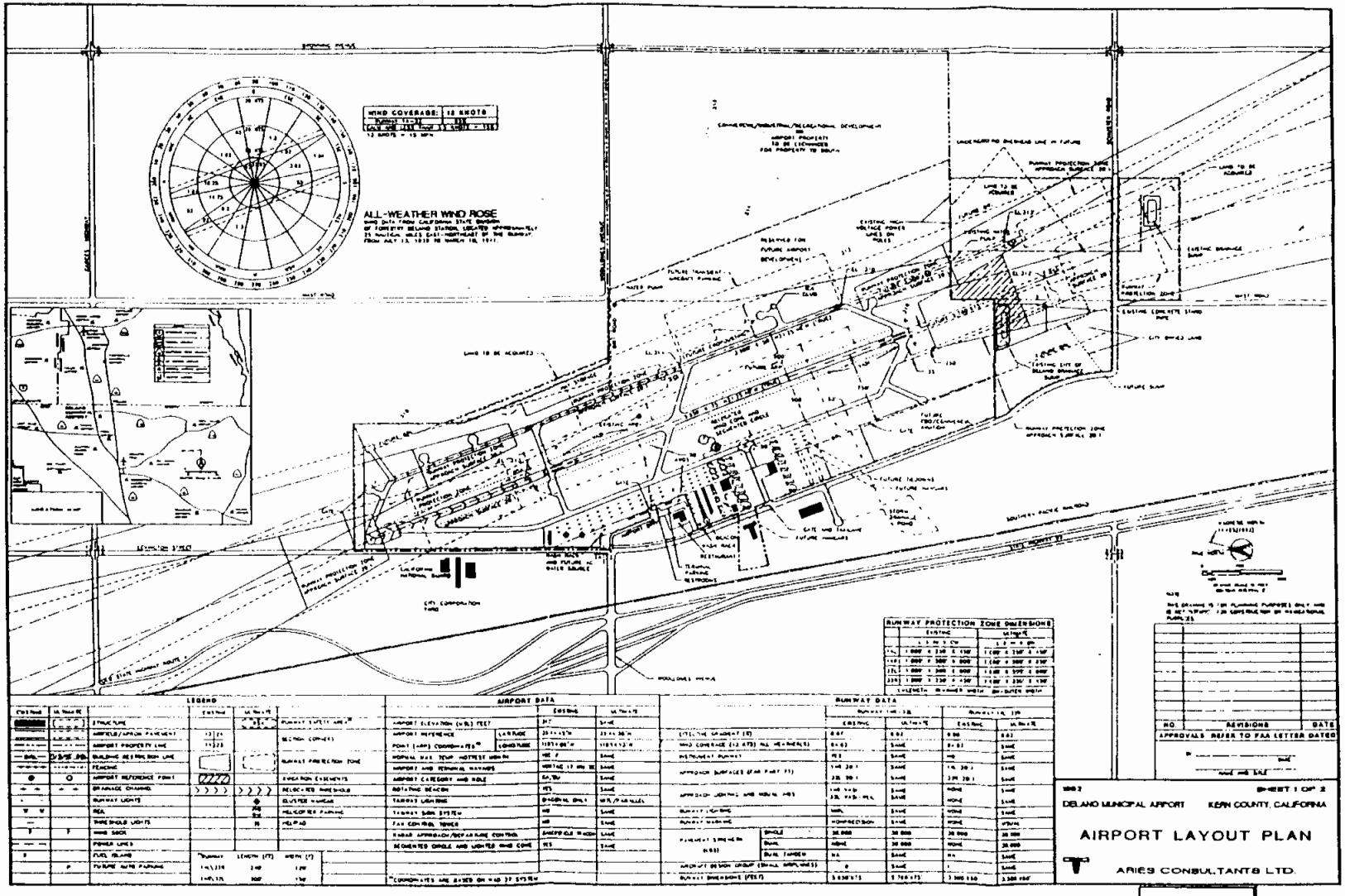

ALL-WEATHER WIND ROSE
WIND COVERAGE: 13 KNOTS
RUNWAY PROTECTION ZONE DIMENSIONS
LEGEND
AIRPORT DATA
RUNWAY DATA
DELANO MUNICIPAL AIRPORT
KERN COUNTY, CALIFORNIA
AIRPORT LAYOUT PLAN
ARIES CONSULTANTS LTD.
SHEET 1 OF 2
REVISIONS
DATE
APPROVALS REFER TO FAA LETTER DATED

Figure 4 - 13

Table 4-9

Forecast Airport Activity

Delano Municipal Airport

AIRCRAFT OPERATIONS

Total	
Annual	38,000
Average Day	104
Distribution	
Air Taxi	10.5%
Other Itinerant	67.1%
Local 22.4%	
Business Jet	3.4%

TIME OF DAY DISTRIBUTION

Data not available

RUNWAY USE DISTRIBUTION

Data not available

FLIGHT TRACK DATA

- Pattern Altitude – 800 feet AGL.
- Runway 14L-32R is restricted to use by aerial applicators, and by helicopters conducting training operations.
- Right traffic to Runway 14R (no east side pattern for main runway).
- Right traffic to Runway 32R (no west side pattern to restricted runway).

Source: Aries (1991) for year 2010.

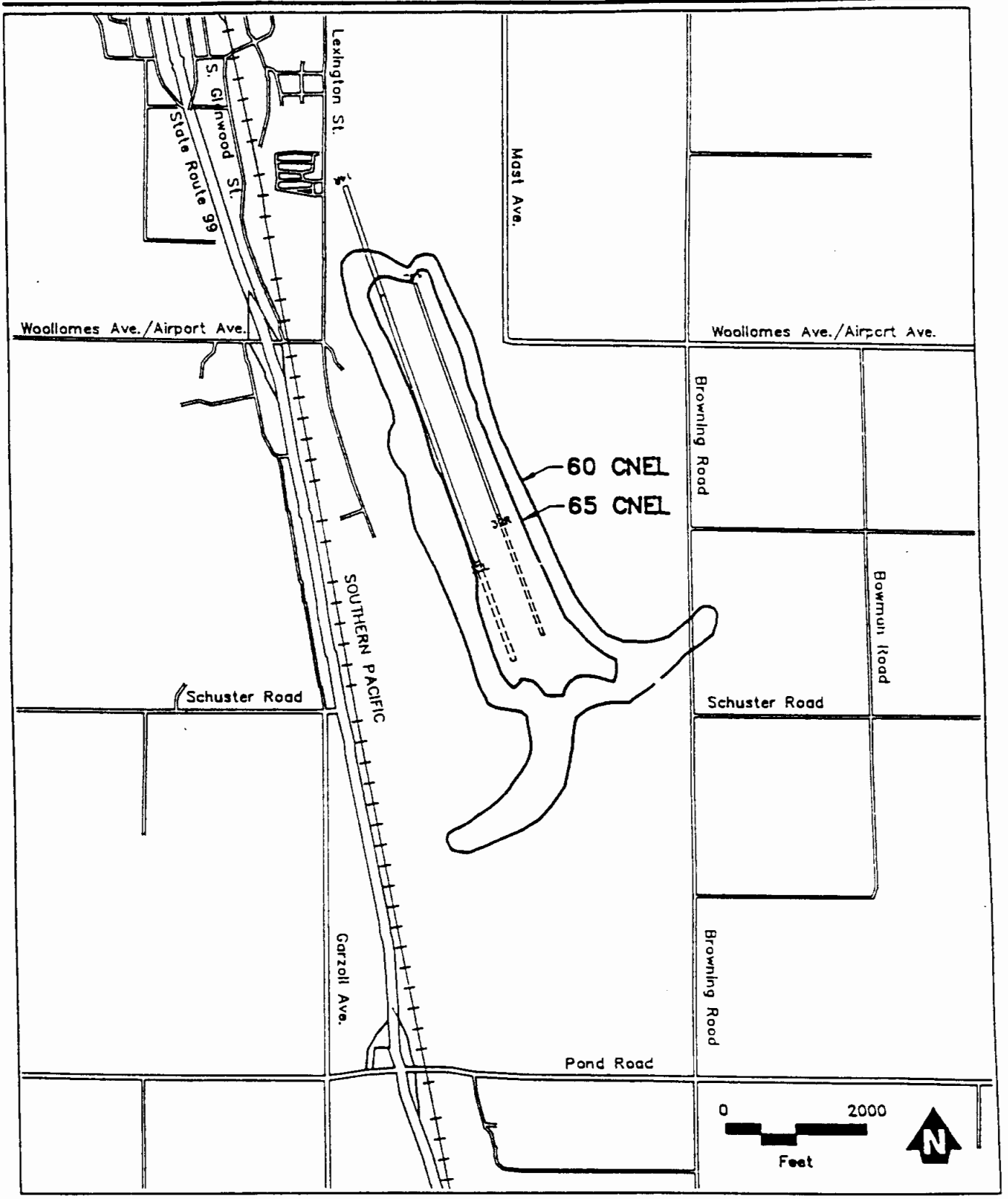


Figure 4 - 14

Noise Contours

Delano Municipal Airport

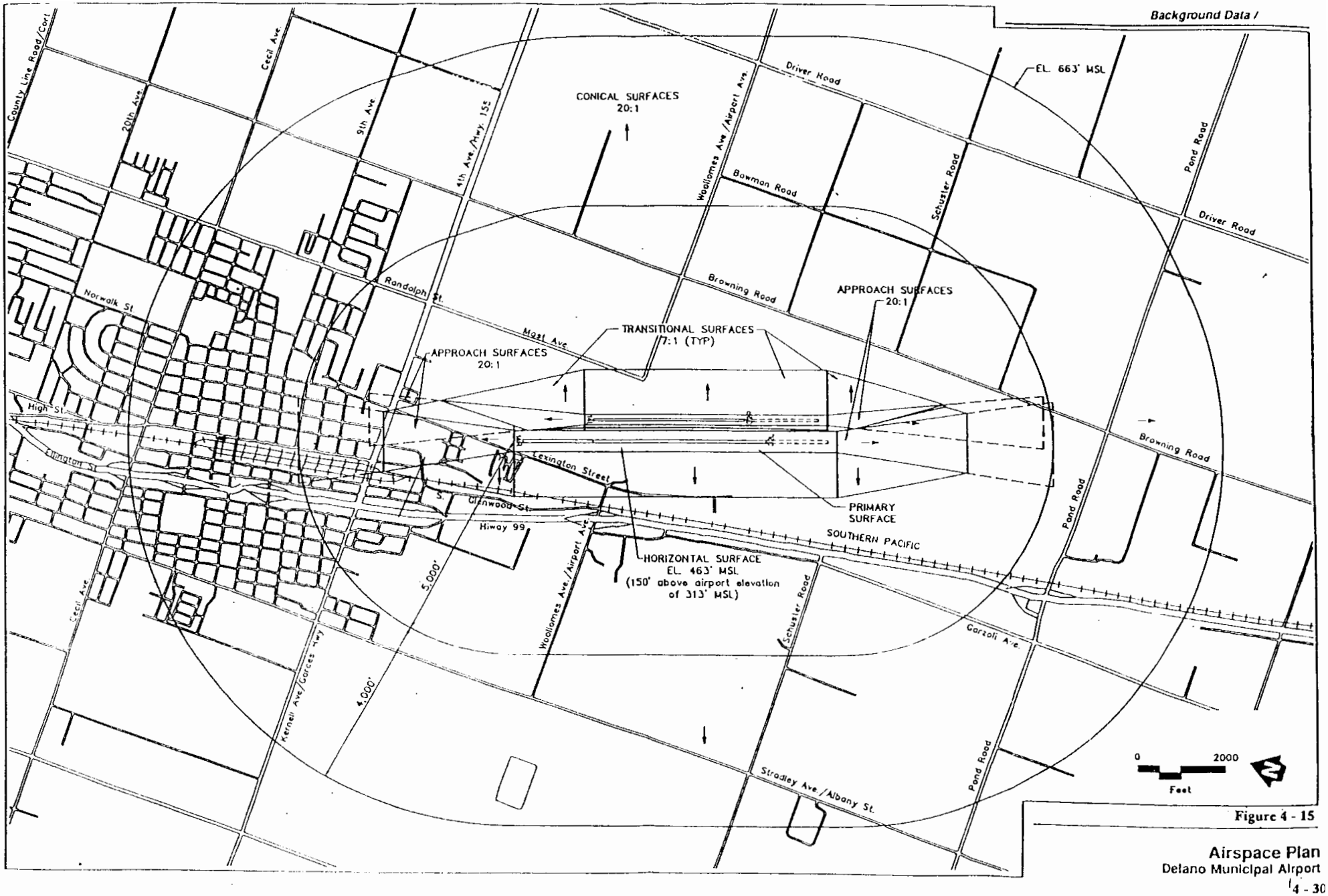


Figure 4 - 15

Airspace Plan
Delano Municipal Airport

4.4 Elk Hills - Buttonwillow Airport

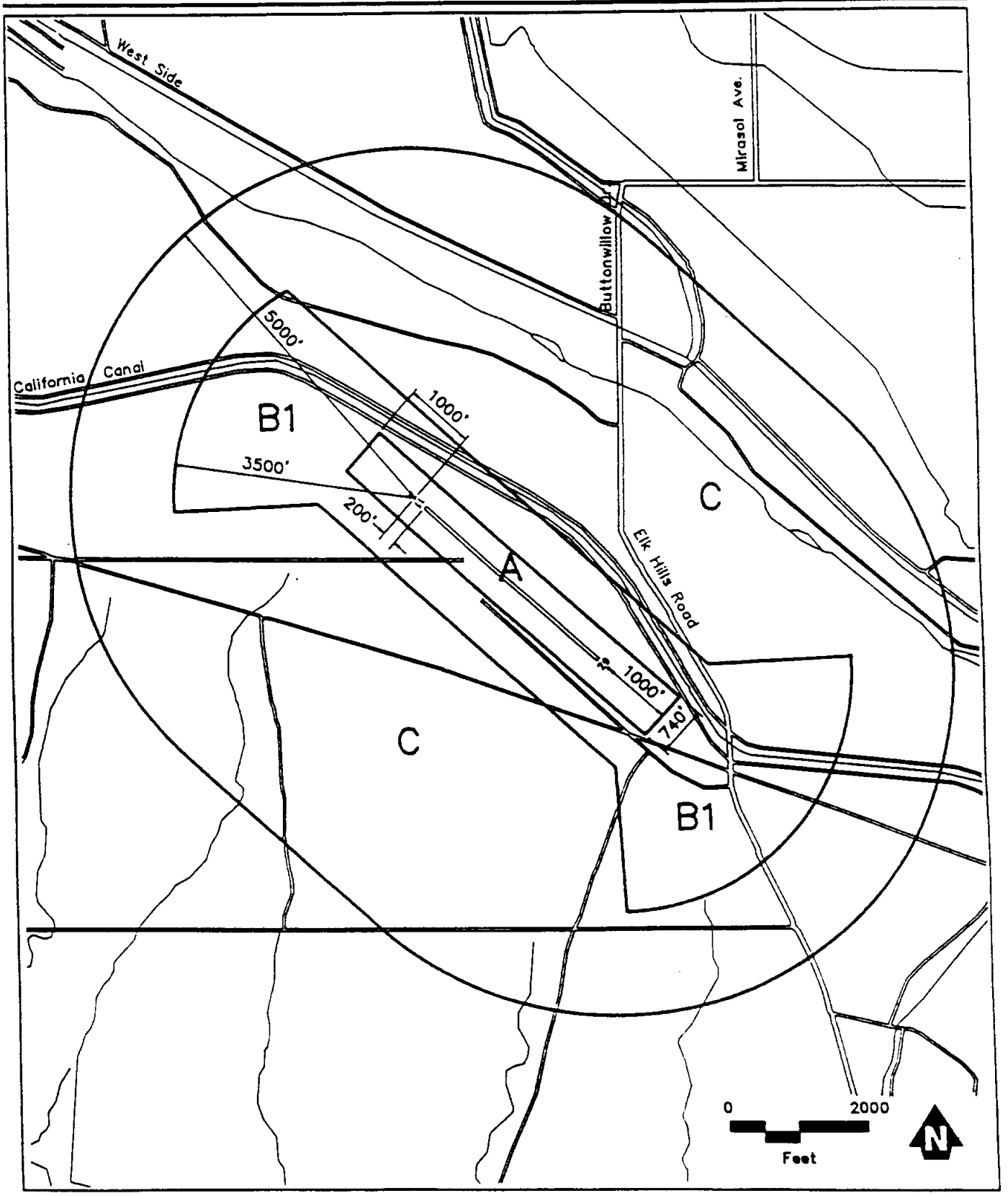

West Side
Mirasol Ave.
Buttonwillow Dr.
5000'
California Canal
1000'
B1
3500'
200'
C
A
Elk Hills Road
1000'
740'
C
B1
0
2000
Feet
N

Figure 4 - 16

Table 4-10

Airport Environs

Elk Hills-Buttonwillow Airport

AIRPORT LOCATION AND ACCESS

- Located approximately 12 miles west of the city of Bakersfield.
- Airport and approaches in County jurisdiction.
- Airport access via Interstate Highway 5, then approximately 4 miles west along State Highway 58 to Mirasol Avenue, which turns into Elk Hills Road. The airport access road is 2 miles south on Elk Hills Road.

EXISTING AIRPORT AREA LAND USES

General Character

- Mostly open land within a half mile radius of the Airport.
- Elk Hills begin on the west side.
- California aqueduct, Kern River, and agricultural uses on the east side.

Runway Approaches

- *Runway 11 (northwest) Approach* — Open land; right traffic.
- *Runway 29 (southeast) Approach* — Open land; left traffic.

Traffic Pattern

- Open, gently-sloped terrain; California Aqueduct runs below north end of pattern.
- No pattern on east side.

LOCAL LAND USE PLANS AND ZONING

- *Kern County General Plan* — Adopted in 1982.

PLANNED LAND USES IN AIRPORT AREA

- No major development proposals currently active.

ESTABLISHED APPROACH PROTECTION MEASURES

- None.

Source: Hodges & Shutt (October 1993)

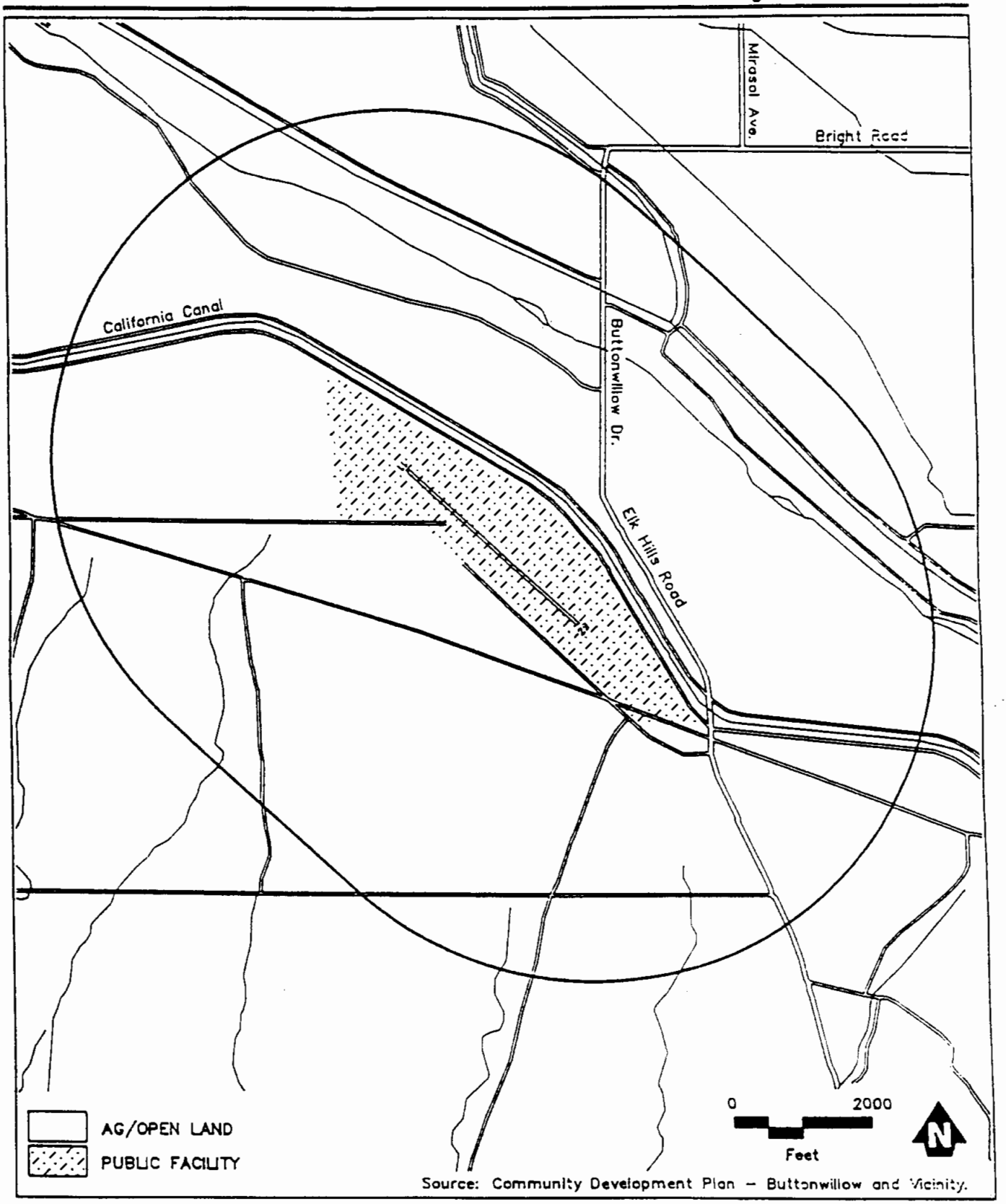


Figure 4 - 17

Land Use Designations

Elk Hills-Buttonwillow Airport

Table 4-11

Airport Features

Elk Hills-Buttonwillow Airport

AIRPORT PROPERTY

- *Ownership* — Kern County.
- *Size* — 216 in fee.
- *Elevation* — 326 feet MSL.

AIRPORT PLANNING

- *Adopted Plans* — Airport Layout Plan (ALP) adopted in 1968.
- *Planned Improvements* — No major development proposals currently active.

BUILDING AREA

- *Location* — Transient tiedowns located on west end of the field.
- *Aircraft Parking Capacity* — Twelve tiedowns.
- *Other Major Facilities* — None.
- *Services* — None.

RUNWAY SYSTEM

Runway 11-29

- *Critical Aircraft* — Single-engine propeller.
- *Classification* — Airport Reference Code BU-1.
- *Dimensions* — 3,260 feet long, 50 feet wide.
- *Lighting* — None.
- *Surface* — Asphalt, fair condition.
- *Taxiways* — Parallel on southwest side; exit taxiways on each end and on center of runway.

RUNWAY APPROACHES

Runway 11

- *Approach Type* — Visual.
- *Runway Protection Zone* — Entirely on airport property.
- *Approach Obstacles* — No penetrations of approach surface.

Runway 29

- *Approach Type* — Visual.
- *Runway Protection Zone* — Entirely on airport property.
- *Approach Obstacles* — None.

Traffic Pattern

- *Location* — Established pattern southwest of runway only.
- *Altitude* — 800 feet above airport elevation.
- *Approach Procedure* — All approaches and departures on Runway 9.

Source: Hodges & Shutt (October 1993)

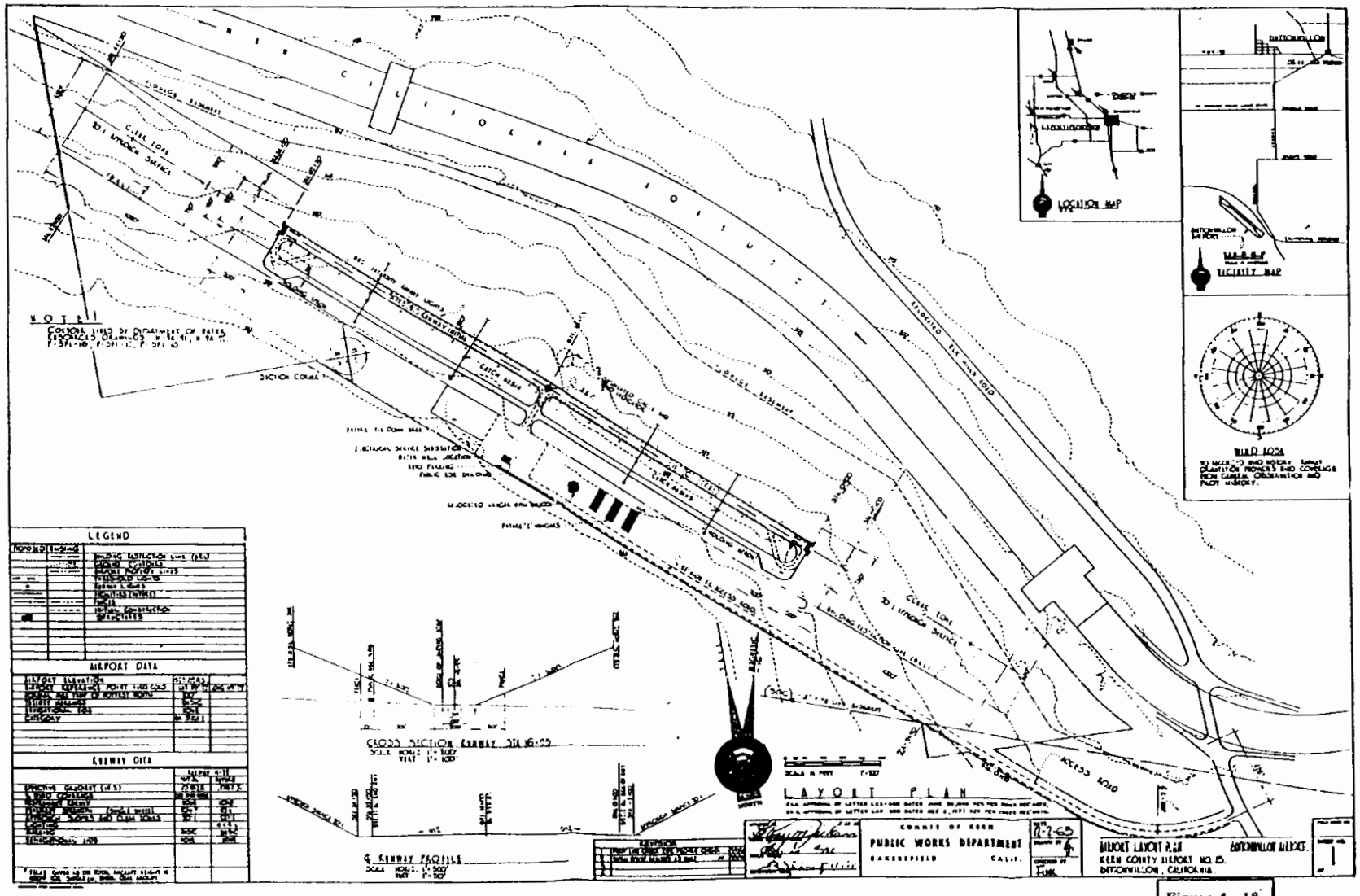

LEGEND
AIRPORT DATA
RUNWAY DATA
CROSS SECTION RUNWAY 30 16-25
RUNWAY PROFILE
LAYOUT PLAN
PUBLIC WORKS DEPARTMENT
BAKERSFIELD
CALIF.
LOCATION MAP
VICINITY MAP
WIND ROSE
NOTES
TO WITHOUT SHEET
CLEAR ZONE
ACCESS ROAD
SECTION CORNER
ELEVATED ACE WITH ROAD
BAKERSFIELD AIRPORT
KERN COUNTY AIRPORT NO. 15.
BAKERSFIELD, CALIFORNIA.

Figure 4 - 18

Table 4-12

Forecast Airport Activity

Elk Hills - Buttonwillow Airport

AIRCRAFT OPERATIONS

Total	
Annual	600
Average Day	2
Distribution	
Single-Engine	100.0%

TIME OF DAY DISTRIBUTION

All Aircraft		
Day	(0700-1900)	100.0%
Evening	(1900-2200)	0%
Night	(2200-0700)	0%

RUNWAY USE DISTRIBUTION

All Aircraft	
All Operations	
Runway 11	0%
Runway 29	100.0%

FLIGHT TRACK DATA

- Pattern Altitude -- 800 feet AGL.
- Right traffic on Runway 11 (no north side pattern).

Source: Aries (1989) for then current year

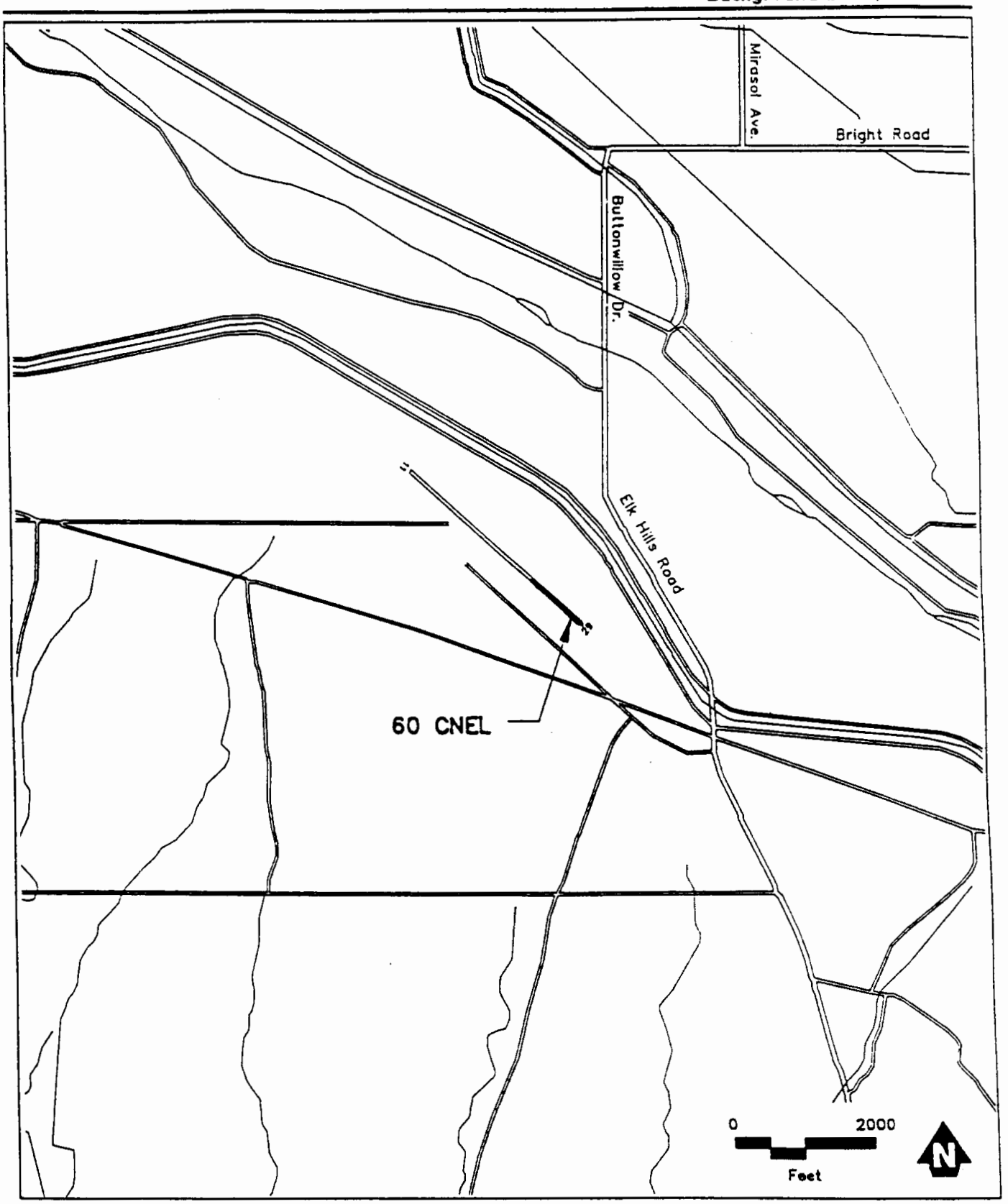


Figure 4 - 19

Noise Contours

Elk Hills-Buttonwillow Airport

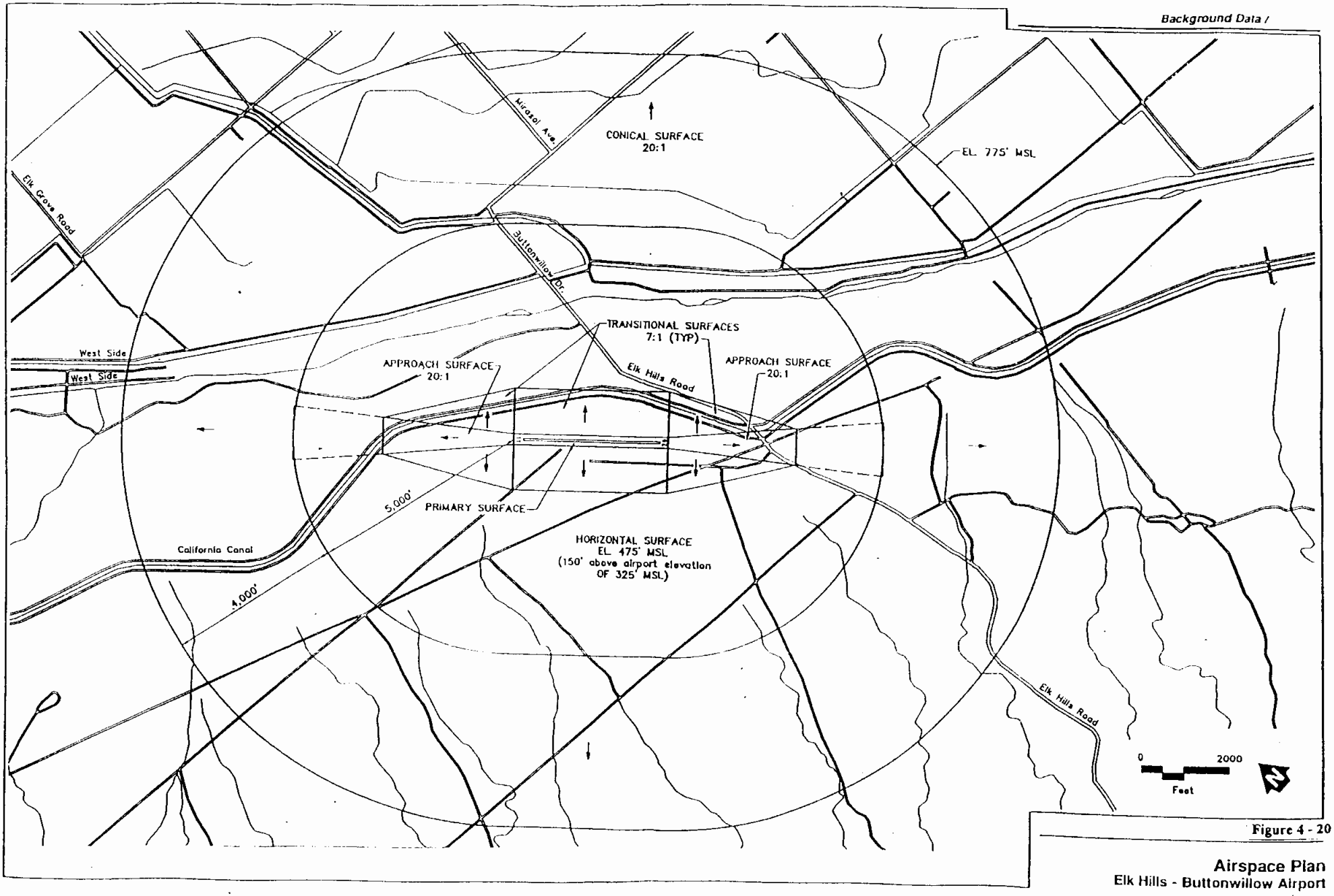


Figure 4 - 20

Airspace Plan
Elk Hills - Buttonwillow Airport

4.5 Inyokern Airport

4.5.1

The compatibility zones include provisions to protect the planned extension of Runway 15-33 to 9,000 feet.

4.5.2

Flight operations must remain clear of adjacent restricted areas R-2505 and R-2506, located east of the airport. Real time coordination for use of this air space may be approved on a case-by-case basis, not to interfere with the military mission. For this reason, the airport planning area includes land underlying the restricted area.

4.5.3

East of Redrock-Inyokern Road is a triangularly-shaped area which is designated for 1-acre residential parcels. The general Compatibility Criteria (Table 2A) would otherwise require 2-acre parcels. However, the triangularly-shaped area can be developed at a 1-acre density, as long as those areas within the balance of the B2 zone which are designated for 2.5-acre parcels retain their designation.

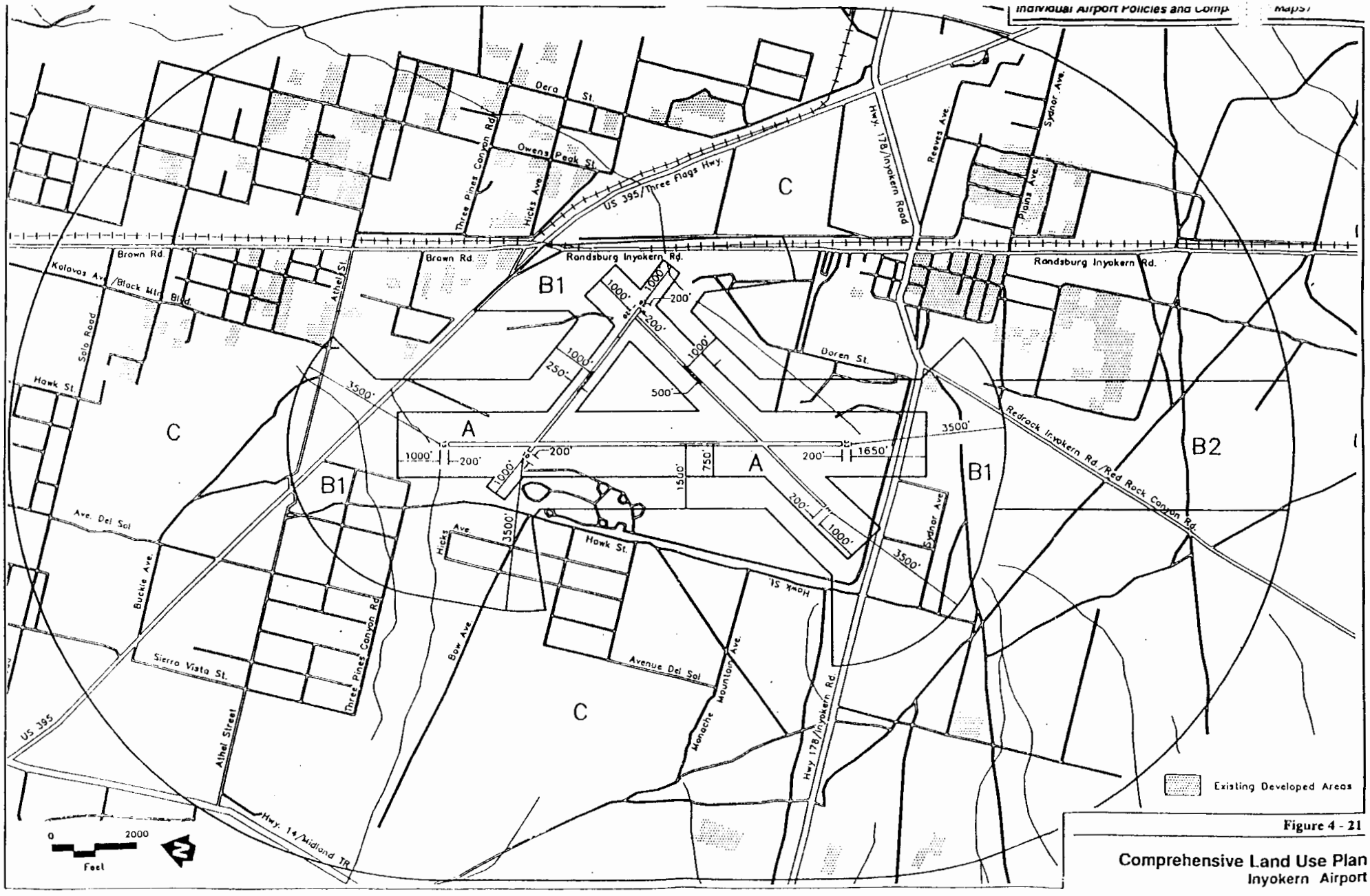


Figure 4 - 21

Comprehensive Land Use Plan
Inyokern Airport

Table 4-13

Airport Environs

Inyokern Airport

AIRPORT LOCATION AND ACCESS

- Located in the northeast corner of Kern County, approximately 100 miles northeast of Bakersfield, the County seat.
- Airport and approaches are totally in county jurisdiction.
- Access to terminal area via State Highway 178.

EXISTING AIRPORT AREA LAND USES

General Character

- Surrounding area is mostly limited agriculture.
- Town of Inyokern lies immediately southeast.
- Scattered rural residential to the southwest.
- Rural residential to the north.

Runway Approaches

- *Runway 15 (northwest) Approach* — U.S. 395 is 4,000 feet from runway end; remainder is primarily open land.
- *Runway 33 (south) Approach* — Highway 178/Inyokern Road approximately 1,200 feet from runway end; open land beyond.
- *Runway 2 (southwest) Approach* — Highway 178/Inyokern Road 1,500 feet from runway end; open land beyond.
- *Runway 20 (northeast) Approach* — Scattered rural residential and open land.
- *Runway 10 (west) Approach* — Undeveloped.
- *Runway 28 (east) Approach* — Brown Road and Southern Pacific Railroad 2,000 feet from runway end; remainder open land.

Traffic Pattern

- Entire pattern lies on west side of Southern Pacific Railroad; scattered rural residential and portions of town of Inyokern; primarily open land.

LOCAL LAND USE PLANS AND ZONING

- *Kern County General Plan* — Adopted 1982.
- *Inyokern Specific Plan*

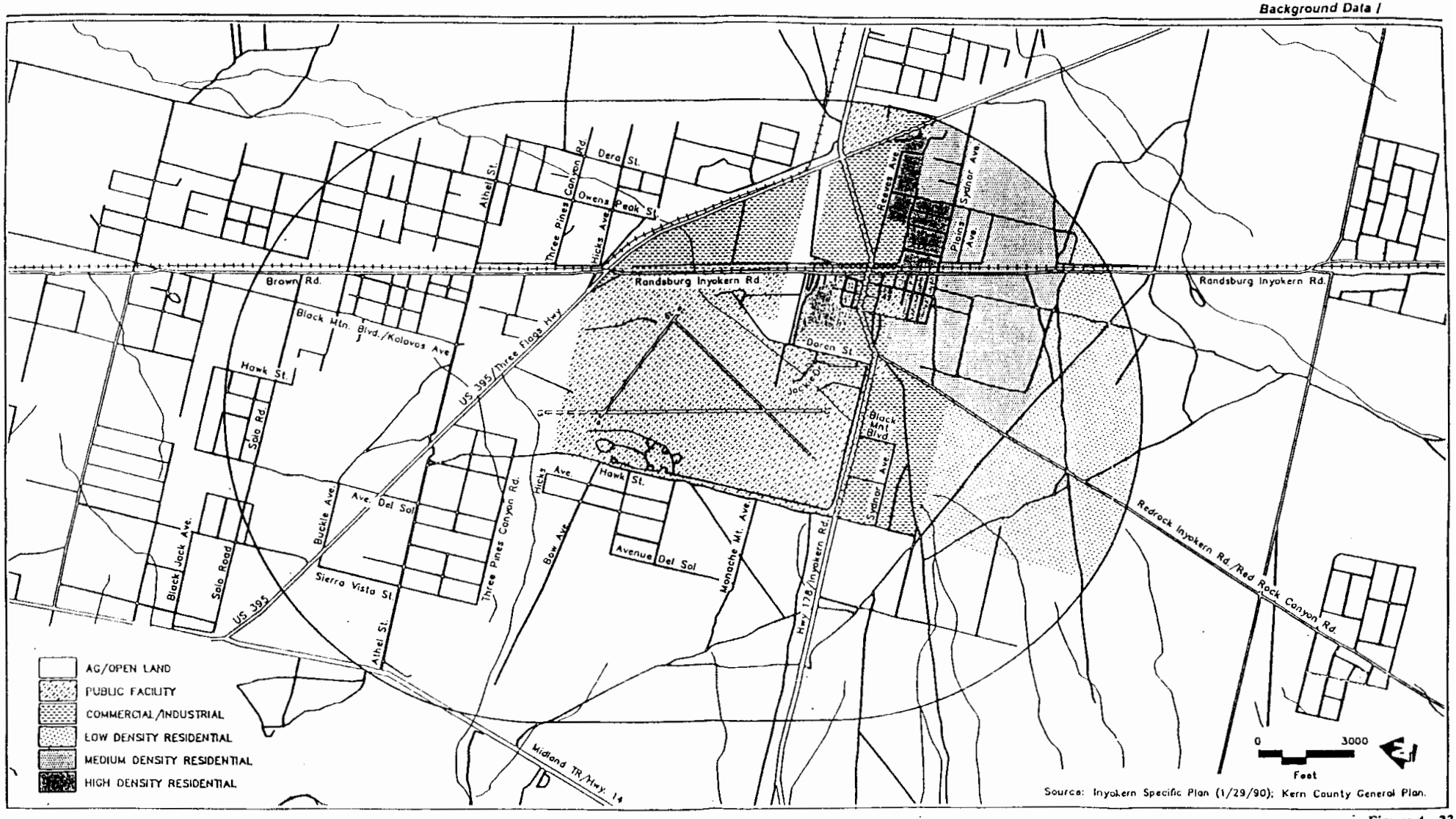
PLANNED LAND USES IN AIRPORT AREA

- Continuing infill of Inyokern with residential and light industrial.
- Majority of surrounding area zoned for large-lot residential uses.
- No major development proposals currently in action.

ESTABLISHED APPROACH PROTECTION MEASURES

- Kern County Height Zoning Ordinance limits the height of objects in the vicinity of the Airport.

Source: Hodges & Shutt (October 1993)



Source: Inyokern Specific Plan (1/29/90); Kern County General Plan.

Figure 4 - 22

Land Use Designations

Inyokern Airport

Table 4-14

Airport Features

Inyokern Airport

AIRPORT PROPERTY

- *Ownership* — Indian Wells Valley Airports District - Kern County.
- *Size* — Approx. 1.347 acres fee title.
- *Elevation* — 2,457 feet MSL.

AIRPORT PLANNING

- *Adopted Plans*
  - Airport Master Plan - Adopted in June 1989.
- *Planned Improvements*
  - Airline terminal expansion or replacement.
  - Expansion of general aviation facilities.
  - Extension of utility lines.
  - Extension of Runway 15-33.
  - Land aquisition.

BUILDING AREA

- *Location* — Southeast end of field.
- *Aircraft Parking Capacity*
  - 125 based and transient tiedowns.
  - 43 T-hangars; one large box hangar.
- *Other Major Facilities* — Fuel island, terminal building.
- *Services* — Aircraft rental; instruction; maintenance; pilot supplies; video coverage.

RUNWAY SYSTEM

Runway 15-33

- *Critical Aircraft* — Large business jet.
- *Classification* — Airport Reference Code C-III.
- *Dimensions* — 7,344 feet long, 75 feet wide; 342' displaced threshold for Runway 15; 350' diplaced threshold for Runway 33.
- *Lighting* — Medium-intensity runway edge lighting.
- *Surface* — Asphalt, fair condition.
- *Taxiways* — Three paved exit taxiways and a paved parallel taxiway.

Runway 2-20

- *Critical Aircraft* — Small business jet.
- *Classification* — Airport Reference Code B-II.
- *Dimensions* — 6,275 feet long, 75 feet wide; 320-foot displaced threshold for Runway 20.
- *Lighting* — Medium-intensity runway edge lighting.
- *Surface* — Asphalt, excellent condition.
- *Taxiways* — Exit taxiway each end; partial parallel taxiway.

Runway 10-28

- *Critical Aircraft* — Light twin-engine.
- *Classification* — Airport Reference Code B-I.
- *Dimensions* — 4,153 feet long, 75 feet wide; 103-foot displaced threshold for Runway 28.
- *Lighting* — Medium-intensity runway edge lighting.
- *Surface* — Asphalt, good condition.
- *Taxiways* — Three exit taxiways.

Source: Hodges & Shutt (October 1993)

AIRPORT CAPITAL IMPROVEMENT PLAN

1. INYOKERN AIRPORT **2. CA** **3. 06-0110** **4. IYK**

Project	Description (a)	Federal Funds (b)	State Funds (c)	Local Funds PFC (d)	Local Funds Other (e)	Total Dollars (f)	Environmental Impact (g)	Start Date (h)
96/97	Overlay taxiways	754,000	-0-	96,000	-0-	850,000	C	10-01-96
98	Airfield Signage (Part 139)	90,000	-0-	10,000	-0-	100,000	C	06-01-98
98/99	Widen RW 15/33, RW lights	585,000	-0-	65,000	-0-	650,000	C	10-01-98
2000	Security Fence, Access Control	90,000	-0-	10,000	-0-	100,000	C	06-01-00
00-02	Construct Fire Station	900,000	-0-	100,000	-0-	1,000,000	C	06-01-01
03	Electrical System, RW 10/28, 02/20	270,000	-0-	30,000	-0-	300,000	C	04-01-03
04	Construct run-up pad	36,000	-0-	4,000	-0-	40,000	C	04-01-04
04	Install PAPI (2)	54,000	-0-	6,000	-0-	60,000	C	04-01-04
04	Ramp security lighting	27,000	-0-	3,000	-0-	30,000	C	04-01-04
04	Access Taxiway - Runway 20	72,000	-0-	8,000	-0-	80,000	C	04-01-04
04	Construct Helipad	45,000	-0-	5,000	-0-	50,000	C	04-01-04
04	Rehabilitate Ramp	-0-	-0-	50,000	-0-	50,000	C	04-01-04
04	Master Plan/EIR	70,000	-0-	30,000	-0-	100,000	C	04-01-04
05/06	Overlay Runway 10/28	470,000	-0-		50,000	520,000	C	

Table 4-14 Continued

Airport Features

Inyokern Airport

RUNWAY APPROACHES

Runway 15

- *Approach Type* — Visual.
- *Runway Protection Zone* — Off airport property; land is covered by an approach protection easement.
- *Approach Obstacles* — None.

Runway 33

- *Approach Type* — Non-precision.
- *Runway Protection Zone* — One-third of the existing RPZ extends beyond airport property.
- *Approach Obstacles* — Highway 1,375 feet from runway end; displaced threshold provides adequate clearance.

Traffic Pattern Runway 15-33

- *Location* — Left pattern for both runways.
- *Altitude* — 800 feet above airport elevation.

Runway 2

- *Approach Type* — Visual.
- *Runway Protection Zone* — Almost entirely on airport property.
- *Approach Obstacles* — Highway approximately 1,400 feet from runway end. 40:1 approach provides adequate clearance.

Runway 20

- *Approach Type* — Visual.
- *Runway Protection Zone* — On airport property.
- *Approach Obstacles* — Bridge 2,000 feet from runway end. Displaced threshold provides adequate clearance.

Traffic Pattern Runway 2-20

- *Location* — Left pattern for both runways.
- *Altitude* — 800 feet above airport elevation.

Runway 10

- *Approach Type* — Visual.
- *Runway Protection Zone* — Entirely on airport property.
- *Approach Obstacles* — None.

Runway 28

- *Approach Type* — Visual.
- *Runway Protection Zone* — On airport property.
- *Approach Obstacles* — Powerline 5,000 feet from runway end. Displaced threshold provides adequate clearance.

Traffic Pattern Runway 10-28

- *Location* — Left pattern for both runways.
- *Altitude* — 800 feet above airport elevation.

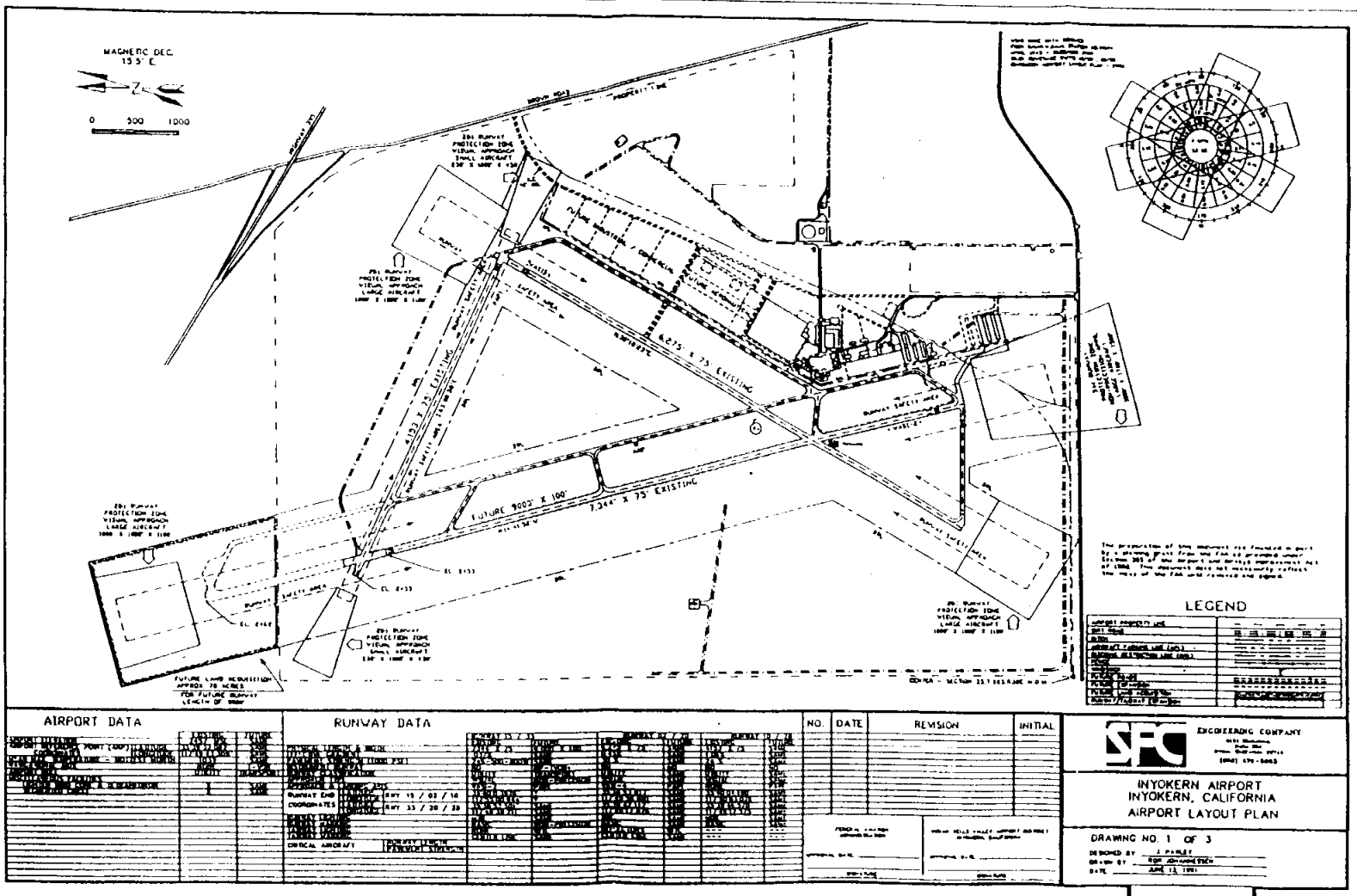

MAGNETIC DEC.
15.5° E
0 500 1000
FUTURE 9000' X 100'
7,344' X 75' EXISTING
6,275' X 75' EXISTING
LEGEND
AIRPORT DATA
RUNWAY DATA
NO.
DATE
REVISION
INITIAL
INYOKERN AIRPORT
INYOKERN, CALIFORNIA
AIRPORT LAYOUT PLAN
DRAWING NO. 1 OF 3

Figure 4 - 23

Table 4-15

Forecast Airport Activity

Inyokern Airport

AIRCRAFT OPERATIONS

Total	
Annual	31,200
Average Day	85
Distribution	
Itinerant:	
Commercial	19.2%
General Aviation	41.7%
Military	0.6%
Local:	
General Aviation	38.5%

TIME OF DAY DISTRIBUTION

Commercial		
Day	(0700-1900)	64.0%
Evening	(1900-2200)	21.0%
Night	(2200-0700)	15.0%
General Aviation		
Day	(0700-1900)	90.3%
Evening	(1900-2200)	5.1%
Night	(2200-0700)	4.6%
Military		
Day	(0700-1900)	100.0%
Evening	(1900-2200)	0%
Night	(2200-0700)	0%

RUNWAY USE DISTRIBUTION

Data Not Available

FLIGHT TRACK DATA

- Pattern Altitude – 800 feet AGL.
- Left traffic to all runways
- Presence of restricted area R-2505 to east requires nonstandard approaches/departures east of Airport.

* Gliders use Right Traffic

Source: Foresite West (1989) for 2007

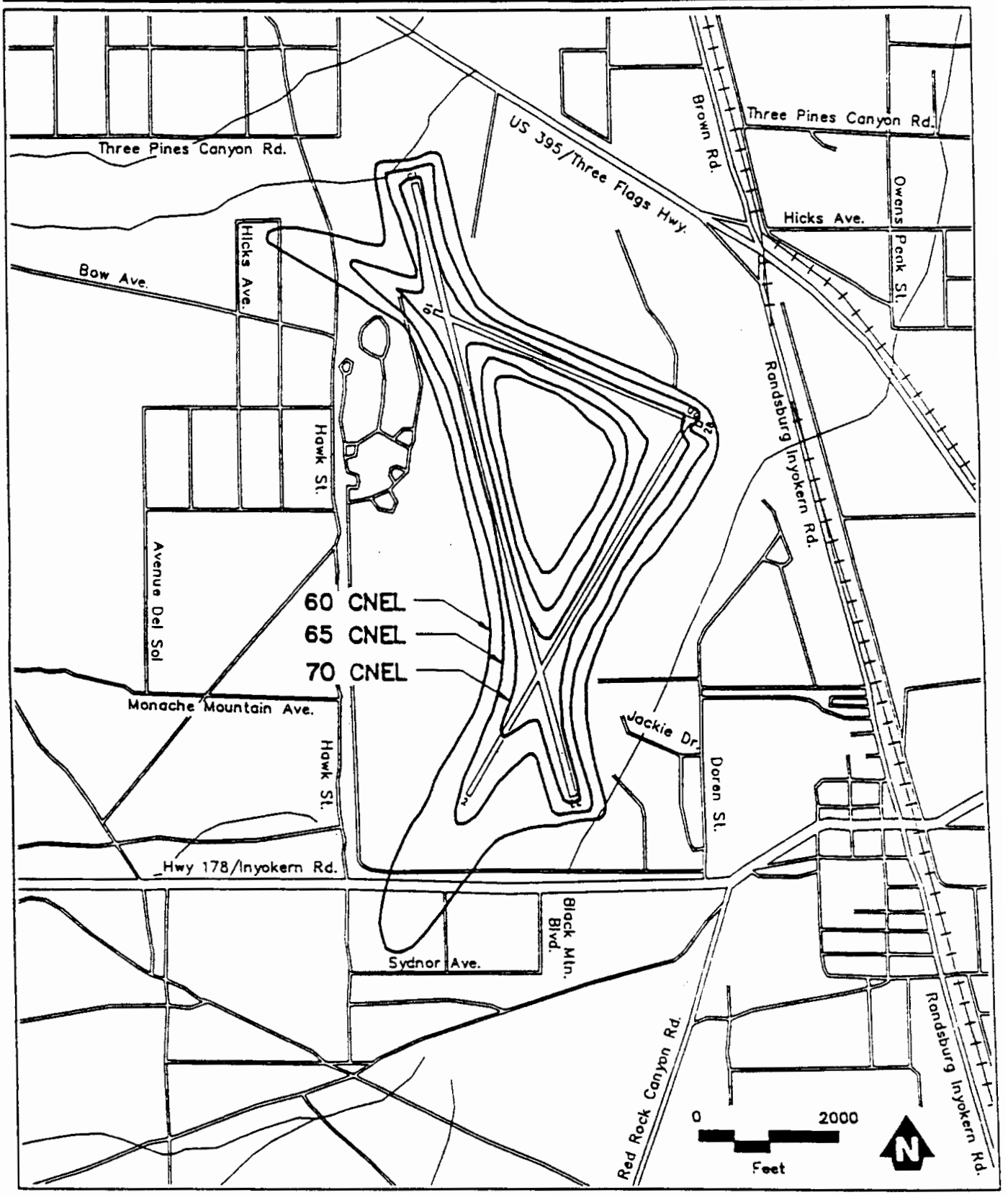


Figure 4 - 24

Noise Contours

Inyokern Airport

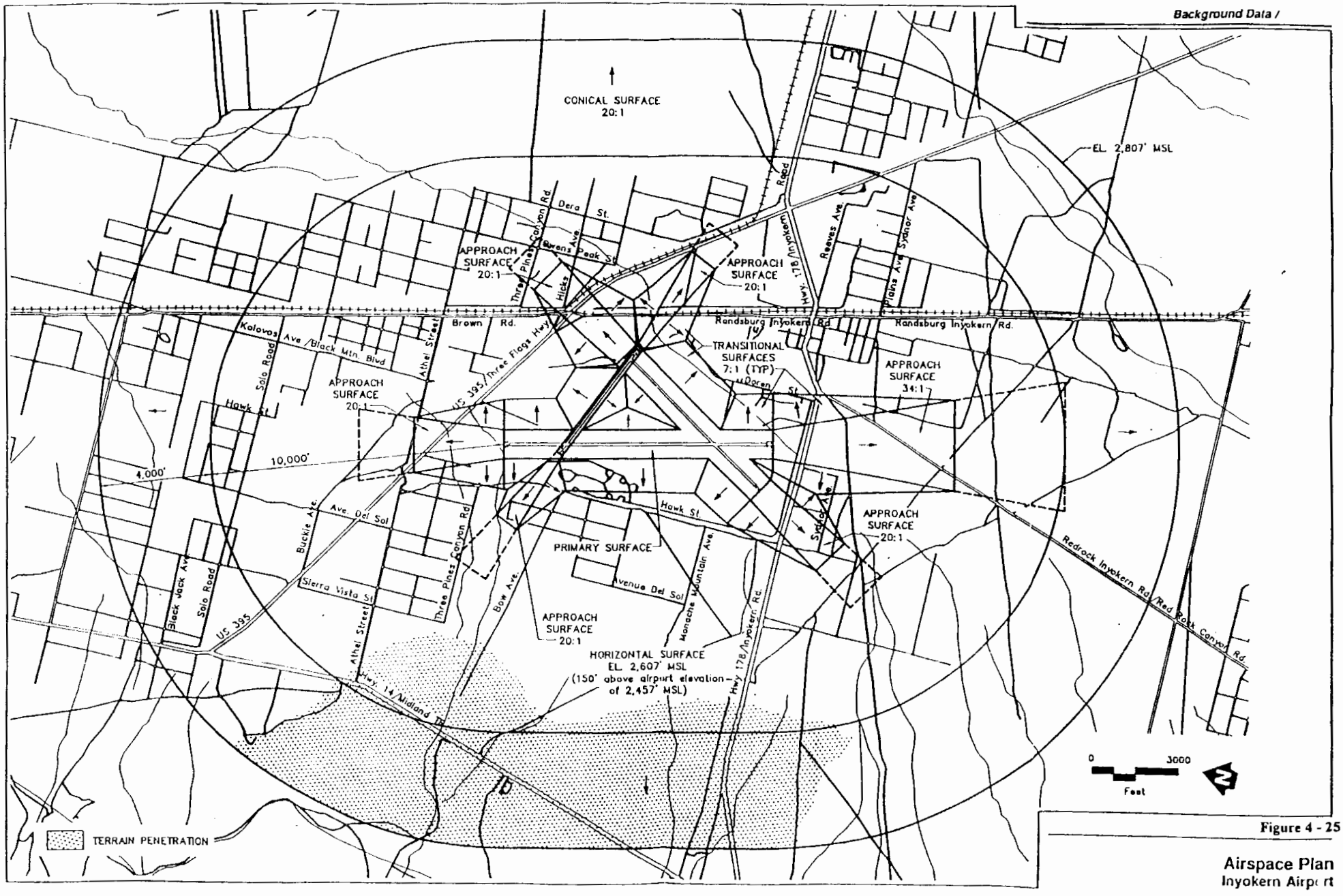


Figure 4 - 25

Airspace Plan
Inyokern Airport

4.6 Kern Valley Airport

4.6.1

The compatibility zones are designed to protect the planned 1,400- foot runway extension.

4.6.2

This plan was prepared as part of the Airport Master Plan for this airport.

4.6.3

Portions of the land which lies within the B1 zone south of the airport is designated for a 2.5-acre parcels. The general Compatibility Criteria (Table 2A) would otherwise require 10-acre parcels. However, because a substantial portion of the southern B1 zone is dedicated to open space and very-low-density uses, those areas currently designated for 2.5-acre parcels may be developed to this density.

4.6.4

On June 18, 1997, the County of Kern acquired 2.95 acres, previously leased from a private property owner, for airport related industrial uses. The property will be zoned M-2 PD (Medium Industrial - Precise Development Combining) to allow future expansion of airport related industrial uses.

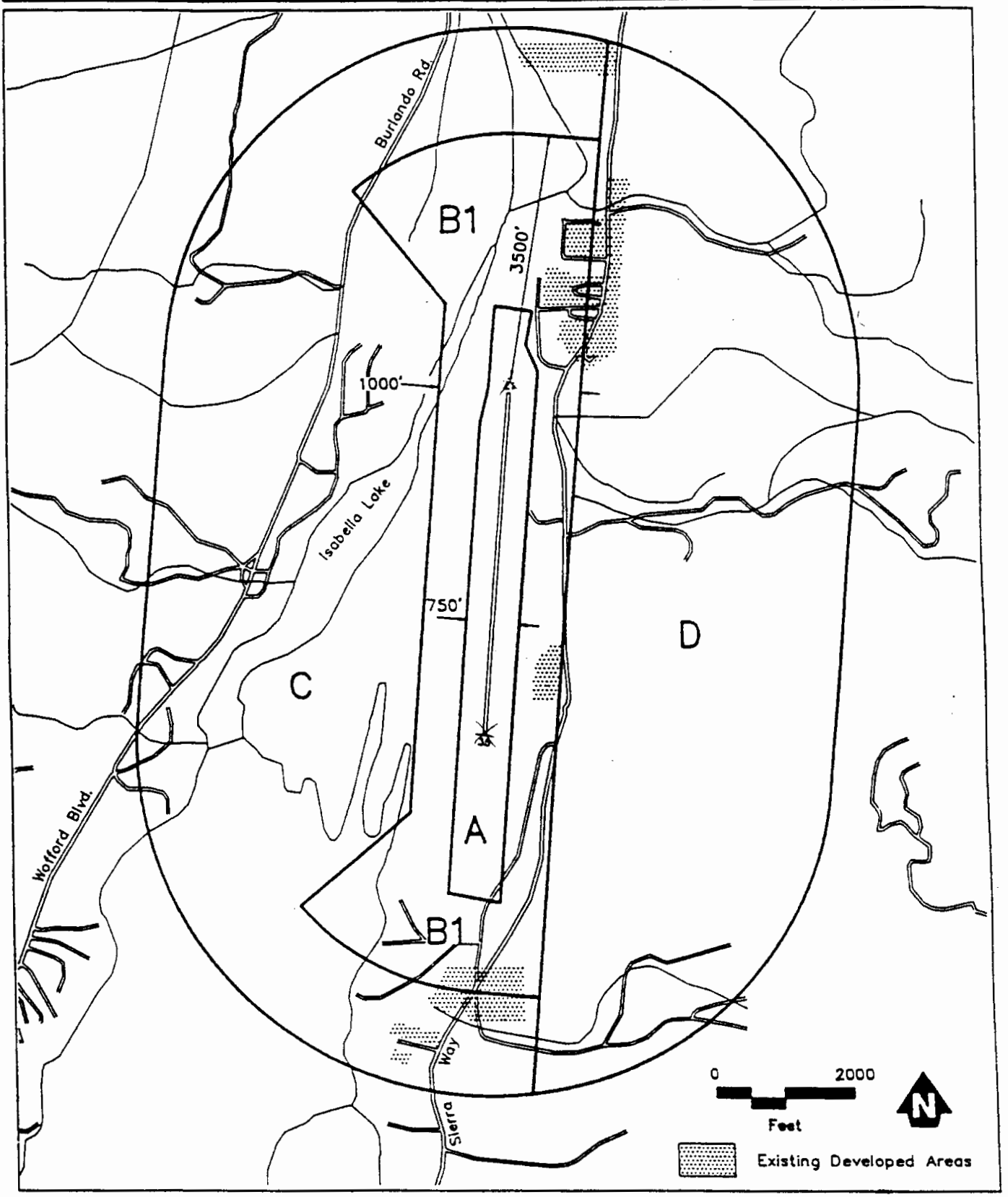

Burlando Rd.
B1
3500'
1000'
Isabella Lake
750'
D
C
A
B1
Wofford Blvd.
Sierra Way
0
2000
Feet
N
Existing Developed Areas

Figure 4 - 26

Table 4-16

Airport Environs

Kern Valley Airport

AIRPORT LOCATION AND ACCESS

- Located 3 miles south of the town of Kernville.
- Airport and approaches in County jurisdiction.
- Airport access via State Highway 178, then north on Sierra Way.

EXISTING AIRPORT AREA LAND USES

General Character

- Kern River runs on west side of airport.
- Mixture of general commercial and medium density residential to northeast.
- Town of Kernville 3 miles to north.
- Town of Lake Isabella approximately 8 miles to southwest.
- Remaining vicinity primarily undeveloped, mountainous terrain.

Runway Approaches

- *Runway 17 (north) Approach* — Open land within the runway protection zone; river and mountainous terrain begins approximately 1,600 feet west of runway centerline.
- *Runway 35 (south) Approach* — Open land within the runway protection zone and beyond.

Traffic Pattern

- Undeveloped.

LOCAL LAND USE PLANS AND ZONING

- Kern County General Plan adopted in 1982.

PLANNED LAND USES IN AIRPORT AREA

- No major development proposals currently active.

ESTABLISHED APPROACH PROTECTION MEASURES

- County Height Zoning Ordinance restricts the height of objects in the Airport's vicinity.

Source: Hodges & Shutt (October 1993)

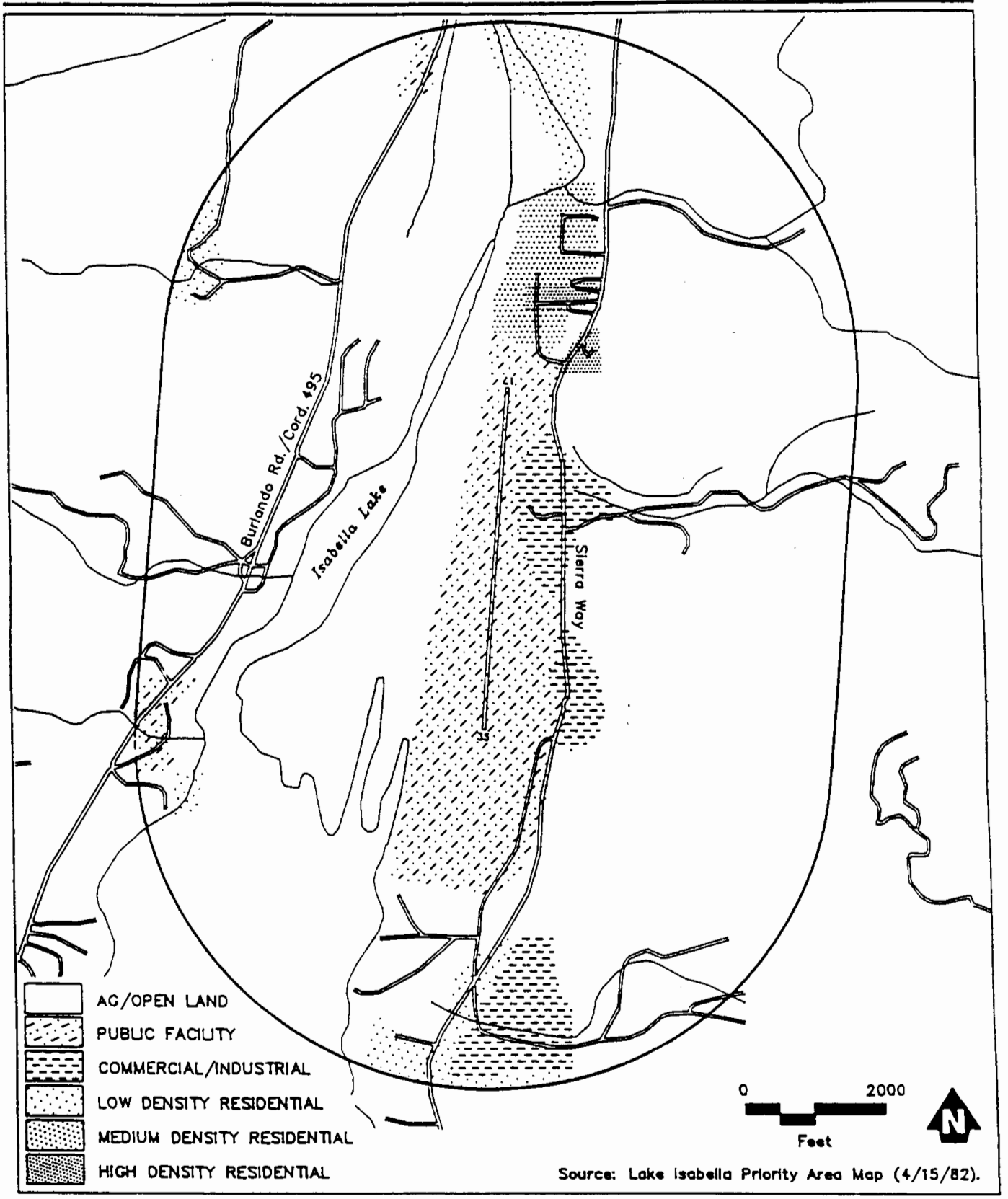


Figure 4 - 27

Land Use Designations

Kern Valley Airport

Table 4-17

Airport Features

Kern Valley Airport

AIRPORT PROPERTY

- *Ownership* — County of Kern.
- *Size* — 212 acres in lease.
- *Elevation* — 2,614 feet MSL.

AIRPORT PLANNING

- *Adopted Plans*
  - Master Plan adopted in 1991.
- *Planned Improvements*
  - Planned runway extension of 1,400 feet; runway widening to 75 feet; full-length parallel taxiway.
  - An increase in hangar and tiedown spaces is planned, as well as some additional auto parking.

BUILDING AREA

- *Location* — Existing building area lies in the southeast corner. Campground and aircraft parking for campers on west side of runway at about mid-field.
- *Aircraft Parking Capacity* — 58 total transient and based aircraft tiedowns.
- *Other Major Facilities* — Seven T-hangars, fuel island, snack bar, and FBO offices.
- *Services* — Fixed base operator provides several general aviation services including: instruction, repairs, charter, 100LL fuel, automobile fuel, and snacks.

RUNWAY SYSTEM

Runway 16-34

- *Critical Aircraft* — Single engine propeller.
- *Classification* — Airport Reference Code BU-I.
- *Dimensions* — 3,500 feet long, 50 feet wide.
- *Lighting* — None.
- *Surface* — Asphalt, good condition.
- *Taxiways* — Parallel taxiway serves the northern portion of the runway, and diverges to the east at mid-field, continuing south to the parking apron, hangar area, and FBO area.

RUNWAY APPROACHES

Runway 17

- *Approach Type* — Visual.
- *Runway Protection Zone* — Currently not on airport property; is planned to be an avigation easement.
- *Approach Obstacles* — Trees 15 feet high, 450 feet from runway end. 16:1 approach slope provides adequate clearance.

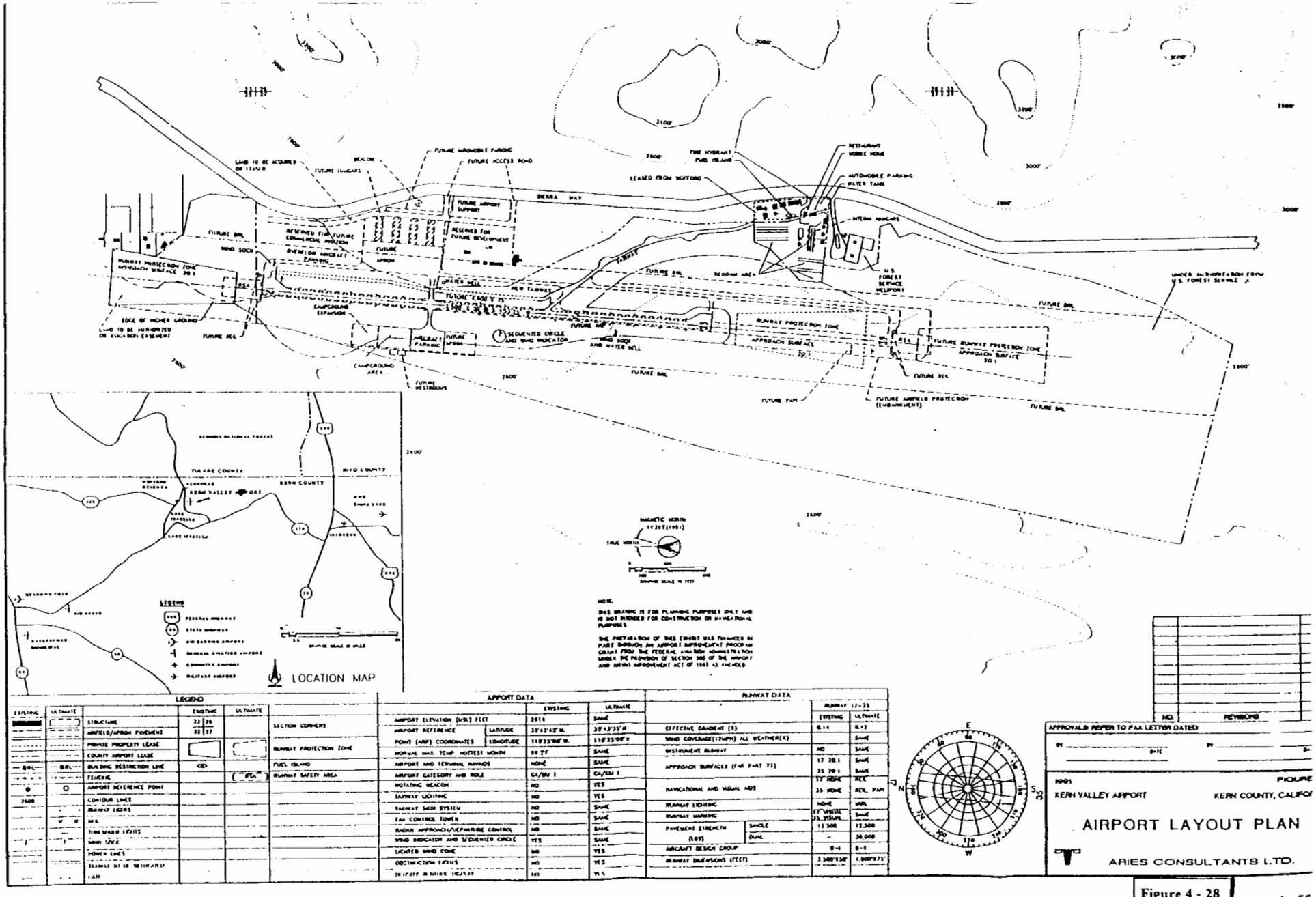
Runway 35

- *Approach Type* — Visual.
- *Runway Protection Zone* — On airport property.
- *Approach Obstacles* — No penetrations of approach surface.

Traffic Pattern

- *Location* — Established pattern west of runway only.
- *Altitude* — 1,000 feet above airport elevation.

Source: Hodges & Shutt (October 1993)



NOTE:

THIS DRAWING IS FOR PLANNING PURPOSES ONLY AND IS NOT INTENDED FOR CONSTRUCTION OR NAVIGATIONAL PURPOSES

THE PREPARATION OF THIS EXHIBIT WAS FINANCED IN PART THROUGH AN AIRPORT IMPROVEMENT PROGRAM GRANT FROM THE FEDERAL AVIATION ADMINISTRATION UNDER THE PROVISION OF SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982 AS AMENDED

LEGEND

EXISTING	ULTIMATE		EXISTING	ULTIMATE	
		STRUCTURE	33 26 / 32 27		SECTION CORNERS
		AIRFIELD/APRON PAVEMENT			
		PRIVATE PROPERTY LEASE			RUNWAY PROTECTION ZONE
		COUNTY AIRPORT LEASE			
BRL	BRL	BUILDING RESTRICTION LINE	CED		FUEL ISLAND
		FENCING		"RSA"	RUNWAY SAFETY AREA
		AIRPORT REFERENCE POINT			
2600		CONTOUR LINES			
		RUNWAY LIGHTS			
		MIRL			
		TURNAROUND LIGHTS			
		WIND SOCK			
		POWER LINES			
		RUNWAY OBJECT FREE AREA			
		LAKE			

AIRPORT DATA

		EXISTING	ULTIMATE
AIRPORT ELEVATION (MSL) FEET		2616	SAME
AIRPORT REFERENCE POINT (ARP) COORDINATES	LATITUDE	35°43'43" N.	35°43'35" N
	LONGITUDE	118°23'08" W.	118°23'08" W
NORMAL MAX. TEMP. HOTTEST MONTH		98.2°F	SAME
AIRPORT AND TERMINAL BEACONS		NONE	SAME
AIRPORT CATEGORY AND ROLE		GA/BU 1	GA/CU 1
ROTATING BEACON		NO	YES
RUNWAY LIGHTING		NO	YES
RUNWAY SIGN SYSTEM		NO	SAME
FAA CONTROL TOWER		NO	SAME
RADAR APPROACH/DEPARTURE CONTROL		NO	SAME
WIND INDICATOR AND SEGMENTED CIRCLE		YES	SAME
LIGHTED WIND CONE		NO	YES
OBSTRUCTION LIGHTS		NO	YES
[illegible]		NO	YES

RUNWAY DATA

		RUNWAY 17-35 EXISTING	RUNWAY 17-35 ULTIMATE
EFFECTIVE GRADIENT (%)		0.14	0.12
WIND COVERAGE (13 MPH) ALL WEATHER (%)			SAME
INSTRUMENT RUNWAY		NO	SAME
APPROACH SURFACES (FAR PART 77)		17 20:1	SAME
		35 20:1	SAME
NAVIGATIONAL AND VISUAL AIDS		17 NONE	REIL
		35 NONE	REIL, PAPI
RUNWAY LIGHTING		NONE	MIRL
RUNWAY MARKING		17 VISUAL 35 VISUAL	SAME
PAVEMENT STRENGTH (LBS)	SINGLE	12,500	12,500
	DUAL	–	30,000
AIRCRAFT DESIGN GROUP		B-I	B-II
RUNWAY DIMENSIONS (FEET)		3,500'X50'	4,800'X75'

NO.	REVISIONS

APPROVALS REFER TO FAA LETTER DATED

BY _____ DATE _____ BY _____ DATE _____

1991 FIGURE

KERN VALLEY AIRPORT KERN COUNTY, CALIFORNIA

AIRPORT LAYOUT PLAN

ARIES CONSULTANTS LTD.

Figure 4 - 28

Table 4-18

Forecast Airport Activity

Kern Valley Airport

AIRCRAFT OPERATIONS

Total	
Annual	18,000
Average Day	49
Distribution	
Air Taxi	5.6%
Other Intinerant	75.0%
Local	19.4%

TIME OF DAY DISTRIBUTION

Data Not Available

RUNWAY USE DISTRIBUTION

Data Not Available

FLIGHT TRACK DATA

- Pattern Altitude – 1,000 feet AGL.
- Right traffic to Runway 17 (no east side pattern).

Source: Aries (1991) for 2010

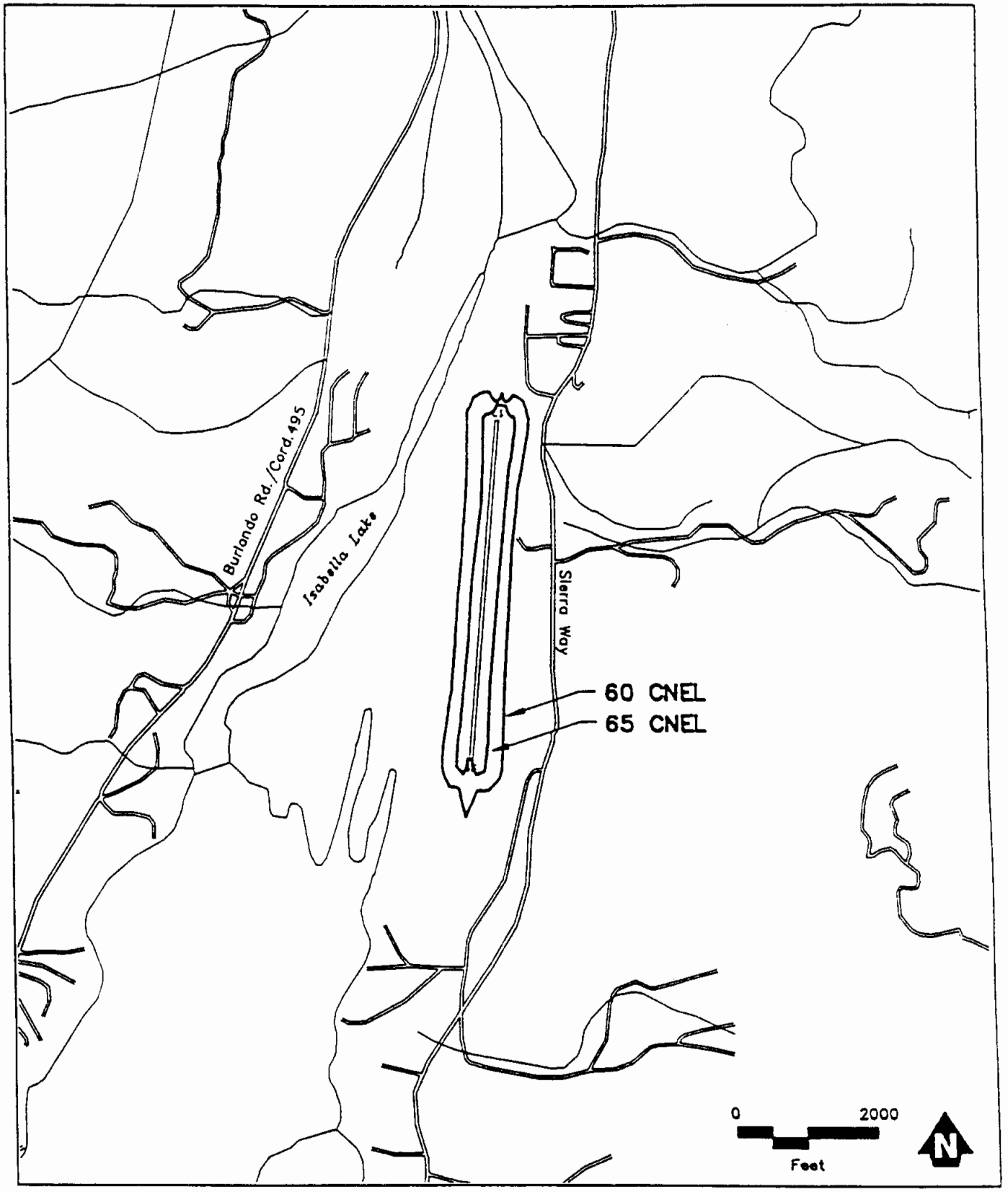


Figure 4 - 29

Noise Contours

Kern Valley Airport

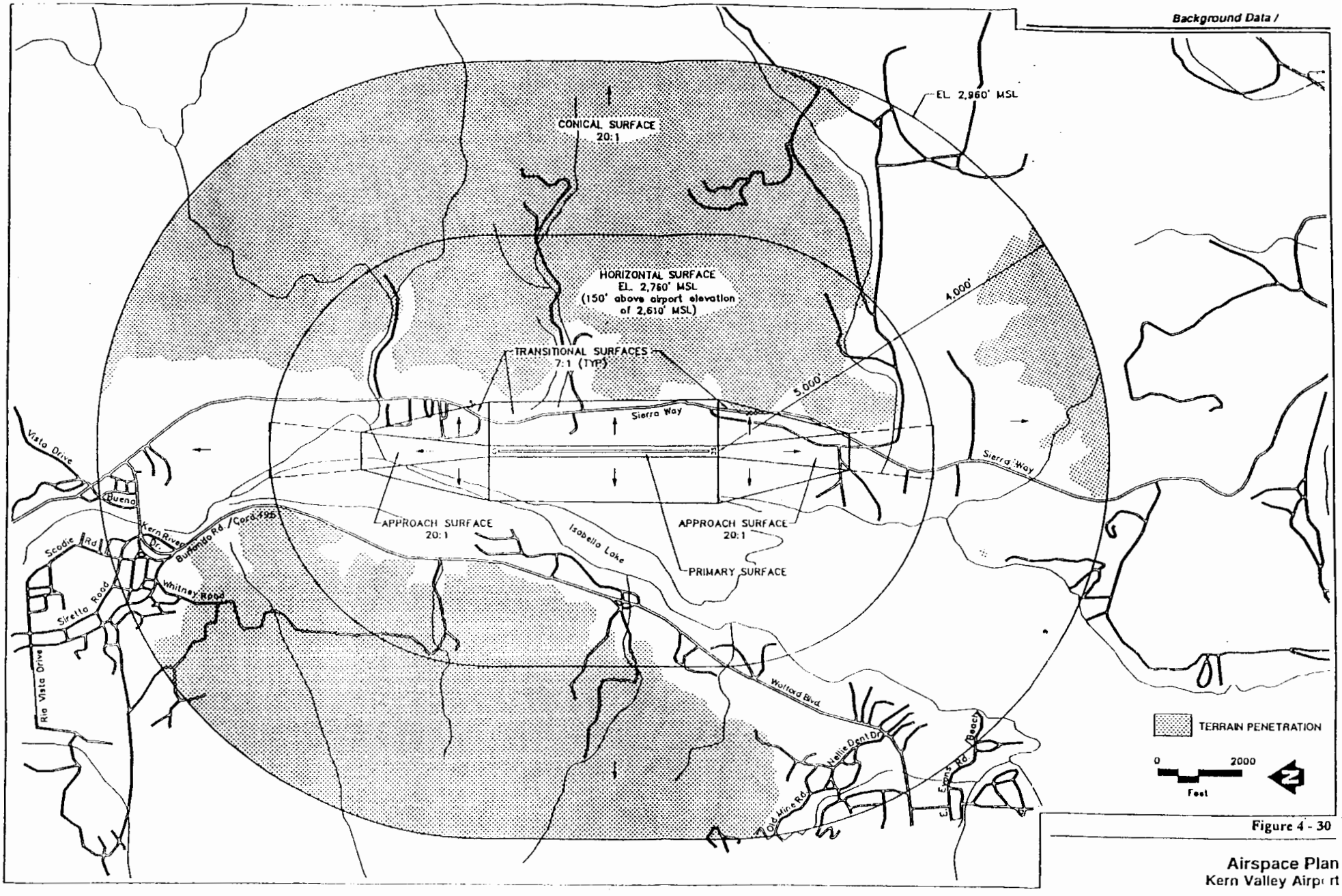


Figure 4 - 30

Airspace Plan
Kern Valley Airport

4.7 Lost Hills-Kern County Airport

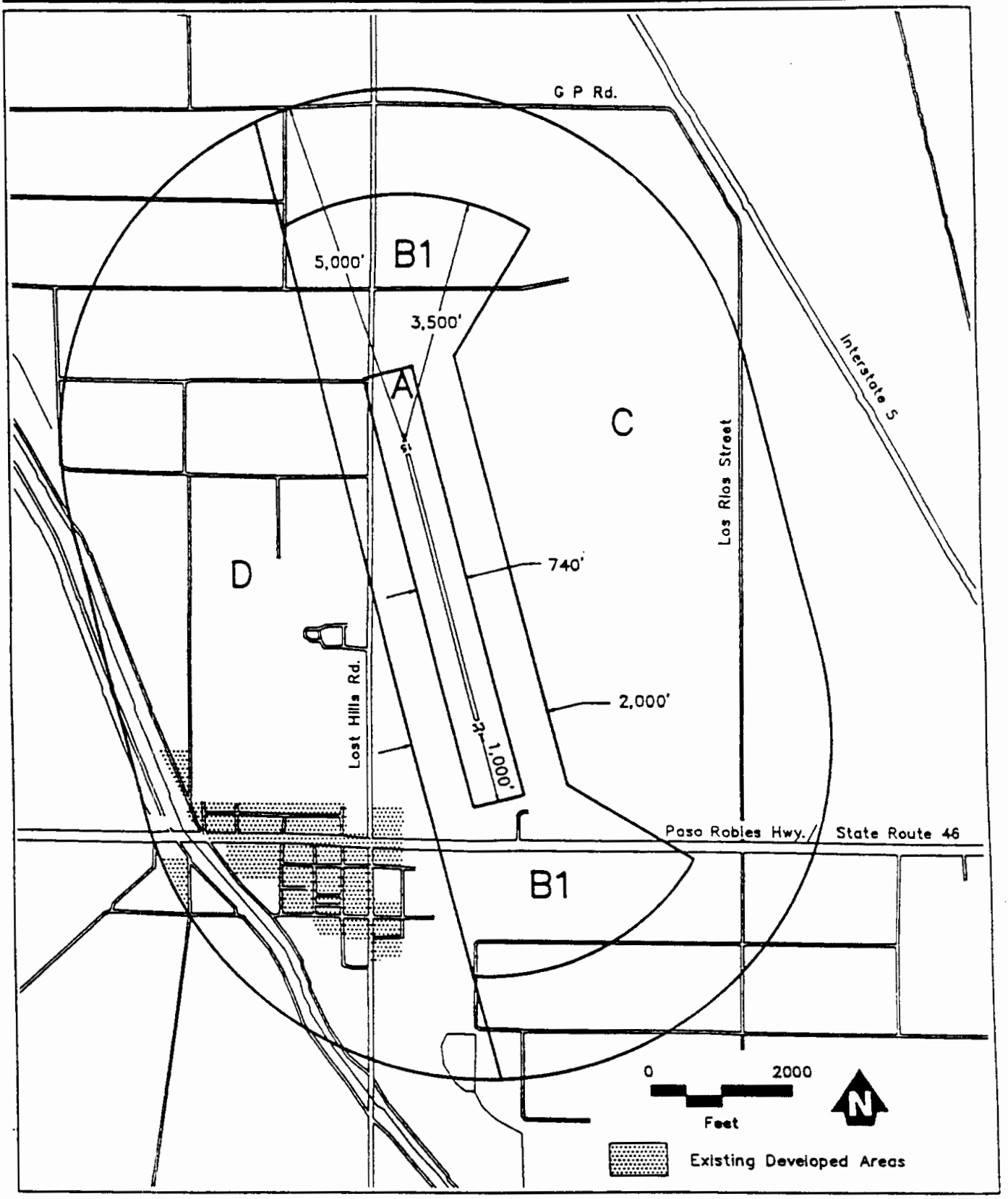


Figure 4 - 31

Comprehensive Land Use Plan

Lost Hills - Kern County Airport

Table 4-19

Airport Environs

Lost Hills-Kern County Airport

AIRPORT LOCATION AND ACCESS

- Just northeast of the town of Lost Hills, and approximately 42 miles northwest of Bakersfield, the County seat.
- Airport and approaches within County jurisdiction.
- Access from Interstate Route 5 via State Highway 46, then north on Woodward Street.

EXISTING AIRPORT AREA LAND USES

General Character

- Most of the vicinity is undeveloped with a small residential subdivision to the southwest.

Runway Approaches

- *Runway 15 (north) Approach* — Undeveloped.
- *Runway 33 (south) Approach* — Undeveloped.

Traffic Pattern

- Pattern established east side only; some agriculture; mostly undeveloped.

LOCAL LAND USE PLANS AND ZONING

- Kern County General Plan adopted 1982.

PLANNED LAND USES IN AIRPORT AREA

- No major projects currently under consideration.
- Continued infill of commercial/industrial in the community southwest of the Airport; additional commercial development near intersection of Interstate Highway 5 and State Highway 46.

ESTABLISHED APPROACH PROTECTION MEASURES

- Kern County Height Overlay Zone limits the height of objects in the vicinity of the Airport.

Source: Hodges & Shutt (October 1993)

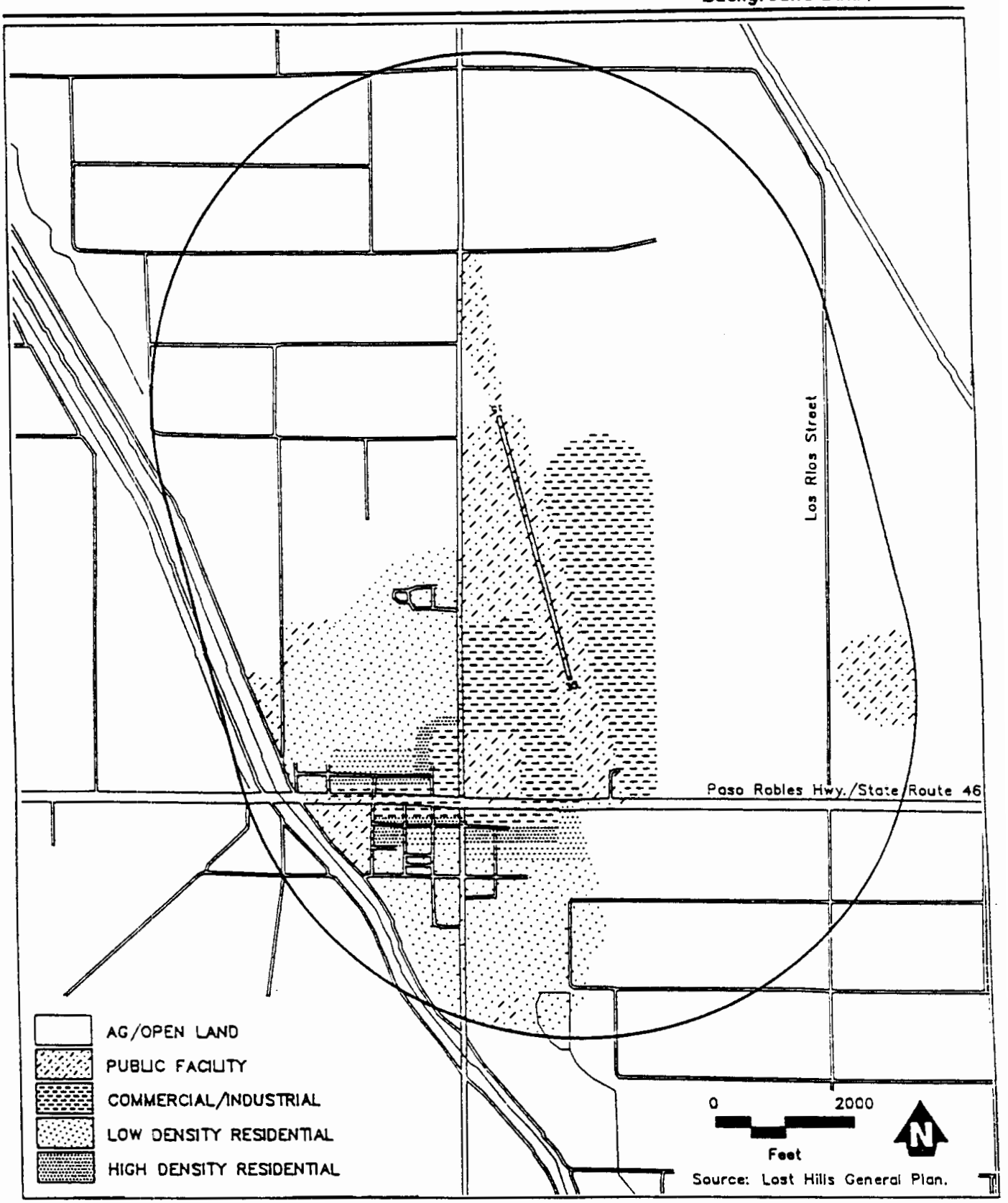


Figure 4 - 32

Land Use Designations

Lost Hills-Kern County Airport

Table 4-20

Airport Features

Lost Hills-Kern County Airport

AIRPORT PROPERTY

- *Ownership* — Kern County.
- *Size* — Approx. 390 acres fee title.
- *Elevation* — 274 feet MSL.

AIRPORT PLANNING

- *Adopted Plans*
  - Airport Layout Plan adopted in 1974.
- *Planned Improvements*
  - No major development proposals currently active.

BUILDING AREA

- *Location* — Mid-field, west side of runway.
- *Aircraft Parking Capacity* — 12 based and transient tiedowns.
- *Other Major Facilities* — 3,600-square-foot hangar, shop building, and mobile home.
- *Services* — None.

RUNWAY SYSTEM

Runway 15-33

- *Critical Aircraft* — Single-engine propeller.
- *Classification* — Airport Reference Code BU-I, small aircraft.
- *Dimensions* — 3,020 feet long, 60 feet wide.
- *Lighting* — Medium-intensity runway edge lighting.
- *Surface* — Asphalt, fair condition.
- *Taxiways* — Two exit taxiways, one at mid-field and one on south end of runway.

RUNWAY APPROACHES

Runway 15

- *Approach Type* — Visual.
- *Runway Protection Zone* — All is within airport property line.
- *Approach Obstacles* — No penetrations of approach surface.

Runway 33

- *Approach Type* — Visual.
- *Runway Protection Zone* — All of existing RPZ is on airport property.
- *Approach Obstacles* — 40-foot-high poles lie 1,300 feet from runway end and 200 feet east of the runway centerline. A 27:1 approach slope provides adequate clearance.

Traffic Pattern

- *Location* — Established pattern east of runway only.
- *Altitude* — 1,000 feet above airport elevation.

Source: Hodges & Shutt (October 1993)

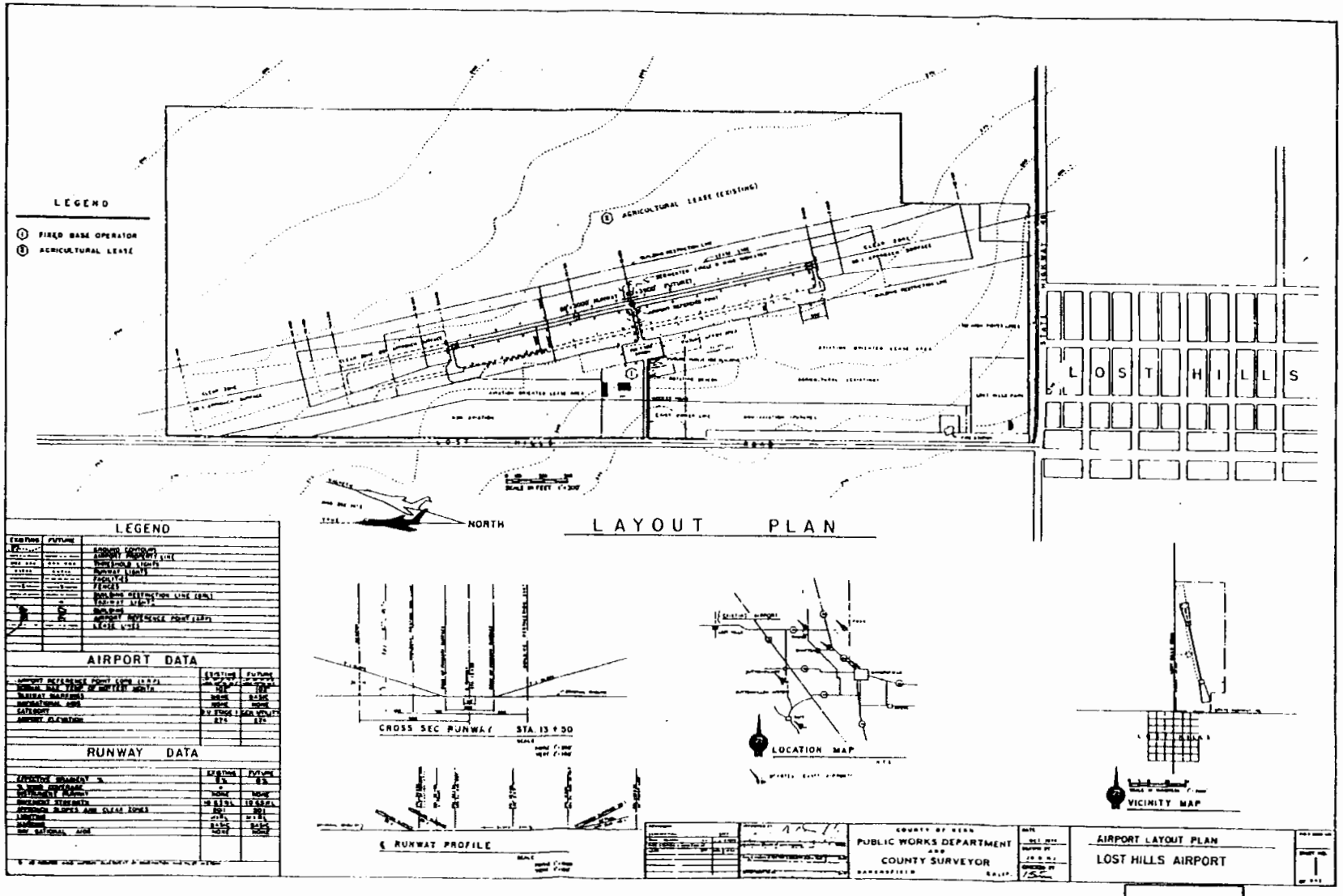

LEGEND
① FIXED BASE OPERATOR
⑧ AGRICULTURAL LEASE
⑧ AGRICULTURAL LEASE (EXISTING)
L O S T H I L L S
NORTH
LAYOUT PLAN
LEGEND
AIRPORT DATA
RUNWAY DATA
CROSS SEC RUNWAY STA. 13 + 50
LOCATION MAP
VICINITY MAP
℄ RUNWAY PROFILE
COUNTY OF KERN
PUBLIC WORKS DEPARTMENT
AND
COUNTY SURVEYOR
BAKERSFIELD
AIRPORT LAYOUT PLAN
LOST HILLS AIRPORT

Figure 4 - 33

Table 4-21

Forecast Airport Activity

Lost Hills-Kern County Airport

AIRCRAFT OPERATIONS

Total	
Annual	3,500
Average Day	10
Distribution	
Single-Engine	100.0%

TIME OF DAY DISTRIBUTION

All Aircraft		
Day	(0700-1900)	90.0%
Evening	(1900-2200)	10.0%
Night	(2200-0700)	0.0%

RUNWAY USE DISTRIBUTION

All Aircraft	
All Operations	
Runway 15	10.0%
Runway 33	90.0%

FLIGHT TRACK DATA

- Pattern Altitude – 1,000 feet AGL.
- Right traffic on Runway 33 (no west side pattern).

Source: Aries (1989) for then current year

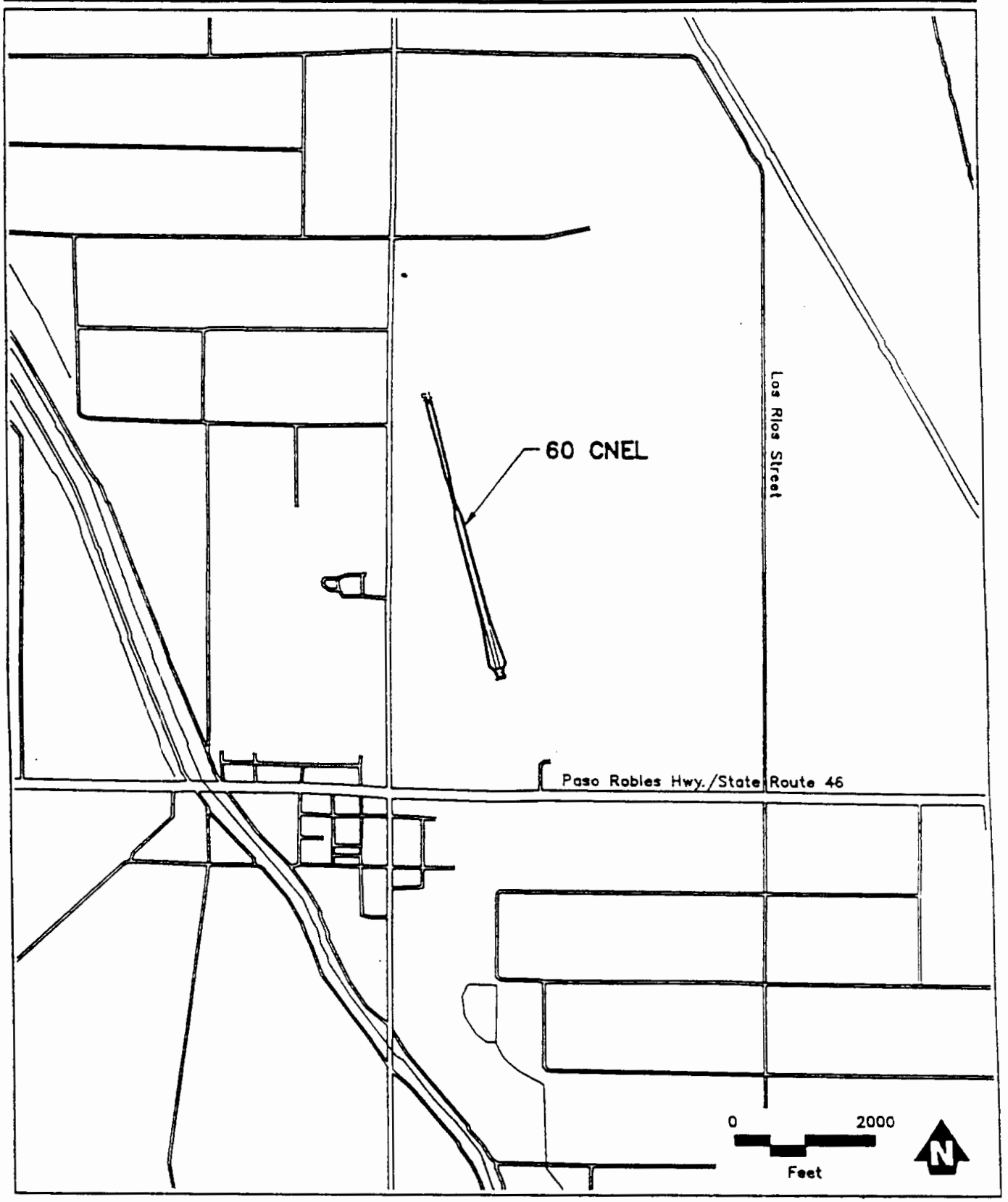


Figure 4 - 34

Noise Contours

Lost Hills-Kern County Airport

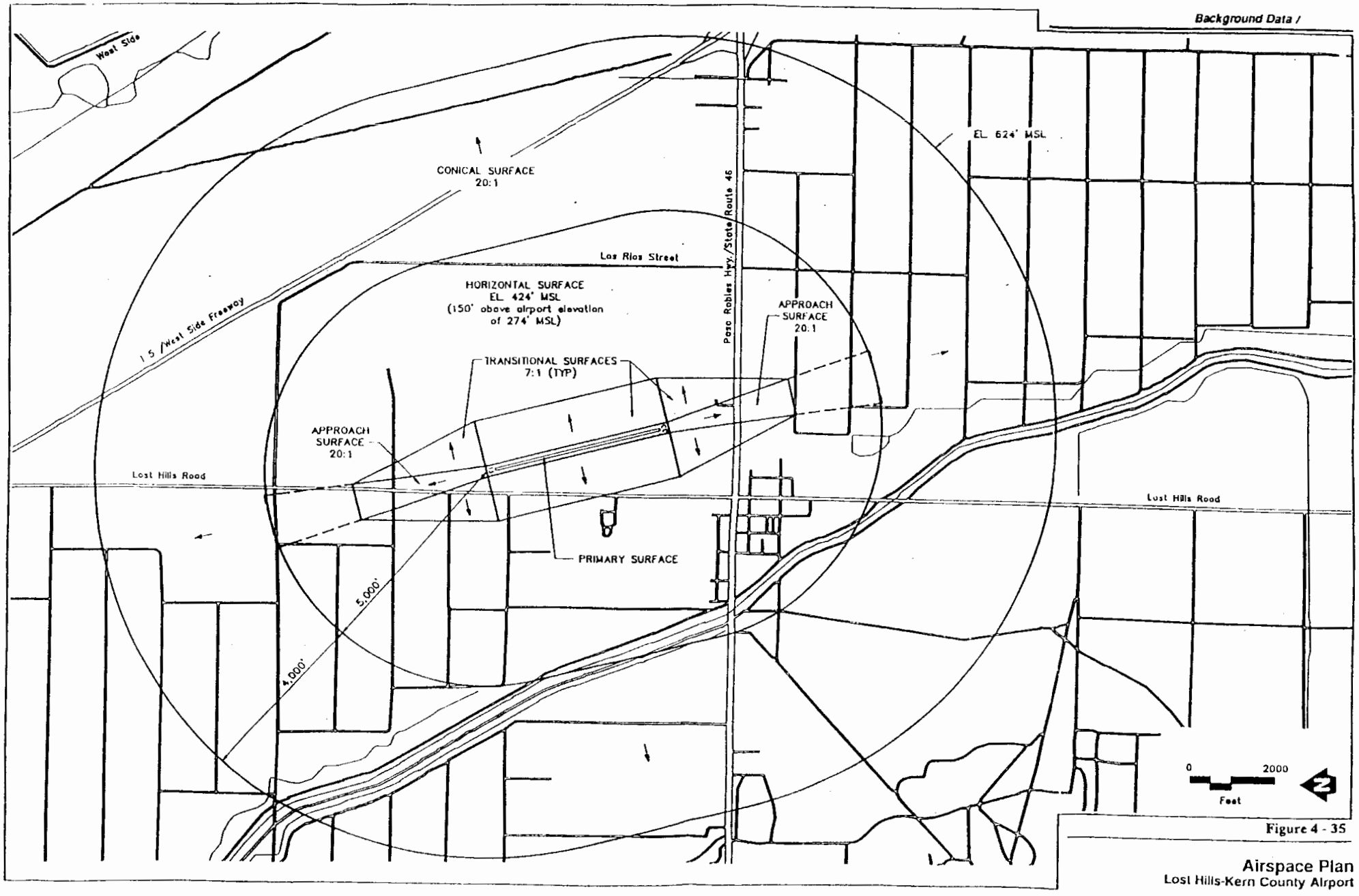


Figure 4 - 35

Airspace Plan
Lost Hills-Kern County Airport

4.8 Meadows Field

4.8.1

The compatibility zones are designed to protect the planned 4,000-foot extension to Runway 12R-30L.

4.8.2

This plan was prepared as part of the Airport Master Plan for this airport.

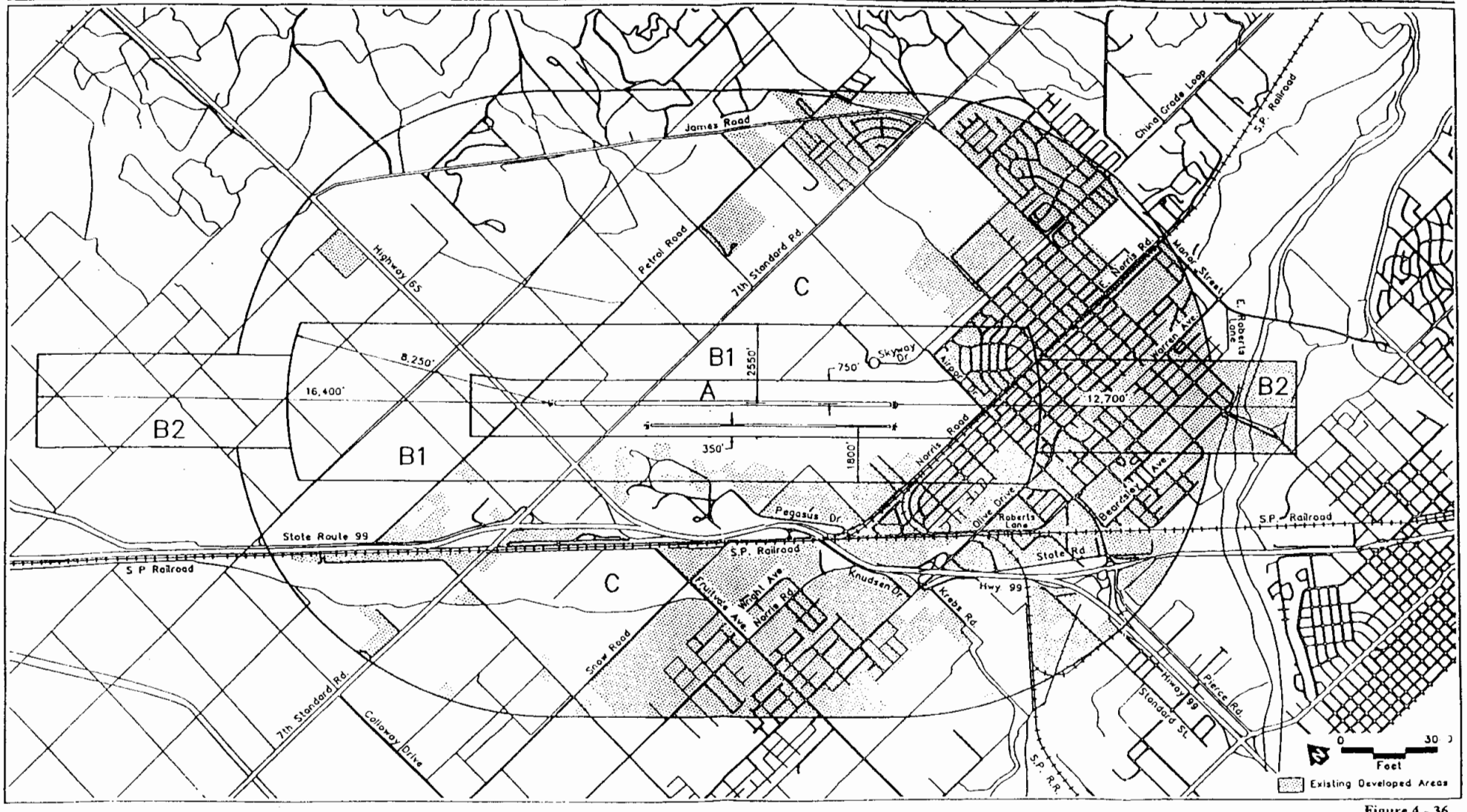

James Road
Highway 65
Petrol Road
7th Standard Rd.
C
B1
2550'
750'
Skyway Dr.
A
8,250'
16,400'
B2
B1
350'
1800'
12,700'
B2
Airport Dr.
Norris Road
E. Norris Rd.
Motor Street
Warren Ave.
E. Roberts Lane
Chical Grade Loop
S.P. Railroad
Pegasus Dr.
Olive Drive
Roberts Lane
Beardsley Ave.
S.P. Railroad
State Route 99
S.P. Railroad
S P Railroad
State Rd.
C
Fruitvale Ave.
Wright Ave.
Norris Rd.
Knudsen Dr.
Hwy 99
Krebs Rd.
Snow Road
7th Standard Rd.
Calloway Drive
Highway 99
Standard St.
Pierce Rd.
S.P. R.R.
0
30
Feet
Existing Developed Areas

Figure 4 - 36

Table 4-22

Airport Environs

Meadows Field

AIRPORT LOCATION AND ACCESS

- Located approximately 4 miles northwest of the city of Bakersfield.
- Airport and approaches totally in County jurisdiction.
- Access from U.S. Highway 99, via Norris Road.

EXISTING AIRPORT AREA LAND USES

General Character

- Intensive agriculture to the north and northwest; service industrial uses to the northeast and to the west; oil fields to the east; educational facilities and medium residential to the south.

Runway Approaches

- *Runway 12L (northwest) Approach* — State Highway 65 approximately 1,000 feet from runway end; intensive agriculture beyond.
- *Runway 30L (southeast) Approach* — Taxiway P at end of runway; intersection of Norris Road and Airport Drive at end of Taxiway P; unincorporated community of Oildale beyond.
- *Runway 12R (northwest) Approach* — Open airport land 1/2 mile out with a road at approximately 2,000 feet; intensive agriculture beyond.
- *Runway 30L (southeast) Approach* — Taxiway R at approximately 1,700 feet; Norris Road at approximately 2,200 feet; community of Oildale beyond.

Traffic Pattern

- Residential development to the south; industrial uses to the west; agricultural, industrial, and residential uses to the east; agricultural and residential uses to the north.

LOCAL LAND USE PLANS AND ZONING

- Kern County *General Plan* adopted in 1982; *2010 Plan* adopted in March 1990.

PLANNED LAND USES IN AIRPORT AREA

- Continued infill of residential uses to the east.
- No major development proposals currently active.

ESTABLISHED APPROACH PROTECTION MEASURES

- City of Bakersfield Height Restricting Zoning Ordinance and Kern County Height Zoning Ordinance limit the height of objects in the vicinity of the Airport.

Source: Hodges & Shutt (October 1993)

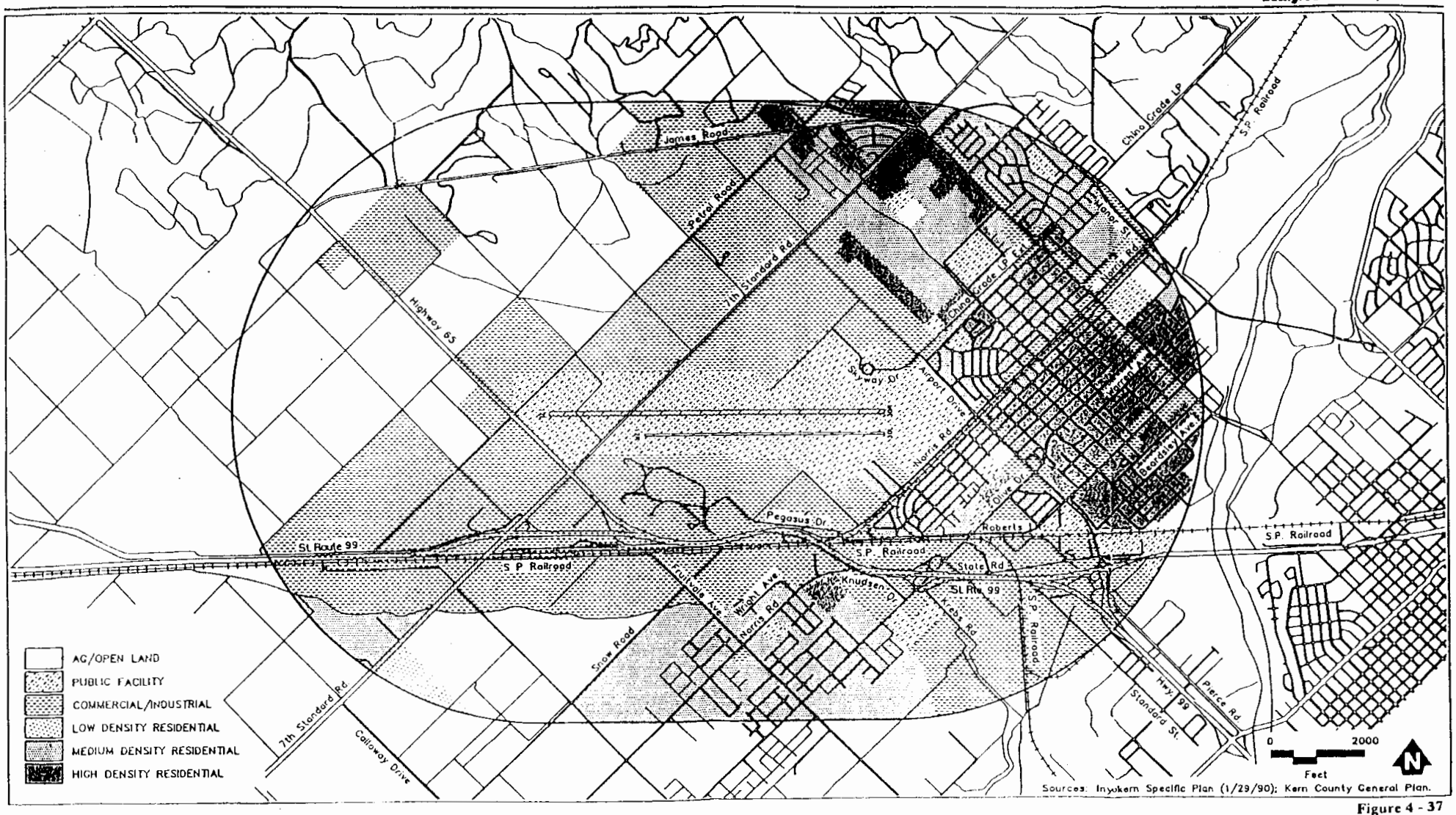


Figure 4 - 37

Land Use Designations

Meadows Field Airport

Table 4-23

Airport Features

Meadows Field

AIRPORT PROPERTY

- *Ownership* — County of Kern.
- *Size* — 1,107 acres in fee.
- *Elevation* — 507 feet MSL.

AIRPORT PLANNING

- *Adopted Plans*
  - Original Master Plan adopted in 1976 by County Board of Supervisors.
  - Master Plan Update and Economic Land Use Study adopted in 1988.
- *Planned Improvements*
  - No change to Runway 12L-30R proposed.
  - A 4,000-foot extension of Runway 12R-30L is planned, including a new parallel taxiway, entry and exit taxiways, and two additional taxiways connecting the extension to the northwest end of Runway 12L-30R and the rest of the airfield.
  - Property acquisition for future airport development and protection.

BUILDING AREA

- *Location* — On east side of runway.
- *Aircraft Parking Capacity* — 188 tiedown spaces, and 118 T-hangars.
- *Other Major Facilities* — Fixed base operations maintenance yard; offices; fuel facilities; administration/terminal building; motel/restaurant.
- *Services* — Flight instruction; aircraft sales; rental; charter; repairs; automobile rental; fuel; restaurant; lodging.

RUNWAY SYSTEM

Runway 12L-30R

- *Critical Aircraft* — Large airline aircraft.
- *Classification* — Airport Reference Code C-IV.
- *Dimensions* — 10,857 feet long, 150 feet wide; Runway 30R threshold displaced 3,428 feet.
- *Lighting* — High-intensity approach lighting system with Runway Alignment Indicator Lights and PAPI on Runway 30R.
- *Surface* — Asphalt; good condition.
- *Taxiways* — Full-length parallel taxiway; 14 exit taxiways.

Runway 12R-30L

- *Critical Aircraft* — Large twin-engine piston.
- *Classification* — Airport Reference Code B-II.
- *Dimensions* — 3,700 feet long, 75 feet wide.
- *Lighting* — Medium intensity runway edge lights.
- *Surface* — Asphalt; good condition.
- *Taxiways* — Three exit taxiways.

Source: Hodges & Shutt (October 1993)

Table 4-23 Continued

Airport Features

Meadows Field

RUNWAY APPROACHES

Runway 12L

- *Approach Type* — Precision.
- *Runway Protection Zone* — All on airport property.
- *Approach Obstacles* — No penetrations of the approach surface.

Runway 30R

- *Approach Type* — Precision.
- *Runway Protection Zone* — Mostly on airport property; remainder covered by avigation easement.
- *Approach Obstacles* — No penetrations of approach surface.

Runway 12R

- *Approach Type* — Visual.
- *Runway Protection Zone* — All on airport property.
- *Approach Obstacles* — No penetrations of the approach surface.

Runway 30L

- *Approach Type* — Visual.
- *Runway Protection Zone* — On airport property.
- *Approach Obstacles* — Railroad 1,700 feet from runway end and 400 feet left of centerline. 46:1 approach provides adequate clearance.

Traffic Pattern

- *Location* — Established pattern northeast of Runway 12L-30R, and southwest of Runway 12L-30R.
- *Altitude* — 1,000 feet above airport elevation.

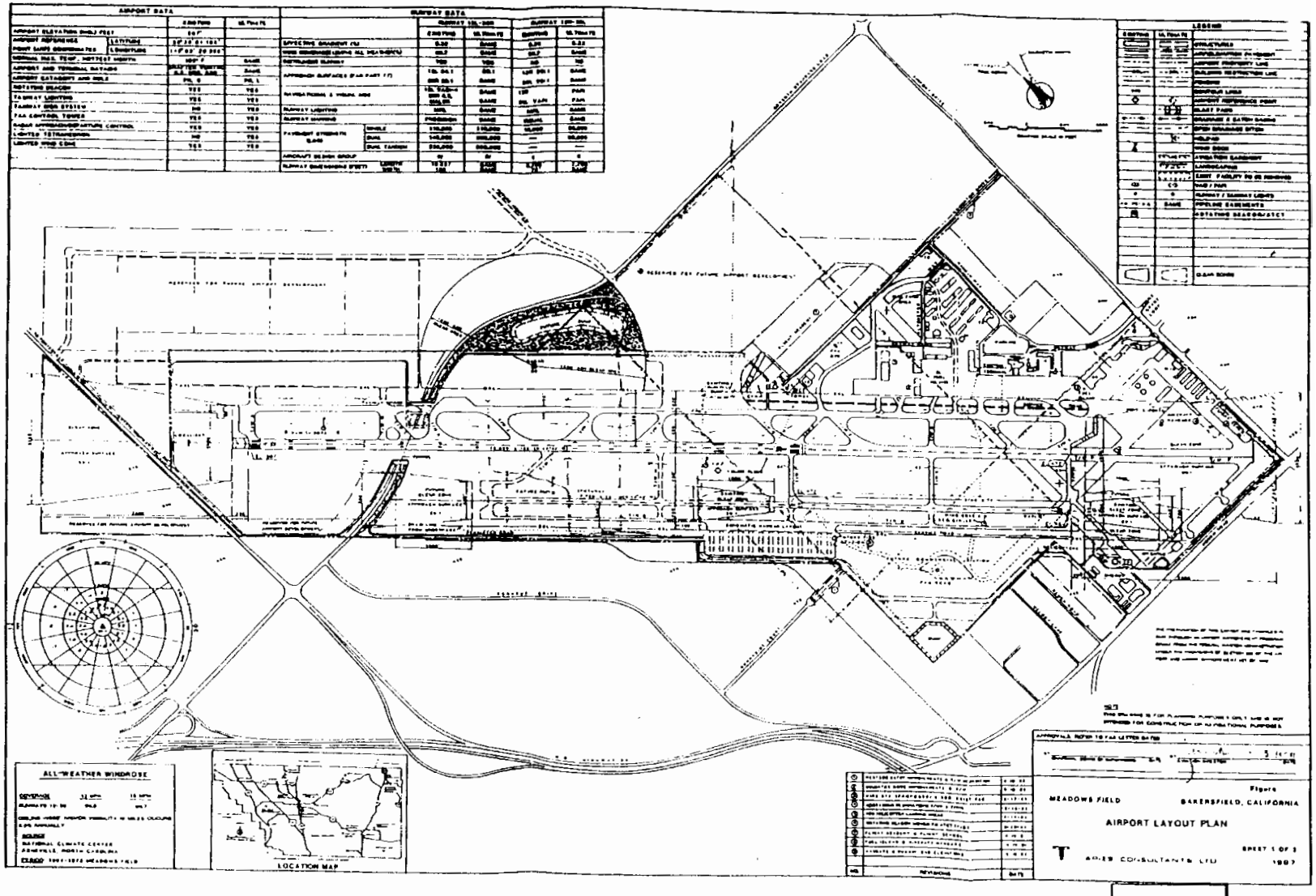

AIRPORT DATA
RUNWAY DATA
LEGEND
ALL-WEATHER WINDROSE
LOCATION MAP
MEADOWS FIELD
BAKERSFIELD, CALIFORNIA
AIRPORT LAYOUT PLAN
ADLER CONSULTANTS LTD
1987

Figure 4 - 38

Table 4-24

Forecast Airport Activity

Meadows Field

AIRCRAFT OPERATIONS

Total	
Annual	259,880
Average Day	712
Distribution	
MD-80	0.8%
B737-200	0.6%
Commuter	11.5%
GA Jet (Noisy)	0.6%
GA Jet (Quiet)	2.0%
Twin Turboprop	2.2%
Twin Prop	22.2%
Single Prop	57.3%
Helicopter (Civil)	1.4%
Helicooter (Military)	1.1%
C-130	0.3%

FLIGHT TRACK DATA

- Pattern Altitude - 1,500 feet AGL.
- Right traffic to 30R (Pattern for Runway 12L-30R is on northeast side).
- Right traffic to Runway 12R (Pattern for Runway 12R-30L is on the southwest side).

TIME OF DAY DISTRIBUTION

	Day (0700-1900)	Evening (1900-2200)	Night (2200-0700)
MD-80	83.0%	17.0%	0%
B737-200	50.0%	50.0%	0%
Commuter	71.0%	12.0%	17.0%
General Aviation	90.0%	7.0%	3.0%
Military	85.0%	15.0%	0%

RUNWAY USE DISTRIBUTION

	Air Carrier/Commuter/Air Taxi/Military		General Aviation Takeoffs/Landings	
Runway No.	Takeoffs	Landings	Single-engine	Twin-engine
12L	10.0%	15.0%	5.0%	6.0%
30R	90.0%	85.0%	45.0%	55.0%
12R	0%	0%	5.0%	4.0%
30l	0%	0%	45.0%	35.0%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: Aries (1993) for 1997.

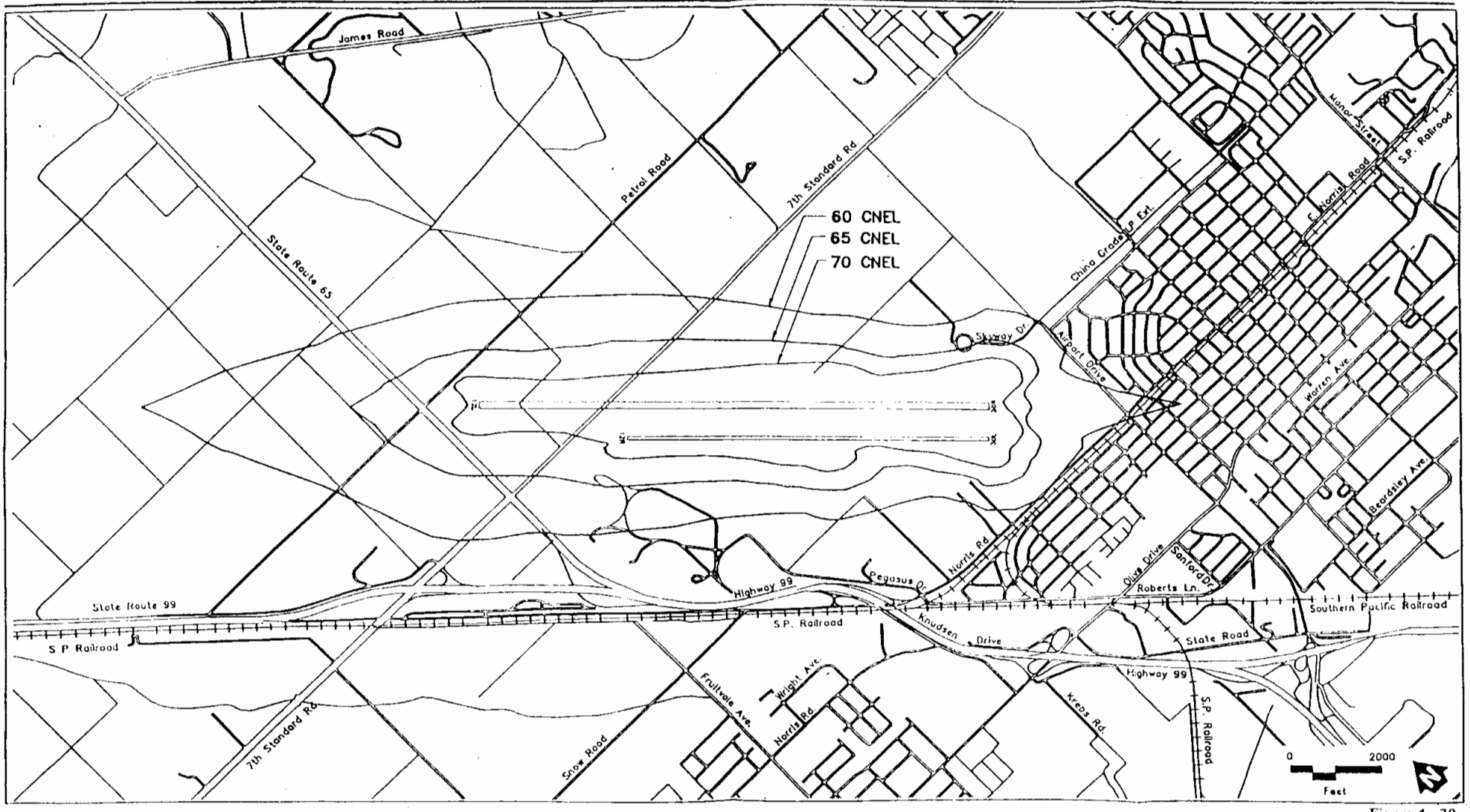


Figure 4 - 39

Noise Contours

Meadows Field Airport

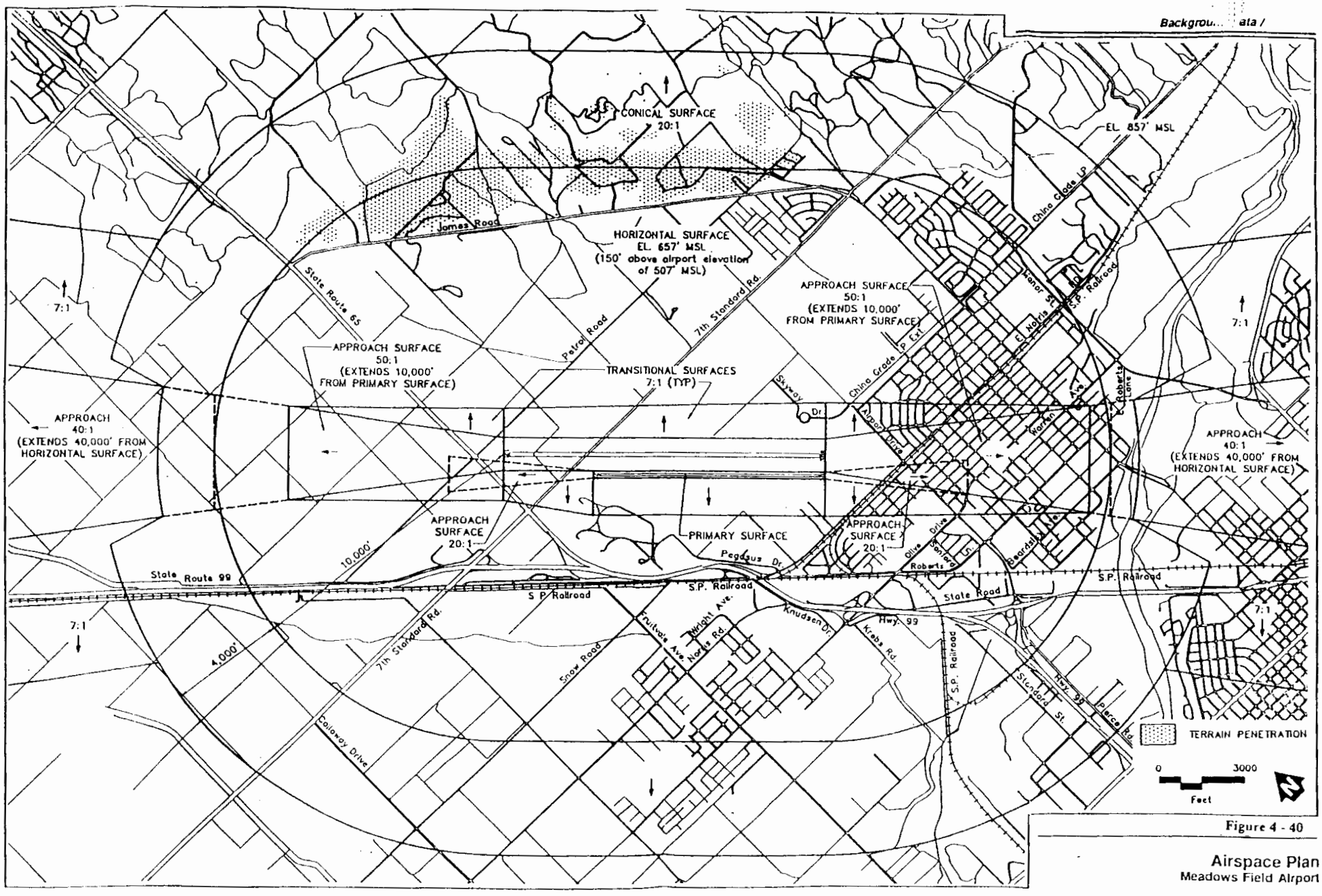


Figure 4 - 40

Airspace Plan
Meadows Field Airport

4.9 Mojave Airport

The Mojave Airport is operated by the East Kern Airport District (EKAD). The EKAD is a special district with an elected Board of Directors and General Manager. The Mojave Airport was formerly a military base, and currently is the largest general aviation airport in Kern County.
The Mojave Airport is contain in an area of approximately 3,000 acres. It serves as a Civilian Flight Test Center, the location of the National Test Pilot School, and as a base for modifications of major military jets and civilian aircraft. It is also a major aircraft storage and reconditioning facility. The Mojave Airport is home to several large industrial operations, such as B.A.E. Systems, Fiberset, Scaled Composites, AVTEL, Orbital Sciences and General Electric. See Table 4–25 and 4–26 for a description of Airport facilities and operations.

4.9.1 Noise Contours

Land within the portion of the Comprehensive Land Use Plan (see Figure 4–41) tied to Runway 12–30 and the future extension of Runway 8–26 may be significantly affected by the noise contours. The noise contours developed for this study were based upon 2001 operations. There is likely to be wide variations in noise contours (and impacts) from year to year. However, the noise contours presented in this report are based upon conservative assumptions which should be useful in guiding land use decision–making.

The runway extension for Runway 8–26 to the east would be accomplished by the East Kern Airport District by acquisition of public and private property which extends from the existing airport property east to the Highway 58 By–Pass. This runway extension is planned by the EKAD but is not currently shown on the existing Airport Layout Plan.

Figure 4–41 further identifies the location of the Mojave Airport Compatibility Zones. These Figures should be utilized when reviewing land development projects proposed within the Mojave Specific Plan to determine which properties are affected by the Mojave Airport Compatibility Zones.

4.9.2 Review of Individual Development Actions within the Mojave Specific Plan Area

4.9.2.1 Additional Types of Actions Reviewed

Types of actions to be reviewed in addition to those found in Section 1.6.1a of this Plan are new or modifications to an existing use permit, land division activities, site plan reviews, and precise development plans.

4.9.3 Supplemental Compatibility Criteria

4.9.3.1 Single Event Noise Levels

Table 4–26 identifies the types of existing and planned activities which occur at the Mojave Airport that are single–event noise generators. Single–event noise levels, as shown on Figure 4–44B should be considered when evaluating the compatibility of land uses. Single–event noise levels are especially important in areas which are regularly overflown by aircraft, but which do not produce significant CNEL contours. Flight patterns for the Mojave Airport should be considered by the County in their review process. Acoustical studies or on–site noise measurements may be required to assist in determining the compatibility of proposed sensitive land uses within the single event noise contour.

4.9.3.2 Avigation Easement Dedication

The owner of any property proposed for development (general plan amendments, zone changes, land division activities, new and modifications to existing use permits, site plan reviews, planned development reviews) within all Compatibility Zones (refer to Figure 4-4 IA), will be required to dedicate an avigation easement to the East Kern Airport District.

4.9.3.3 Other Flight Hazards

New land uses (or the expansion of existing land uses) with activities which may produce hazards to aircraft in flight shall not be permitted within the Mojave Airport's influence area, as depicted on Figure 4-41. Specific characteristics to be avoided include:

(1) Glare, distracting lights, or light patterns which could be mistaken for airport lights;

(2) Sources of dust, steam, or smoke which may impair pilot visibility;

(3) Sources of electrical interference with aircraft communications or navigation;

(4) Any use, especially landfills and certain agricultural uses, which may attract large flocks of birds, except in the Zone E; and

(5) Any light or series of lights which may cause visual discomfort or loss of orientation during critical phases of flight.

(6) Any future project with the capability of generating extended periods of airborne dust and particulate matter which may become a hazard within the Mojave Airport area of influence shall reviewed by the East Kern Airport District. Applications should include construction and operational information in sufficient detail to allow an impact analysis to be completed. Mitigation measures may be required as part of project review.

(7) Commercial and/or industrial development at the new SR-58/Business 58 interchange and SR-58/SR-14 interchange in the Mojave Specific plan shall specifically be reviewed for the following concerns: a) glare and distracting lights, b) sources of dust, steam, or smoke which may impact pilot visibility, and c) height and location of signs and structures.

4.9.4 Compatibility and the Mojave Specific Plan

The proposed Mojave Specific Plan will be developed in conformance with the Kern County Airport Land Use Compatibility Plan. All land use changes must be consistent with ALUCP.

4.9.5 Mojave Airport – Influence Zone E

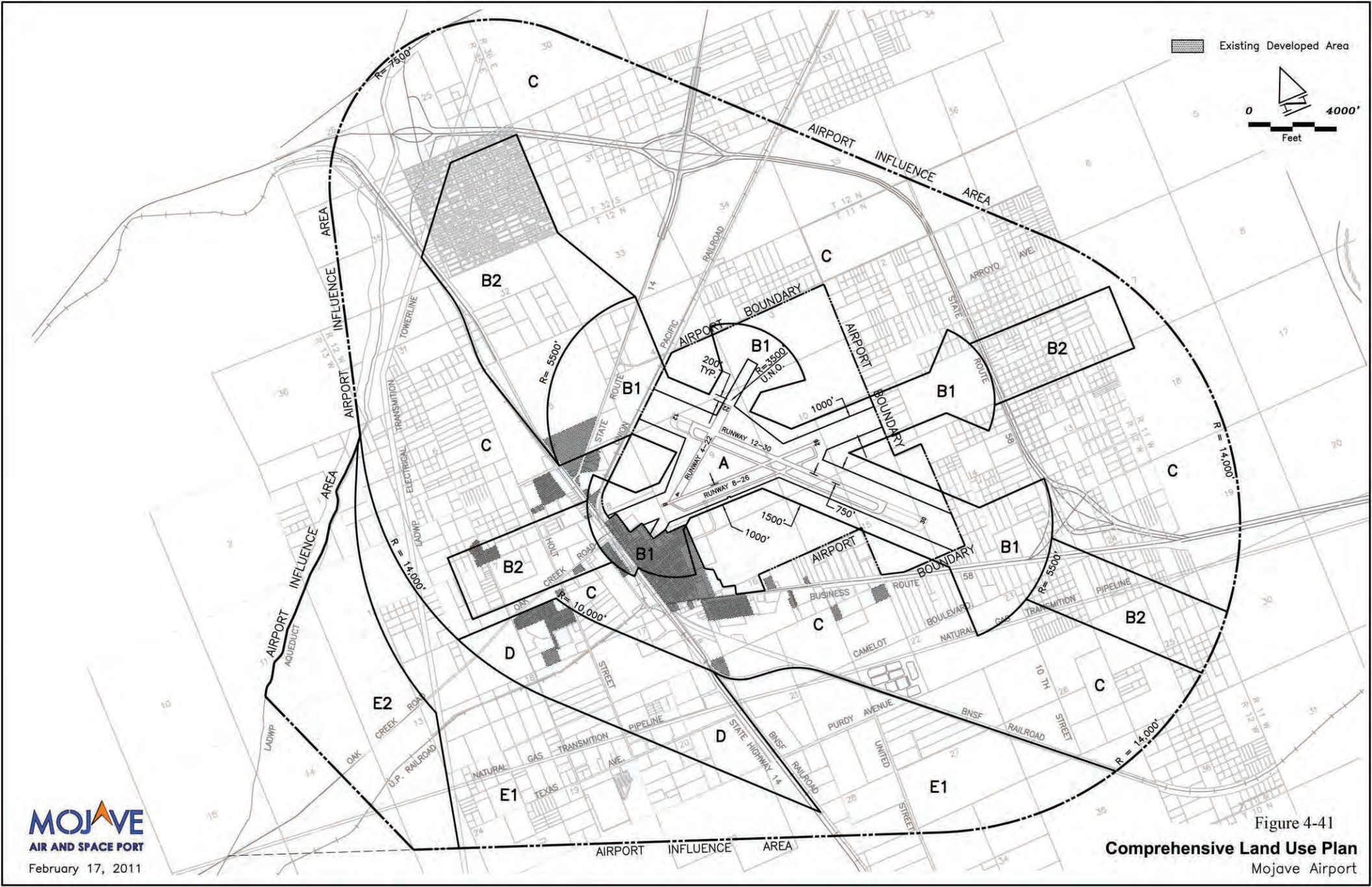
(1) Influence Zone E1 indicates areas where development may have a significant impact on airport operations and flight safety, and as such shall have the following applied to all projects within it:

(a) Development that could potentially attract large flocks of birds should implement best management practices to abate bird attraction to the development.

(b) No structure or earthen formation shall exceed 100 feet in height above ground level. Private and public generator tie-in lines, collector lines and transmission lines are exempt from this requirement and subject to review on a case by case basis.

(2) Influence Zone E2 indicates areas where development may have a lesser impact on airport operations and flight safety, yet still represent an area of concern for the Mojave Air and Space Port. As such development shall have the following applied to all projects within it:

(a) No structure or earthen formation shall exceed 415 feet in height above ground level unless the East Kern Airport District provides evidence that the location of the specific structure(s) that exceeds said height is compatible with Mojave Air and Space Port flight operations.



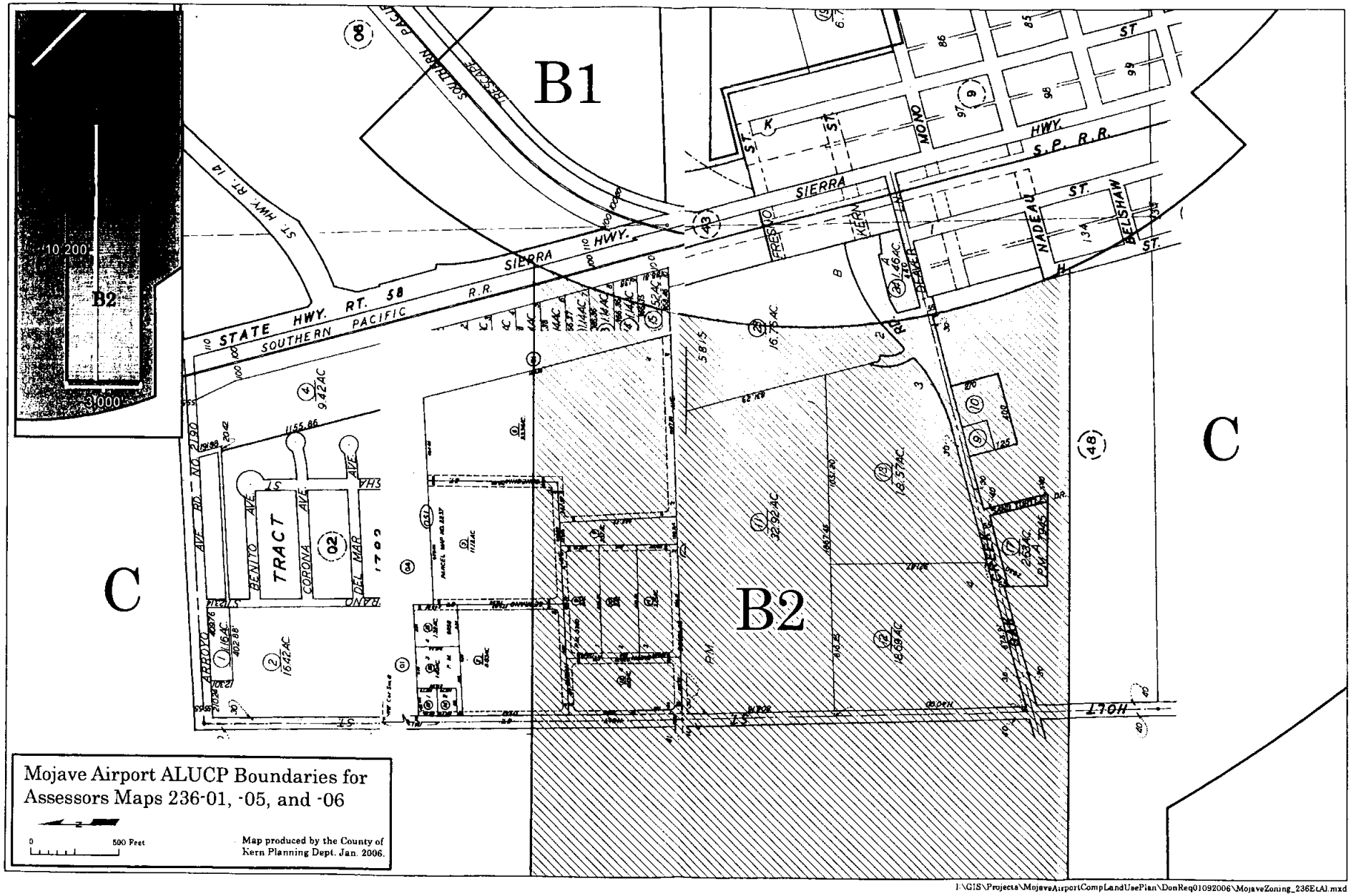
MOJAVE AIR AND SPACE PORT

February 17, 2011

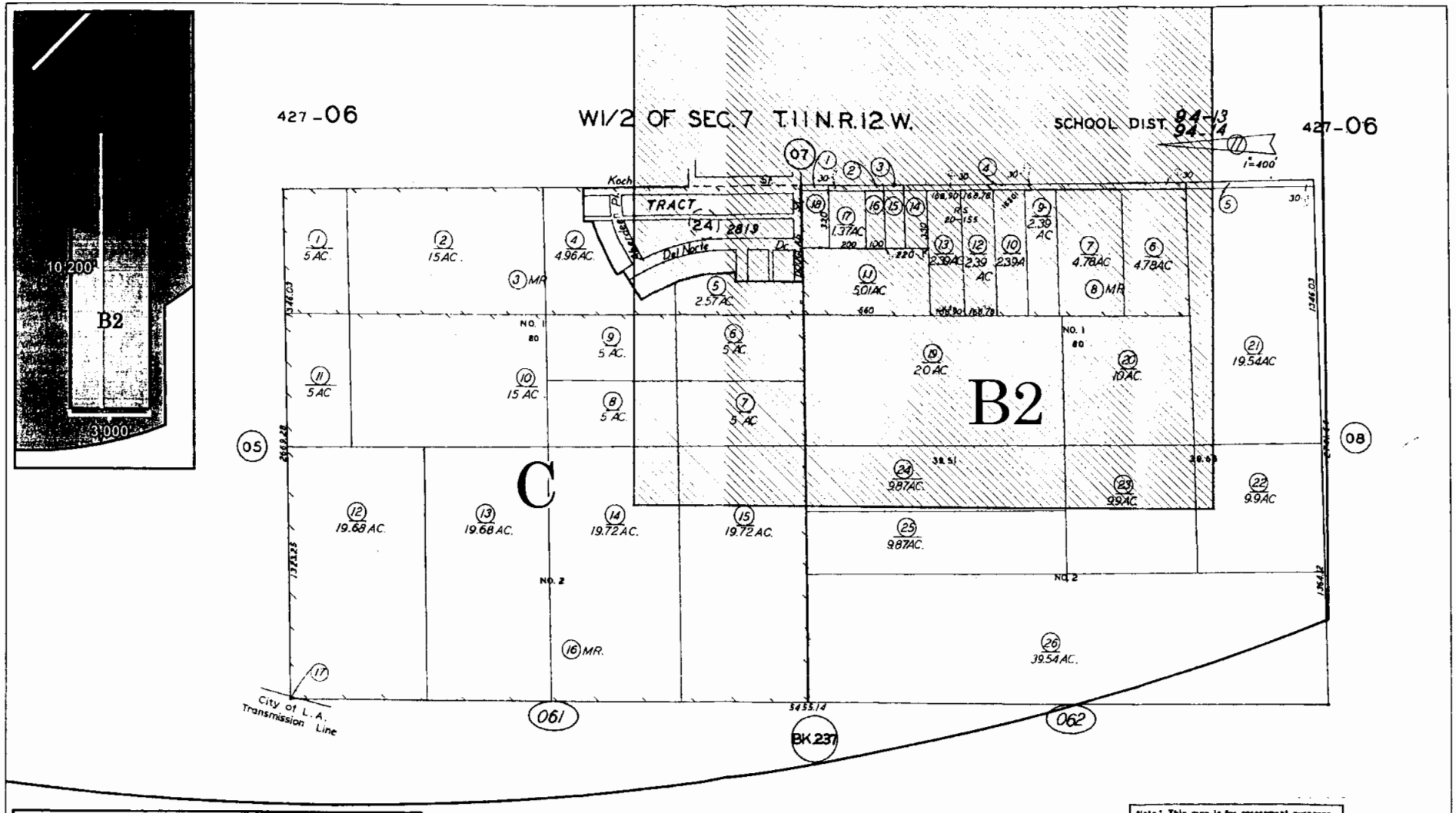
Figure 4-41

Comprehensive Land Use Plan

Mojave Airport



I:\GIS\Projects\MojaveAirportCompLandUsePlan\DonReq01092006\MojaveZoning_236EtAl.mxd



Mojave Airport ALUCP Boundaries for Assessors Map 427-06

0 500 Feet

Map produced by the County of Kern Planning Dept. Jan. 2006.

Note: This map is for assessment purposes only. It is not to be construed as portraying legal ownership or divisions of land for purposes of zoning or subdivision law.

ASSESSORS MAP NO. 427-06
COUNTY OF KERN

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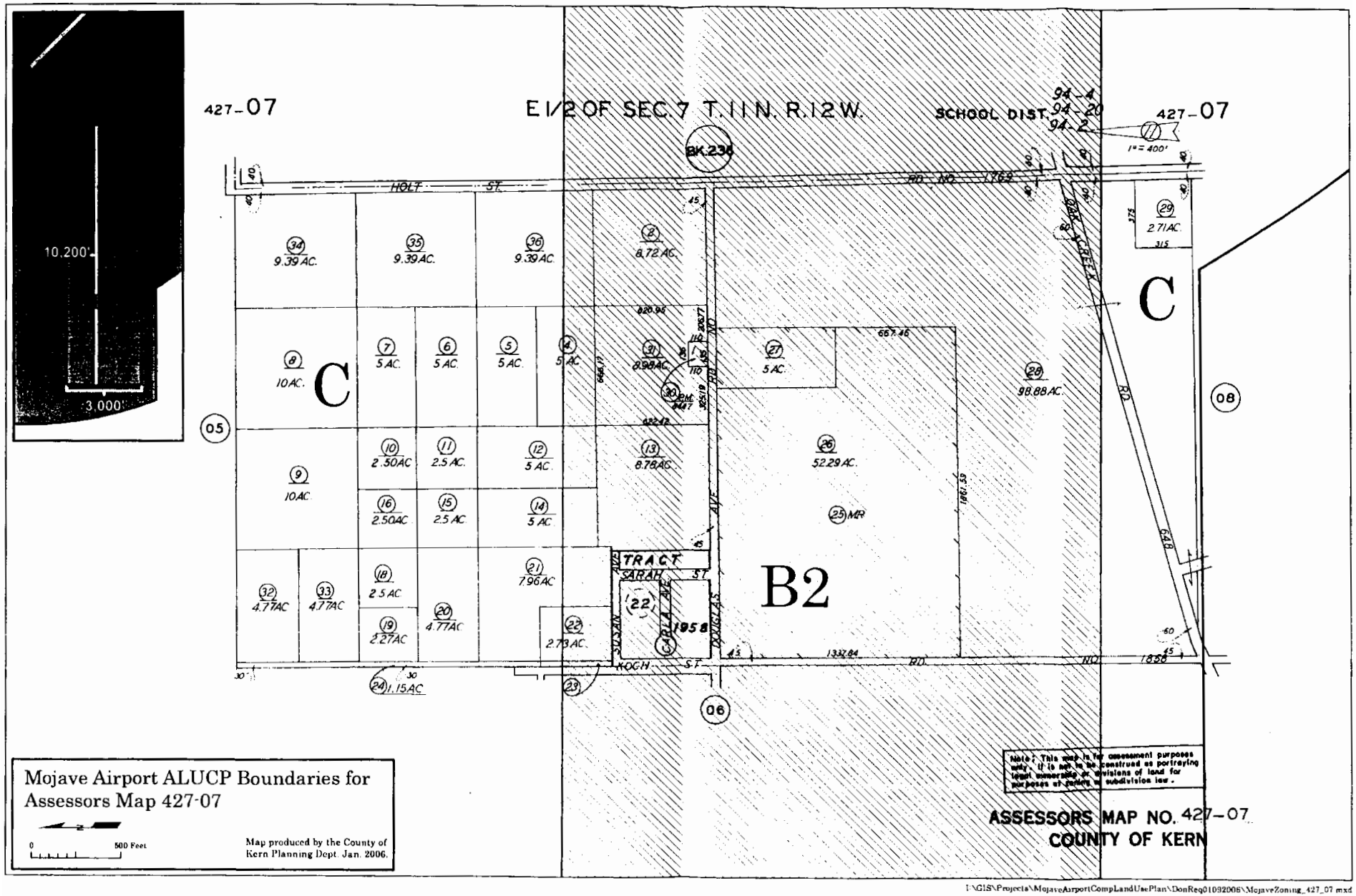

Mojave Airport ALUCP Boundaries for Assessors Map 427-07

0 500 Feet

Map produced by the County of Kern Planning Dept. Jan. 2006.

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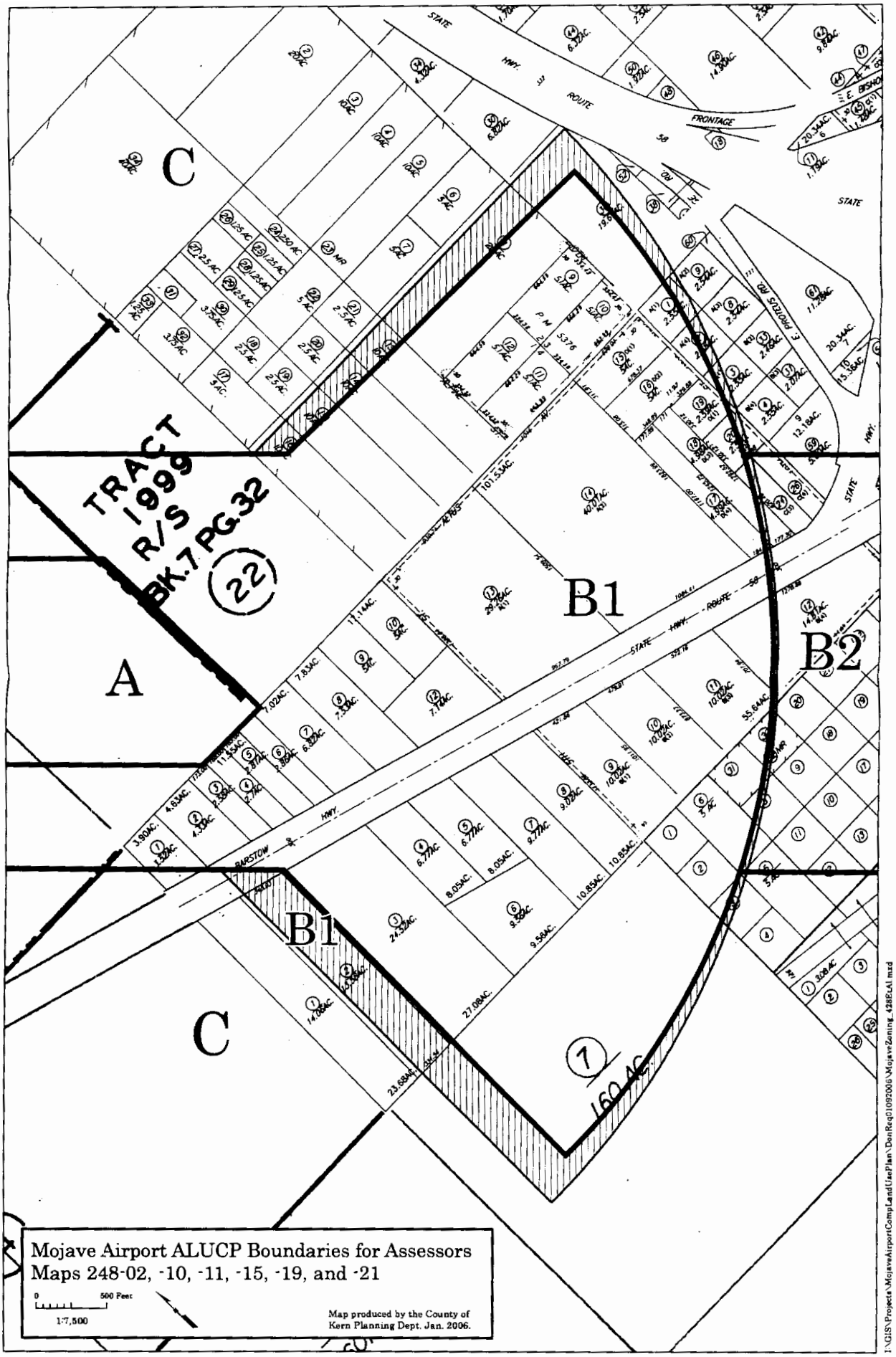

Mojave Airport ALUCP Boundaries for Assessors Maps 248-02, -10, -11, -15, -19, and -21

0 500 Feet

1:7,500

Map produced by the County of Kern Planning Dept. Jan. 2006.

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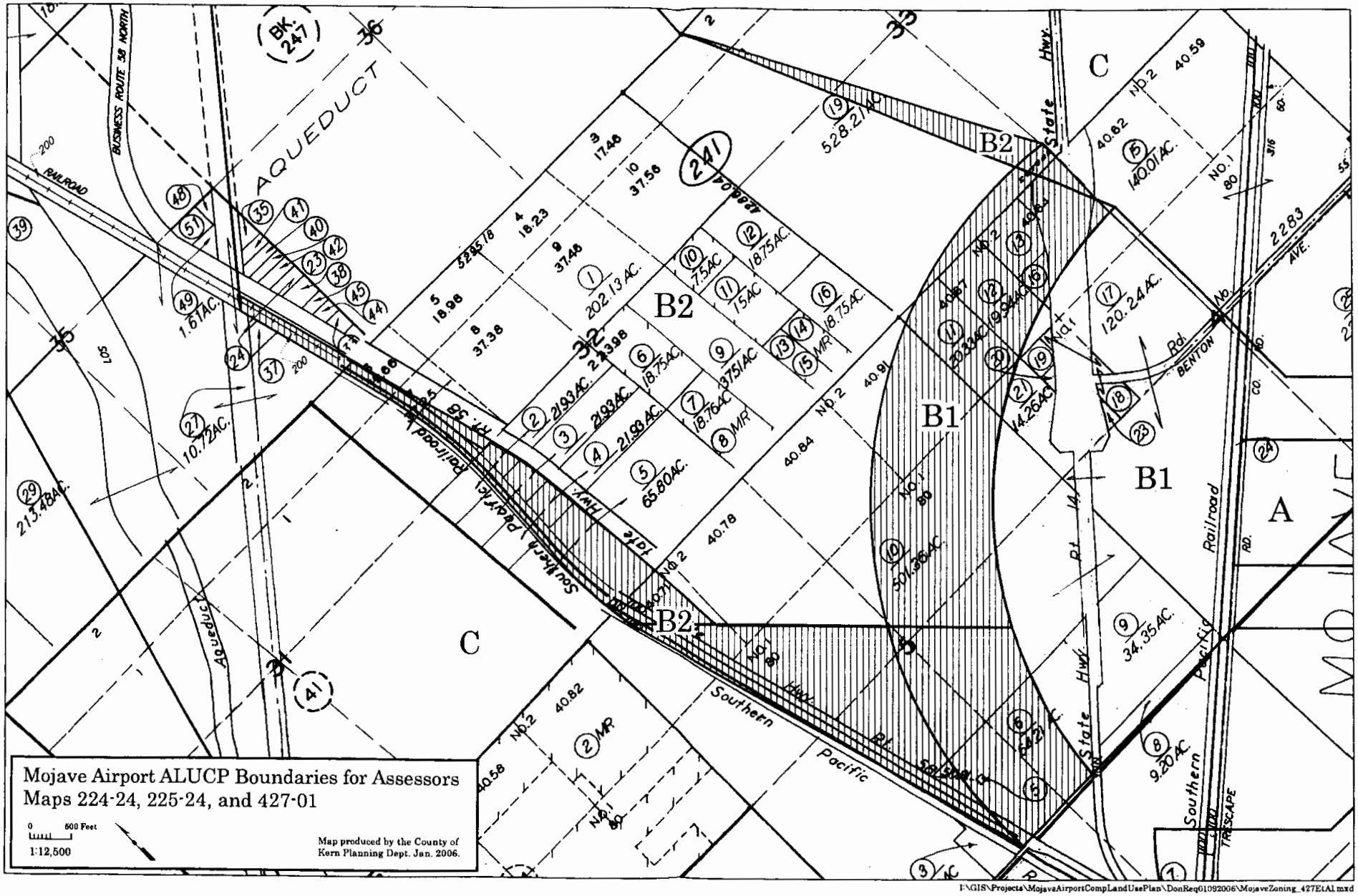

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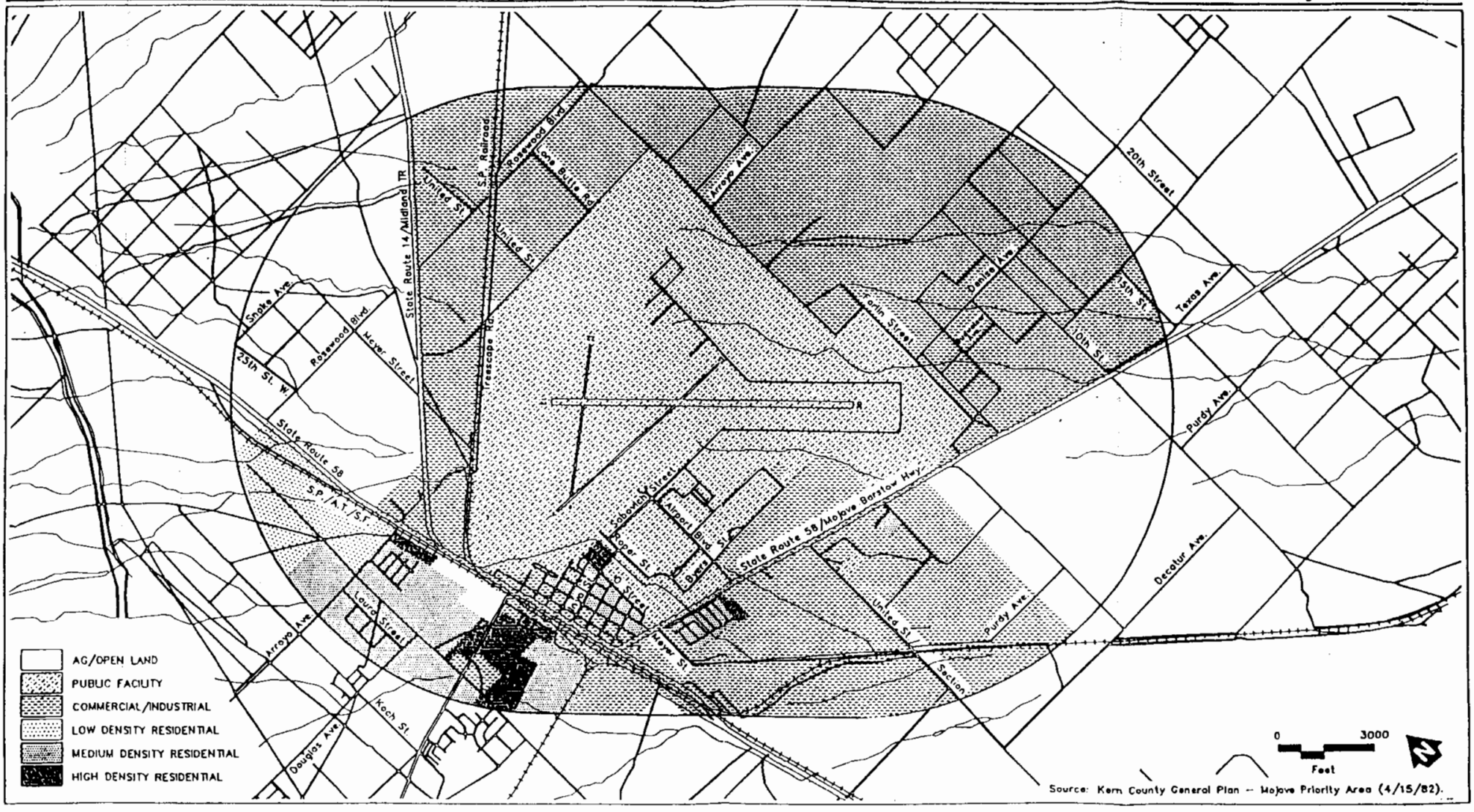


Figure 4 - 42

Land Use Designations

Mojave Airport

Table 4-25

Airport Environs

Mojave Airport

AIRPORT LOCATION AND ACCESS

- Located in the southeastern corner of Kern County, on the east side of the town of Mojave.
- Airport and approaches in County jurisdiction.
- Airport access via State Highway 58, then north on Airport Boulevard.

EXISTING AIRPORT AREA LAND USES

General Character

- Open land to the north and east.
- Industrial/commercial uses on south side of airport.

Runway Approaches

- *Runway 12 (northwest) Approach* — Open land.
- *Runway 30 (southeast) Approach* — Open land.
- *Runway 8 (west) Approach* — Some mixed residential and commercial development.
- *Runway 26 (east) Approach* — Open land.
- *Runway 4 (southwest) Approach* — Residential and commercial uses; high school.
- *Runway 22 (northeast) Approach* — Open land.

Traffic Pattern

- Land Uses
  - Primarily flat, open terrain.

LOCAL LAND USE PLANS AND ZONING

- Kern County *General Plan* adopted in 1982.
- Mojave Specific Plan (proposed adoption 2003)

PLANNED LAND USES IN AIRPORT AREA

- Continued infill of mixed uses in the community.

ESTABLISHED APPROACH PROTECTION MEASURES

- County Height Zoning Ordinance limits the height of objects in the airport vicinity.
- Easements and notifications as described in the ALUCP.

Source: East Kern Airport District (April 2003)

Table 4-26

Airport Features

Mojave Airport

AIRPORT PROPERTY

- *Ownership* — East Kern Airport District - Kern County.
- *Size* — 2,998 acres in fee.
- *Elevation* — 2,791 feet MSL.

AIRPORT PLANNING

- *Planned Improvements*:

  Southeasterly extension of Runway 12/30 to 12,000 feet.

  Easterly extension of Runway 8/26 to 12,000 feet.

  Spaceport designation by Federal Aviation Administration

  Foreign Trade Zone designation by U.S. Department of Commerce

  Expansion of existing railroad in conjunction with the Foreign Trade Zone designation; activities include: cargo, warehousing, soft tire, distribution, and transportation

BUILDING AREA

- *Location* — South end of airfield.
- *Aircraft Parking Capacity* — 600 tiedowns; 60 T-hangars.
- *Other Major Facilities* — Several hangars and office/shop buildings utilized as flight testing support facilities.
- *Services*:
  - 100LL and jet fuel.
  - Restaurant
  - Aircraft storage
  - Leased hangar space
  - Aircraft demolition
  - Aircraft maintenance and repair operations (MRO)

CIVILIAN FLIGHT TEST CENTER

- National Test Pilot School
- Flight Research, Inc.
- Flight Test Associates
- Glider activity
- Powered aircraft for flight development, research test and evaluation, including conventional and non-conventional power systems
- Propulsion and flight control system development and testing
- Power plants utilizing anchored ground test stands and air vehicles of various categories
- Various launch systems utilizing mother ship technology and horizontal runway technology
- Air vehicles utilizing rotor technology, air breathing technology, and conventional and non-conventional rocket technology, and glider recovery technology

RUNWAY SYSTEM

Runway 12-30

- *Critical Aircraft* — High performance military jet and large airline aircraft.
- *Classification* — Airport Reference Code D-V.
- *Dimensions* — 9,600 feet long, 200 feet wide.
- *Lighting* — High intensity runway edge lighting.
- *Surface* — Concrete/asphalt, good condition.
- *Taxiways* — Parallel on southwest side; four exit taxiways

Runway 8-26

- *Critical Aircraft* — Light twin-engine.
- *Classification* — Airport Reference Code C-III.
- *Dimensions* — 7,050 feet long, 100 feet wide.
- *Lighting* — Meoium intensity runway edge lighting.
- *Surface* — Asphalt, good condition.
- *Taxiways* — Parallel on south side; three exit taxiways.

Runway 4-22

- *Critical Aircraft* — Light twin-engine.
- *Classification* — Airport Reference Code A-I.
- *Dimensions* — 3,943 feet long, 50 feet wide.
- *Lighting* — No lighting.
- *Surface* — Aspnalt, fair condition.
- *Taxiways* — Connector taxiway on north end; two exit taxiways.

Source: East Kern Airport District (April 2003)

Table 4-26 Continued

Airport Features

Mojave Airport

RUNWAY APPROACHES

Runway 12

- *Approach Type* — Visual.
- *Runway Protection Zone* — On airport property.
- *Approach Obstacles* — No penetrations to approach surface.

Runway 30

- *Approach Type* — Visual.
- *Runway Protection Zone* — On airport property.
- *Approach Obstacles* — No penetrations of approach surface.

Runway 8

- *Approach Type* — Visual, with PAPI.
- *Runway Protection Zone* — On airport property.
- *Approach Obstacles* — No penetrations to approach surface.

Runway 26

- *Approach Type* — Visual, with PAPI.
- *Runway Protection Zone* — On airport property.
- *Approach Obstacles* — No penetrations of approach surface.

Runway 4

- *Approach Type* — Visual.
- *Runway Protection Zone* — On airport property.
- *Approach Obstacles* — 60-foot pole 2,000 feet from runway end; 30:1 approach slope provides adequate clearance.

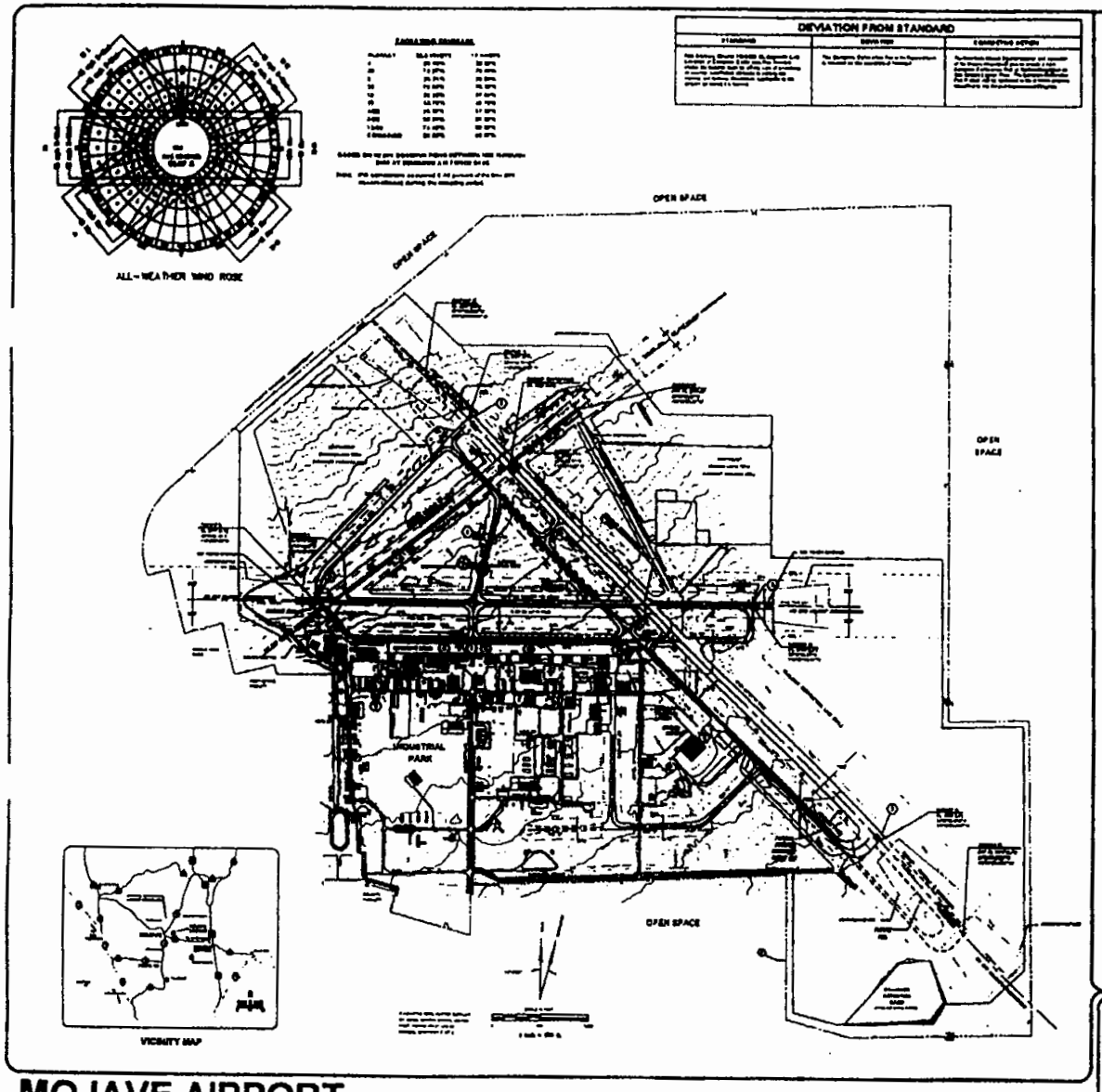
Runway 22

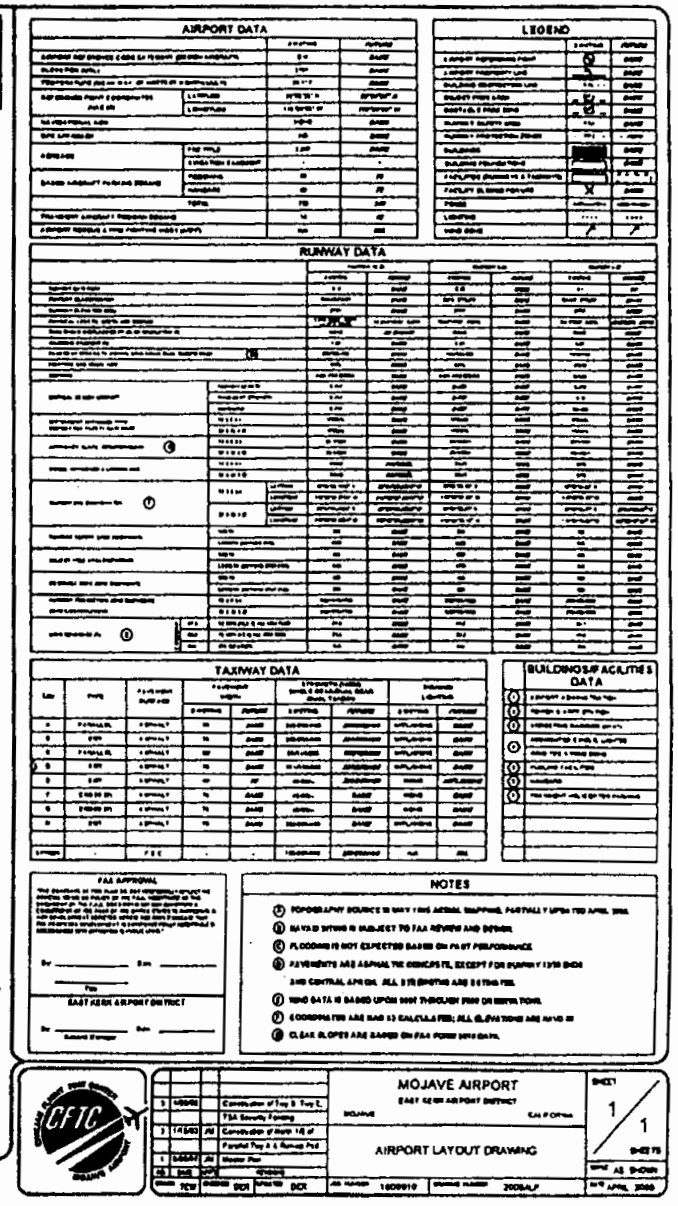
- *Approach Type* — Visual.
- *Runway Protection Zone* — On airport property.
- *Approach Obstacles* — No penetrations of approach surface.

Traffic Pattern

- *Location* — Established pattern northeast side of Runway 12-30; north side of 8-26; northwest side of 4-22.
- *Altitude* — 1,000 feet above airport elevation.

Source: East Kern Airport District (April 2003)





MOJAVE AIRPORT

East Kern Airport District 1434 Flight Line, Mojave, CA 93501 (661)824-2433

(Updated June 13, 2006)
(Resolution 2006-224)

Table 4-27

FORECAST AIRPORT ACTIVITY
Mojave Airport

AIRCRAFT OPERATIONS

Total	
Annual	17,575
Average Day	48
Distribution	
Single-Engine	58.3%
Twin Engine	14.4%
Turboprop	14.1%
Military Jet	7.3%

RUNWAY USE DITRIBUTION

General Aviation	
Runway 22	10%
Runway 12	0.0%
Runway 30	5.0%
Runway 8	25.0%
Runway 26	45.0%
Runway 4	15.0%
Airline and Military	
Runway 12	10%
Runway 30	70%
Runway 8	5%
Runway 26	15%

FLIGHT TRACK DATA

- Pattern Altitude – 1,000 feet AGL for piston aircraft, 1,500 feet AGL for turbine aircraft.
- Right traffic to Runways 22, 26, and 30; however, air traffic controllers often authorize left traffic to these runways.
- Military aircraft typically make overhead approach and descend east of the Airport into the traffic pattern to Runway 30.

TIME OF DAY DISTRIBUTION

General Aviation Aircraft

Day	(0700-1900)	90%
Evening	(1900-2200)	5.0%
Night	(2200-0700)	5.0%

Airline and Military Aircraft

Day	(0700-1900)	90%
Evening	(1900-2200)	5.0%
Night	(2200-0700)	5.0%

Source: Mojave Tower counts for 2004 and Mojave Tenants
Amended June 13, 2006, Resolution 2006-224

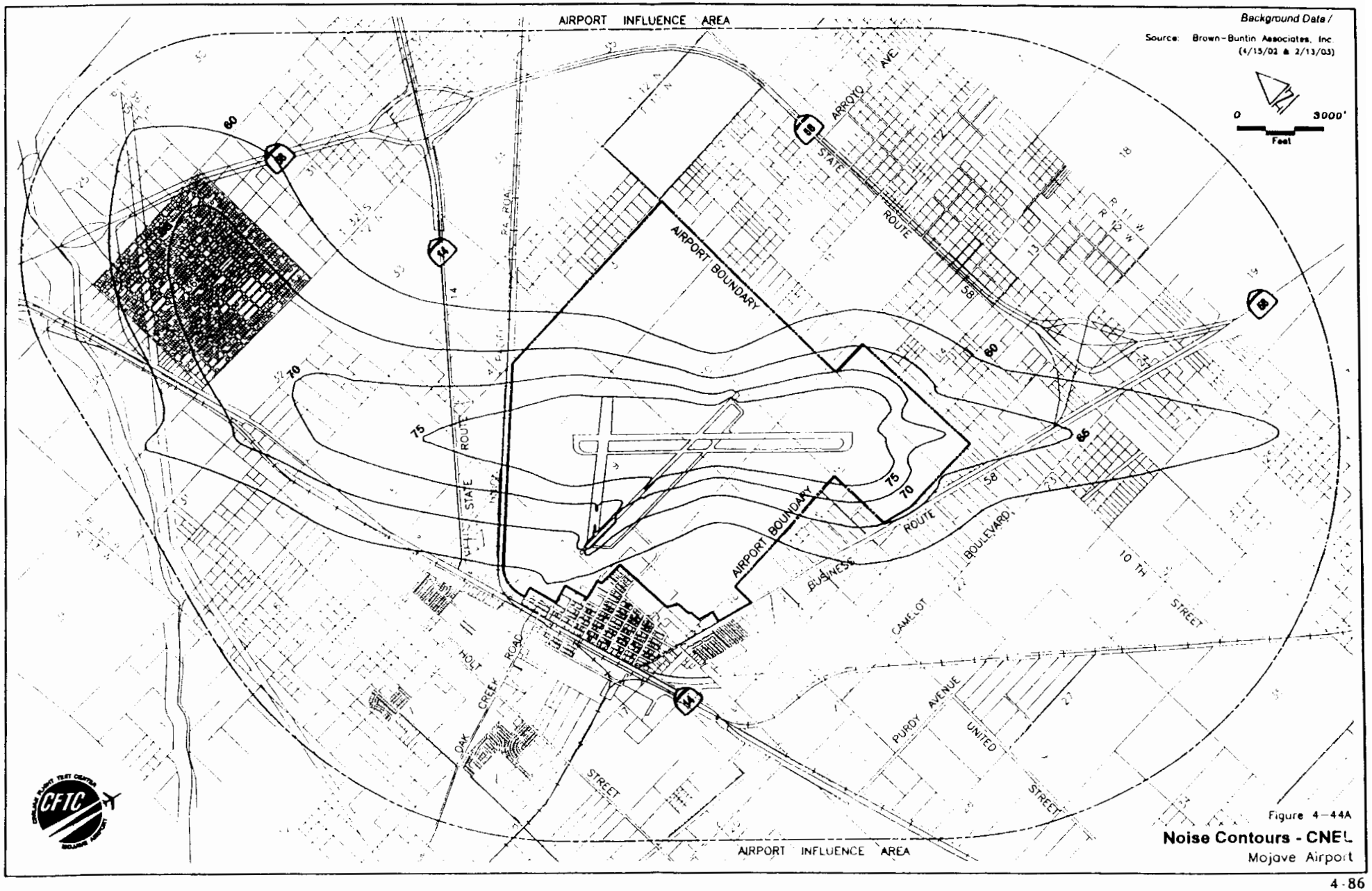


Figure 4—44A

Noise Contours - CNEL

Mojave Airport

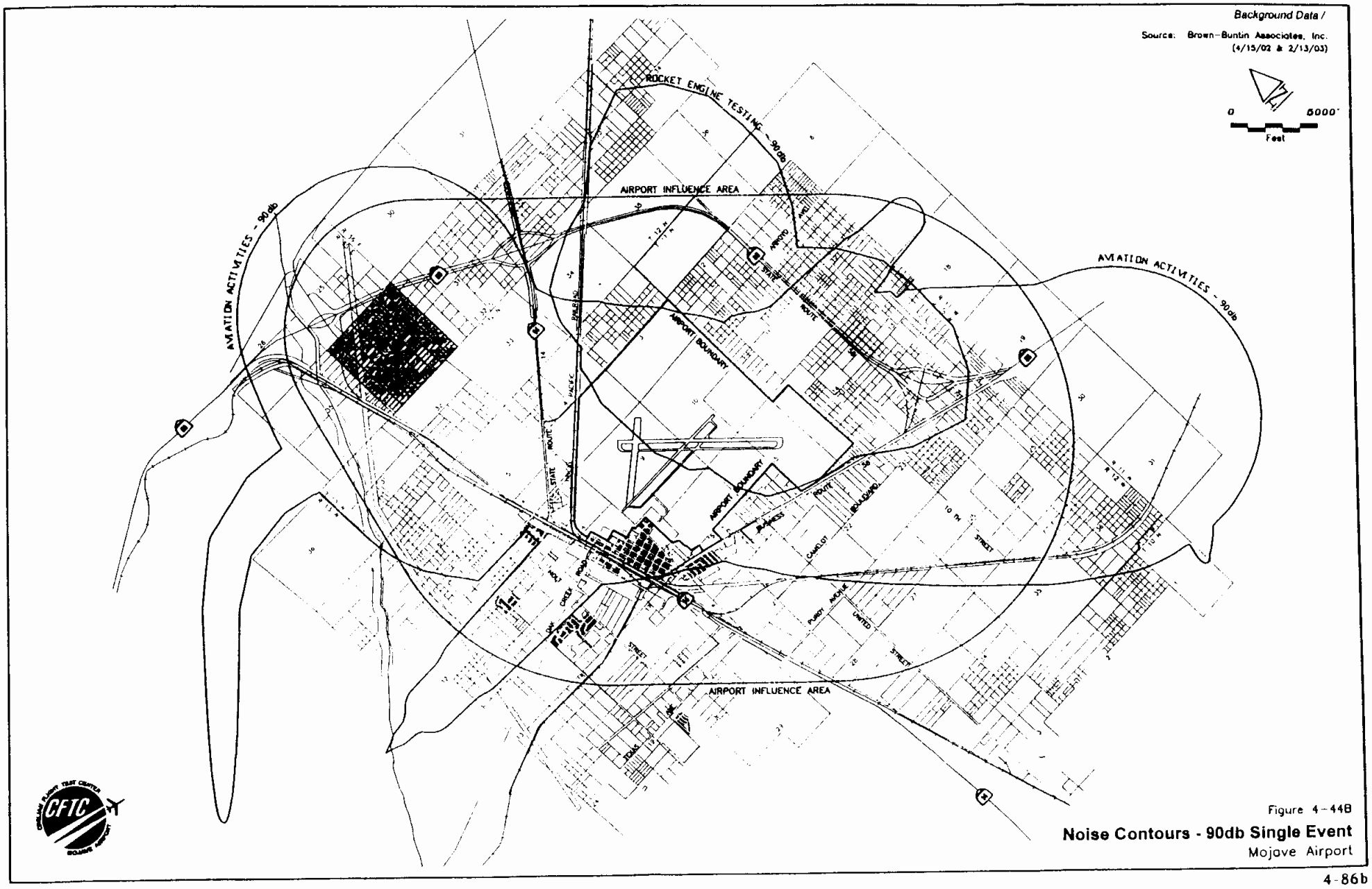


Figure 4-44B

Noise Contours - 90db Single Event

Mojave Airport

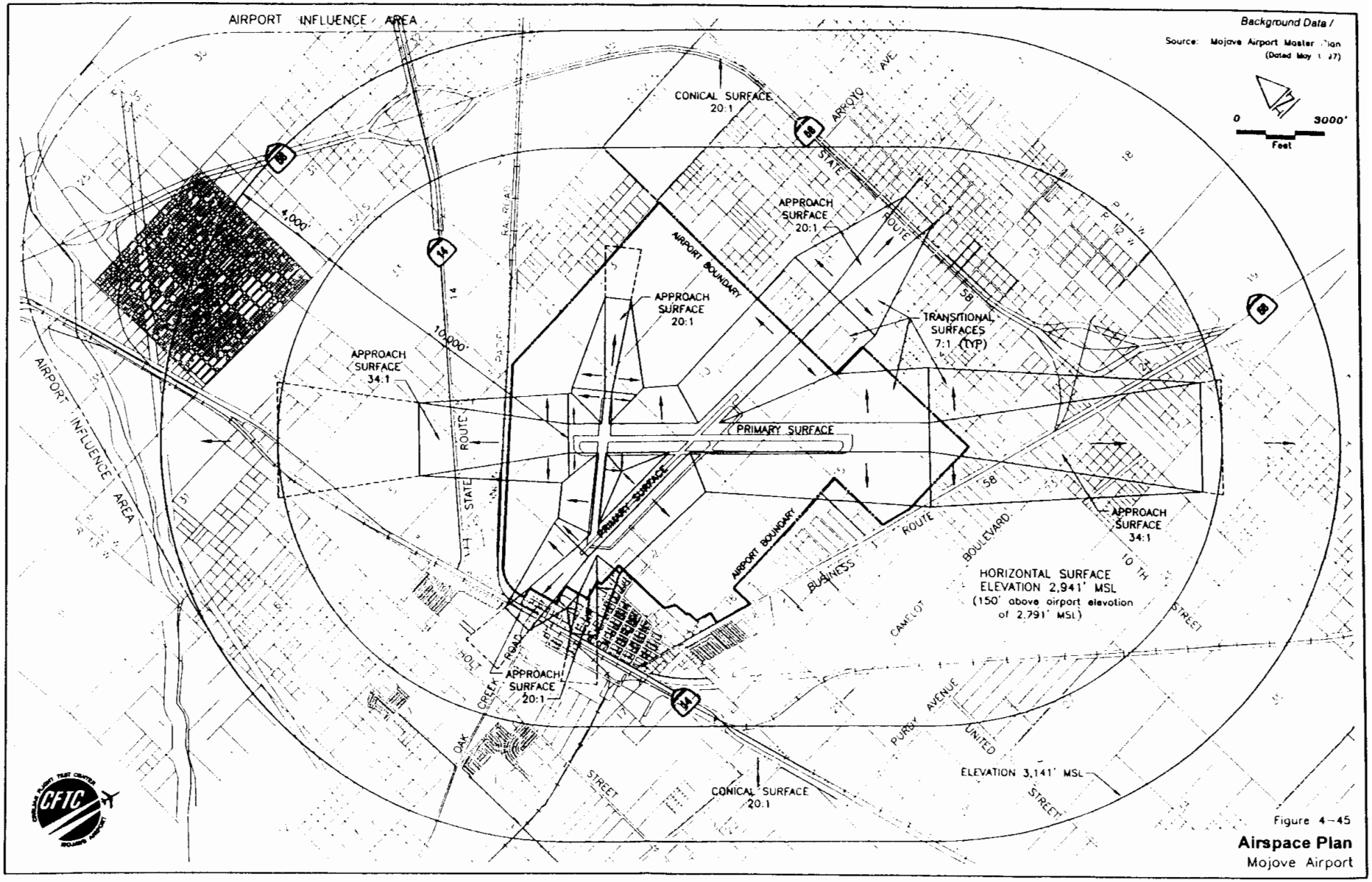


Figure 4-45

Airspace Plan

Mojave Airport

4.10 Mountain Valley Airport

4.10.1

Sailplane approaches and departures are conducted exclusively to the north of the Airport. During departures, tow planes commonly make a 360° overhead departure. Noise concerns and, to a lesser degree, safety concerns dictated the extension of the B1 and B2 zones to areas commonly overflown by arriving and departing sailplanes.

4.10.2

Mendiburu Springs subdivision will be considered to be "infill" as long as it develops as currently planned. If the project is proposed to be amended or redesigned, the project's uses and densities would need to be reviewed for consistency with the intent of the Airport Land Use Compatibility Plan.

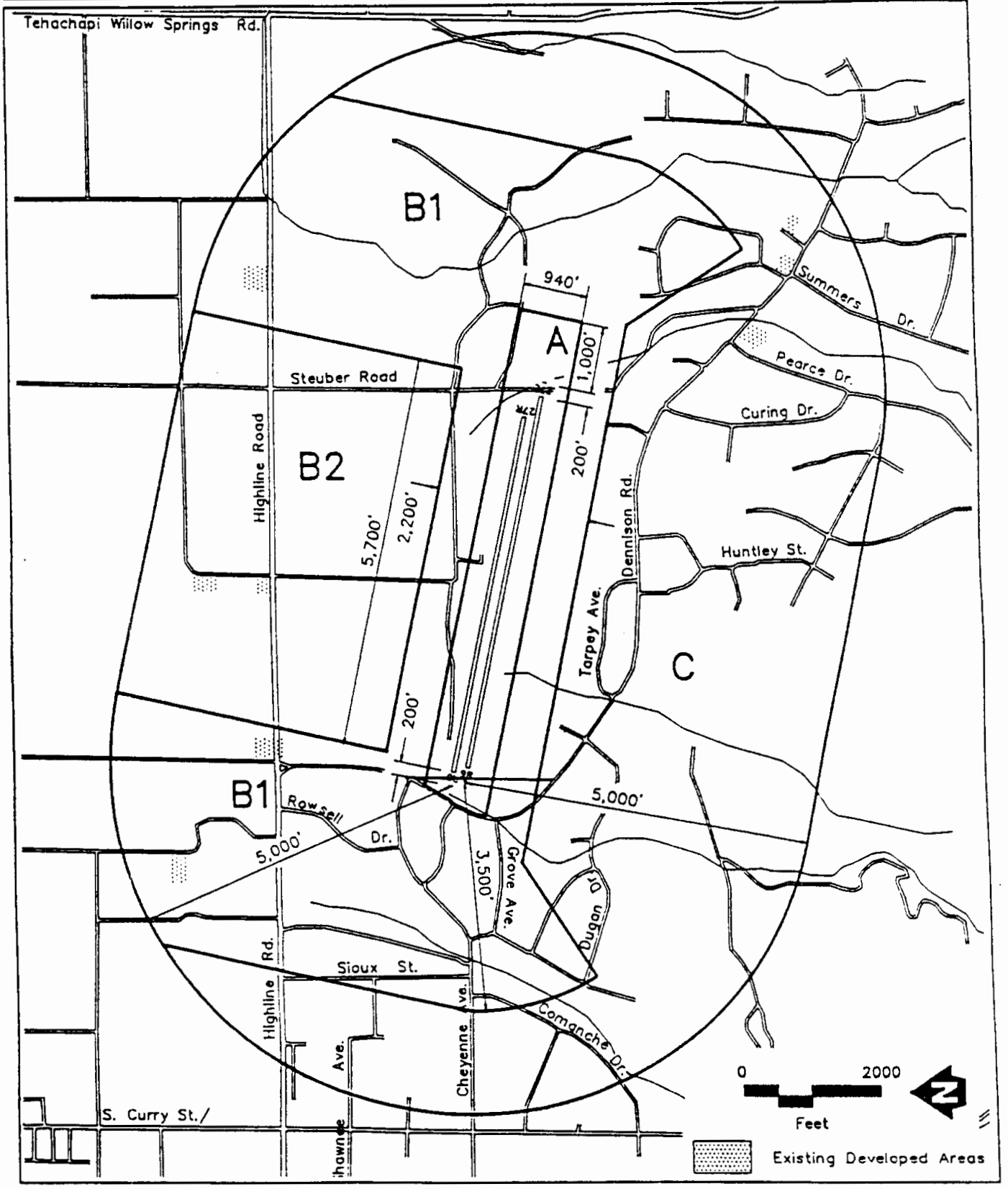

Tehachapi Willow Springs Rd.
B1
940'
A
1,000'
Summers Dr.
Pearce Dr.
Curing Dr.
Steuber Road
Highline Road
B2
5,700'
2,200'
200'
Dennison Rd.
Huntley St.
Tarpey Ave.
C
200'
B1
Rowsell Dr.
5,000'
5,000'
3,500'
Grove Ave.
Dugan Dr.
Sioux St.
Highline Rd.
Ave.
Cheyenne Ave.
Comanche Dr.
S. Curry St./
Shawnee
0
2000
Feet
Existing Developed Areas

Figure 4 - 46

Table 4-28

Airport Environs

Mountain Valley Airport

AIRPORT LOCATION AND ACCESS

- Located 2 miles south of the city of Tehachapi.
- Access from State Highway 58 via Dennison Road.

EXISTING AIRPORT AREA LAND USES

General Character

- Agricultural uses to north; mountains to south; open land to the east and west.

Runway Approaches

- *Runway 9L (west) Approach* — Undeveloped.
- *Runway 27R (east) Approach* — Undeveloped.
- *Runway 9R (west) Approach* — Undeveloped.
- *Runway 27L (east) Approach* — Undeveloped.

Traffic Pattern

- Mostly undeveloped land; some agriculture to the north.

LOCAL LAND USE PLANS AND ZONING

- Kern County *General Plan* adopted in 1982.

PLANNED LAND USES IN AIRPORT AREA

- Continuing infill of rural residential north of airport.
- No major projects currently under consideration.

ESTABLISHED APPROACH PROTECTION MEASURES

- None.

Source: Hodges & Shutt (October 1993)

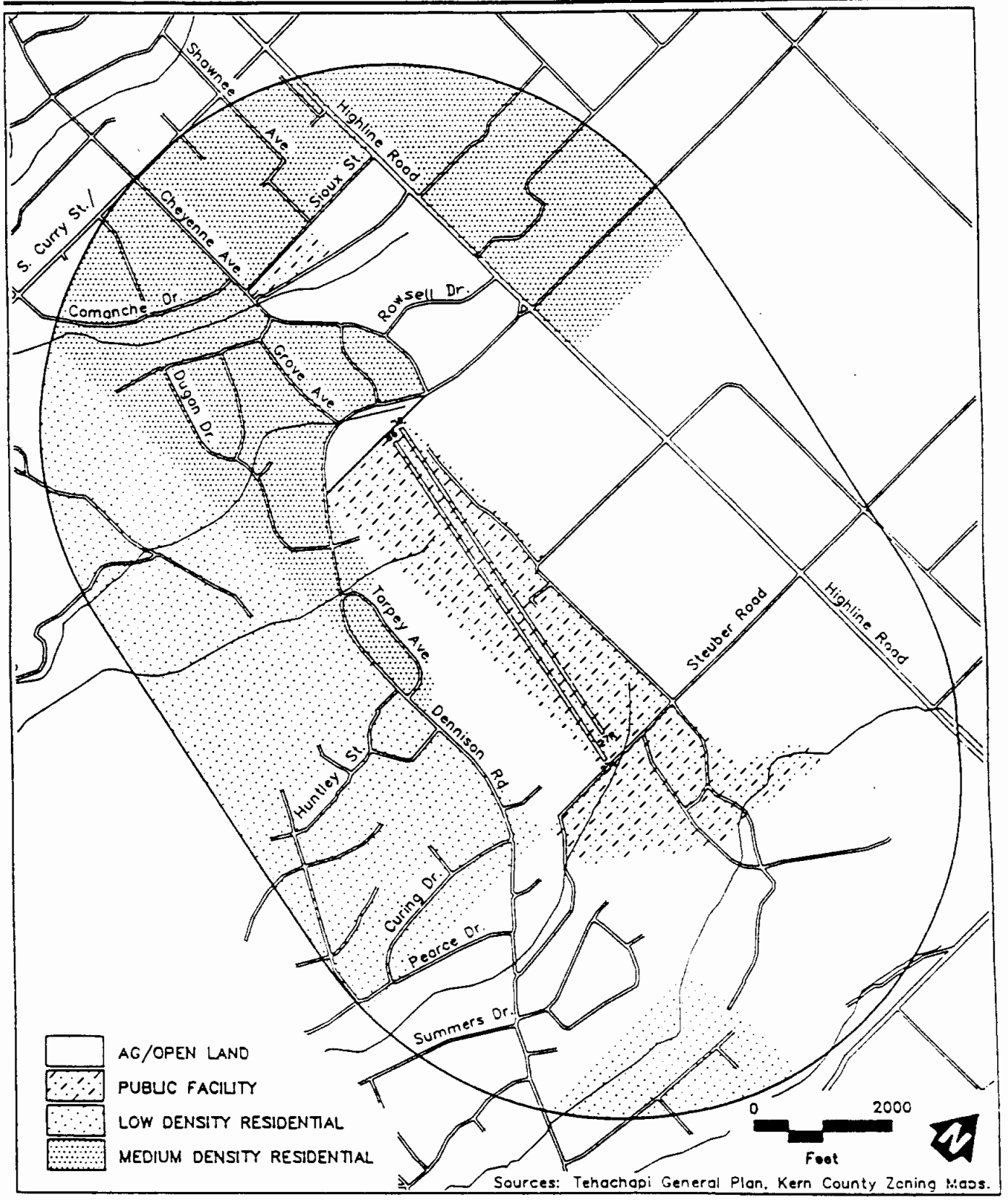


Figure 4 - 47

Land Use Designations

Mountain Valley Airport

Table 4-29

Airport Features

Mountain Valley Airport

AIRPORT PROPERTY

- *Ownership* — Private - L&J Barret, J&J Chapman, and O. Munchow.
- *Size* — Approx. 170 acres fee title.
- *Elevation* — 4,220 feet MSL.

AIRPORT PLANNING

- *Adopted Plans* None.
- *Planned Improvements*
  - No major projects currently under consideration.

BUILDING AREA

- *Location* — North of runways, mid-field.
- *Aircraft Parking Capacity* — 110 based and transient tiedowns.
- *Other Major Facilities* — Fuel island, deli, and office/shop buildings.
- *Services* — Sailplane rental; instruction; repairs; sales.

RUNWAY SYSTEM

Runway 9L-27R

- *Critical Aircraft* — Single-engine propeller.
- *Classification* — Airport Reference Code B-I, small aircraft.
- *Dimensions* — 5,190 feet long, 60 feet wide; 200' displaced threshold for Runway 9R; 380-foot diplaced threshold for Runway 27R.
- *Lighting* — None.
- *Surface* — Gravel, good condition.
- *Taxiways* — Three exit taxiways.

Runway 9R-27L

- *Critical Aircraft* — Single-engine propeller.
- *Classification* — Airport Reference Code B-I, small aircraft.
- *Dimensions* — 5,420 feet long, 60 feet wide.
- *Lighting* — None.
- *Surface* — Gravel/soil, good condition.
- *Taxiways* — Partial parallel taxiway, three exit taxiways, two connector taxiways.

Source: Hodges & Shutt (October 1993)

Table 4-29 Continued

Airport Features

Mountain Valley Airport

RUNWAY APPROACHES

Runway 9L

- *Approach Type* — Visual.
- *Runway Protection Zone* — Essentially all of existing RPZ is off airport property.
- *Approach Obstacles* — Hill penetrates approach surface 1,320 from runway end. 33:1 approach slope provides adequate clearance.

Runway 27R

- *Approach Type* — Visual.
- *Runway Protection Zone* — Essentially all of existing RPZ is off airport property.
- *Approach Obstacles* — Road passes near end of runway.

Runway 9R

- *Approach Type* — Visual.
- *Runway Protection Zone* — Essentially all of existing RPZ is off of airport property line.
- *Approach Obstacles* — None; 20:1 approach slope provides adequate clearance.

Runway 27L

- *Approach Type* — Visual.
- *Runway Protection Zone* — Essentially all of existing RPZ is off airport property.
- *Approach Obstacles* — Road penetrates approach surface. 23:1 approach slope and 380-foot displaced threshold provide adequate clearance.

Traffic Pattern

- *Location* — Established pattern both sides of runway; glider patterns north of field; powered aircraft south.
- *Altitude* — 1,000 feet above aiport elevation.

Source: Hodges & Shutt (October 1993)

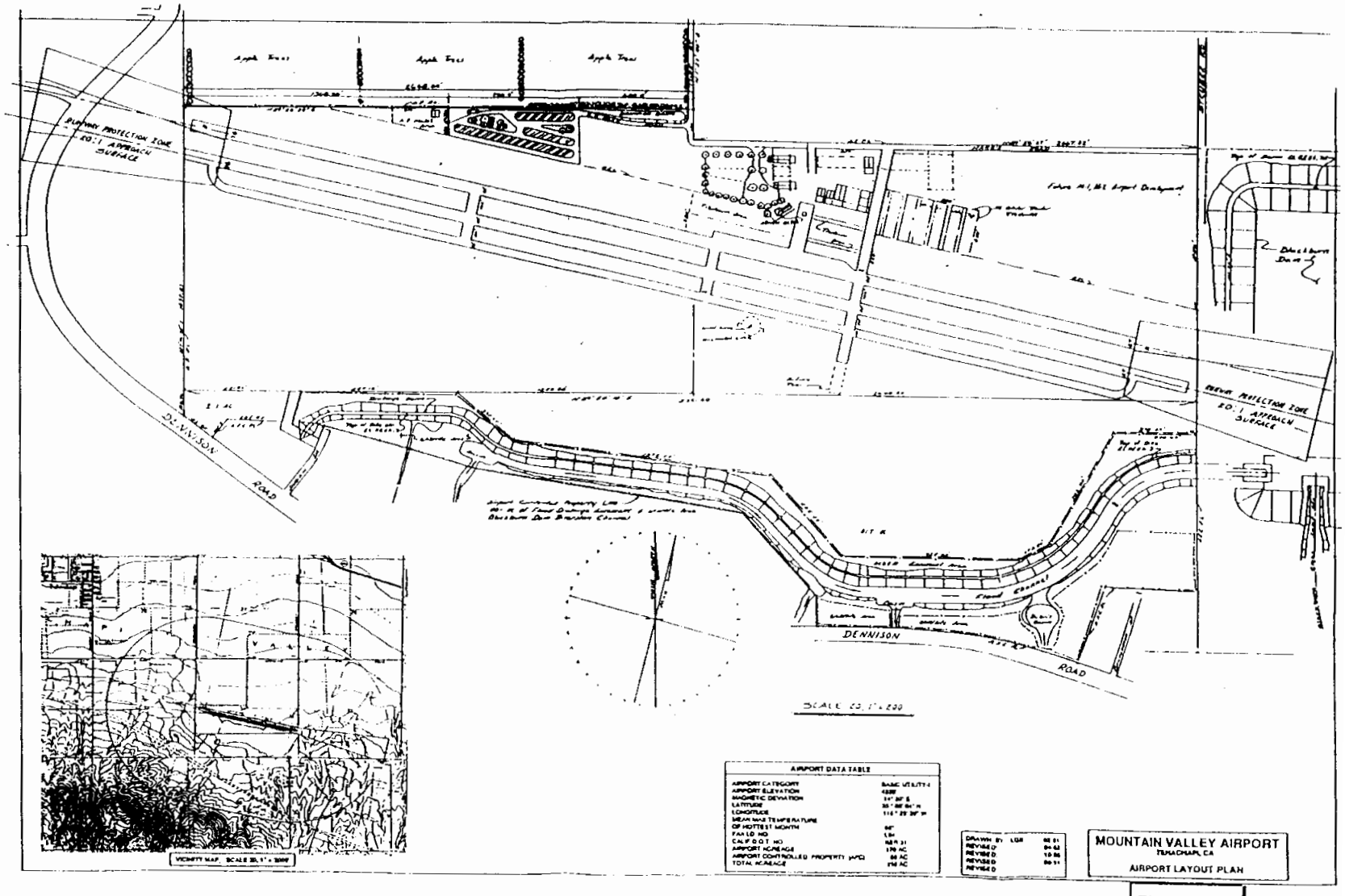

DENNISON
ROAD
DENNISON
ROAD
AIRPORT DATA TABLE
MOUNTAIN VALLEY AIRPORT
TEHACHAPI, CA
AIRPORT LAYOUT PLAN

Figure 4 - 48

Table 4-30

Forecast Airport Activity

Mountain Valley Airport

AIRCRAFT OPERATIONS

Total	
Annual	56,000
Average Day	153
Distribution	
Single-Engine	99.4%
Twin-Engine	0.6%

TIME OF DAY DISTRIBUTION

All Aircraft		
Day	(0700-1900)	98.0%
Evening	(1900-2200)	1.0%
Night	(2200-0700)	1.0%

RUNWAY USE DISTRIBUTION

All Operations	Sailplanes	Powered
Runway 9L	20.0%	1.8%
Runway 9R	2.2%	25.5%
Runway 27L	8.9%	70.9%
Runway 27R	68.9%	1.8%

FLIGHT TRACK DATA

- Pattern Altitude – 1,000 feet AGL.
- Sailplane pattern north of airport.
- Powered aircraft pattern north of airport.

Source: Hodges & Shutt (1993) for then current year.

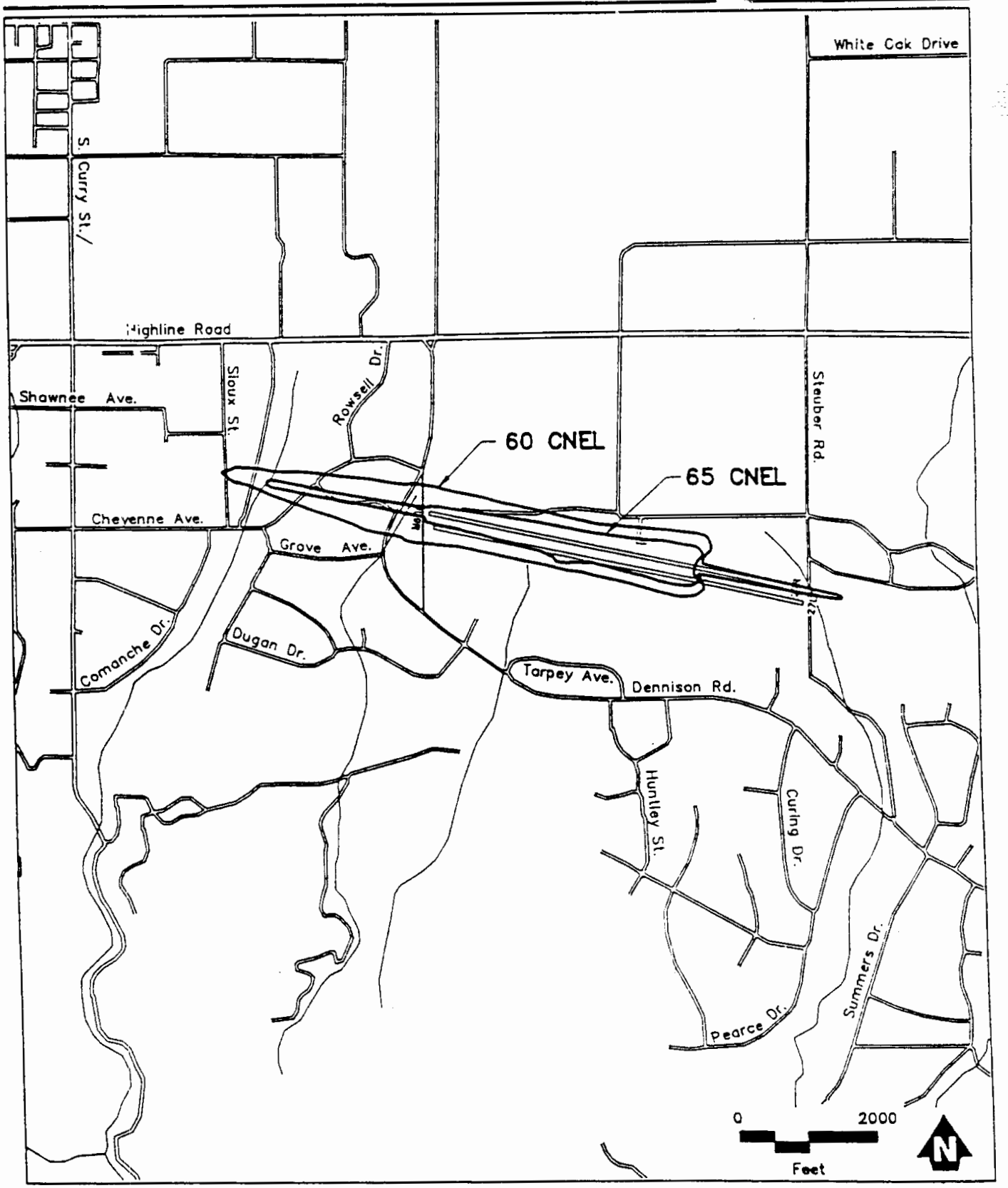


Figure 4 - 49

Noise Contours

Mountain Valley Airport

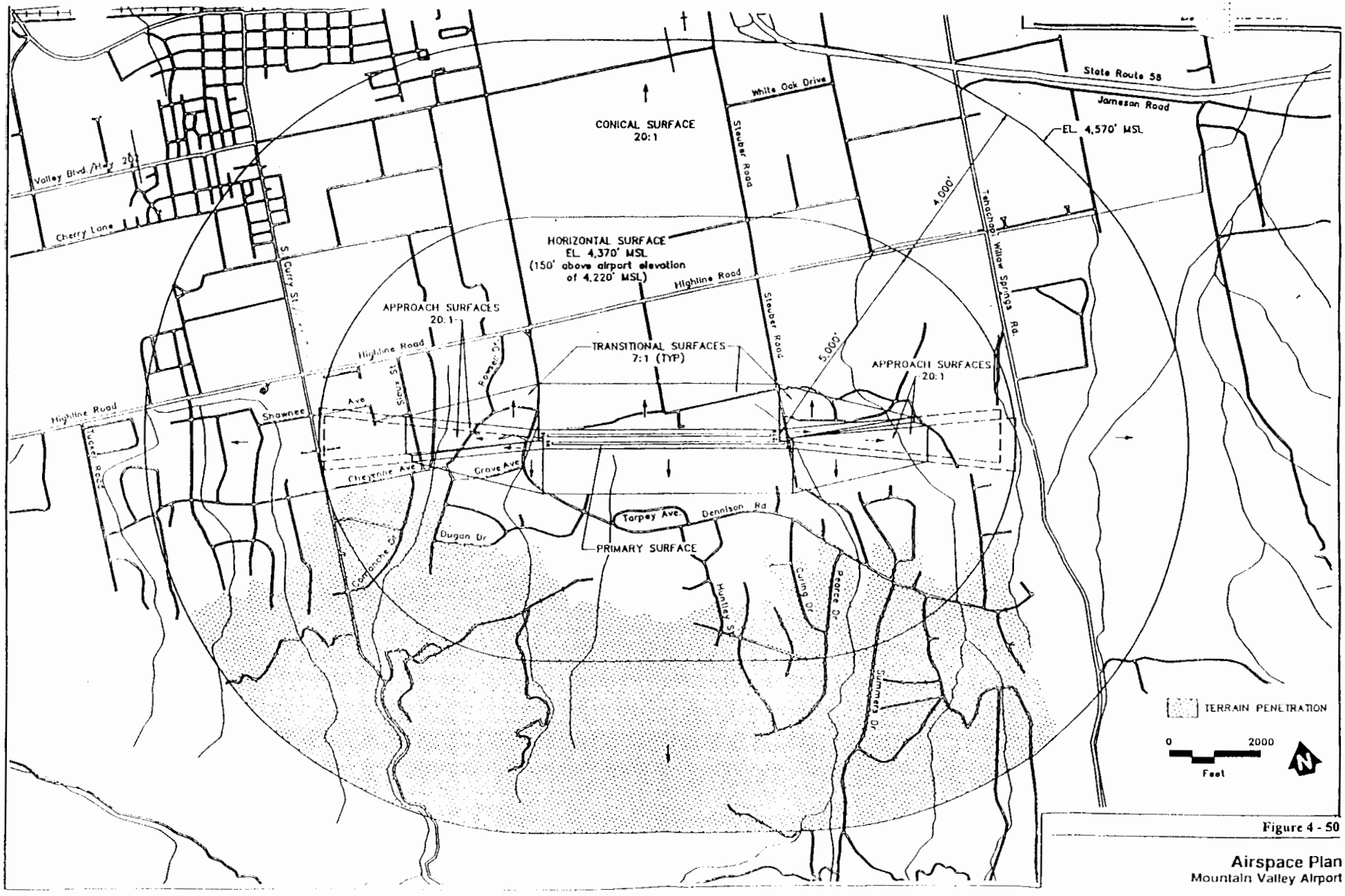


Figure 4 - 50

Airspace Plan
Mountain Valley Airport

4.11 Poso-Kern County Airport

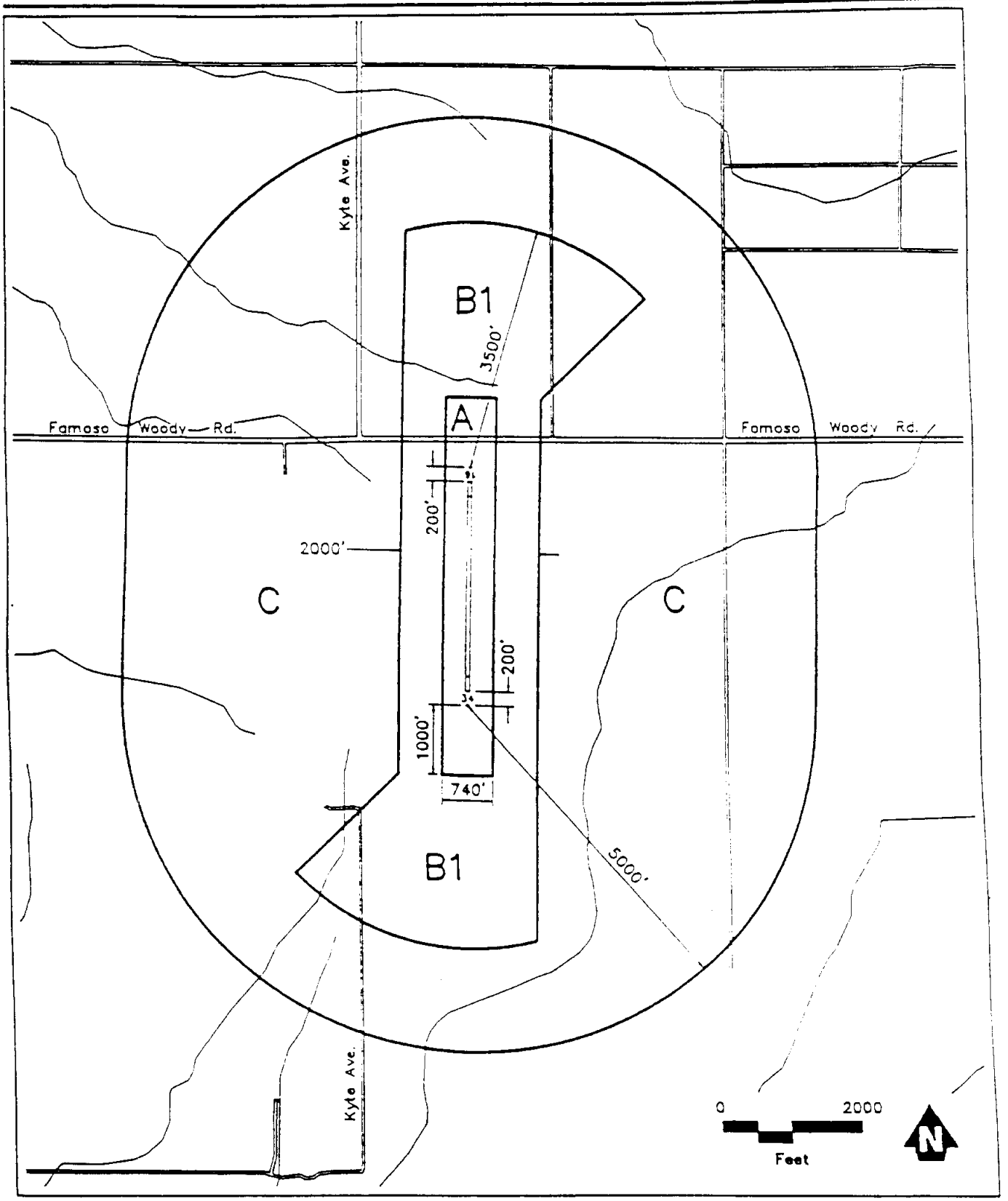

Kyte Ave.
B1
3500'
A
Famoso Woody Rd.
Famoso Woody Rd.
200'
2000'
C
C
200'
1000'
740'
B1
5000'
Kyte Ave.
0
2000
Feet
N

Figure 4 - 51

Table 4-31

Airport Environs

Poso-Kern County Airport

AIRPORT LOCATION AND ACCESS

- Located approximately 20 miles north of the city of Bakersfield
- Airport and approaches in County jurisdiction
- Airport access via State Highway 99, then east on Famoso Highway

EXISTING AIRPORT AREA LAND USES

General Character

- Agriculture surrounding all sides of airport

Runway Approaches

- *Runway 16 (north) Approach* — Open land within the runway protection zone continuing out to 1/2 mile from the runway end
- *Runway 34 (south) Approach* — Open land within the runway protection zone continuing out to 1/2 mile from the runway end.

Traffic Pattern

- Open land and agriculture.
- Left pattern for both runways.

LOCAL LAND USE PLANS AND ZONING

- Kern County General Plan adopted in 1982

PLANNED LAND USES IN AIRPORT AREA

- No major development proposals currently active

ESTABLISHED APPROACH PROTECTION MEASURES

- Kern County Height Zoning Ordinance restricts the height of objects in the Airport's vicinity

Source: Hodges & Shutt (October 1993)

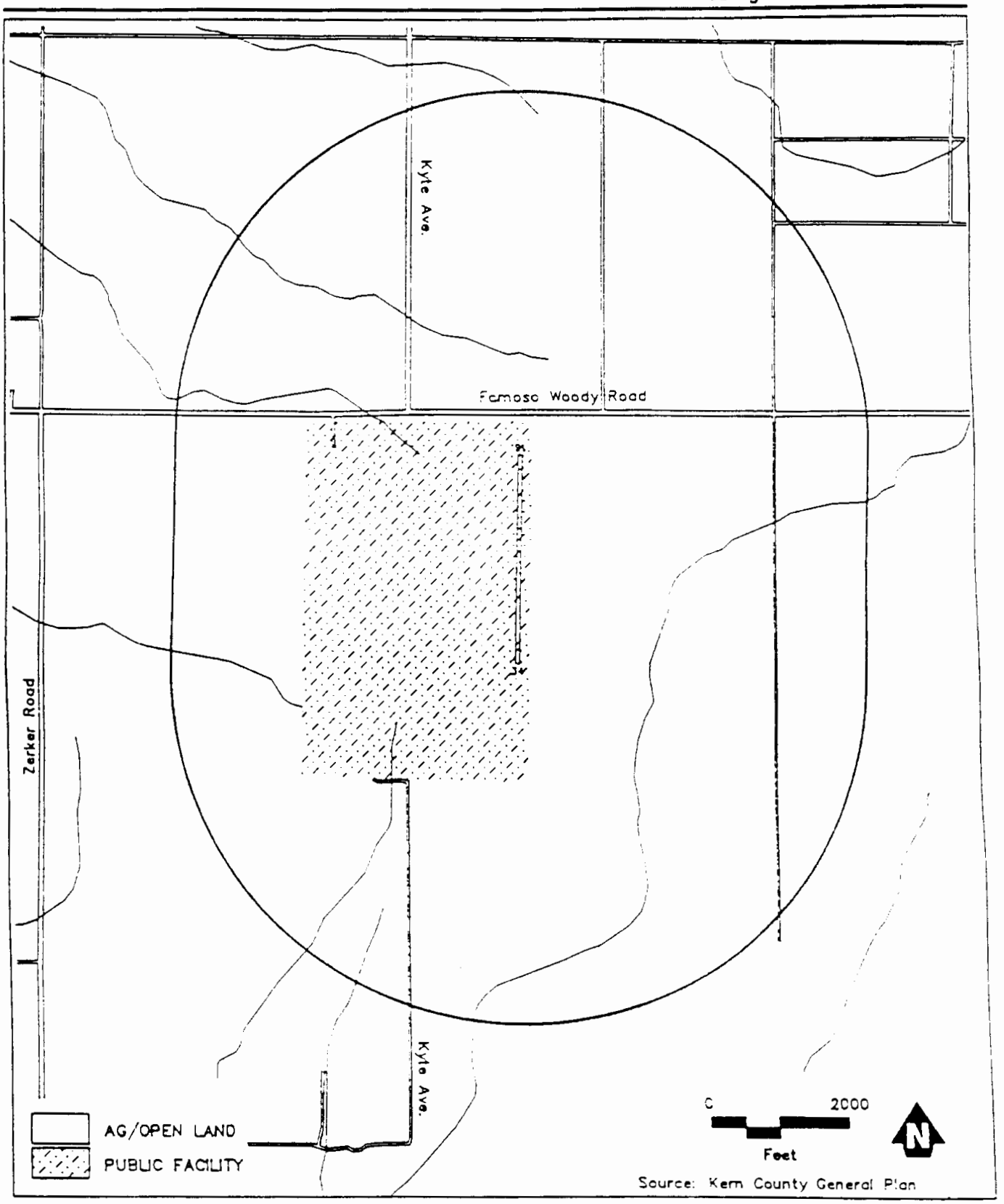


Figure 4 - 52

Land Use Designations

Poso-Kern County Airport

Table 4-32

Airport Features

Poso-Kern County Airport

AIRPORT PROPERTY

- *Ownership* — County of Kern
- *Size* — 400 acres in fee
- *Elevation* — 635 feet MSL

AIRPORT PLANNING

- *Adopted Plans*
  - None
- *Planned Improvements*
  - No change in runway dimensions or capacities

BUILDING AREA

- *Location* — None
- *Aircraft Parking Capacity* — No designated parking spaces, several acres of open land where aircraft can be parked
- *Other Major Facilities* — None
- *Services* — None

RUNWAY SYSTEM

Runway 16-34

- *Critical Aircraft* — Single-engine, propeller
- *Classification* — Airport Reference Code B-I
- *Dimensions* — 3,[illegible]00 feet long, 60 feet wide
- *Lighting* — None
- *Surface* — Asphalt, fair condition
- *Taxiways* — No taxiways at this airfield

RUNWAY APPROACHES

Runway 16

- *Approach Type* — Visual
- *Runway Protection Zone* — About half is currently on airport property
- *Approach Obstacles* — Trees 20 feet high and 525 feet from runway end, 16:1 approach slope and displaced threshold of 210 feet provide adequate clearance. Fence 4 feet high and 10 feet from runway end.

Runway 34

- *Approach Type* — Visual
- *Runway Protection Zone* — Entirely on airport property
- *Approach Obstacles* — Fence 4 feet high and 10 feet from runway end

Traffic Pattern

- *Location* — Left approach pattern for both runways
- *Altitude* — 800 feet above airport elevation
- *Approach Procedure* — None

Source: Hodges & Shutt (October 1993)

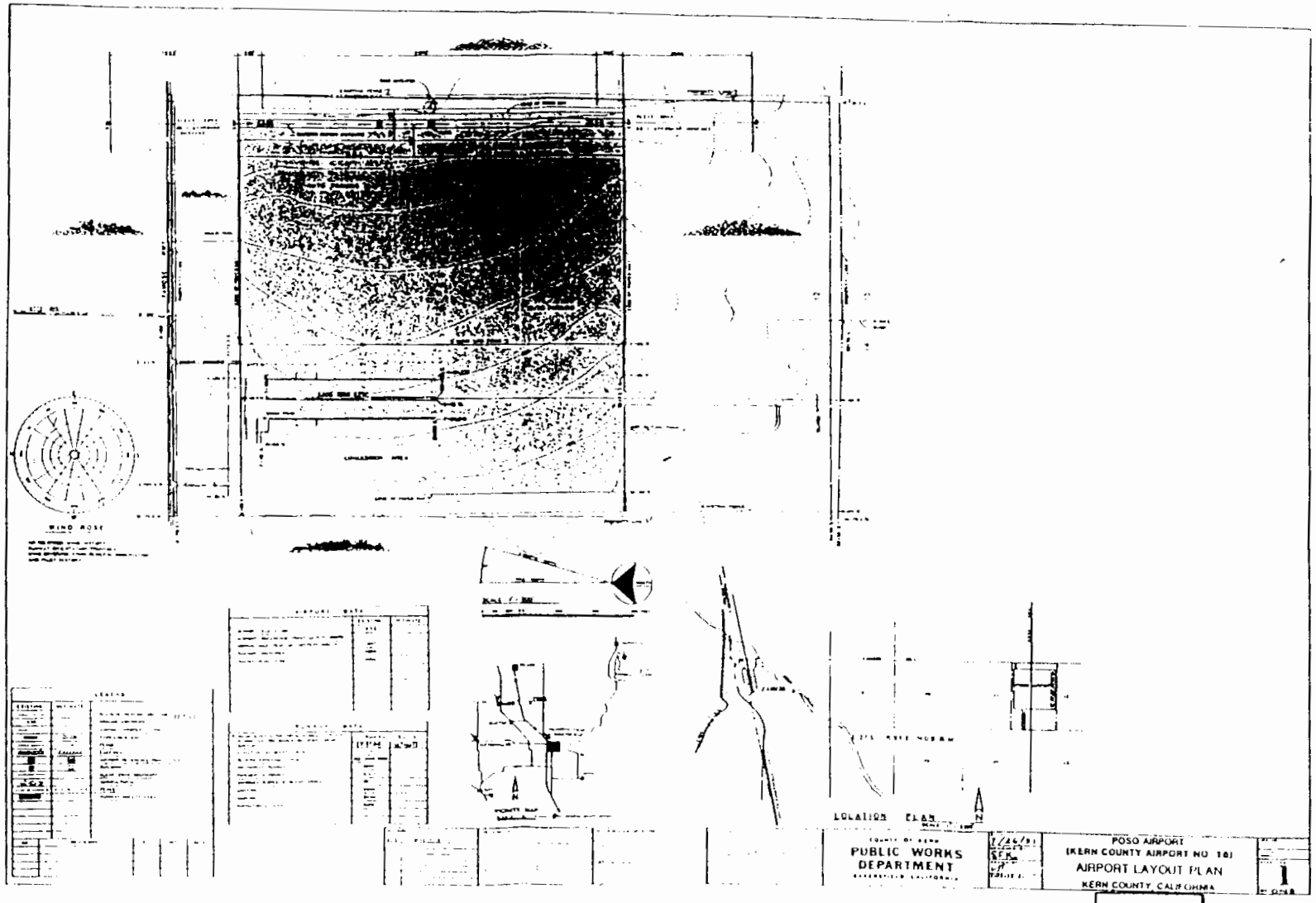

WIND ROSE
LOCATION PLAN
PUBLIC WORKS
DEPARTMENT
POSO AIRPORT
(KERN COUNTY AIRPORT NO 16)
AIRPORT LAYOUT PLAN
KERN COUNTY, CALIFORNIA

Figure 4 - 53

Table 4-33

Forecast Airport Activity

Poso-Kern County Airport

AIRCRAFT OPERATIONS

Total	
Annual	1,000
Average Day	3
Distribution	
Single-Engine	100.0%

TIME OF DAY DISTRIBUTION

All Aircraft		
Day	(0700-1900)	100.0%
Evening	(1900-2200)	0%
Night	(2200-0700)	0%

RUNWAY USE DISTRIBUTION

All Aircraft	
All Operations	
Runway 16	0%
Runway 34	100.0%

FLIGHT TRACK DATA

- Pattern Altitude – 800 feet AGL

Source: Ares (1989) for then current year

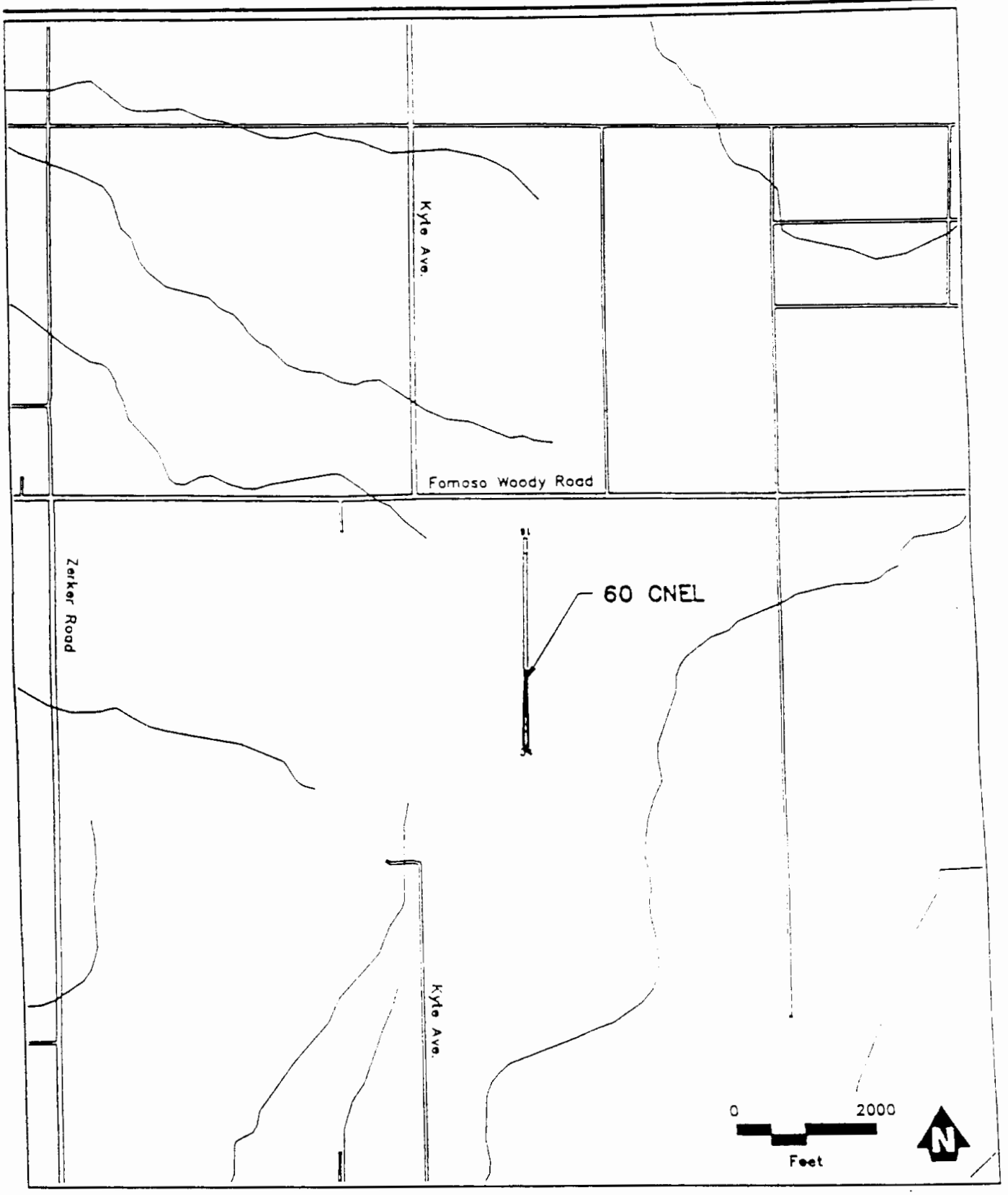


Figure 4 - 54

Noise Contours
Poso-Kern County Airport

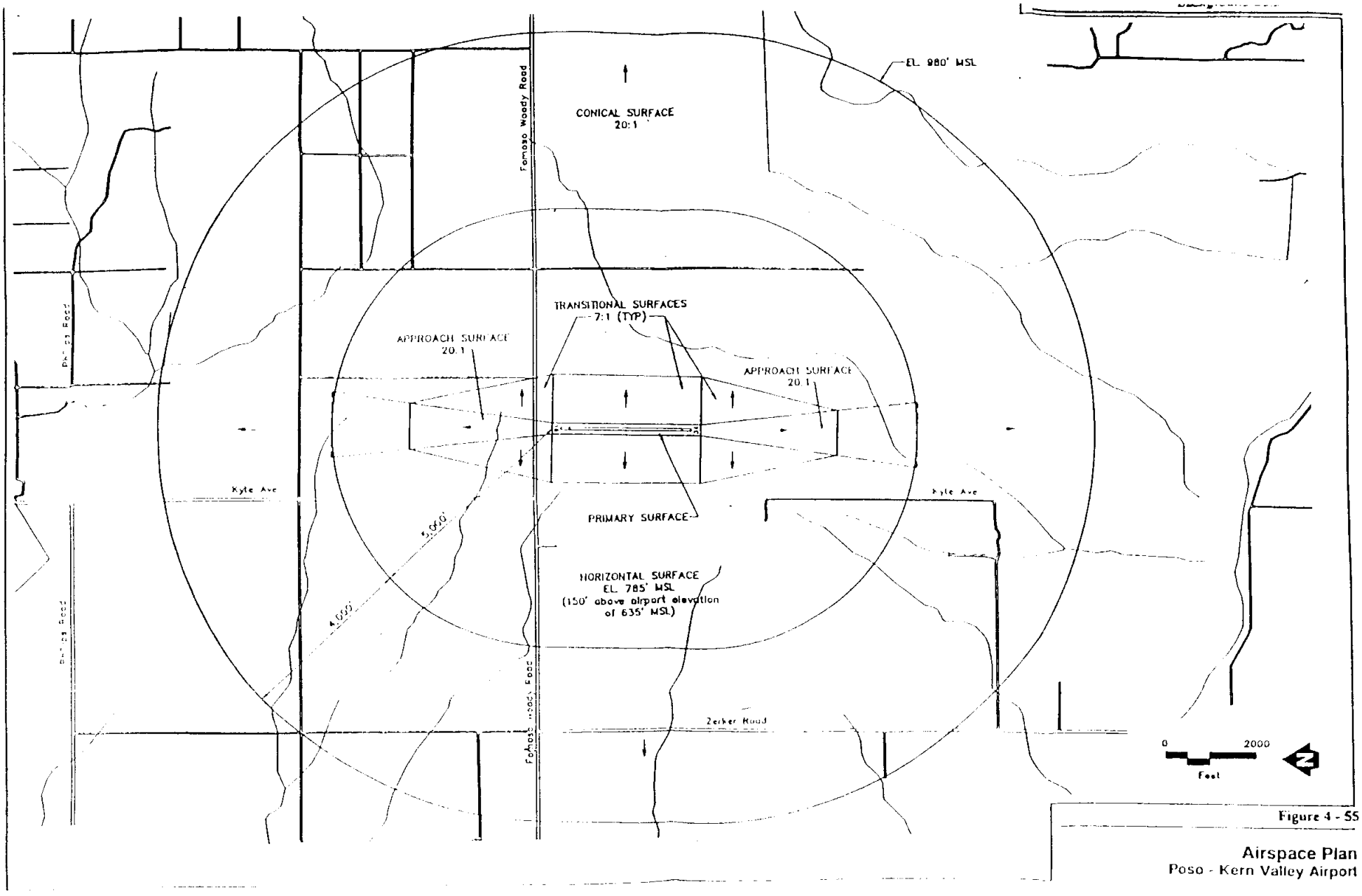


Figure 4 - 55

Airspace Plan
Poso - Kern Valley Airport

4.12 Rosamond Skypark

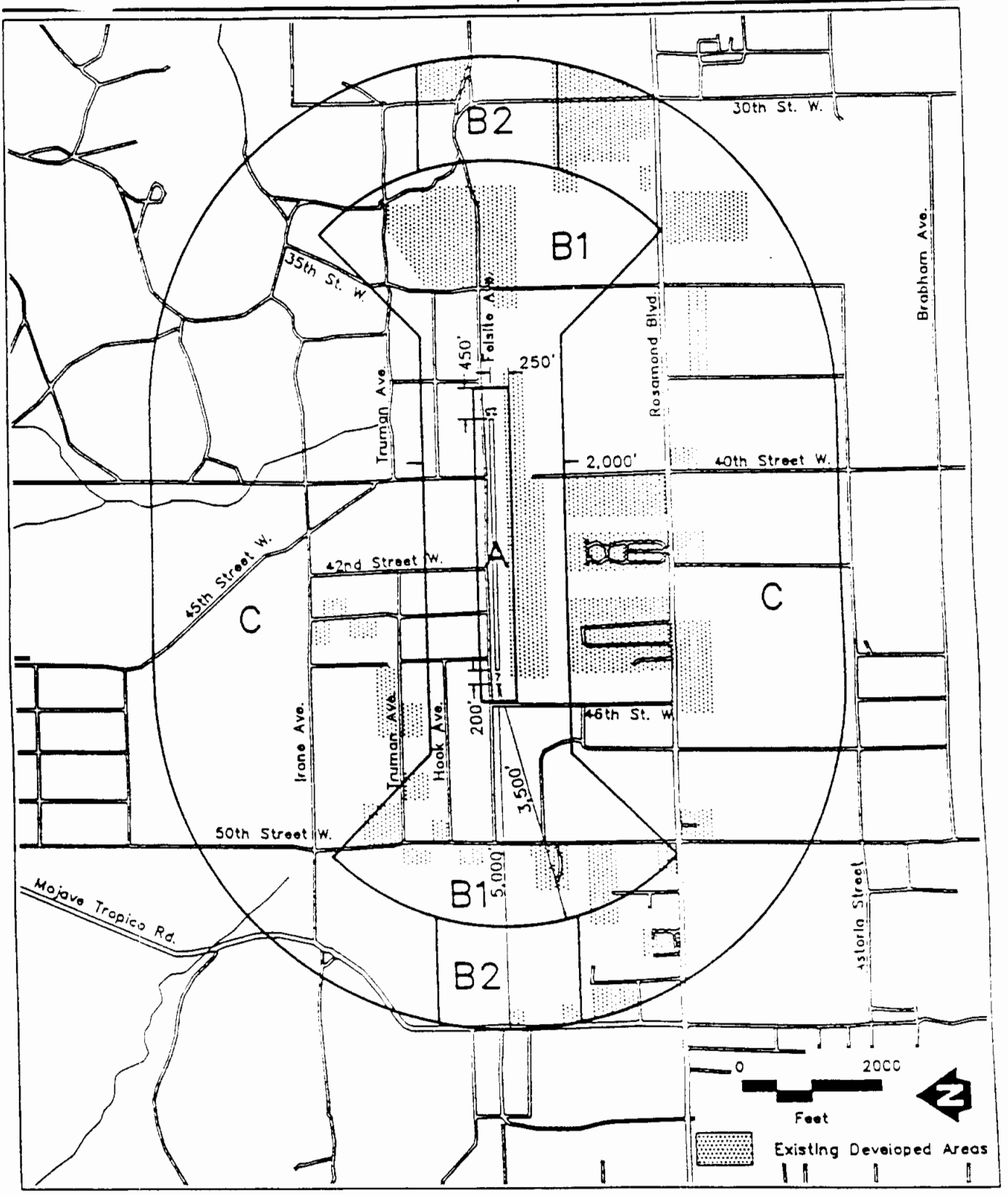


Figure 4 - 56

Comprehensive Land Use Plan

Rosamond Airport

Table 4-34

Airport Environs

Rosamond Skypark

AIRPORT LOCATION AND ACCESS

- Approximately 70 miles southeast of the city of Bakersfield.
- Airport and most of approaches under county jurisdiction
- Access from State Route 14 via Rosamond Boulevard West

EXISTING AIRPORT AREA LAND USES

General Character

- Low- and medium-density residential areas surround the airport. Residential sub-division associated with the airport has taxiways which connect the airfield and individual home-owners' hangars

Runway Approaches

- *Runway 7 (west) Approach* — Low-density residential.
- *Runway 25 (east) Approach* — Medium-density residential.

Traffic Pattern

- Powered aircraft pattern on south side, primarily medium-density residential; some low-density residential
- Glider plane pattern on north side, primarily low-density residential; some medium-density residential

LOCAL LAND USE PLANS AND ZONING

- *Kern County General Plan* — Adopted in 1982

PLANNED LAND USES IN AIRPORT AREA

- Continuing infill of residential uses
- No major projects currently under consideration

ESTABLISHED APPROACH PROTECTION MEASURES

- Kern County Height Zoning Ordinance restricts the height of objects in the Airport's vicinity

Source: Hodges & Shutt (October 1993)

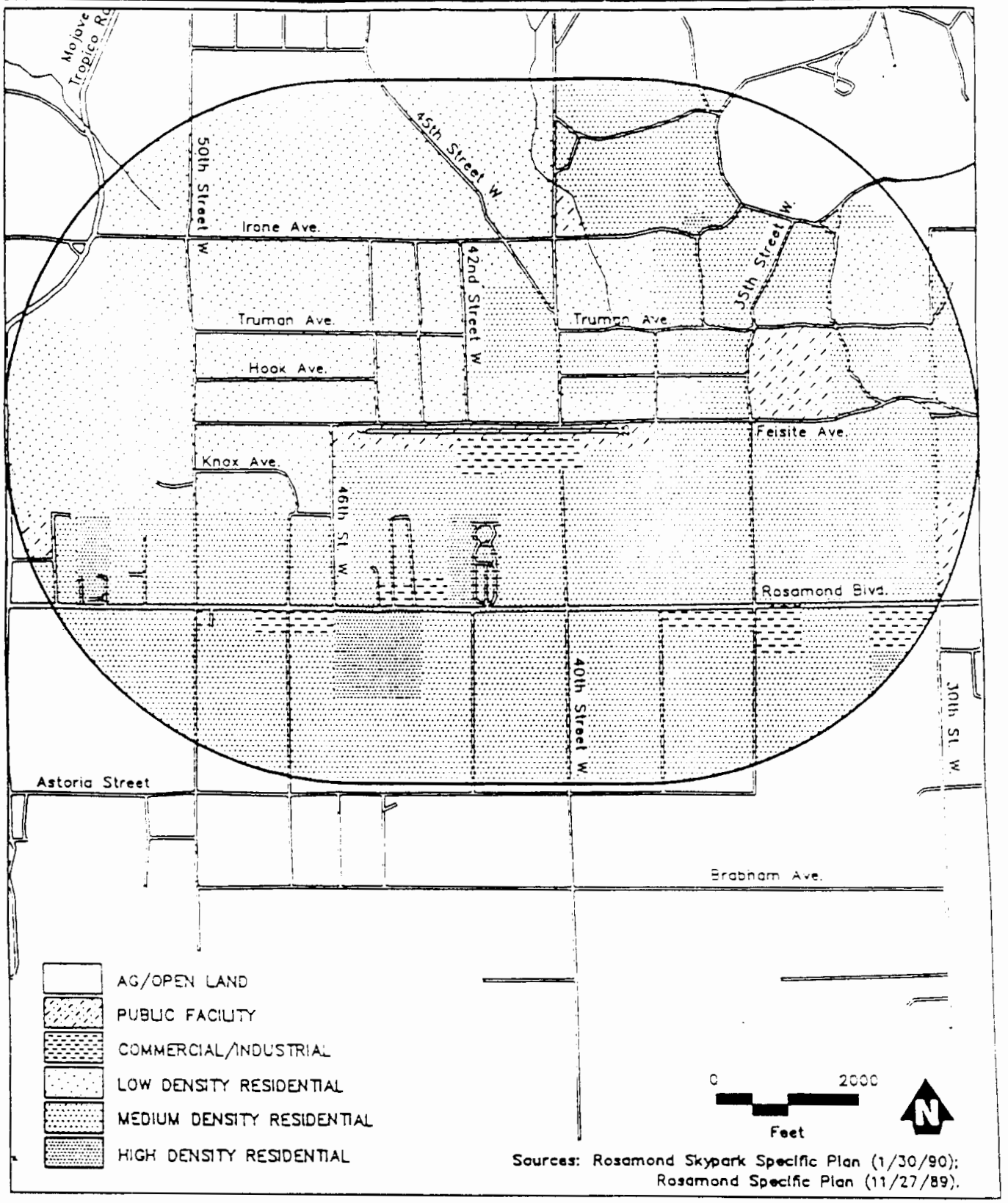


Figure 4 - 57

Land Use Designations

Rosamond Skypark

Table 4-35

Airport Features

Rosamond Skypark

AIRPORT PROPERTY

- *Ownership* — Private - Rosamond Skypark Association
- *Size* — 100 acres fee title
- *Elevation* — 2,415 feet MSL

AIRPORT PLANNING

- *Adopted Plans*
  - Privately-owned airport; no formally adopted plans.
- *Planned Improvements*
  - No major development proposals currently active

BUILDING AREA

- *Location* — South side, mid-field
- *Aircraft Parking Capacity* — Approximately 24 based and transient tiedowns; 29 privately-owned T-hangars.
- *Other Major Facilities* — Two fixed base operations' maintenance hangars/offices; fuel facilities; restaurant.
- *Services* — Fixed base operator services include fuel, aircraft sales, repairs, rentals and flight instruction.

RUNWAY SYSTEM

Runway 7-25

- *Critical Aircraft* — Light twin-engine propeller
- *Classification* — Airport Reference Code B-I, small aircraft
- *Dimensions* — 3,600 feet long, 50 feet wide
- *Lighting* — Low-intensity runway edge lighting
- *Surface* — Asphalt, good condition
- *Primary Taxiways* — Full-length parallel taxiway, exit taxiways

RUNWAY APPROACHES

Runway 7

- *Approach Type* — Visual
- *Runway Protection Zone* — Approximately half of the RPZ is within the airport property line.
- *Approach Obstacles* — Fence 5 feet high at end of runway, 300 feet from displaced threshold. 50:1 approach slope to displaced threshold provides adequate clearance

Runway 25

- *Approach Type* — Visual
- *Runway Protection Zone* — Most of existing RPZ is off airport property
- *Approach Obstacles* — Pole 35 feet high, 1,740 feet from runway end, threshold displaced 200 feet to provide adequate clearance

Traffic Pattern

- *Location* — Established pattern south of runway only
- *Altitude* — 800 feet above airport elevation

Source: Hodges & Shutt (October 1990)

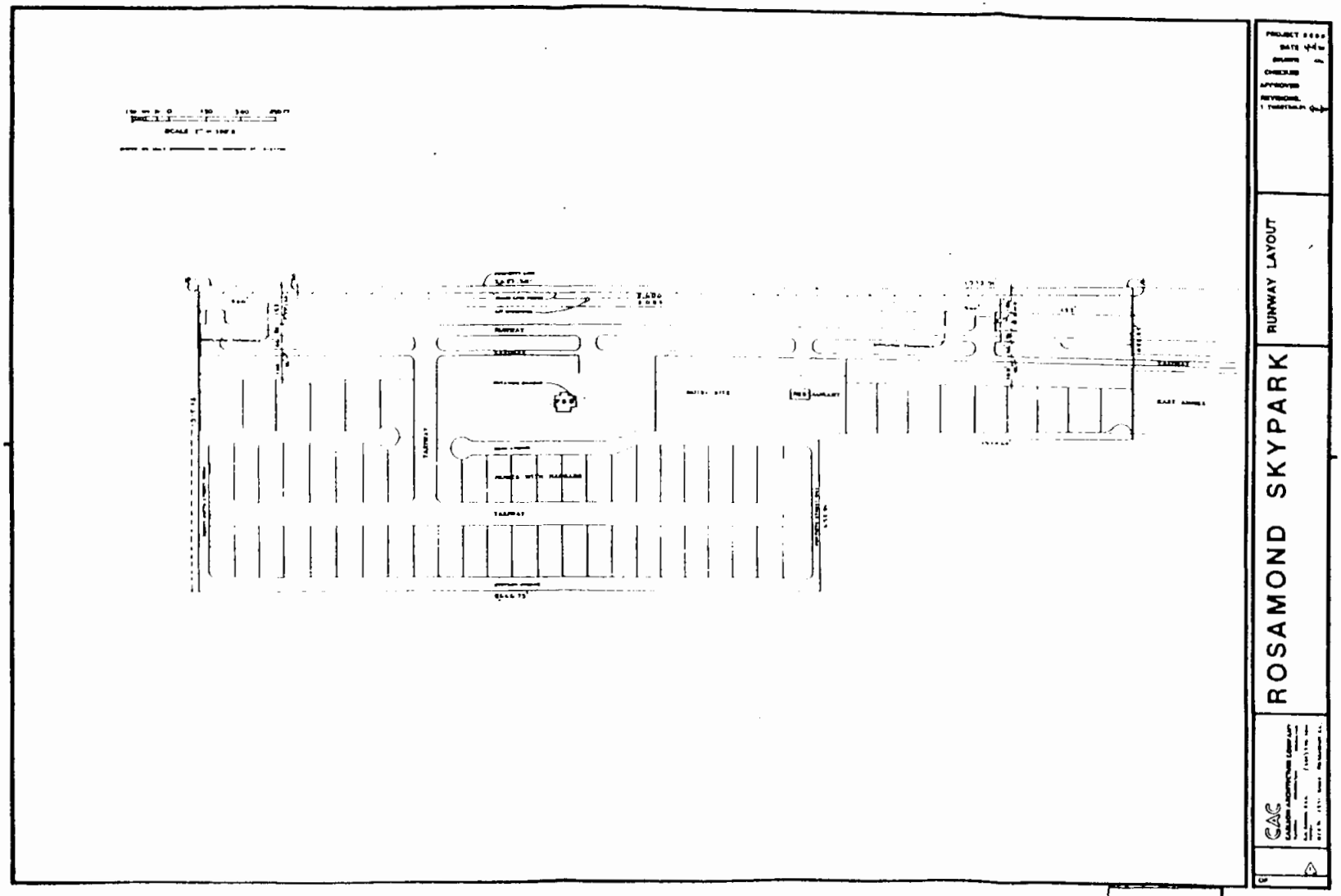


Figure 4 - 58

Table 4-36

Forecast Airport Activity

Rosamond Skypark

AIRCRAFT OPERATIONS

Total	
Annual	42,500
Average Day	[illegible]
Distribution	
Single-Engine	88.0%
Twin-Engine	7.7%
Turboprop	0.9%
Business Jet	3.4%

TIME OF DAY DISTRIBUTION

All Aircraft		
Day	(0700-1900)	78.0%
Evening	(1900-2200)	11.0%
Night	(2200-0700)	11.0%

RUNWAY USE DISTRIBUTION

All Aircraft	
All Operations	
Runway 7	10.0%
Runway 25	90.0%

FLIGHT TRACK DATA

- Pattern Altitude – 800 feet AGL
- Right traffic on Runway 7 (no north side pattern)

Source: Aries (1989) for then current year

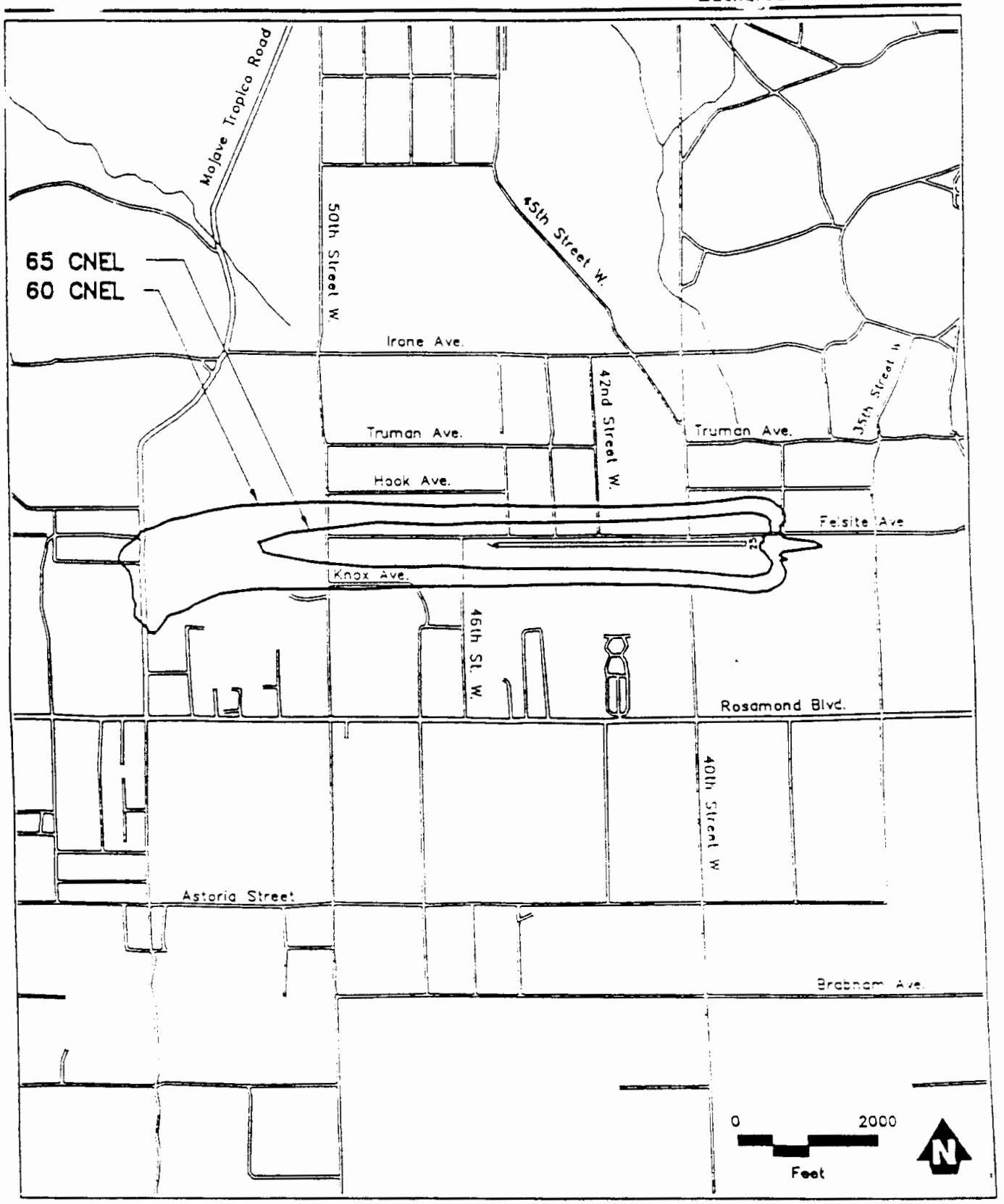


Figure 4 - 59

Noise Contours
Rosamond Skypark

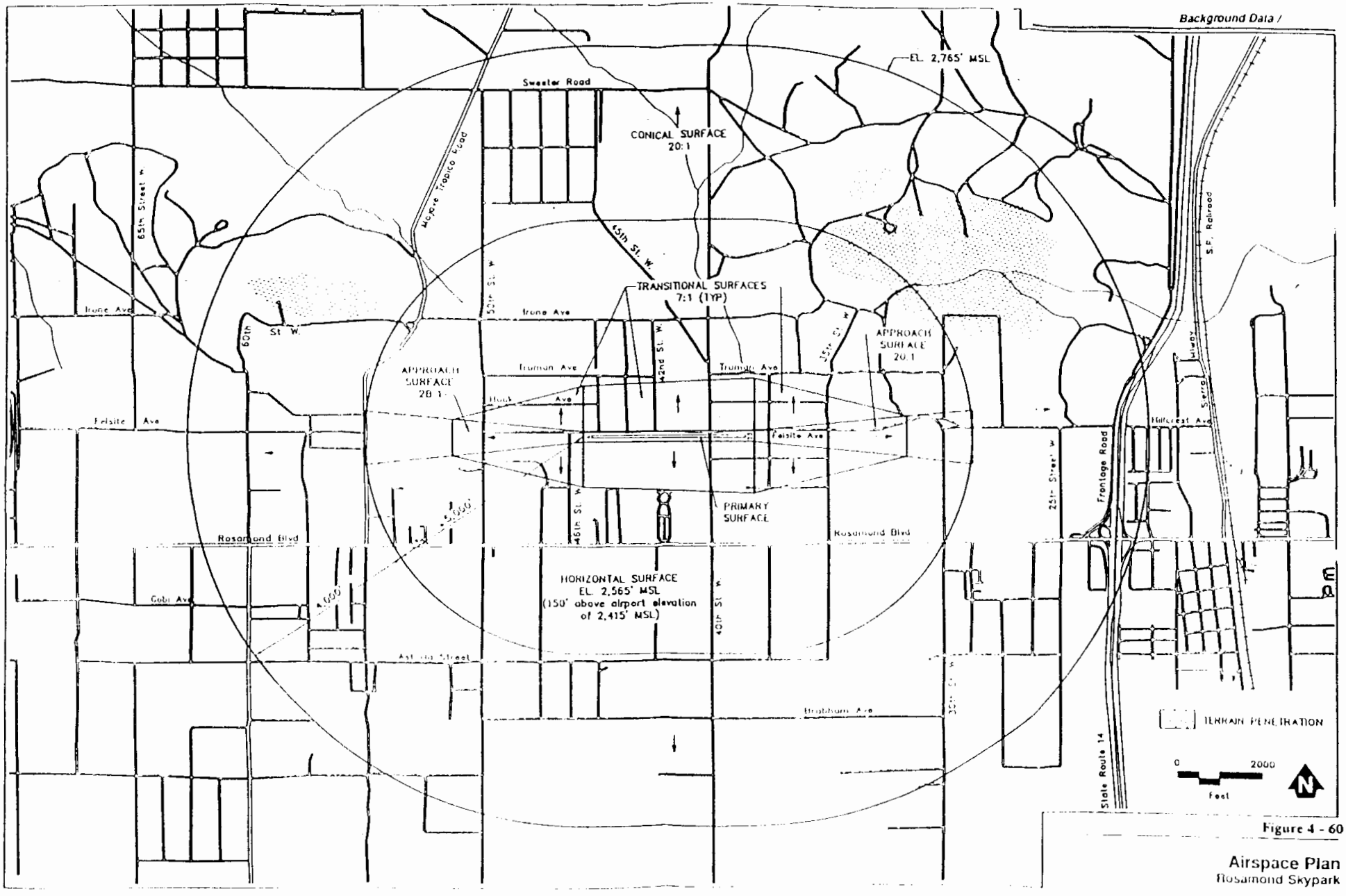


Figure 4 - 60

Airspace Plan
Rosamond Skypark

4.13 Shafter Airport - Minter Field

4.13.1

The compatibility zones include provisions to protect the planned 1,500-foot extension of Runway 12-30.

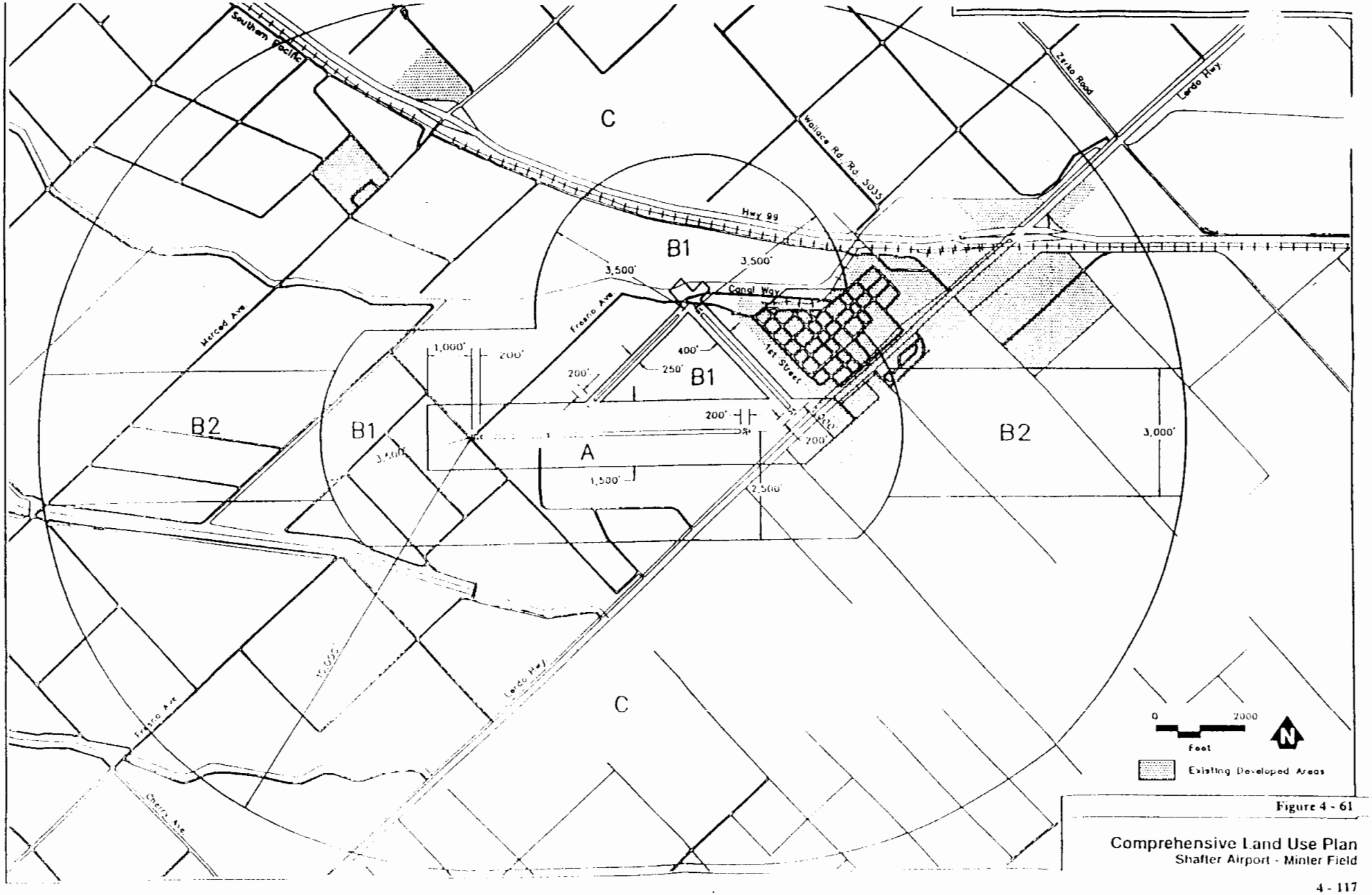


Figure 4 - 61

Comprehensive Land Use Plan
Shafter Airport - Minter Field

Table 4-37

Airport Environs

Shafter Airport - Minter Field

AIRPORT LOCATION AND ACCESS

- Located approximately 12 miles northwest of the city of Bakersfield.
- Airport and most of approaches within City of Shafter
- Access from State Highway 99, via Lerdo Highway

EXISTING AIRPORT AREA LAND USES

General Character

- Low density residential development to the southeast; balance primarily agriculture

Runway Approaches

- *Runway 12 (northwest) Approach* — Agriculture out to 1 mile
- *Runway 30 (southeast) Approach* — Commercial building out 600 feet; agriculture out to 1 mile

Traffic Pattern

- One residential subdivision southeast of airport; commercial-industrial to the east; agricultural uses elsewhere.

LOCAL LAND USE PLANS AND ZONING

- Kern County *General Plan* adopted in 1982
- City of Shafter *General Plan*

PLANNED LAND USES IN AIRPORT AREA

- Continued infill of commercial/industrial uses to the southeast, continued use of remaining area for agriculture

ESTABLISHED APPROACH PROTECTION MEASURES

- City of Shafter and Kern County Height Zoning Ordinance limits the height of objects in the vicinity of the Airport

Source: Source: Hodges & Shutt (October 1993)

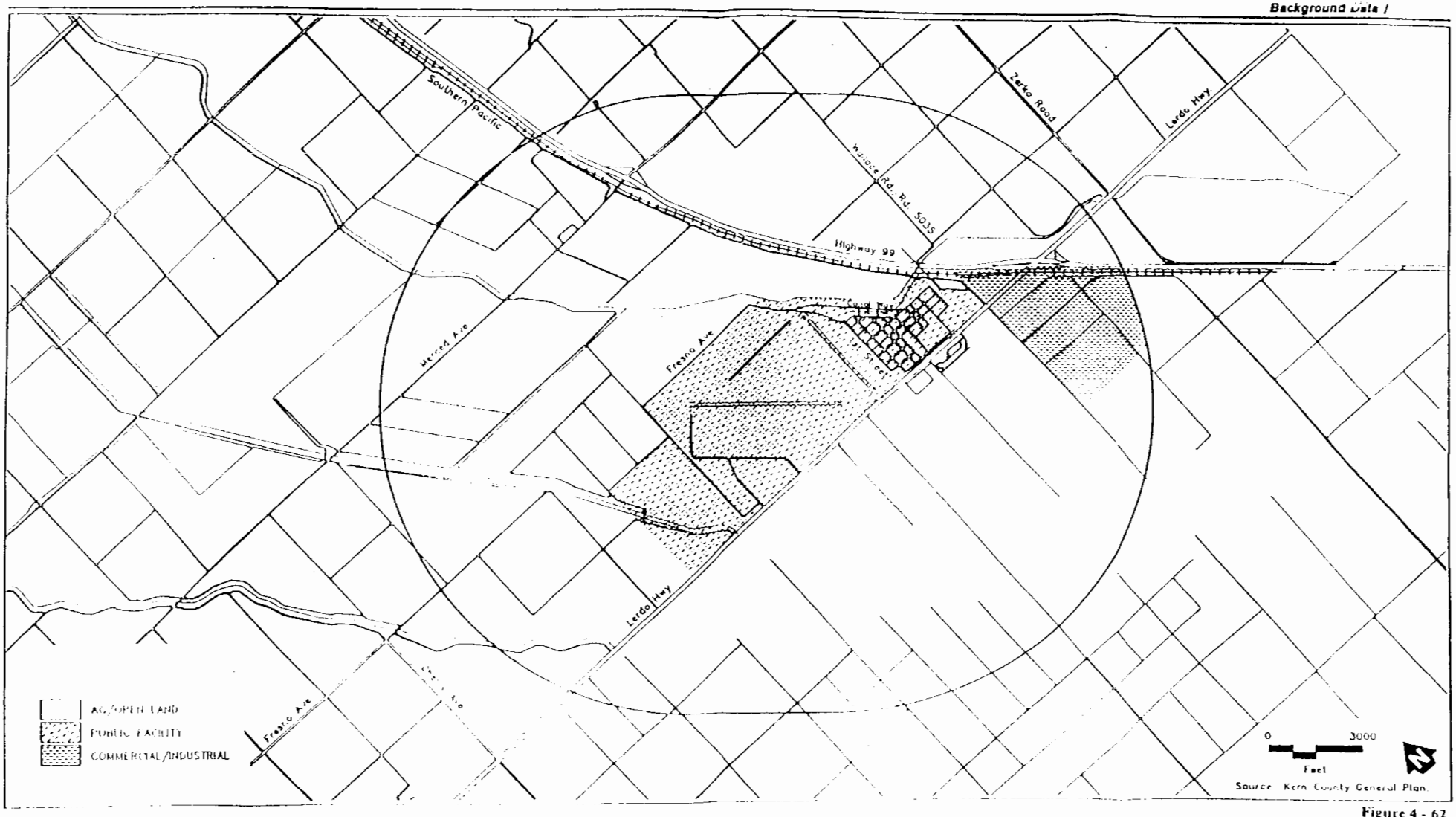


Figure 4 - 62

Land Use Designations

Shafter Airport-Minter Field

Table 4-38

Airport Features

Shafter Airport - Minter Field

AIRPORT PROPERTY

- *Ownership* — Minter Field Airport District
- *Size* — 1 223 acres in fee
- *Elevation* — 422 feet MSL

AIRPORT PLANNING

- *Adopted Plans*
  - 1990 Master Plan adopted by Minter Field Airport District
- *Planned improvements*
  - Reactivation of Runway 7-25
  - Proposed extension of Runway 12-30 by 1 500 feet
  - Planned hangar development in apron area east of Runway 16 end

BUILDING AREA

- *Location* — Primary building area east of Runway 16-34; secondary area reserved for aviation uses south of Runway 12-30
- *Aircraft Parking Capacity* — 114 tiedown spaces, and 45 T-hangars.
- *Other Major Facilities* — Fixed base operations maintenance hangar; offices; fuel facilities; Minter Field Air Museum
- *Services* — Flight instruction, repairs, 80 and 100LL fuel

RUNWAY SYSTEM

Runway 12-30

- *Critical Aircraft* — Medium business jet
- *Classification* — Airport Reference Code C-II
- *Dimensions* — 4 520 feet long, 100 feet wide
- *Lighting* — Medium-intensity runway edge lights
- *Surface* — Asphalt, good condition
- *Taxiways* — Full-length parallel taxiway, four exit taxiways, one connector taxiway

Runway 16-34

- *Critical Aircraft* — Light twin-engine
- *Classification* — Airport Reference Code B-II small aircraft
- *Dimensions* — 2 980 feet long, 100 feet wide
- *Lighting* — None
- *Surface* — Concrete, fair condition
- *Taxiways* — Full-length parallel taxiway; four exit taxiways

Runway 7-25

- *Critical Aircraft* — Agricultural applicator
- *Classification* — Airport Reference Code A-I
- *Dimensions* — 2 800 feet long, 60 feet wide
- *Lighting* — None
- *Surface* — Asphalt, poor condition
- *Taxiways* — One exit taxiway

Table 4-38 Continued

Airport Features

Shafter Airport - Minter Field

RUNWAY APPROACHES

Runway 12

- *Approach Type* — Visual, non-precision is planned
- *Runway Protection Zone* — Entirely on airport property
- *Approach Obstacles* — No penetrations to approach surface.

Runway 30

- *Approach Type* — Non-precision, precision approach is planned
- *Runway Protection Zone* — Approximately 10 acres off airport property, which is planned for approach protection easement
- *Approach Obstacles* — No penetrations to approach surface.

Runway 16

- *Approach Type* — Visual.
- *Runway Protection Zone* — Approximately half is off airport property, and is planned for future avigation easement.
- *Approach Obstacles* — Road 10 feet above and 535 from runway end; 33:1 approach slope provides adequate clearance

Runway 34

- *Approach Type* — Visual
- *Runway Protection Zone* — Approximately two-thirds off airport property, which is planned for approach protection easement.
- *Approach Obstacles* —Road 15 feet above and 470 feet from runway end, approach slope of 18:1 provides adequate clearance

Runway 7

- *Approach Type* — Visual
- *Runway Protection Zone* — On airport property
- *Approach Obstacles* — No penetrations of approach surface.

Runway 25

- *Approach Type* — Visual.
- *Runway Protection Zone* — Approximately 1/2 is off airport property.
- *Approach Obstacles* — Access road 220 feet from runway end.

Traffic Pattern

- *Location* — Established pattern both sides of each runway.
- *Altitude* — 800 feet above airport elevation

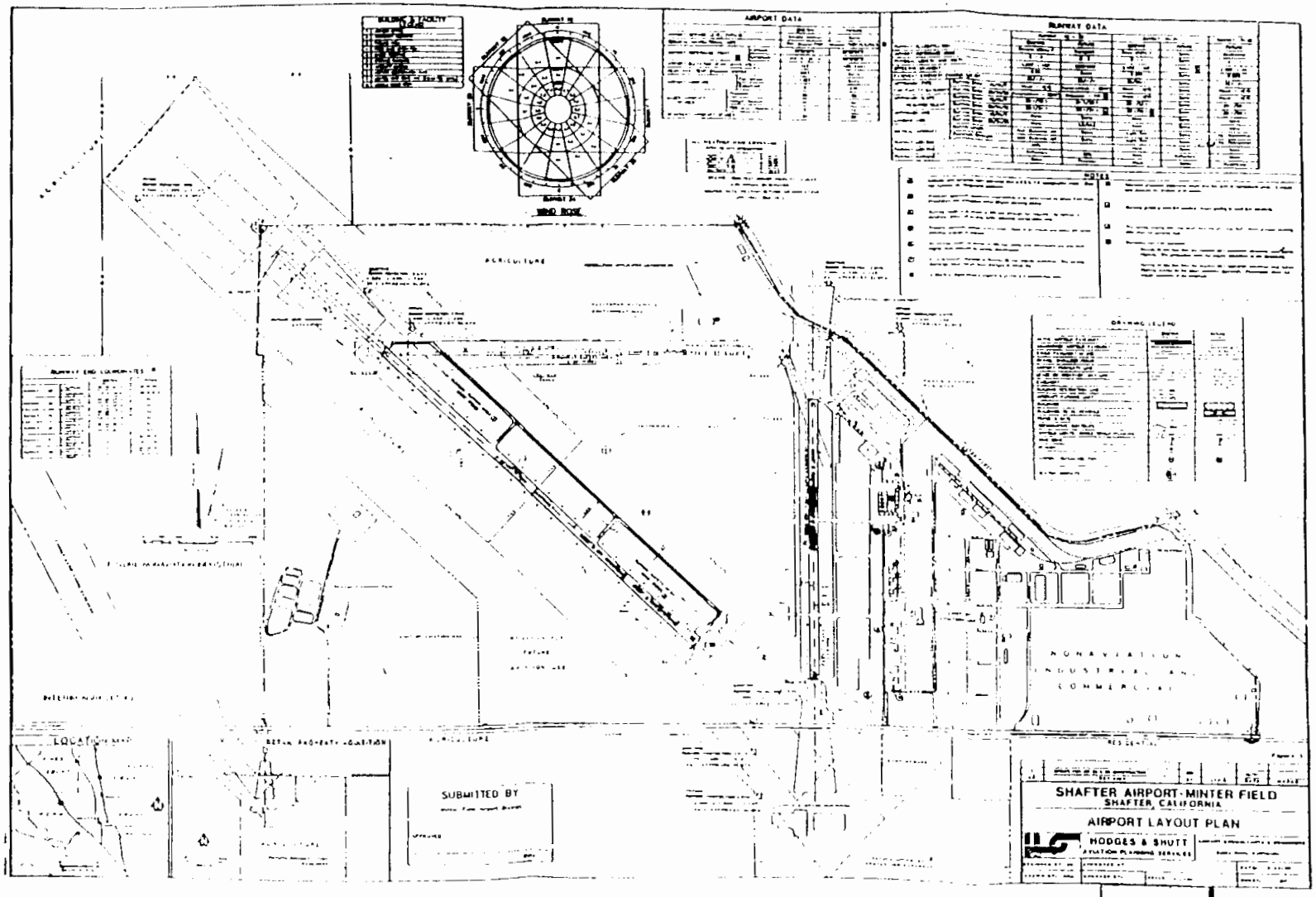

AIRPORT DATA
RUNWAY DATA
WIND ROSE
AGRICULTURE
NONAVIATION
INDUSTRIAL AND
COMMERCIAL
SUBMITTED BY
SHAFTER AIRPORT-MINTER FIELD
SHAFTER, CALIFORNIA
AIRPORT LAYOUT PLAN
HODGES & SHUTT

Figure 4 63

Table 4-39

Forecast Airport Activity

Shafter-Minter Field

AIRCRAFT OPERATIONS

Total	
Annual	30,000
Average Day	82.2
Distribution	
Single-Engine	56.7%
Aerial Applicator	21.6%
Twin-Engine	10.0%
Business Jet	1.7%

TIME OF DAY DISTRIBUTION

All Aircraft		
Day	(0700-1900)	90.0%
Evening	(1900-2200)	7.0%
Night	(2200-0700)	3.0%

RUNWAY USE DISTRIBUTION

	Percentage of Takeoffs					
	RW 7	RW 12	RW 16	RW 25	RW 30	RW 34
Single-Engine	–	2	5	–	80	13
Aerial Applicator	90	–	10	–	–	–
Twin-Engine	–	10	–	–	90	–
Business Jet	–	10	–	–	90	–
	Percentage of Landings					
	RW 7	RW 12	RW 16	RW 25	RW 30	RW 34
Single-Engine	–	2	3	–	85	10
Aerial Applicator	90	–	10	–	–	–
Twin-Engine	–	10	–	–	90	–
Business Jet	–	10	–	–	90	–

FLIGHT TRACK DATA

- Pattern Altitude – 800 feet AGL.
- Runway 7-25 used exclusively by aerial applicator aircraft

Source: Hodges & Shutt (April 1990) for the year 2008

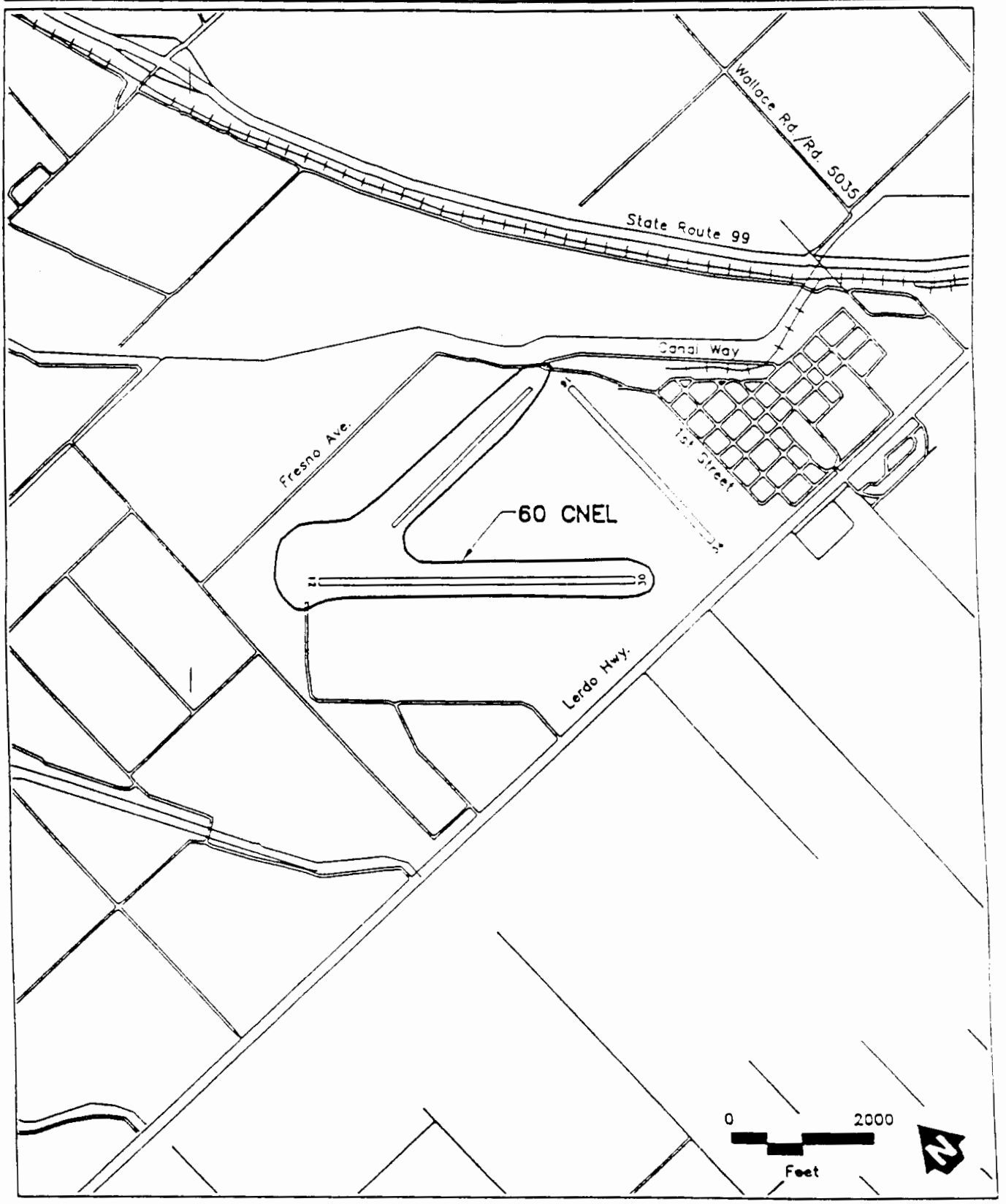


Figure 4 - 64

Noise Contours

Shafter Airport-Minter Field

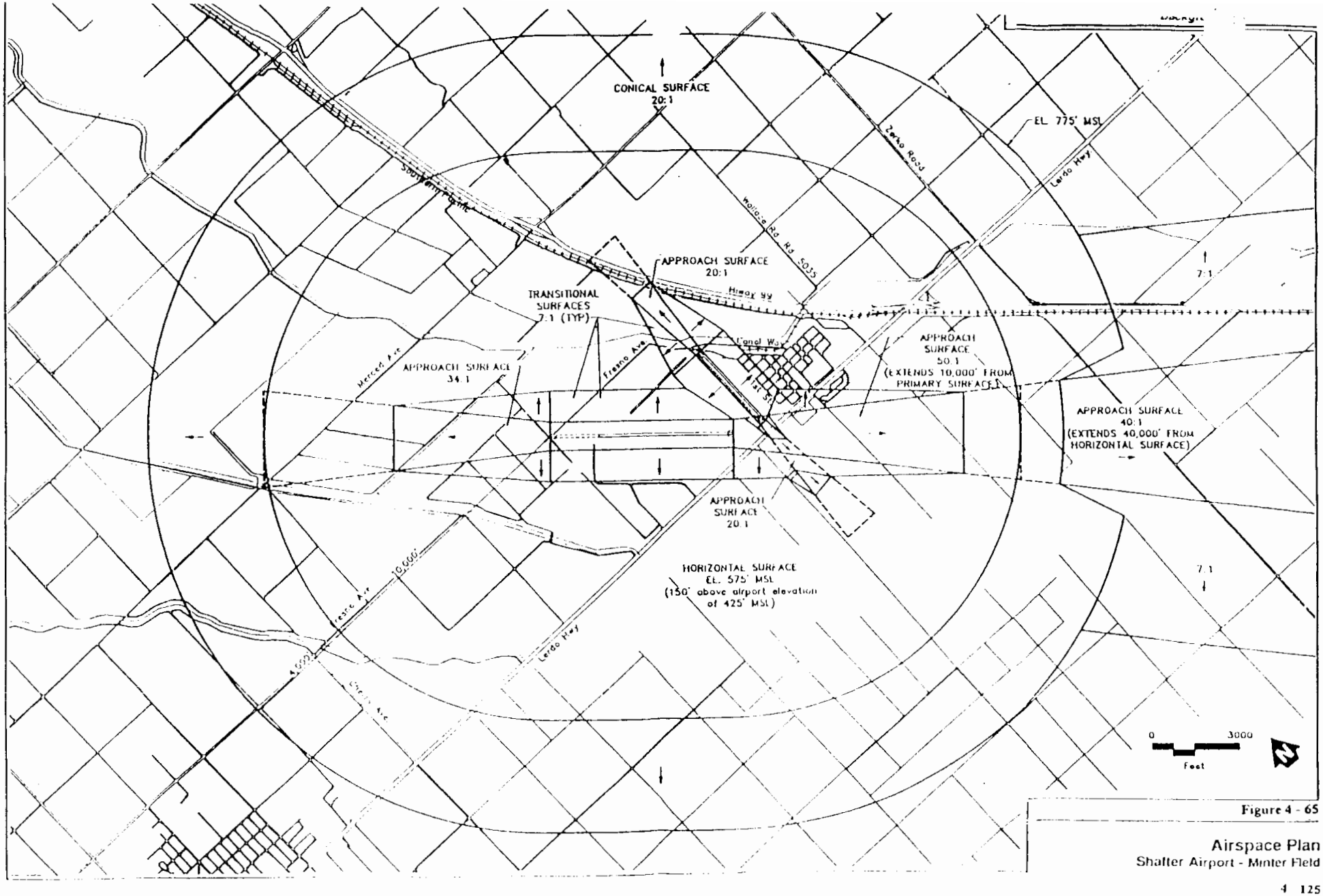


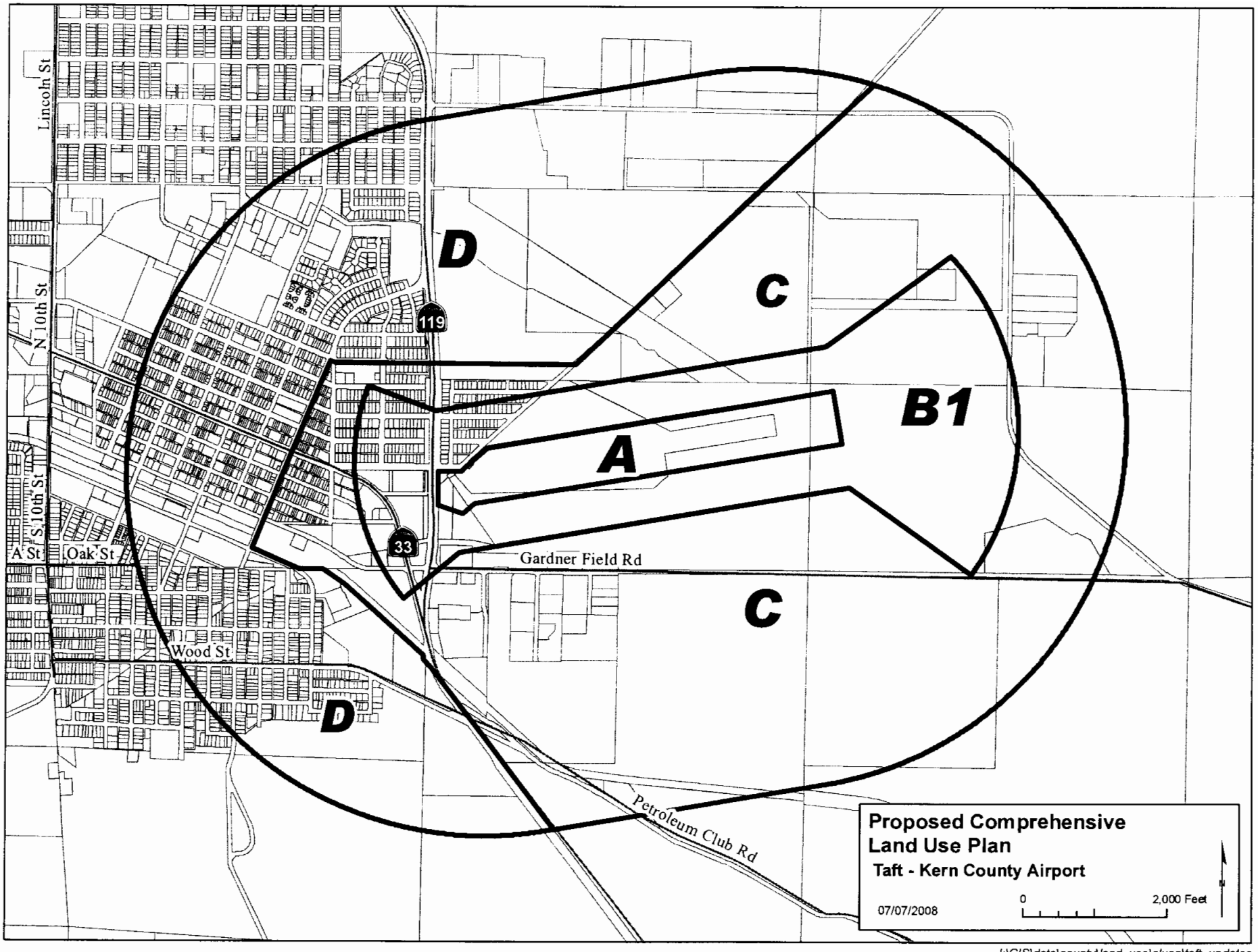
Figure 4 - 65

Airspace Plan
Shafter Airport - Minter Field

4.14 Taft-Kern County Airport

4.14.1

Operations west of the Airport are prohibited. That is, landings on Runway 7, and departures on Runway 25 are prohibited. Noise is, therefore, a significant concern only a short distance west of the runway. Safety concerns extend further from the airfield. An aircraft making a go-around during an unsuccessful landing attempt is likely to overfly the city of Taft.



I:\GIS\data\county\land_use\alucp\taft_updates

Table 4-40

Airport Environs

Taft-Kern County Airport

AIRPORT LOCATION AND ACCESS

- Located approximately 40 miles southwest of the city of Bakersfield
- Airport and approaches principally in County jurisdiction
- Airport access via State Route 33, then 2.5 miles east along East Kern Street to airport entrance

EXISTING AIRPORT AREA LAND USES

General Character

- Mixed urban uses immediately West of the Airport

Runway Approaches

- Runway 7 (east) Approach - Takeoffs only this runway; mixed urban uses
- Runway 25 (west) Approach - Landings only this runway; open land and oil fields out to ½ mile; sewage treatment plant beyond.

Traffic Pattern

- Pattern established on south side of Runway 7-25
- Primarily open land and oil fields

LOCAL LAND USE PLANS AND ZONING

- Kern County General Plan - Adopted in 1982

PLANNED LAND USES IN AIRPORT AREA

- Continued infill of mixed urban uses from the City of Taft
- No major development proposals currently active

ESTABLISHED APPROACH PROTECTION MEASURES

- Kern County Height Zoning Ordnance limits the height of objects in the airport area

Source: Hodges & Shutt (October 1993)

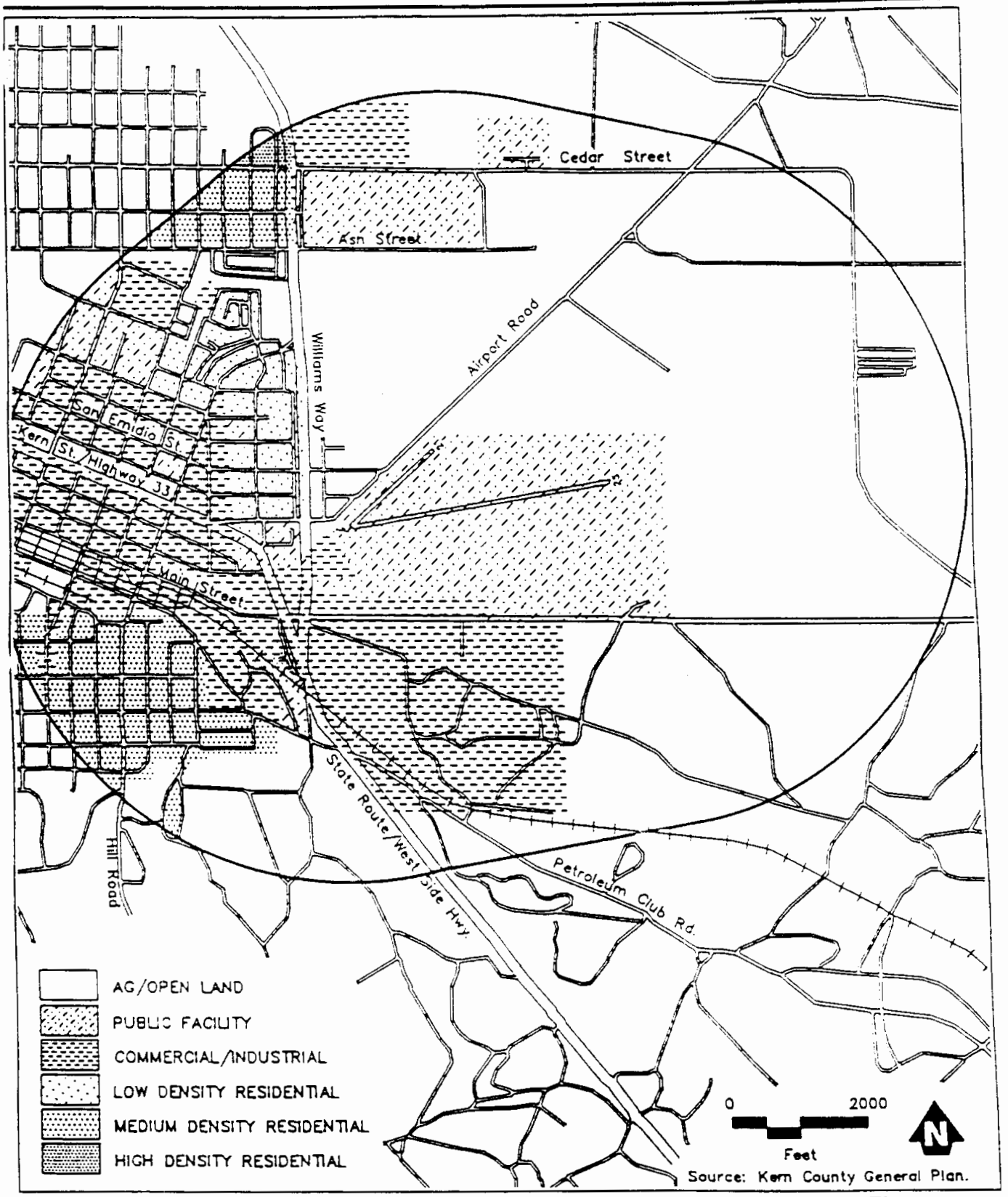


Figure 4 - 67

Land Use Designations

Taft-Kern County Airport

Table 4-41

Airport Features

Taft-Kern County Airport

AIRPORT PROPERTY

- Ownership - Privately owned by Standard Oil Company.
- Size - 71 acres in lease
- Elevation - 875 feet MSL.

AIRPORT PLANNING

- Adopted Plans - ALP dated 12/1/87 has not been officially adopted
- Planned Improvements - No runway extension or other plans which would change off-airport effects

BUILDING AREA

- Location - Primary and secondary building areas are south and east of Runway 25
- Aircraft Parking Capacity - 18 tiedowns,16 T hangars.
- Other Major Facilities - Fixed base operators maintenance building, lounge building, fuel facilities
- Services - Aircraft rental, repairs, flight instruction

RUNWAY SYSTEM

Runway 7-25

- Critical Aircraft-Single - engine propeller; also occasional small twin-engine propeller aircraft
- Classification - Airport Reference Code B-1
- Dimensions – 3,970 feet long 60 feet wide Runway 25 threshold displaced 250 feet
- Lighting - Low intensity runway edge lighting
- Surface - Asphalt fair condition
- Taxiways - None at this airfield

RUNWAY APPROACHES

Runway 7

- Approach Type - No approaches this runway
- Runway Protection Zone - Falls under both City and County jurisdiction
- Approach obstacles - Road 12 feet above and 200 feet from end of runway; tiedowns at end of runway; fence 4 feet high; diagonal to threshold

Runway 25

- Approach Type – Visual
- Runway Protection Zone - Entirely n County jurisdiction
- Approach Obstacles - No penetrations of approach surface

Traffic Pattern

- Location – Established pattern on south side of Runway 7-25
- Altitude - 870 feet above airport elevation
- Approach Procedure - Land Runway 25 (uphill); takeoff Runway 7 (downhill)

Source Hodges & Shutt (October 1993)

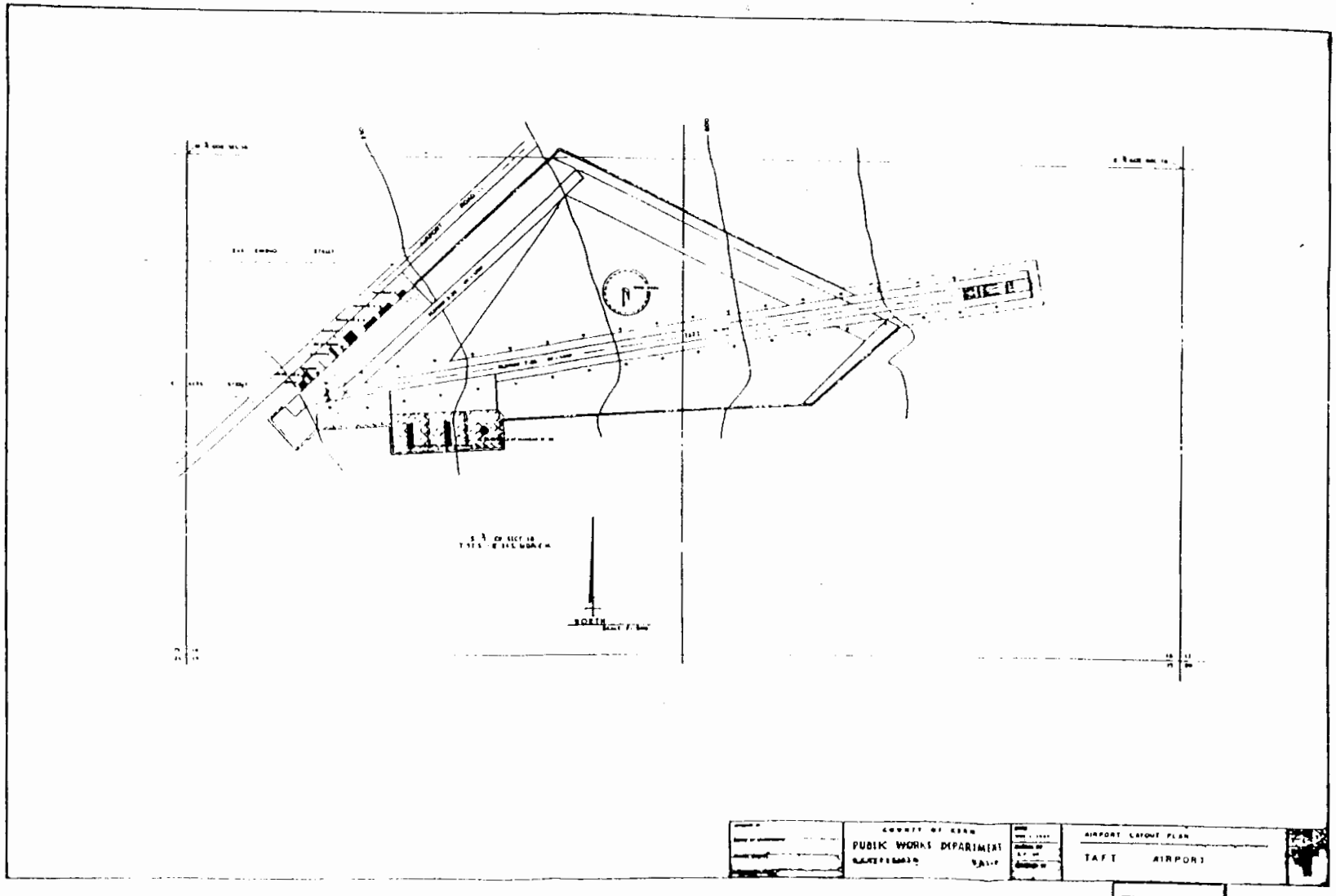

NORTH
COUNTY OF KERN
PUBLIC WORKS DEPARTMENT
AIRPORT LAYOUT PLAN
TAFT AIRPORT

Figure 4 - 68

Table 4-42

Airport Activity

Taft-Kern County Airport

AIRPORT OPERATIONS

Total	
Annual	10,764
Average Day	30
Distribution	
Single-Engine	96.7%
Twin-Engine	2.3%

TIME OF DAY DISTRIBUTION

All Aircraft	
Day (0700-1900)	96.7%
Evening (1900-2200)	1.0%
Night (2200-0700)	0%

RUNWAY USE DISTRIBUTION

All Aircraft	
All Operations	
Runway 7-25	100.0%

FLIGHT TRACK DATA

- Pattern Altitude – 825 Feet AGL
- No landings of Runway 7
- No Departures on Runway 25

Source Hodges & Shutt (October 1993)

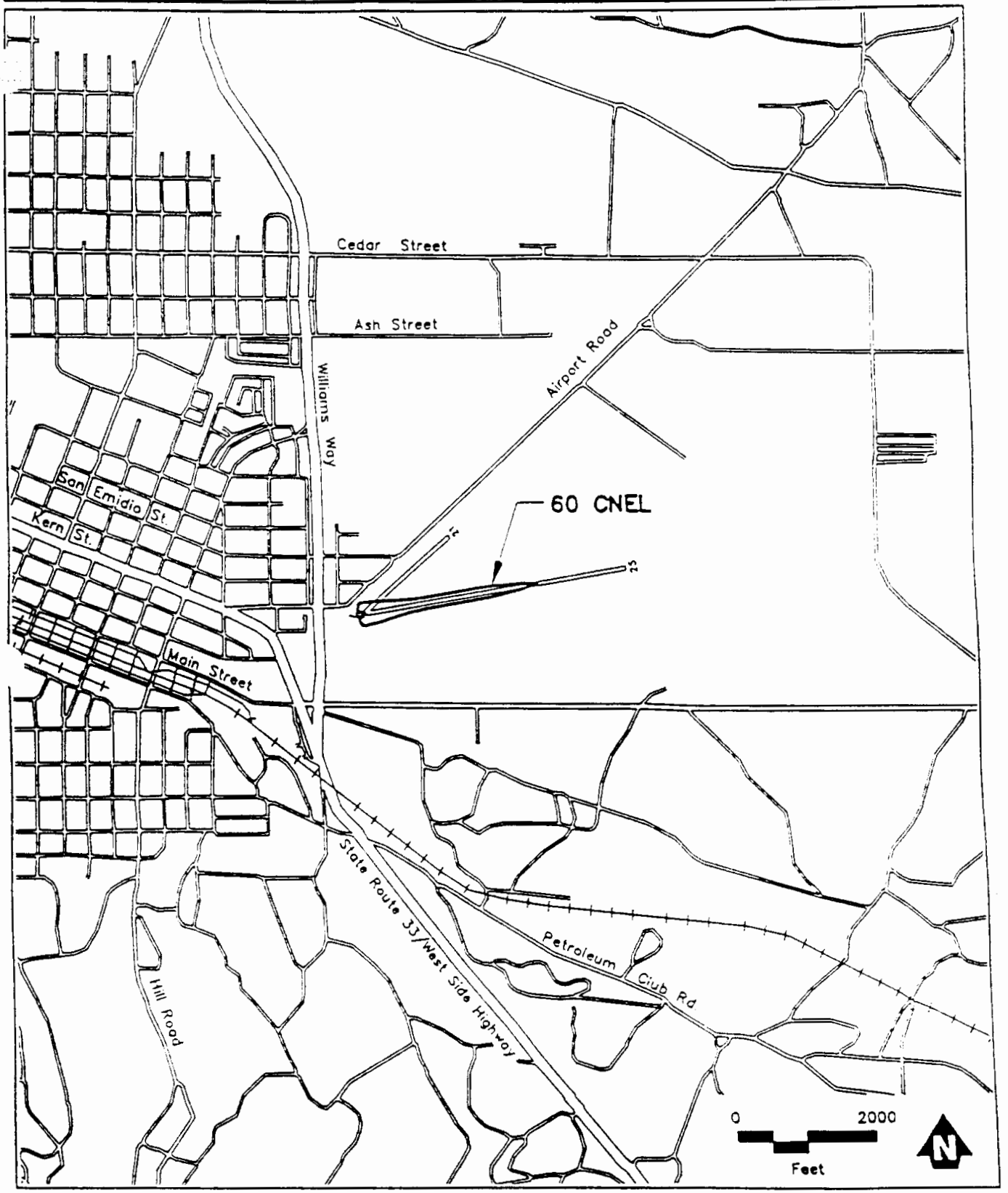


Figure 4 - 69

Noise Contours

Taft-Kern County Airport

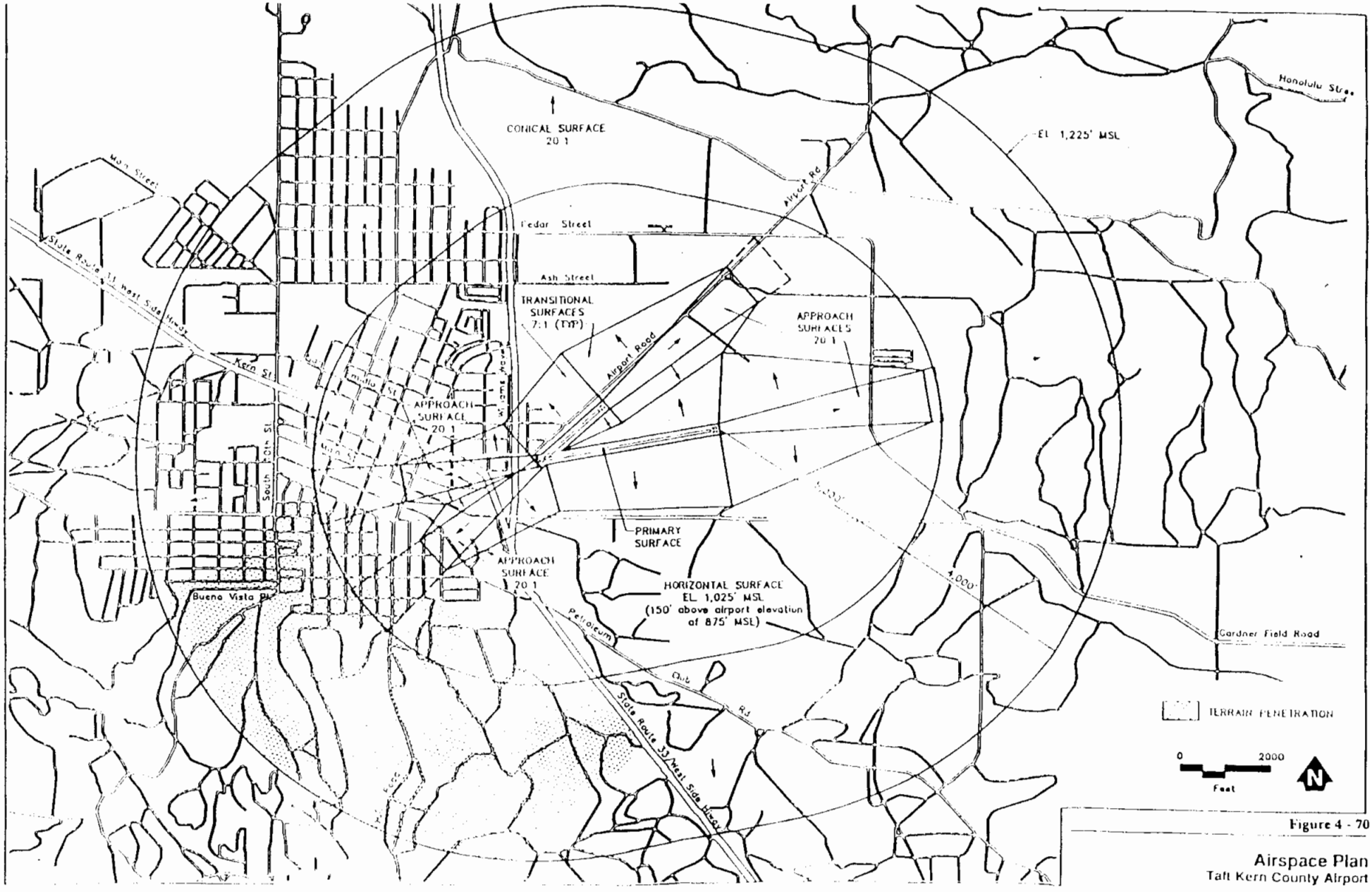


Figure 4 - 70

Airspace Plan
Taft Kern County Airport

4.15 Tehachapi Municipal Airport

4.15.1

Developments within the Capital Hills Specific Plan area are considered to be "existing" for the purpose of this Plan. Final maps have been recorded and initial improvements have been made. The City has made a long-term financial commitment to the project in the form of Mello Roos (CFD) bonds.

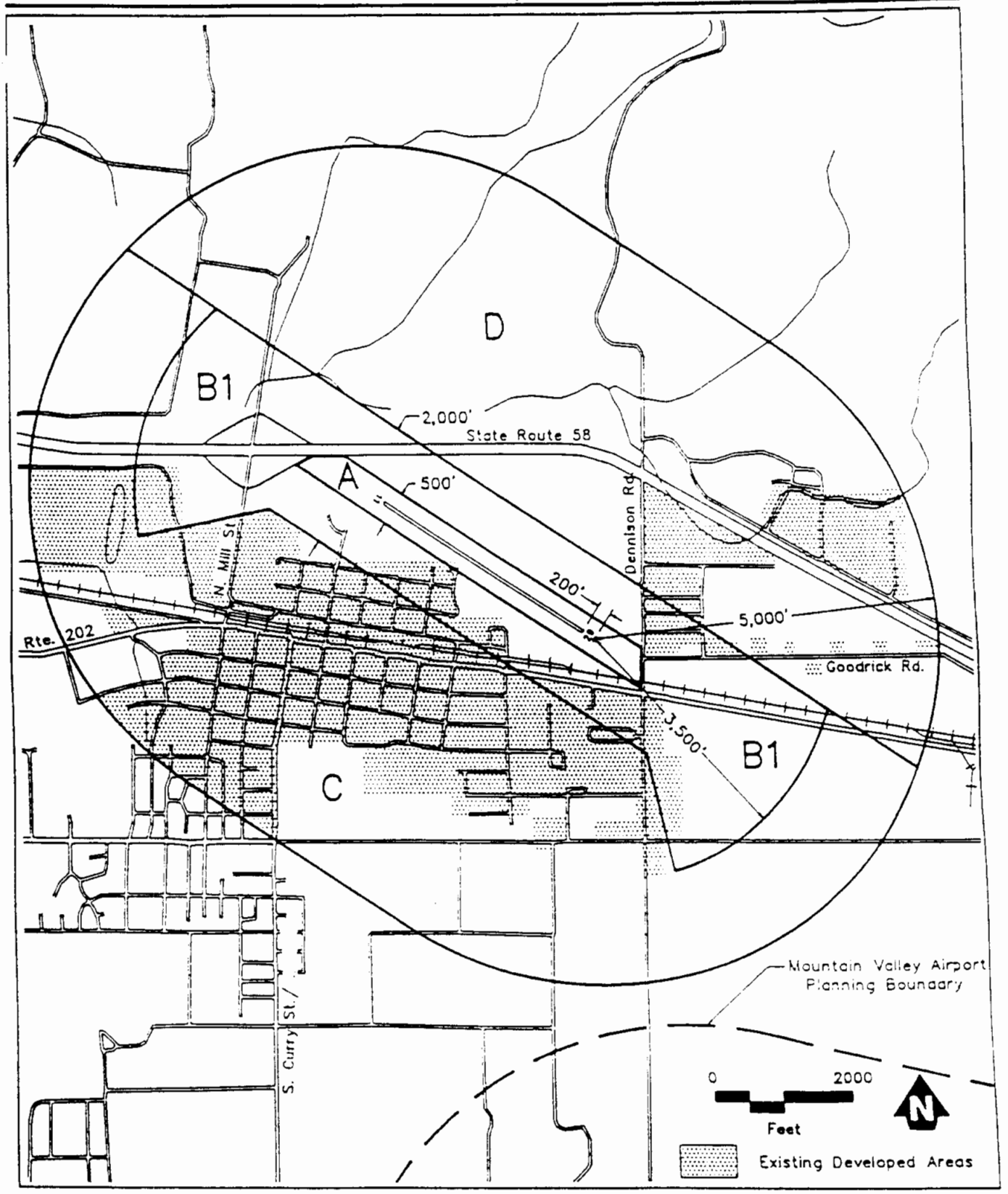

D
B1
2,000'
State Route 58
A
500'
N. Mill St.
Dennison Rd.
200'
5,000'
Rte. 202
Goodrick Rd.
3,500'
B1
C
Mountain Valley Airport
Planning Boundary
S. Curry St.
0
2000
Feet
N
Existing Developed Areas

Figure 4 - 71

Table 4-43

Airport Environs

Tehachapi Municipal Airport

AIRPORT LOCATION AND ACCESS

- Located 40 miles southeast of the city of Bakersfield
- Airport and approaches within the jurisdiction of the City of Tehachapi
- Access from State Highway 58 via Mill Street

EXISTING AIRPORT AREA LAND USES

General Character

- Primarily commercial/industrial and medium-density residential uses to the west and south
- Agricultural uses to southeast, mountains to north
- Several public-use facilities in the area

Runway Approaches

- *Runway 11 (northwest) Approach* — Undeveloped, mountainous terrain.
- *Runway 29 (southeast) Approach* — Agriculture and open land.

Traffic Pattern

- Established pattern on south side only
- Southwest primarily commercial/industrial and medium-density residential, southeast medium-density residential, schools, and some commercial uses

LOCAL LAND USE PLANS AND ZONING

- *City of Tehachapi General Plan Update-Land Use Element* — Adopted by City in May 1992, sets land use policies for airport environs.

PLANNED LAND USES IN AIRPORT AREA

- Continuing infill of Tehachapi with residential and small-scale commercial/industrial uses
- Continuing infill of commercial/industrial north of airport
- Continued residential development south of the airport

ESTABLISHED APPROACH PROTECTION MEASURES

- City General Plan Land Use Element incorporates adopted airport compatibility criteria.

Source: Hodges & Shutt (October 1993)

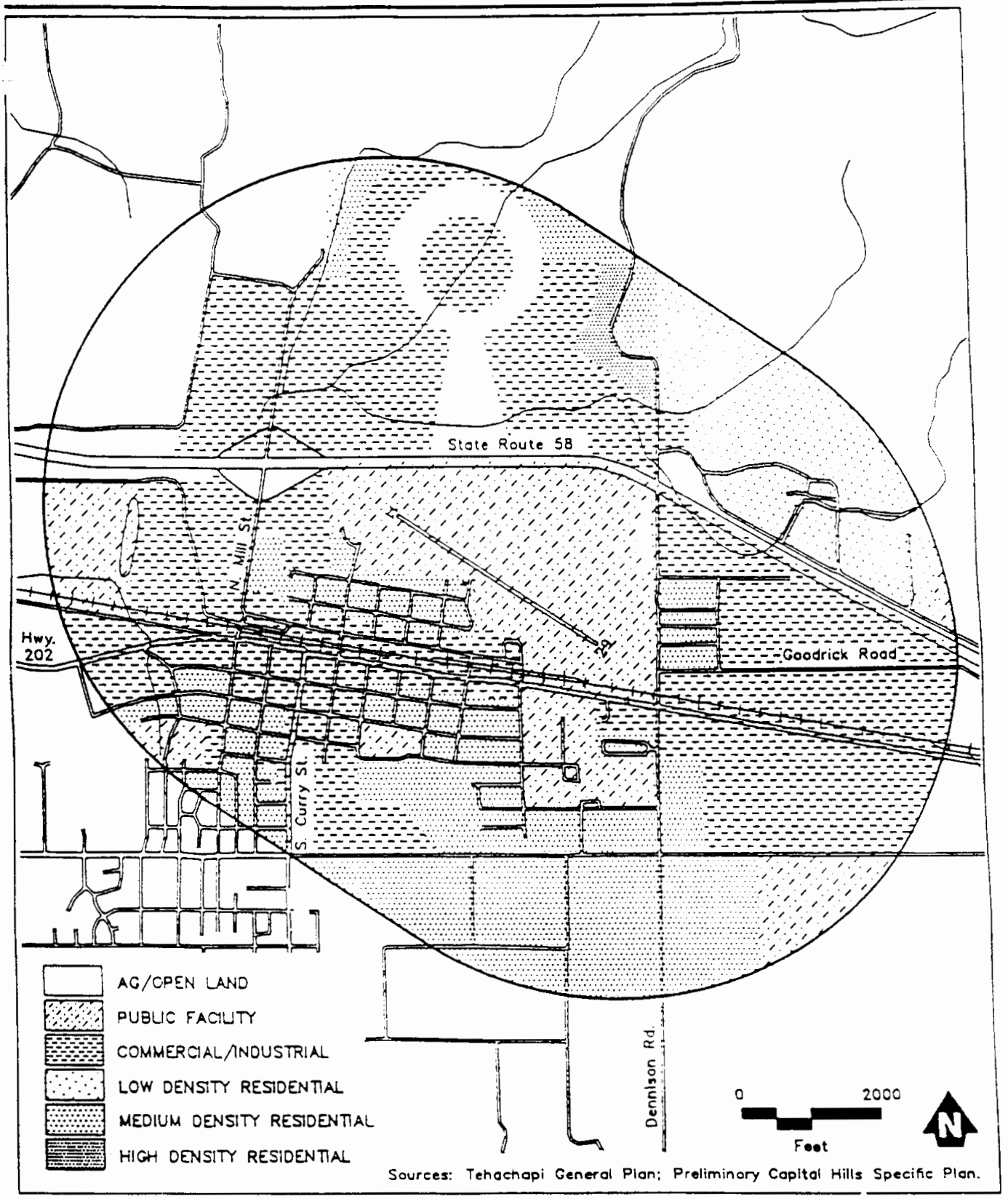


Figure 4 - 72

Land Use Designations

Tehachapi Municipal Airport

Table 4-44

Airport Features

Tehachapi Municipal Airport

AIRPORT PROPERTY

- *Ownership* — City of Tehachapi
- *Size* — 264 acres fee title
- *Elevation* — 4,002 feet MSL

AIRPORT PLANNING

- *Adopted Plans*
  - Airport Master Plan Update, adopted September 1993
- *Planned Improvements*
  - Planned runway extension of 200 feet
  - Parallel taxiway relocation
  - Future non-precision approach on both runways

BUILDING AREA

- *Location* — Primary building area runs along south side of runway; terminal area and based aircraft hangar development planned on north side of runway.
- *Aircraft Parking Capacity*
  - 54 based and transient tiedowns, 50 T-hangars.
  - Seven individual T-hangars; one large box hangar.
- *Other Major Facilities* — Fuel island, administration building
- *Services* — Aircraft rental, repairs, flight instruction, 80 and 100LL fuel

RUNWAY SYSTEM

Runway 11-29

- *Critical Aircraft* — Light twin-engine propeller
- *Classification* — Airport Reference Code B-I, small aircraft
- *Dimensions* — 4,035 feet long, 50 feet wide, 300-foot displaced threshold for Runway 11, 535-foot displaced threshold for Runway 29
- *Lighting* — Medium-intensity runway edge lighting
- *Surface* — Asphalt, good condition
- *Taxiways* — Full-length parallel taxiway, 5 exit taxiways

RUNWAY APPROACHES

Runway 11

- *Approach Type* — Visual
- *Runway Protection Zone* — Approximately half of existing RPZ is off airport property, but is planned to be acquired as an avigation easement.
- *Approach Obstacles* — Hill lies 276 feet above and 4,800 feet from runway end; approach slope of 16:1 provides adequate clearance.

Runway 29

- *Approach Type* — Visual
- *Runway Protection Zone* — Approximately half of existing RPZ is off airport property, but is planned to be acquired as an avigation easement
- *Approach Obstacles* — Poles stand 31 feet above and 450 feet from the runway end, 100 feet right of the projected centerline; 8:1 approach slope provides adequate clearance

Traffic Pattern

- *Location* — Established pattern south of runway only
- *Altitude* — 1,000 feet above airport elevation

Source: Hodges & Shutt (October 1993)

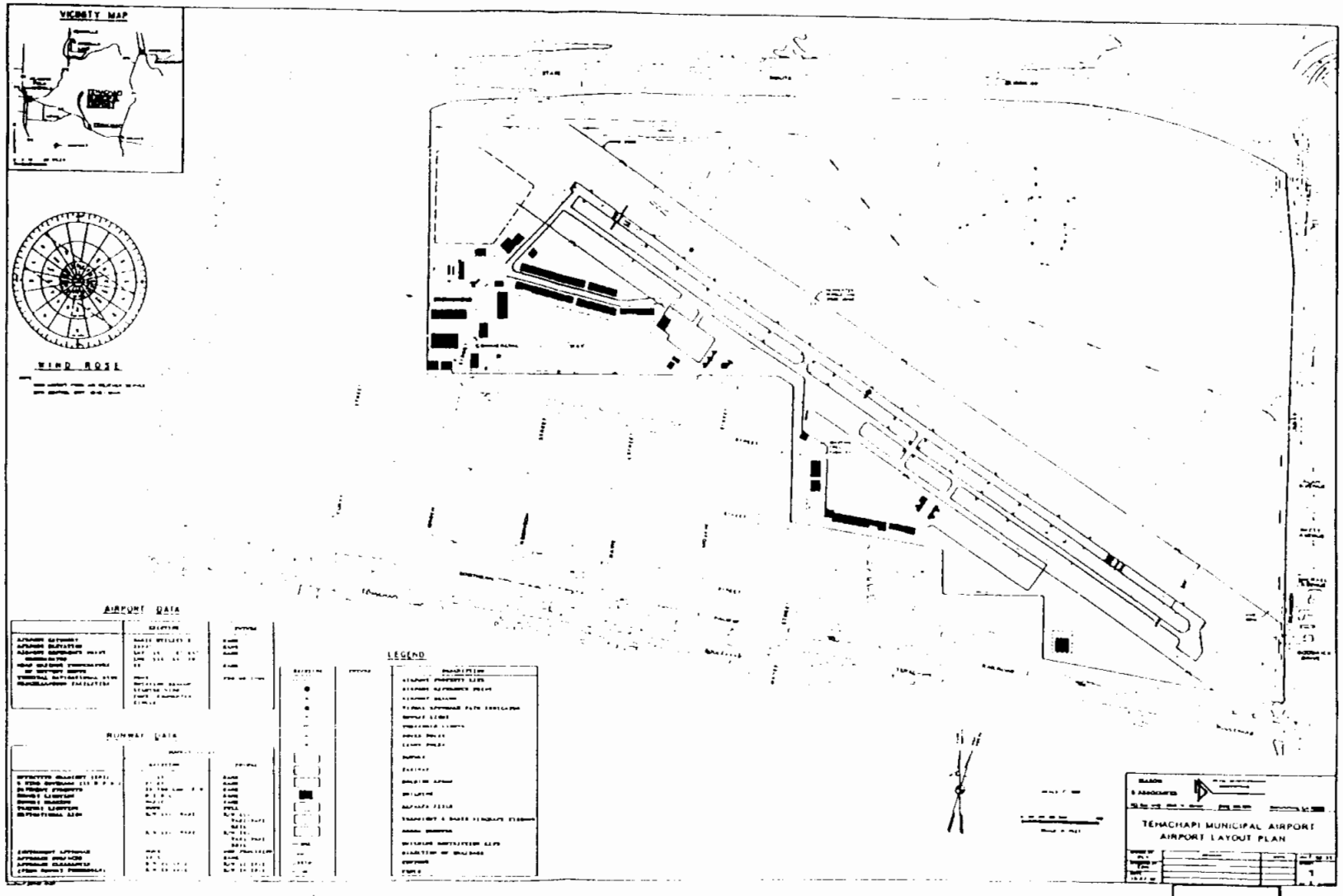

VICINITY MAP
WIND ROSE
AIRPORT DATA
RUNWAY DATA
LEGEND
TEHACHAPI MUNICIPAL AIRPORT
AIRPORT LAYOUT PLAN

Figure 4 - 73

Table 4-45

Forecast Airport Activity

Tehachapi Municipal Airport

AIRCRAFT OPERATIONS

Total	
Annual	36 500
Average Day	100
Distribution	
Single-Engine	87 7%
Twin-Engine	12 3%

TIME OF DAY DISTRIBUTION

All Aircraft		
Day	(0700-1900)	90 0%
Evening	(1900-2200)	7 0%
Night	(2200-0700)	3 0%

RUNWAY USE DISTRIBUTION

All Aircraft	
All Operations	
Runway 11	15 0%
Runway 29	85 0%

FLIGHT TRACK DATA

- Pattern Altitude – 1 000 feet AGL
- Right traffic on Runway 11 (no north side pattern)

Sources: Airport Master Plan (1987) for year 2008 forecast; Hodges & Shutt (September 1993) for distribution

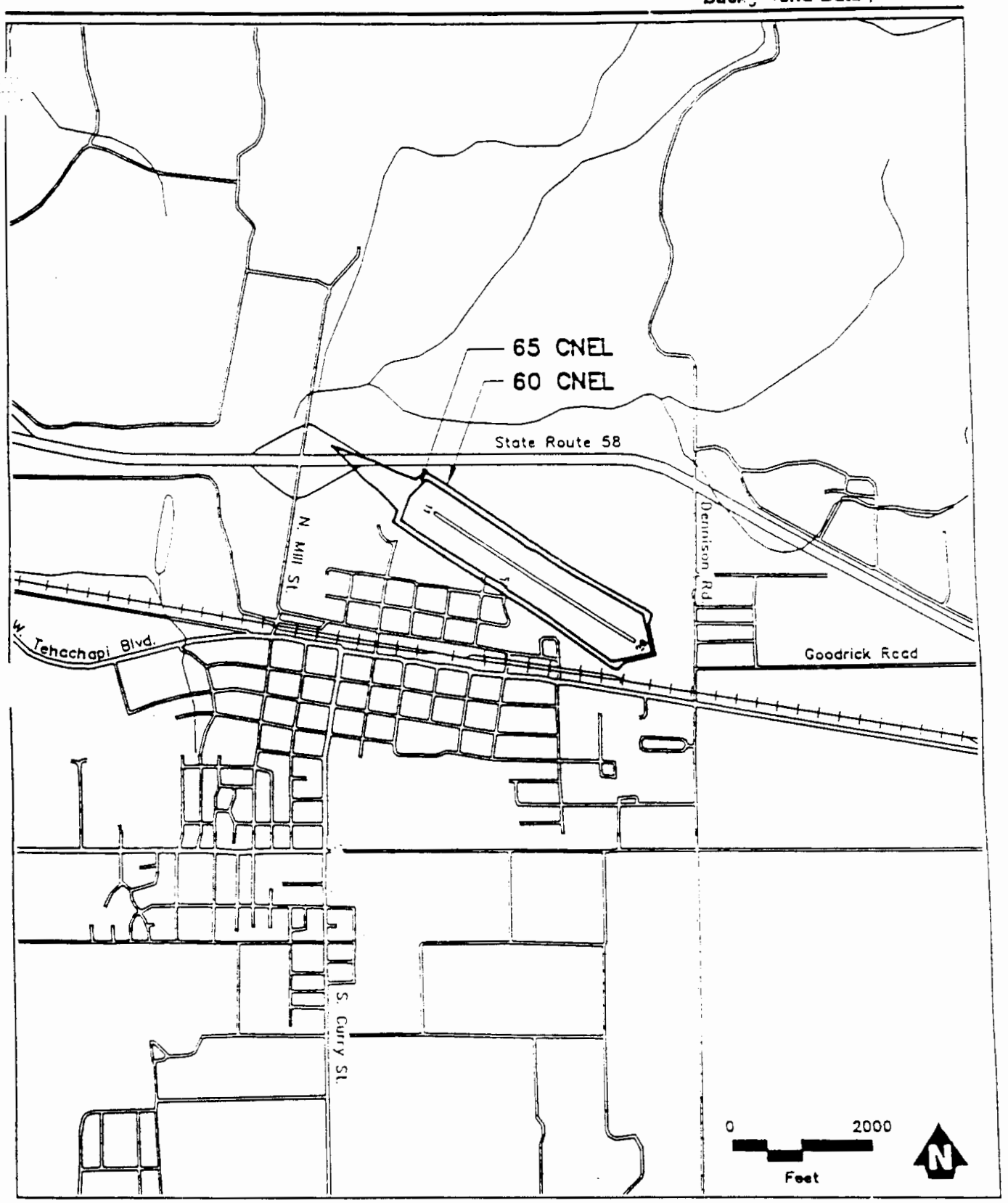


Figure 4 - 74

Noise Contours

Tehachapi Municipal Airport

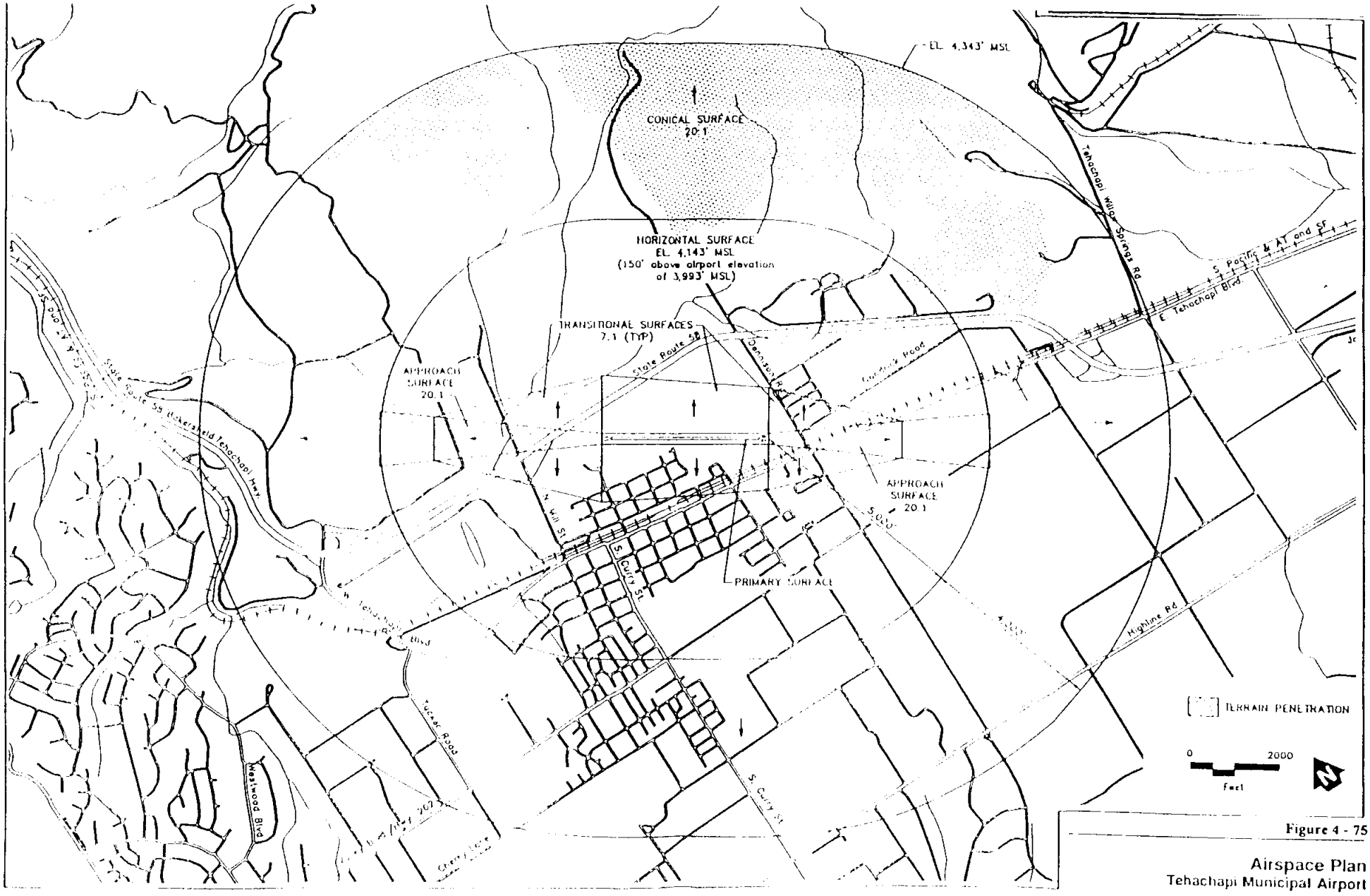


Figure 4 - 75

Airspace Plan
Tehachapi Municipal Airport

4.16 Wasco-Kern County Airport

4.16.1

If the Airport's operational procedures are changed to eliminate aircraft overflights south and southwest of the Airport, the B1* and C* zones can be converted to a D zone.

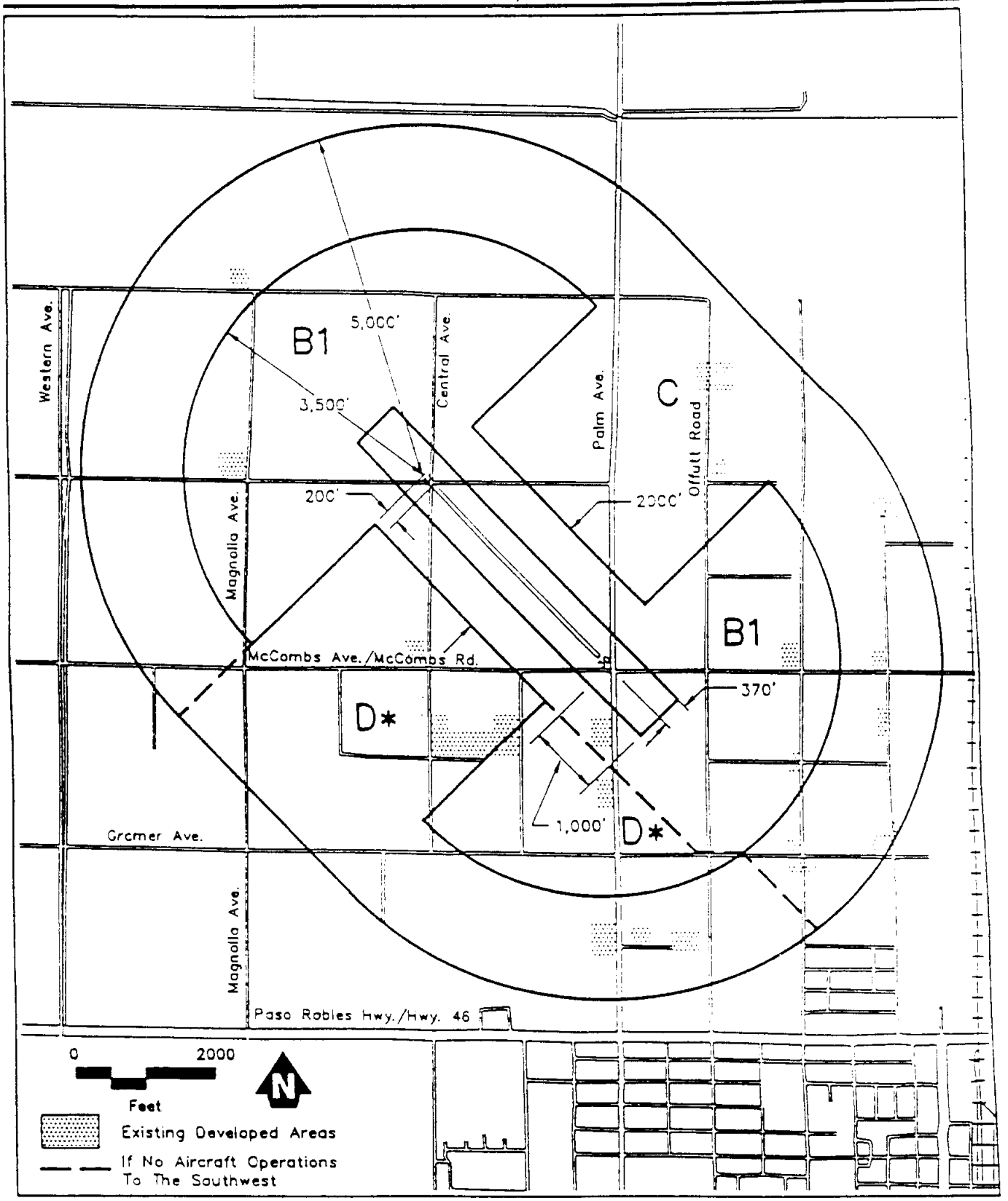

Western Ave.
B1
5,000'
3,500'
Central Ave.
Palm Ave.
C
Offutt Road
200'
2000'
Magnolia Ave.
B1
McCombs Ave./McCombs Rd.
370'
D*
1,000'
D*
Gromer Ave.
Magnolia Ave.
Paso Robles Hwy./Hwy. 46
0
2000
Feet
N
Existing Developed Areas
If No Aircraft Operations To The Southwest

Figure 4 - 76

Figure 4-76 - Comprehensive Land Use Plan - Wasco-Kern County Airport

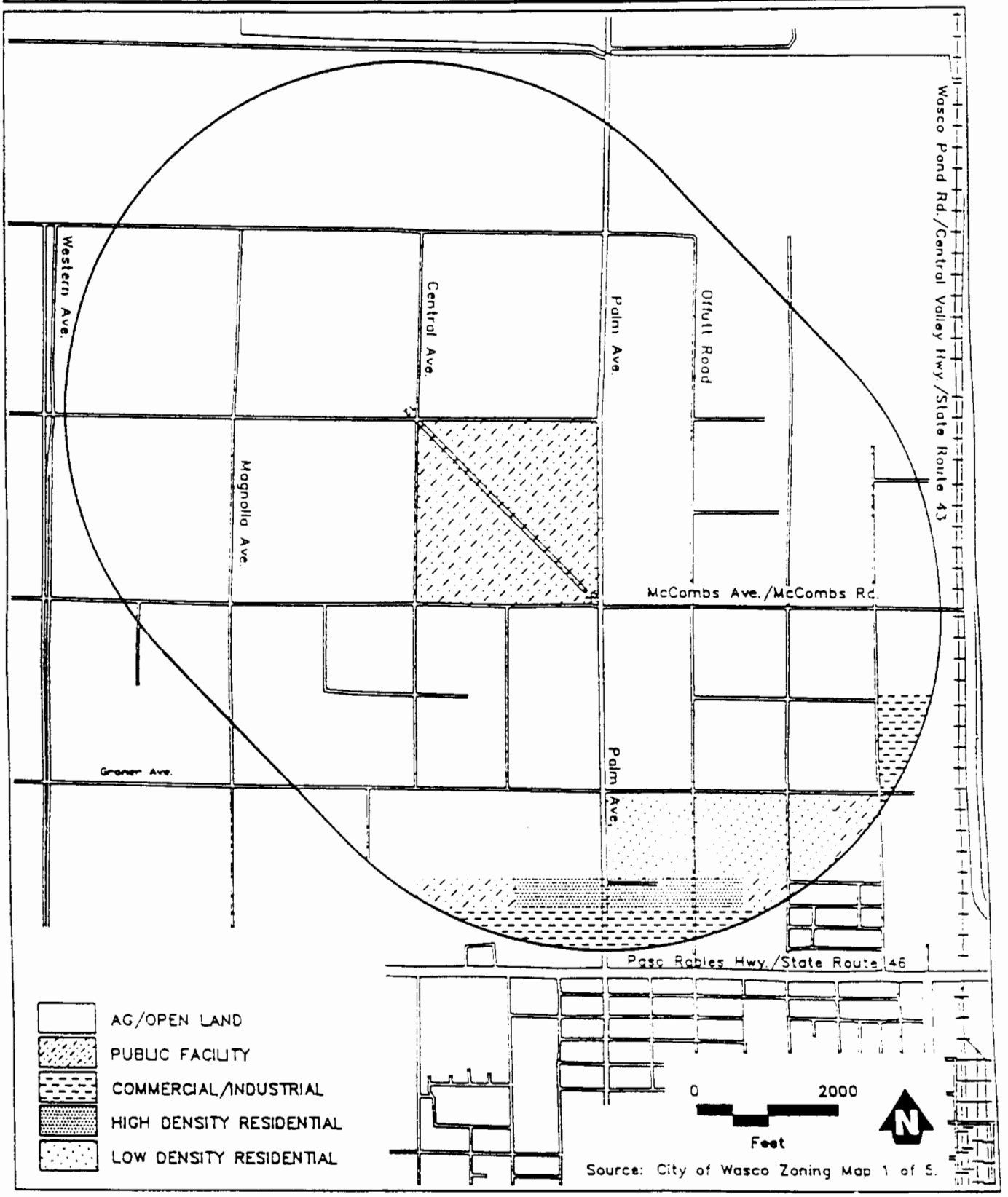


Figure 4 - 77

Land Use Designations

Wasco-Kern County Airport

Table 4-47

Airport Features

Wasco-Kern County Airport

AIRPORT PROPERTY

- *Ownership* — County of Kern.
- *Size* — 158 acres in fee.
- *Elevation* — 313 feet MSL.

AIRPORT PLANNING

- *Planned Improvements*
  - No change in runway dimensions or capacities.

BUILDING AREA

- *Location* — Along east end of field.
- *Aircraft Parking Capacity* — 36 based and transient tiedowns: 11 T-hangars; 6 box-type hangars.
- *Other Major Facilities* — Fuel facilities.
- *Services* — 100LL fuel; no other services.

RUNWAY SYSTEM

Runway 12-30

- *Critical Aircraft* — Single-engine, propeller.
- *Classification* — Airport Reference Code BU-I.
- *Dimensions* — 3,380 feet long, 60 feet wide.
- *Lighting* — Medium-intensity runway edge lighting.
- *Surface* — Asphalt, good condition.
- *Taxiways* — Full-length parallel on north side; three exit taxiways.

RUNWAY APPROACHES

Runway 12

- *Approach Type* — Visual.
- *Runway Protection Zone* — About half is currently on airport property.
- *Approach Obstacles* — Road lies 15 feet above and 200 feet from the runway end at a distance of 130 feet right of the projected centerline; approach slope of 20:1 and displaced threshold of 465 feet provide adequate clearance.

Runway 30

- *Approach Type* — Visual.
- *Runway Protection Zone* — About half is currently on airport property.
- *Approach Obstacles* — Adjacent road, fence line, and a sign; approach slope of 19:1 and a displaced threshold of 240 feet provide adequate clearance.

Traffic Pattern

- *Location* — Established pattern both sides of runway.
- *Altitude* — 800 feet above airport elevation.
- *Approach Procedure* — None.

Source: Hodges & Shutt (October 1993)

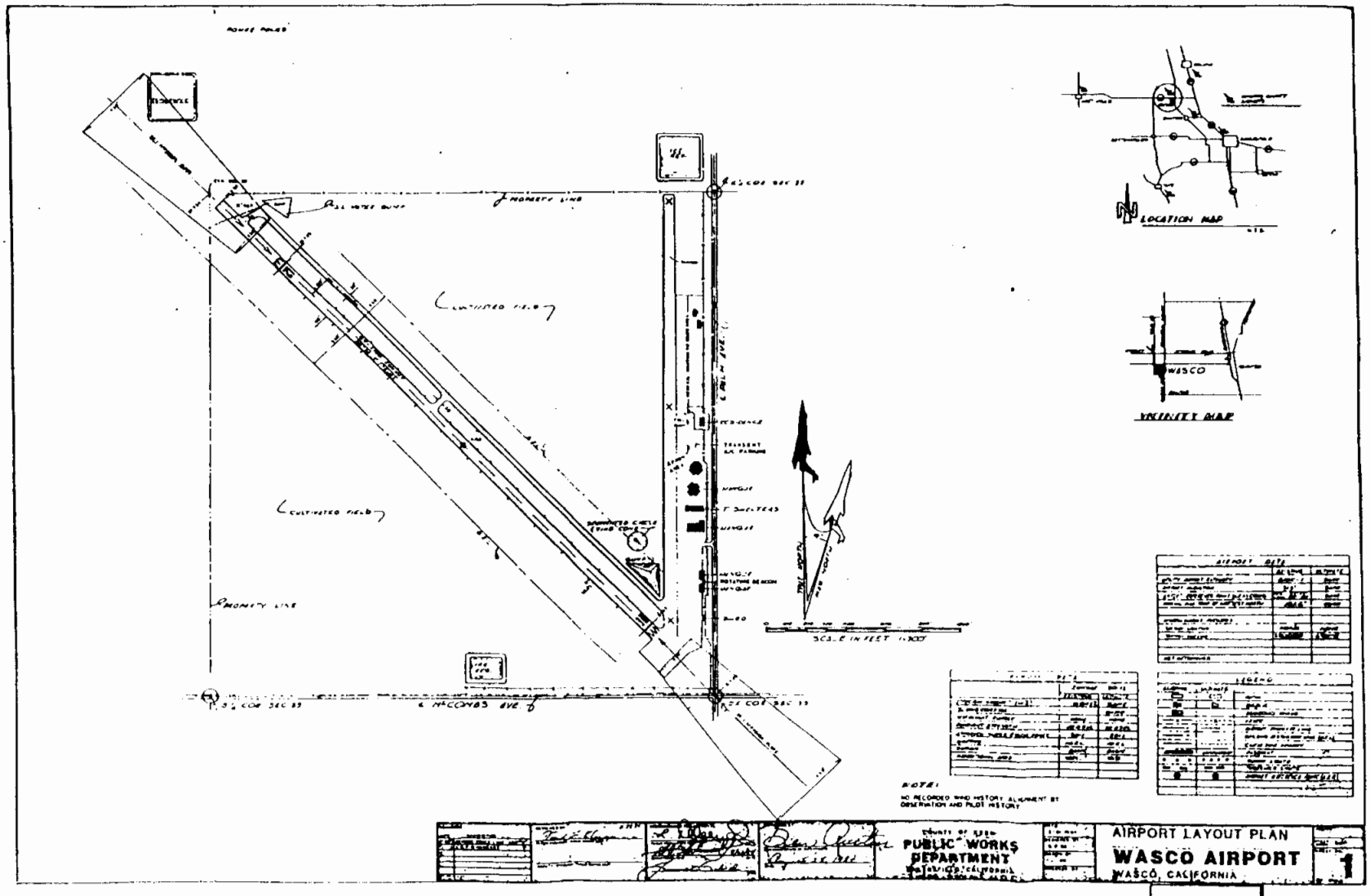

LOCATION MAP
WASCO
VICINITY MAP
PROPERTY LINE
CULTIVATED FIELD
CULTIVATED FIELD
PROPERTY LINE
E. MACCOMBS AVE.
SCALE IN FEET
NOTE:
NO RECORDED WIND HISTORY ALIGNMENT BY OBSERVATION AND PILOT HISTORY
COUNTY OF KERN
PUBLIC WORKS DEPARTMENT
AIRPORT LAYOUT PLAN
WASCO AIRPORT
WASCO, CALIFORNIA

Figure 4 - 78

Table 4-48

Forecast Airport Activity

Wasco-Kern County Airport

AIRCRAFT OPERATIONS

Total	
Annual	11,050
Average Day	31
Distribution	
Single-Engine	96.8%
Twin-Engine	3.2%

TIME OF DAY DISTRIBUTION

All Aircraft		
Day	(0700-1900)	85.0%
Evening	(1900-2200)	10.0%
Night	(2200-0700)	5.0%

RUNWAY USE DISTRIBUTION

All Aircraft	
All Operations	
Runway 12	10.0%
Runway 30	90.0%

FLIGHT TRACK DATA

- Pattern Altitude – 800 feet AGL.

Source: Aries (1989) for then current year

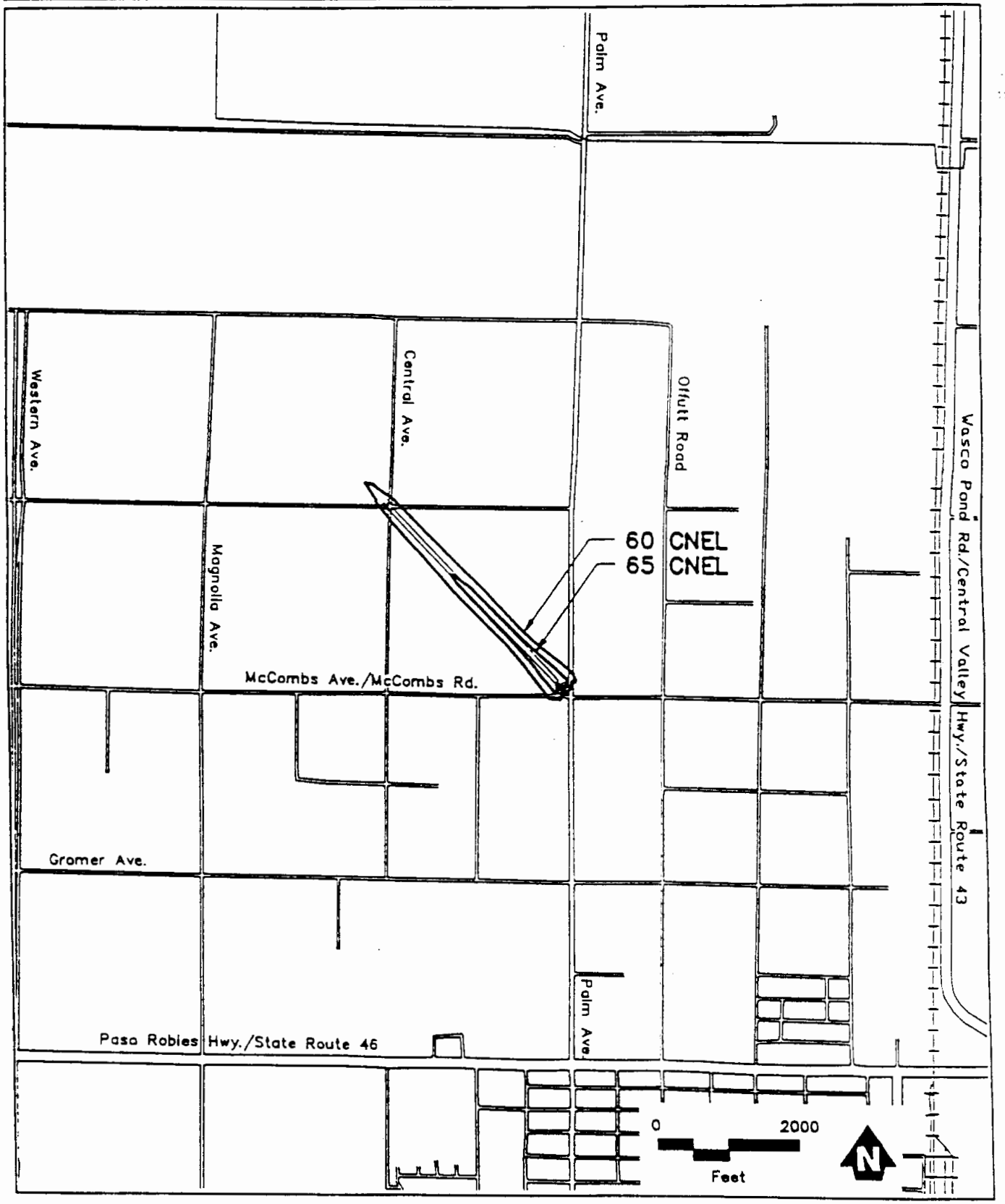


Figure 4 - 79

Noise Contours

Wasco-Kern County Airport

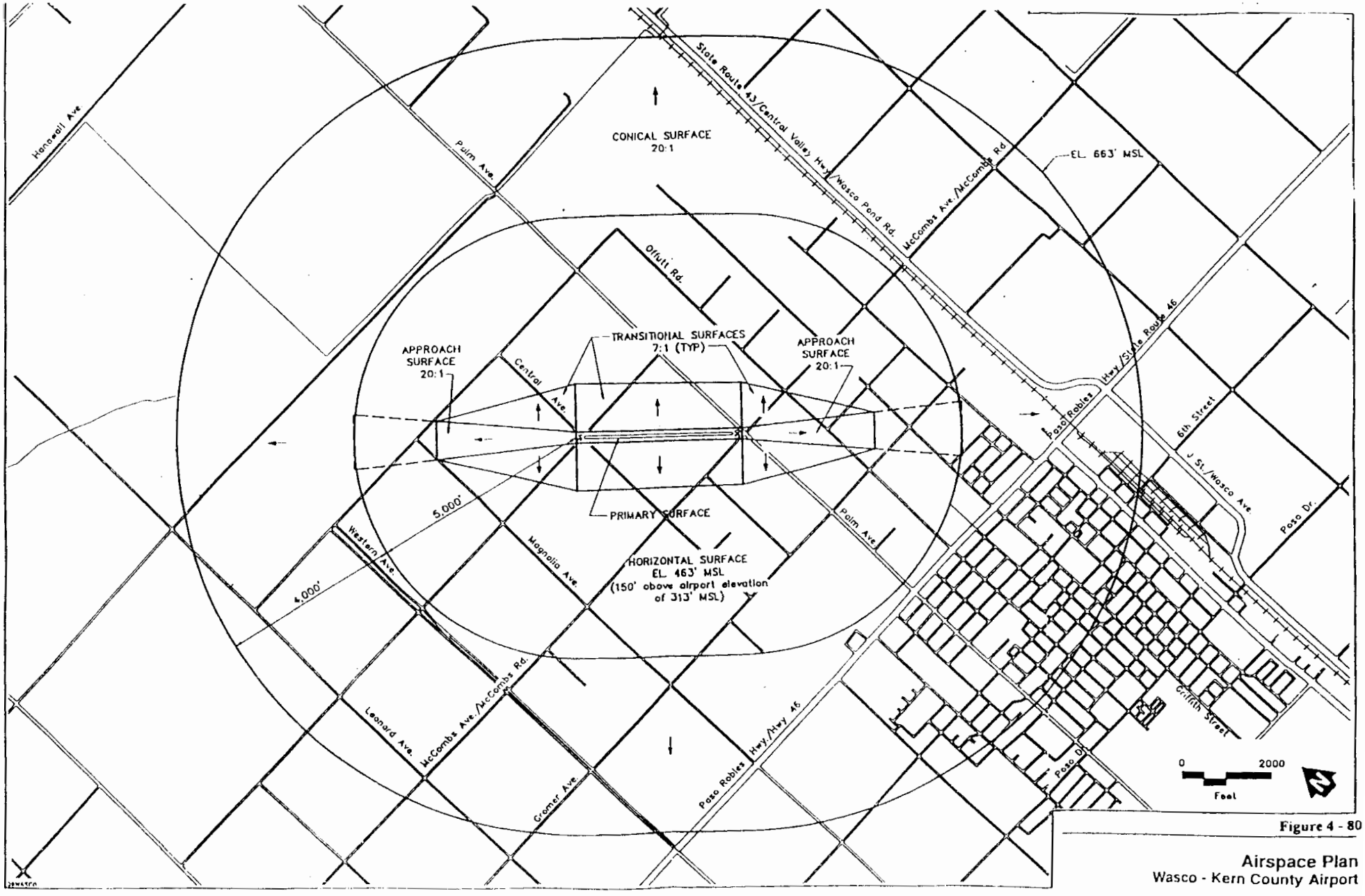


Figure 4 - 80

Airspace Plan
Wasco - Kern County Airport

4.17 Military Aviation

4.17.1 Introduction

Kern County has two military aviation installations, the China Lake Naval Air Weapons Station (NAWS) and Edwards Air Force Base (AFB) both of which are located in the eastern part of the county. Each installation has unique flying operations and their primary mission is to test military aircraft and weapon systems.

Due to the required flying mission at these military bases aircraft will need to fly beyond the boundaries of the installations at supersonic speeds and sometimes as low as 200 feet above the ground. In order to minimize flight hazards to non-military aircraft the military aircraft from these installations fly within restricted airspace known as the Joint Service Restricted R-2508 Complex (Section 4.20). This complex is considered an extension of the airspace for these military aviation installations and their flying mission.

4.17.2 Encroachment

Because of the extreme flying capabilities and needs of military aircraft, military officials have concerns about land development that compromises the mission of the installations. The concern for encroachments on military aviation involves balancing the need to preserve the present and future flight operation capabilities to meet mission requirements, with the public health, safety, quality of life and economic stability of neighboring communities. The following are identified areas to be reviewed for compatibility issues:

1. **Population Growth** – High density residential uses and concentrated commercial uses directly adjacent to the base and under specific air routes can create safety, operation and testing issues.

2. **Commercial Development** –Creation of a development that attracts large concentrations of people in a sensitive low flight corridor. Height of structures and signs that penetrate into airspace in low flight corridors.

3. **Towers** – Obstructions such as cellular towers, radio towers, television towers and wind turbines that penetrate into airspace become a hazard to flight safety. Concentrated numbers of such structures can result in the loss of a route as useable for testing and training operations.

4. **Noise Complaints** – Potential impacts range from low level flying, high level, intermittent sonic booms to specialty impacts such as routine, recurring helicopter missions.

5. **Air Space Conflicts** – Impacts outside the control of local government land use that will further increase the limits on use of airspace. Examples include designation of wilderness areas, National Parks and new areas of concentrated populations outside the county.

6. **Environmental Pressures** – Air Quality is important to flight test operations. Activities that generate dust, steam or smoke should be mitigated. Elimination of habitat for threatened or endangered species on private land increases the pressure to preserve on base habitat. Expansion of base employment in conjunction with off-base development increases traffic on regional and local road networks. New lakes and golf courses can attract, particularly in this desert region, large flocks of birds, which become a hazard to flight operations.

7. **Radio Frequency Conflicts** –Conflict of users of the radio frequency spectrum located both on and off military installations. Operations of unmanned radio-controlled aircraft flights can have electronic interference from other sources of radio signals. Coordination of frequency and notification can mitigate this impact.

4.17.3 Notification

China Lake Naval Air Weapons Station (NAWS) and Edwards Air Force Base (AFB) both shall be notified of development that falls within any of the following categories:

- Any structure within 75 miles of the R-2508 complex that is greater than 50 feet tall.
- Any project within 50 miles of R-2508 that emit radio and communication frequencies.
- Any environmental document or discretionary project with 25 miles of the military installation boundaries.
- Any project that would create environmental impacts (e.g. visibility, elevated obstructions) within 25 miles of the R-2508 complex
- Any project within 25 miles of the centerline of any route/corridor.
- Any project with the potential to impact the utilities of the military installation (water, gas, electricity, phone, roads, railway, etc.) required for normal bases operations.
- Any environmental document within the R-2515 complex requires a copy sent to Edwards AFB and primary notification to China Lake Naval Air Weapons Station NAWS.
- Any environmental document within the R-2505 and R-2506 complexes requires a copy sent to China Lake NAWS and primary notification to Edwards AFB.

4.17.4 Conditions of Approval

The following are example of conditions of approval that may be included, as appropriate, in planning documents:

- Avigation Easement - Legal Agreement attached to property records to document develop/owner acknowledgment and legal notice of the military aviation installation's operation.

- Frequency Deconfliction - When a source of frequency emissions is proposed within the R-2508 area, military officials request all coordination pass through the respective Frequency Management Office of each installation to avoid potential frequency conflict.

- Dust Abatement - Any activity that contributes to decreased visibility may adversely impact the flying or test mission.

- Obstruction Lighting - Lights are used to increase visibility of obstacles. Specifics on obstruction lighting can be found in FAA Advisory Circular 70/7460-1K.

- Mitigation Measure - Any other mitigating action to reduce potential impact of project/proposal to the mission of the military installation.

4.17.5 Change in Mission

The Department of Defense is continually updating strategies for national security and upgrading inventories with technologically newer aircraft and weapons systems. The flight mission at these installations is continually evolving which could change or alter issues of concern for land use around these bases.

4.18 Naval Air Weapons Station (NAWS) China Lake

4.18.1 Mission

The NAWS China Lake installation is located in eastern Kern next to the City of Ridgecrest and near the community of Inyokern in the western Mojave Desert. The installation covers more than 600,000 acres in Kern, Inyo, and San Bernardino counties, making it the Navy's largest land activity. The flight activities of the China Lake installation operate from three runways which are encompassed by a vast array of laboratories, test facilities, and restricted air space. The main facilities and runways are within Kern County section of the military installation. The primary mission of the installation is to perform research and development, test, and evaluation, logistics, and in-service support for guided missiles, free-fall weapons, targets, support equipment, crew systems, and electronic warfare. Various aircraft are utilized for weapons testing but fighter aircraft generate the majority flight operations. These flight operations test an aircraft's ability to deliver weapons and the capabilities of weapon systems.

4.18.2 Air Installation Compatible Use Zones Study

The Department of Defense requires military aviation facilities to complete an Air Installation Compatible Use Zones (AICUZ) study. A copy of the April 2011 *Final Air Installation Compatibility Use Zones Study for the Naval Air Weapons Station at China Lake* is located within the *References* section of this title, as Appendix G. The primary purpose of the AICUZ study is to protect public safety and health, encourage appropriate development in the vicinity of military airfields, and to protect taxpayer's investment in national defense. The China Lake AICUZ (2011) has been updated to reflect changes at the facility and includes modification and upgrade of aircraft and alterations to the flying mission. The revised AICUZ identifies the location of the safety zones within the base boundaries and noise impacts to land uses outside the base boundaries.

The AICUZ study will be used to evaluate development, as appropriate, within the Kern County portion of the study area, to determine compatibility with the finding required in Policy 1.7.1(c). Noise contour information and recommendations shall be used in reviewing proposals for land use and appropriate actions and mitigation considered to reduce impacts Chapter 6 (Land Use Compatibility Analysis) of the document is a recommendation from the United State Department of the Navy, no Military Influence Areas (MIA) have been adopted by the Board of Supervisors in the unincorporated area, and safety issues raised by the Department of Defense on land use proposals are required to include additional site specific information and substantial evidence beyond that referenced on safety in the AICUZ. Further direction on the AICUZ document for use in land use reviews, including issues raised by Kern County on changes to installation operations that could reduce impacts on unincorporated areas that have not been completely addressed, will be developed as an implementation agreement with NAWS China Lake and Kern County, to be in place by the end of 2013.

4.19 Edwards Air Force Base

4.19.1 Mission

Edwards Air Force Base (AFB) is the home of the Air Force Flight Test Center, which holds stature as the nation's premier flight test facility, research, development, test and evaluation of aerospace systems for the United States and its allies. The primary mission of Edwards is the developmental test and evaluation of new aircraft and the ongoing operational test and evaluation of current aircraft. The flight operations at Edwards consist of fighter, bomber, cargo, trainer, and reconnaissance aircraft. The base is located in eastern Kern in the western Mojave Desert, adjacent to the communities of Rosamond, Boron, North Edwards, and Mojave and extends into Los Angeles and San Bernardino counties. The base which covers over 301,000 acres, has two concrete runways and an auxiliary asphalt runway. Aircraft may also land on the hard packed surface of the Rogers Dry Lake and Rosamond Dry Lake. The Dryden Flight Research Center, NASA's premier installation for aeronautical flight research, is located at Edwards AFB. In addition to carrying out aeronautical research, the center also supports the space shuttle program as a backup landing site. Also assigned to Edwards AFB are two Marine Corps Reserve helicopter squadrons and associated support staff which has the primary mission of transporting combat troops and equipment.

4.19.2 Air Installation Compatible Use Zones Study

The Department of Defense requires military aviation facilities to prepare an Air Installation Compatible Use Zones (AICUZ) study. The principal purpose of the AICUZ study is to protect community safety and health, promote appropriate development in the vicinity of military airfields, and to protect taxpayer's investment in national defense. The currently referenced AICUZ study for Edwards AFB was completed in 1994. Presently base personnel are updating the present AICUZ study to reflect the on going changes at the installation that include utilization of new aircraft and alterations to the flying mission. The AICUZ will indicate the location of safety zones and noise impacts associated with the flying mission. Because of the vast size of Edwards AFB areas affected by the current impacts are confined within the boundaries of the installation.

4.20 Joint Service Restricted R-2508 Complex

As the flying mission at these military aviation installations will fly beyond the boundaries of the installations, the Department of Defense and the Federal Aviation Administration created an area of restricted airspace in order to minimize flight hazards to non-military aircraft by military aircraft. Access to this airspace is greatly limited to civilian aircraft and only after obtaining prior permission. This vast restricted airspace is known as the Joint Service Restricted R-2508 Complex (Figure 4-81). The complex encompasses 20,000 square miles of electronically surveilled ranges permitting unrestricted flight test from near ground level to near space at various locations. The R-2508 complex contains a number of internal complexes and operating areas, and is the hub of a network of other major airspace ranges located in the southwestern United States. The immense area of R-2508 covers portions of Kern, Inyo, Mono, Los Angeles, San Bernardino, and Tulare Counties and reaches into a small portions of the State of Nevada. Over 3,200 square miles of eastern Kern County are within the complex (Figure 4-82).

Within the R-2508 complex are other designated restricted airspaces known as R-2505, R-2506, and R-2515 which are the immediate and adjacent airspace to China Lake NAWS and Edwards AFB. The military installations also retain the use of supersonic flight corridors which allow unrestricted use of airspace for the testing of high limit aircraft capabilities.

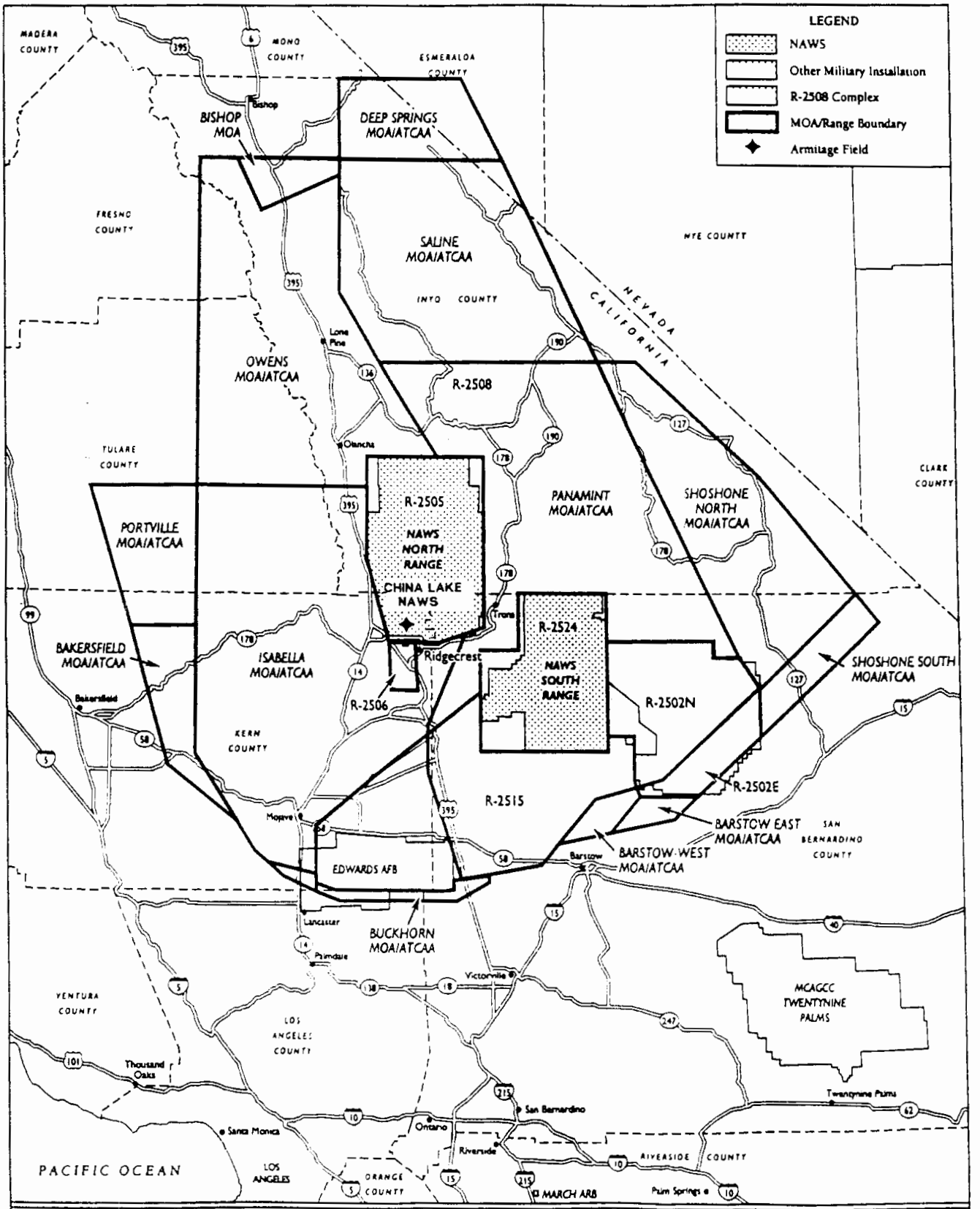


Figure 4-81
Joint Service Restricted R-2508 Complex Full View

R-2508 Complex

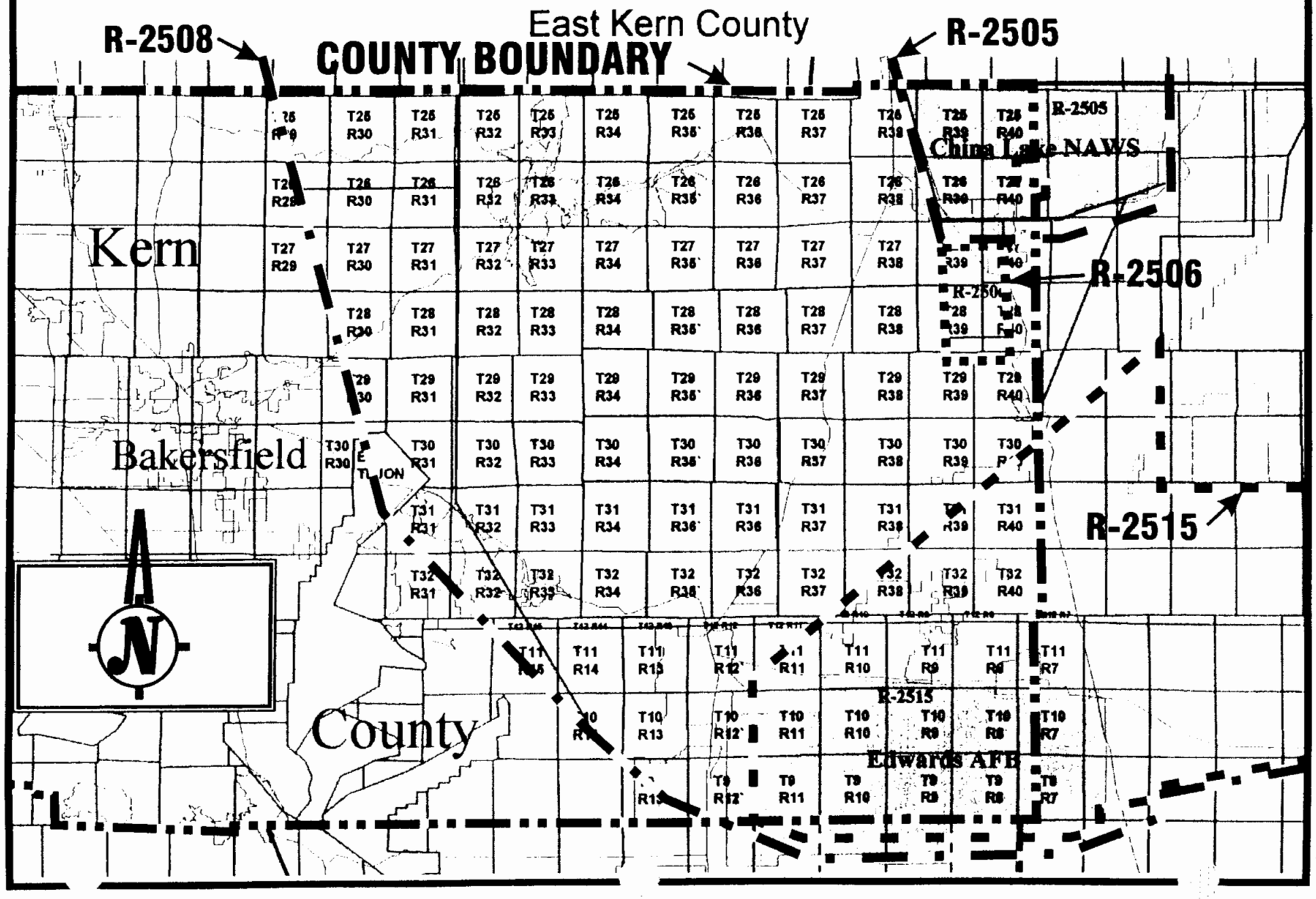


Figure 4-82

PART II

SUPPORTING INFORMATION

CHAPTER 5

5.0 IMPLEMENTATION STRATEGIES FOR LOCAL JURISDICTIONS

INTRODUCTION

The policies set forth in this Airport Land Use Compatibility Plan contain performance-type standards intended to prevent occurrence of future new conflicts between airport operations and surrounding land uses. Implementation of these criteria requires action by the local jurisdictions that have control over the airport-vicinity land use. This process is comparable to that established by the California Environmental Quality Act — the state has adopted a set of guidelines that must then be implemented by the specific procedures and other actions adopted by each local government.

The following strategies are divided into two categories: (1) those that can or must be taken by the local land use jurisdictions; and (2) actions that are available to a local jurisdiction when it is also the owner of the airport creating the impacts.

LOCAL JURISDICTION ACTIONS

Land Use Designations

The most fundamental means of assuring compatibility between an airport and surrounding land uses is by the designation of appropriate land uses in local general plans, specific plans, and zoning ordinances. California state aeronautics law requires local jurisdictions to make their general plans and specific plans consistent with the county airport land use commission (where one exists) plan or adopted Airport Land Use Compatibility Plan or otherwise to override the commission.

Although long-term maintenance of airport/land use compatibility is difficult and often impossible without designation of compatible land uses, this form of land use control also has significant limitations. To overcome these limitations, other forms of land use controls are normally essential as part of a complete airport/land use compatibility implementation strategy.

- **Ease of Change** — Nothing permanently locks in a land use designation. As conditions and marketing demands change, less restrictive development may be proposed.

- **Restrictiveness** — Land use designations are limited in the degree of restrictiveness that they can contain. If they are deemed to eliminate all reasonable economic use of private property, they can be considered an unfair taking and result in inverse condemnation. Especially in areas near ends of runways, additional restrictions may needed that can be accomplished by this means alone.

- **Lack of Retroactiveness** — Designating an area for a different use than the one already existing may encourage change over the long run, but it does not directly eliminate existing incompatible uses. Other devices, such as fee simple acquisition, may be necessary to bring about the changes.

Airport Combining Zones

One way of overcoming the lack of aviation orientation of basic land use designations is adoption of an overlay or combining zone. A combining zone supplements local land use designations by adding specific noise and, often more importantly, safety criteria (e.g., maximum number of people on the site, site design and open space criteria, height restrictions, etc.) applicable to future development in the airport vicinity. Geographically, the combining zone should extend at least a mile from the runway ends and encompass lands regularly overflown by aircraft at or below traffic pattern altitudes.

An airport combining zone has several important benefits. Most importantly, it permits the continued utilization of the majority of the design and use guidelines contained in the existing zones. At the same time, it provides a mechanism for implementation of provisions that may apply to only a few types of land uses within a given land use category or zoning district. This avoids the need for a large number of discrete zoning districts. It also enables local jurisdictions to use the performance standards provided in the Airport Land Use Compatibility Plan directly, rather than through redefinition of existing zoning district descriptions.

Combining Zone Components

Requirements defined in a combining zone ordinance could include:

- **Noise Insulation Standards** — In highly noise-impacted areas, the ordinance could be used to assure compliance with state statutes regarding interior noise levels. The ordinance could specify the construction techniques necessary to meet the requirements.

- **Height Limitations** — Restrictions on the height of buildings, antennas, trees, and other objects near airports, as defined by Federal Aviation Regulations (FAR) Part 77, Subpart C, and regulated by California aeronautics law, can be implemented as part of a combining zone. Although Part 77 surfaces are complex, three-dimensional shapes even at airports with only one runway, the general flatness of the land around airports in Kern County limits the significance. Except within Compatibility Zone A, and to a minor extent Zone B, only objects exceeding 35 feet in height would have a potential to penetrate the Part 77 surfaces.

- **FAA Notification Requirements** — Combining zones also can be used to assure that project developers are informed about the need for compliance with the notification requirements of FAR Part 77. Subpart B of the regulations require that the proponent of any project which exceeds a specified set of height criteria submit a "Notice of Proposed Construction or Alteration" (Form 7460-1) to the Federal Aviation Administration prior to commencement of construction. The height criteria associated with this notification requirement are lower than those spelled out in Part 77, Subpart C, which define airspace obstructions. The purpose of the notification is to determine if the proposed construction would constitute a potential hazard or obstruction to flight. Notification is not required for proposed structures that would be shielded by existing structures or by natural terrain of equal or greater height, where it is obvious that the proposal would not adversely affect air safety.

- **Maximum Densities** — The principal noise and safety compatibility standards in the Airport Land Use Compatibility Plan are expressed in terms of dwelling units per acre for residential uses and people per acre for other land uses. These standards can either be included as is in a compatibility zone or used to modify the underlying land use designations. For residential land

uses, the correlation between the compatibility criteria and land use designations is direct. For other land uses, the implications of the density limitations are not as clear. One step that can be taken by local governments is to establish a matrix indicating whether specific types of land uses are or are not compatible with each of the four compatibility zones. To be useful, the land use categories will need to be more detailed than typically provided by general plan or zoning ordinance land use designations. Appendix C herein provides a sample compatibility matrix for over 70 types of land uses.

- **Open Space Requirements** — Airport Land Use Compatibility Plan criteria regarding airport-vicinity open space suitable for emergency aircraft landings can be implemented by a combining zone. These criteria are most effectively carried out by planning at the general or specific plan level, but may also need to be addressed in terms of the development restrictions on large parcels.

Avigation Easements

Avigation easements are another type of land use control measure available to local jurisdictions. These easements have historically been used to establish height limitations, prevent other flight hazards, and permit noise impacts. More recently, they have been employed as a form of buyer awareness — the recording of an easement with the title to a property ensures that prospective buyers of the property are informed about the airport impacts.

Methods of Acquisition

As with all easements, an avigation easement applies only to the specific property to which it is attached and it is binding on all subsequent owners of the property. Avigation easements can be obtained either by purchase or by required dedication.

- **Purchase** — Acquisition of avigation easements for some monetary amount is usually done by the airport proprietor, which may or may not be the same as the local land use jurisdiction. In most instances, the purchase of avigation easements is limited to property within runway protection zones (previously called clear zones) or elsewhere very close to the airport boundaries where some significant degree of restriction or impact is involved.

- **Dedication** — Required dedication of avigation easements is sometimes set as a condition for local jurisdiction approval of a proposed land use development, especially a residential development, in the vicinity of an airport. Generally, when avigation easements are obtained in this manner, they are primarily intended to serve as a comprehensive and stringent form of buyer awareness measure — the rights conveyed by the easement dedication are seldom more restrictive than the conditions and rights established in other legal forms (e.g., airport-vicinity height-limit zoning ordinances, Federal Aviation Regulations, etc.).

Property Rights Conveyed

A standard avigation easement conveys the following property rights from the owner of the property to the holder of the easement:

- **Overflight** — A right-of-way for free and unobstructed passage of aircraft through the airspace over the property at any altitude above a surface specified in the easement (set in accordance with Federal Aviation Regulations Part 77 and/or criteria for terminal instrument approaches).

- **Height Limits** — A right to prohibit the construction or growth of any structure, tree, or other object that would enter the acquired airspace.

- **Access and Abatement** — A right-of-entry onto the property, with appropriate advance notice, for the purpose of removing, marking, or lighting any structure or other object that enters the acquired airspace.

Easements which convey only certain ones of these rights are common. An easement containing only the first right is usually referred to as an overflight easement. The last two rights are often collectively called a height-limit or airspace easement. Overflight easements are useful in locations sufficiently distant from an airport that height limits and other restrictions are not a concern. Height-limit easements have most frequently been obtained by purchase on properties close to an airport where restrictions on the height of objects are necessary. Because height-limit easements do not include the overflight easement rights, there is little apparent advantage to obtaining them rather than a complete avigation easement.

Buyer Awareness Measures

Buyer awareness is an umbrella category for types of airport/land use compatibility measures whose objective is to ensure that prospective buyers of property in the vicinity of an airport are made aware of the airport's existence and the impacts that the airport activity has on surrounding land uses. Avigation easements are the most definitive form of buyer awareness measure. Buyer awareness, though, can also be successfully implemented through other types of programs. Two primary methods are deed notices and real estate disclosure statements.

Deed Notices

Deed notices are statements, attached to the deed to a property, disclosing that the property is subject to routine overflights and may produce noise, light, electromagnetic emissions, and other impacts by aircraft operating at a nearby airport. An ideal application of deed notices is as a condition of approval for development of residential land uses in airport-vicinity locations where neither noise nor safety are significant factors, but frequent aircraft overflights may be annoying to some people. In addition to being recorded with the deed to a property, the notices should be included on parcel maps and any tentative or final subdivision map.

Deed notices are similar to avigation or other aviation-related easements in that they become part of the title to a property and thus are a permanent form of buyer awareness. The distinguishing difference between deed notices and avigation easements is that deed notices only serve as a disclosure of potential overflights, whereas avigation easements convey an identified set of property rights. In locations where height limitations or other land use restrictions are unnecessary, deed notices have the advantage of being less cumbersome to define. Also, they give less appearance of having an negative affect on the value of the property.

A example of a deed notice is included in Appendix E.

AIRPORT PROPRIETOR ACTIONS

When a local land use jurisdiction is also the owner of the airport creating the impacts, the jurisdiction gains significant additional capabilities with regard to assuring airport/land use compatibility. Sometimes, the jurisdiction can use airport/land use compatibility actions such as those described below in addition to or in lieu of restrictions on land use development.

Acquisition of Fee Simple Title

Outright airport-owner purchase of fee simple title to a property is the most direct means of land use control. It provides positive assurance of long-term land use compatibility and is the only type of action that enables existing incompatible uses to be removed.

Federal Aviation Administration Funding

Acquisition of property for approach protection purposes is eligible for federal grants under the Federal Aviation Administration Airport Improvement Program. FAA guidelines state that:

> ". . land interest is eligible which is necessary to restrict the use of land in the approach and the transitional zones (the dimensions as cited in the applicable Advisory Circulars) to activities and purposes compatible with normal airport operations as well as to meet current and anticipated development at the airport." (FAA Order 5100.38A)

Airport sponsors are encouraged "to acquire the minimum property interest necessary to ensure safe aeronautical use." Except when required for noise compatibility, normally only the portion of approach zone property within 5,000 feet of the runway end is grant eligible.

Limitations

Weighing against the benefits of fee simple acquisition are several important drawbacks:

- **Cost** — Fee simple acquisition is usually the most expensive land use compatibility measure. Also, although some 90% of acquisition costs are eligible for FAA grants under current legislation, the FAA participates in acquisition of parcels only within the limited area indicated above. Most airport operators cannot afford to purchase property without assistance from the FAA.

- **Disruptiveness** — The need to relocate residents and businesses occupying the property to be acquired is disruptive both to the individuals directly involved and to the neighborhood as a whole. Compliance with state and federal relocation laws is required (assistance in finding replacement property must be provided and moving costs must be paid).

- **Tax Implications** — Government acquisition of real property removes it from the tax rolls unless it is leased out for compatible development.

- **Owner Opposition** — Landowners may be unwilling to sell their property voluntarily. Although the property can still be acquired by eminent domain, the condemnation process can be time consuming and costly (both financially and socially).

Acquisition of Approach Protection Easements

As with easements in general, approach protection easements are a form of less-than-fee interest in real property. The key distinction between approach protection easements and the standard avigation easements discussed earlier is that approach protection easements establish specific controls on the underlying use of the land; avigation easements do not. Certain development rights that normally are associated with land ownership would be acquired (e.g., rights to develop high-density residential facilities). The landowner would have all other rights associated with land ownership including the right to sell the property. The easement would, however, be attached to the property title and therefore be binding on subsequent owners. In concept, approach protection easements are very similar to conservation easements which have been employed in several states as a means of agricultural land preservation.

There are two means by which approach protection easements can be acquired. One is through direct purchase. This method is suitable where the existing land uses are compatible with airport activities, but where prevention of future incompatible uses is of such importance that other, less absolute control measures (e.g., zoning) are deemed inadequate. The second method is by retention of the easement when reselling property previously acquired in fee. This approach is necessary when the existing land uses are not compatible with airport activities. In either case, several specific issues must be addressed in the acquisition process:

- **Lack of Precedence** — A difficulty associated with use of approach protection easements as an airport/land use compatibility measure is that there is little previous experience with them. More experience exists with the conservation easements employed as a means of agricultural land preservation, but these most often are obtained through donation rather than purchase. Several airports, however, are currently in the process of obtaining approach protection easements. Their experience will be invaluable elsewhere.

- **Determining Cost of Acquisition** — One of the problems with acquisition of approach protection easements is determining their fair cost, especially when they are purchased directly. In theory, the cost of an approach protection easement should be the difference between a property's market value without the easement and its remaining value with the easement restrictions attached. The market values would be based upon the concept of "highest and best use" and would be determined by appraisal. The problem that arises, however, is the lack of comparable transactions upon which to base appraisals of the easement-restricted property. Some negotiation undoubtedly would come into play regarding what uses reasonably could still occur on the property and what the property's "fair" value for such purposes should be.

- **Maximum Acceptable Cost** — If the cost of acquiring an approach protection easement is determined to represent a significant percentage of the fee simple value (30-50% as a maximum), it becomes preferable to purchase the property in fee and resell it with the easement attached. The value of the easement would be easier to determine under such circumstances. Although appraisals would still need to be obtained, the actual sale price of the property would be established by the open market.

- **Description of Restrictions** — An approach protection easement is a negative easement in that it restricts the underlying rights to use of the land. However, the easement agreement can be written either to prohibit specified uses or to permit only those uses listed. The latter is more certain to prevent development of incompatible uses, although it may also eliminate unantici-

pated uses that would be compatible. Regardless of the approach, the agreement must be carefully worded to prevent future disputes.

- **Transfer of Development Rights** — An extension of the approach protection easement concept is to allow the development rights acquired and removed from one parcel to be sold or transferred to another parcel where development would be acceptable. The latter parcel would then be allowed to be developed to a higher degree than would otherwise be permitted by the underlying zoning. Implementation of development rights transfer would require approval by the local jurisdiction and coordination with other community land use planning criteria.

Airport Operational Restrictions and Facility Modifications

All of the airport/land use compatibility implementation strategies discussed previously in this chapter involve some form of control on land use. The other approach to minimizing compatibility conflicts is to reduce the impacts created by aircraft operating at an airport. This can be done by adoption of restrictions on the way aircraft are permitted to operate at the airport and/or by construction of physical facilities to mitigate operational impacts.

At most airports where operational restrictions or facility modifications have been implemented, the objective has been to reduce the airport's noise impacts. Enhancement of safety can, however, also be an important goal. The following list represents only a few of the numerous actions that can be beneficial at general aviation airports. The choice of which ones to implement depends upon the nature and extent of the impacts and the characteristics of the land uses being affected.

- **Preferential Runway** — When winds are blowing at more than about 5 knots, the wind direction dictates which runway is used at an airport. During calm or near calm conditions any runway can be used. The purpose of a preferential runway policy is to establish which runway should be used under these circumstances. Since aircraft takeoffs typically create more noise than do landings, overall noise impacts can sometimes be reduced by directing these operations over lands whose uses are the least affected by noise.

- **Traffic Pattern Location and Altitudes** — Standard left-hand traffic pattern turns result in a pattern on each side of a runway. Often, high terrain or airspace conflicts necessitate limitation of the pattern to a single side of the runway. The length or width of the pattern sometimes is limited for similar reasons. Such restrictions also can be established for noise abatement purposes — for example, to place the pattern over open land and avoid overflight of urban areas. Increasing the altitude of the traffic pattern is another change that can have noise reduction benefits. Implementation of these actions, it must be noted, requires coordination with the Federal Aviation Administration.

- **Single-Event Noise Level Limits** — Overall airport noise levels can potentially be reduced by restricting or prohibiting operation of the noisiest aircraft. This technique is most effective when a few specific types of aircraft are far noisier than others operating at the airport. Maximum noise level criteria can be based upon published data, such as Federal Aviation Regulations Part 36, or, at severely impacted airports, upon actual monitoring of individual events.

- **Aircraft Weight Limit** — Most airports have an operational weight limit set to reflect the pavement strength or other physical limitations of the airport. Aircraft weight limit restrictions also

can be established as a means of reducing the potential severity of off-airport accidents. Additionally, because heavier aircraft tend to be louder than lighter ones, an aircraft weight limit can serve as a form of single-even noise level limit.

- **Nighttime Restrictions** — Any of the above restrictions can be fixed to be more stringent during nighttime hours than during the daytime. The concept is that airport impacts, particularly from noise, are more disturbing during the night than in the daytime.

- **Run-up Locations** — Normal practice is for aircraft to conduct run-ups at a designated location adjacent to the point they taxi onto the runway. If such a location produces excessive noise impacts upon adjacent property, it is often reasonable to move the run-up area to another convenient spot. Alternatively, a sound barrier (such as an earthen berm) can sometimes be constructed between the run-up area and the impacted land uses.

- **Other Facility Modifications** — At some airports, other physical changes to the runway configuration can hold prospects for reducing noise and/or safety impacts. Such facility modifications might include displacing or relocating a runway landing threshold or construction of a new runway to take traffic off a runway that produces more significant impacts.

Federal Aviation Administration Runway Approach Protection Standards

Federal Aviation Regulations
Part 77 — Objects Affecting Navigable Airspace

Subpart A—General

§ 77.1 Scope.

This Part—

(a) Establishes standards for determining obstructions in navigable airspace;

(b) Sets forth the requirements for notice to the Administrator of certain proposed construction or alteration;

(c) Provides for aeronautical studies of obstructions to air navigation, to determine their effect on the safe and efficient use of airspace;

(d) Provides for public hearings on the hazardous effect of proposed construction or alteration on air navigation; and

(e) Provides for establishing antenna farm areas.

§ 77.2 Definition of terms.

For the purpose of this Part:

"Airport available for public use" means an airport that is open to the general public with or without a prior request to use the airport.

"A seaplane base" is considered to be an airport only if its sea lanes are outlined by visual markers.

"Nonprecision instrument runway" means a runway having an existing instrument approach procedure utilizing air navigation facilities with only horizontal guidance, or area type navigation equipment, for which a straight-in nonprecision instrument approach procedure has been approved, or planned, and for which no precision approach facilities are planned, or indicated on an FAA planning document or military service military airport planning document.

"Precision instrument runway" means a runway having an existing instrument approach procedure utilizing an Instrument Landing System (ILS), or a Precision Approach Radar (PAR). It also means a runway for which a precision approach system is planned and is so indicated by an FAA approved airport layout plan; a military service approved military airport layout plan; any other FAA planning document, or military service military airport planning document.

"Utility runway" means a runway that is constructed for and intended to be used by propeller driven aircraft of 12,500 pounds maximum gross weight and less.

"Visual runway" means a runway intended solely for the operation of aircraft using visual approach procedures, with no straight-in instrument approach procedure and no instrument designation indicated on an FAA approved airport layout plan, a military service approved military airport layout plan, or by any planning document submitted to the FAA by competent authority.

§ 77.3 Standards.

(a) The standards established in this Part for determining obstructions to air navigation are used by the Administrator in—

(1) Administering the Federal-aid Airport Program and the Surplus Airport Program;

(2) Transferring property of the United States under Section 16 of the Federal Airport Act;

(3) Developing technical standards and guidance in the design and construction of airports; and

(4) Imposing requirements for public notice of the construction or alteration of any structure where notice will promote air safety.

(b) The standards used by the Administrator in the establishment of flight procedures and aircraft operational limitations are not set forth in this Part but are contained in other publications of the Administrator.

§ 77.5 Kinds of objects affected.

This Part applies to—

(a) Any object of natural growth, terrain, or permanent or temporary construction or alteration, including equipment or materials used therein, and apparatus of a permanent or temporary character; and

(b) Alteration of any permanent or temporary existing structure by a change in its height (including appurtenances), or lateral dimensions, including equipment or materials used therein.

Subpart B—Notice of Construction or Alteration

§ 77.11 Scope.

(a) This subpart requires each person proposing any kind of construction or alteration described in § 77.13(a) of this chapter to give adequate notice to the Administrator. It specifies the locations and dimensions of the construction or alteration for which notice is required and prescribes the form and manner of the notice. It also requires supplemental notices 48 hours before the start and upon the completion of certain construction or alteration that was the subject of a notice under § 77.13(a).

(b) Notices received under this subpart provide a basis for—

(1) Evaluating the effect of the construction or alteration on operational procedures and proposed operational procedures;

(2) Determinations of the possible hazardous effect of the proposed construction or alteration on air navigation;

(3) Recommendations for identifying the construction or alteration in accordance with the current Federal Aviation Administration Advisory Circular AC 70/7460-1 entitled "Obstruction Marking and Lighting," which is available without charge from the Department of Transportation, Distribution Unit, TAD 484.3, Washington, D.C. 20590;

(4) Determining other appropriate measures to be applied for continued safety of air navigation; and

(5) Charting and other notification to airmen of the construction or alteration.

§ 77.13 Construction or alteration requiring notice.

(a) Except as provided in § 77.15, each sponsor who proposes any of the following construction or alteration shall notify the Administrator in the form and manner prescribed in § 77.17:

(1) Any construction or alteration of more than 200 feet in height above the ground level at its site.

(2) Any construction or alteration of greater height than an imaginary surface extending outward and upward at one of the following slopes:

(i) 100 to 1 for a horizontal distance of 20,000 feet from the nearest point of the nearest runway of each airport specified in subparagraph (5) of this paragraph with at least one runway more than 3,200 feet in actual length, excluding heliports.

(ii) 50 to 1 for a horizontal distance of 10,000 feet from the nearest point of the nearest runway of each airport specified in subparagraph (5) of this paragraph with its longest runway no more than 3,200 feet in actual length, excluding heliports.

(iii) 25 to 1 for a horizontal distance of 5,000 feet from the nearest point of the nearest landing and takeoff area of each heliport specified in subparagraph (5) of this paragraph.

(3) Any highway, railroad, or other traverse way for mobile objects, of a height which, if adjusted upward 17 feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance, 15 feet for any other public roadway, 10 feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road, 23 feet for a railroad, and for a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally

traverse it, would exceed a standard of paragraph (1) or (2) of this section.

(4) When requested by the FAA, any construction or alteration that would be in an instrument approach area (defined in the FAA standards governing instrument approach procedures) and available information indicates it might exceed a standard of Subpart C of this part.

(5) Any construction or alteration on any of the following airports (including heliports):

(i) An airport that is available for public use and is listed in the Airport Directory of the current Airman's Information Manual or in either the Alaska or Pacific Airman's Guide and Chart Supplement.

(ii) An airport under construction, that is the subject of a notice or proposal on file with the Federal Aviation Administration, and, except for military airports, it is clearly indicated that the airport will be available for public use.

(iii) An airport that is operated by an armed force of the United States.

(b) Each sponsor who proposes construction or alteration that is the subject of a notice under paragraph (a) of this section and is advised by an FAA regional office that a supplemental notice is required shall submit that notice on a prescribed form to be received by the FAA regional office at least 48 hours before the start of the construction or alteration.

(c) Each sponsor who undertakes construction or alteration that is the subject of a notice under paragraph (a) of this section shall, within 5 days after that construction or alteration reaches its greatest height, submit a supplemental notice on a prescribed form to the FAA regional office having jurisdiction over the region involved, if—

(1) The construction or alteration is more than 200 feet above the surface level of its site; or

(2) An FAA regional office advises him that submission of the form is required.

§ 77.15 Construction or alteration not requiring notice.

No person is required to notify the Administrator for any of the following construction or alteration:

(a) Any object that would be shielded by existing structures of a permanent and substantial character or by natural terrain or topographic features of equal or greater height, and would be located in the congested area of a city, town, or settlement where it is evident beyond all reasonable doubt that the structure so shielded will not adversely affect safety in air navigation.

(b) Any antenna structure of 20 feet or less in height except one that would increase the height of another antenna structure.

(c) Any air navigation facility, airport visual approach or landing aid, aircraft arresting device, or meteorological device, of a type approved by the Administrator, or an appropriate military service on military airports, the location and height of which is fixed by its functional purpose.

(d) Any construction or alteration for which notice is required by any other FAA regulation.

§ 77.17 Form and time of notice.

(a) Each person who is required to notify the Administrator under § 77.13(a) shall send one executed form set (four copies) of FAA Form 7460-1, Notice of Proposed Construction or Alteration, to the [Manager] , Air Traffic Division, FAA Regional Office having jurisdiction over the area within which the construction or alteration will be located. Copies of FAA Form 7460-1 may be obtained from the headquarters of the Federal Aviation Administration and the regional offices.

(b) The notice required under § 77.13(a) (1) through (4) must be submitted at least 30 days before the earlier of the following dates—

(1) The date the proposed construction or alteration is to begin.

(2) The date an application for a construction permit is to be filed.

However, a notice relating to proposed construction or alteration that is subject to the licensing requirements of the Federal Communications Act may be sent to the FAA at the same time the application for construction is filed with the Federal Communications Commission, or at any time before that filing.

(c) A proposed structure or an alteration to an existing structure that exceeds 2,000 feet in height above the ground will be presumed to be a hazard to air navigation and to result in an inefficient utilization of airspace and the applicant has the burden of overcoming that presumption. Each notice submitted under the pertinent provisions of this Part 77 proposing a structure in excess of 2,000 feet above ground, or an alteration that will make an existing structure exceed that height, must contain a detailed showing, directed to meeting this burden. Only in exceptional cases, where the FAA concludes that a clear and compelling showing has been made that it would not result in an inefficient utilization of the airspace and would not result in a hazard to air navigation, will a determination of no hazard be issued.

(d) In the case of an emergency involving essential public services, public health, or public safety that requires immediate construction or alteration, the 30-day requirement in paragraph (b) of this section does not apply and the notice may be sent by telephone, telegraph, or other expeditious means, with an executed FAA Form 7460-1 submitted within five days thereafter. Outside normal business hours, emergency notices by telephone or telegraph may be submitted to the nearest FAA Flight Service Station.

(e) Each person who is required to notify the Administrator by paragraph (b) or (c) of § 77.13, or both, shall send an executed copy of FAA Form 117-1, Notice of Progress of Construction or Alteration, to the [Manager], Air Traffic Division, FAA Regional Office having jurisdiction over the area involved.

§ 77.19 Acknowledgment of notice.

(a) The FAA acknowledges in writing the receipt of each notice submitted under § 77.13 (a).

(b) If the construction or alteration proposed in a notice is one for which lighting or marking standards are prescribed in the FAA Advisory Circular AC 70/7460-1 entitled "Obstruction Marking and Lighting," the acknowledgment contains a statement to that effect and information on how the structure should be marked and lighted in accordance with the manual.

(c) The acknowledgment states that an aeronautical study of the proposed construction or alteration has resulted in a determination that the construction or alteration—

(1) Would not exceed any standard of Subpart C and would not be a hazard to air navigation;

(2) Would exceed a standard of Subpart C but would not be a hazard to air navigation; or

(3) Would exceed a standard of Subpart C and further aeronautical study is necessary to determine whether it would be hazard to air navigation, that the sponsor may request within 30 days that further study, and that, pending completion of any further study, it is presumed the construction or alteration would be a hazard to air navigation.

Subpart C—Obstruction Standards

§ 77.21 Scope.

(a) This subpart establishes standards for determining obstructions to air navigation. It applies to existing and proposed manmade objects, objects of natural growth, and terrain. The standards apply to the use of navigable airspace by aircraft and to existing air navigation facilities, such as an air navigation aid, airport, Federal airway, instrument approach or departure procedure, or approved off-airway route. Additionally, they apply to a planned facility or use, or a change in an existing facility or use, if a proposal therefor is on file with the Federal Aviation Administration or an appropriate military service on the date the notice required by § 77.13(a) is filed.

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(b) At those airports having defined runways with specially prepared hard surfaces, the primary surface for each such runway extends 200 feet beyond each end of the runway. At those airports having defined strips or pathways that are used regularly for the taking off and landing of aircraft and have been designated by approriate authority as runways, but do not have specially prepared hard surfaces, each end of the primary surface for each such runway shall coincide with the corresponding end of the runway. At those airports, excluding seaplane bases, having a defined landing and takeoff area with no defined pathways for the landing and taking off of aircraft, a determination shall be made as to which portions of the landing and takeoff area are regularly used as landing and takeoff pathways. Those pathways so determined shall be considered runways and an appropriate primary surface as defined in § 77.25(c) will be considered as being longitudinally centered on each runway so determined, and each end of that primary surface shall coincide with the corresponding end of that runway.

(c) The standards in this subpart apply to the effect of construction or alteration proposals upon an airport if, at the time of filing of the notice required by § 77.13(a), that airport is—

(1) Available for public use and is listed in the Airport Directory of the current Airman's Information Manual or in either the Alaska or Pacific Airman's Guide and Chart Supplement; or,

(2) A planned or proposed airport or an airport under construction, that is the subject of a notice or proposal on file with the Federal Aviation Administration, and, except for military airports, it is clearly indicated that that airport will be available for public use; or,

(3) An airport that is operated by an armed force of the United States.

(d) [Deleted]

§ 77.23 Standards for determining obstructions.

(a) An existing object, including a mobile object, is, and a future object would be, an obstruction to air navigation if it is of greater height than any of the following heights or surfaces:

(1) A height of 500 feet above ground level at the site of the object.

(2) A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within 3 nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 500 feet.

(3) A height within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area, which would result in the vertical distance between any point on the object and an established minimum instrument flight altitude within that area or segment to be less than the required obstacle clearance.

(4) A height within an en route obstacle clearance area, including turn and termination areas, of a Federal airway or approved off-airway route, that would increase the minimum obstacle clearance altitude.

(5) The surface of a takeoff and landing area of an airport or any imaginary surface established under §§ 77.25, 77.28, or 77.29. However, no part of the takeoff or landing area itself will be considered an obstruction.

(b) Except for traverse ways on or near an airport with an operative ground traffic control service, furnished by an air traffic control tower or by the airport management and coordinated with the air traffic control service, the standards of paragraph (a) of this section apply to traverse ways used or to be used for the passage of mobile objects only after the heights of these traverse ways are increased by:

(1) Seventeen feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance.

(2) Fifteen feet for any other public roadway.

(3) Ten feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road.

(4) Twenty-three feet for a railroad.

(5) For a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it.

§ 77.25 Civil airport imaginary surfaces.

The following civil airport imaginary surfaces are established with relation to the airport and to each runway. The size of each such imaginary surface is based on the category of each runway according to the type of approach available or planned for that runway. The slope and dimensions of the approach surface applied to each end of a runway are determined by the most precise approach existing or planned for that runway end.

(a) Horizontal surface—a horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of specified radii from the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs. The radius of each arc is:

(1) 5,000 feet for all runways designated as utility or visual;

(2) 10,000 feet for all other runways.

The radius of the arc specified for each end of a runway will have the same arithmetical value. That value will be the highest determined for either end of the runway. When a 5,000-foot arc is encompassed by tangents connecting two adjacent 10,000-foot arcs, the 5,000-foot arc shall be disregarded on the construction of the perimeter of the horizontal surface.

(b) Conical surface—a surface extending outward and upward from the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

(c) Primary surface—a surface longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of that runway; but when the runway has no specially prepared hard surface, or planned hard surface, the primary surface ends at each end of that runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline. The width of a primary surface is:

(1) 250 feet for utility runways having only visual approaches.

(2) 500 feet for utility runways having nonprecision instrument approaches.

(3) For other than utility runways the width is:

(i) 500 feet for visual runways having only visual approaches.

(ii) 500 feet for nonprecision instrument runways having visibility minimums greater than three-fourths statute mile.

(iii) 1,000 feet for a nonprecision instrument runway having a nonprecision instrument approach with visibility minimums as low as three-fourths of a statute mile, and for precision instrument runways.

The width of the primary surface of a runway will be that width prescribed in this section for the most precise approach existing or planned for either end of that runway.

(d) Approach surface—a surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end.

(1) The inner edge of the approach surface is the same width as the primary surface and it expands uniformly to a width of:

(i) 1,250 feet for that end of a utility runway with only visual approaches;

(ii) 1,500 feet for that end of a runway other than a utility runway with only visual approaches;

(iii) 2,000 feet for that end of a utility runway with a nonprecision instrument approach:

(iv) 3,500 feet for that end of a nonprecision instrument runway other than utility, having visibility minimums greater than three-fourths of a statute mile;

(v) 4,000 feet for that end of a nonprecision instrument runway, other than utility, having a nonprecision instrument approach with visibility minimums as low as three-fourths statute mile; and

(vi) 16,000 feet for precision instrument runways.

(2) The approach surface extends for a horizontal distance of:

(i) 5,000 feet at a slope of 20 to 1 for all utility and visual runways;

(ii) 10,000 feet at a slope of 34 to 1 for all nonprecision instrument runways other than utility; and,

(iii) 10,000 feet at a slope of 50 to 1 with an additional 40,000 feet at a slope of 40 to 1 for all precision instrument runways.

(3) The outer width of an approach surface to an end of a runway will be that width prescribed in this subsection for the most precise approach existing or planned for that runway end.

(e) *Transitional surface*—These surfaces extend outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces. Transitional surfaces for those portions of the precision approach surface which project through and beyond the limits of the conical surface, extend a distance of 5,000 feet measured horizontally from the edge of the approach surface and at right angles to the runway centerline.

§ 77.27 [Revoked]

§ 77.28 Military airport imaginary surfaces.

(a) *Related to airport reference points.* These surfaces apply to all military airports. For the purposes of this section a military airport is any airport operated by an armed force of the United States.

(1) *Inner horizontal surface*—A plane is oval in shape at a height of 150 feet above the established airfield elevation. The plane is constructed by scribing an arc with a radius of 7,500 feet about the centerline at the end of each runway and interconnecting these arcs with tangents.

(2) *Conical surface*—A surface extending from the periphery of the inner horizontal surface outward and upward at a slope of 20 to 1 for a horizontal distance of 7,000 feet to a height of 500 feet above the established airfield elevation.

(3) *Outer horizontal surface*—A plane, located 500 feet above the established airfield elevation, extending outward from the outer periphery of the conical surface for a horizontal distance of 30,000 feet.

(b) *Related to runways.* These surfaces apply to all military airports.

(1) Primary surface—A surface located on the ground or water longitudinally centered on each runway with the same length as the runway. The width of the primary surface for runways is 2,000 feet. However, at established bases where substantial construction has taken place in accordance with a previous lateral clearance criteria, the 2,000-foot width may be reduced to the former criteria.

(2) *Clear zone surface*—A surface located on the ground or water at each end of the primary surface, with a length of 1,000 feet and the same width as the primary surface.

(3) *Approach clearance surface*—An inclined plane, symmetrical about the runway centerline extended, beginning 200 feet beyond each end of the primary surface at the centerline elevation of the runway end and extending for 50,000 feet. The slope of the approach clearance surface is 50 to 1 along the runway centerline extended until it reaches an elevation of 500 feet above the established airport elevation. It then continues horizontally at this elevation to a point 50,000 feet from the point of beginning. The width of this surface as the runway end is the same as the primary surface, it flares uniformly, and the width at 50,000 is 16,000 feet.

(4) *Transitional surfaces*—These surfaces connect the primary surfaces, the first 200 feet of the clear zone surfaces, and the ap-

proach clearance surfaces to the inner horizontal surface, conical surface, outer horizontal surface or other transitional surfaces. The slope of the transitional surface is 7 to 1 outward and upward at right angles to the runway centerline.

§ 77.29 Airport imaginary surfaces for heliports.

(a) *Heliport primary surface.* The area of the primary surface coincides in size and shape with the designated takeoff and landing area of a heliport. This surface is a horizontal plane at the elevation of the established heliport elevation.

(b) *Heliport approach surface.* The approach surface begins at each end of the heliport primary surface with the same width as the primary surface, and extends outward and upward for a horizontal distance of 4,000 feet where its width is 500 feet. The slope of the approach surface is 8 to 1 for civil heliports and 10 to 1 for military heliports.

(c) *Heliport transitional surfaces.* These surfaces extend outward and upward from the lateral boundaries of the heliport primary surface and from the approach surfaces at a slope of 2 to 1 for a distance of 250 feet measured horizontally from the centerline of the primary and approach surfaces.

AERONAUTICS LAW
STATE AERONAUTICS ACT **Appendix B**

PUBLIC UTILITIES CODE
(CHAPTER 4, ARTICLE 3.5)

AIRPORT LAND USE COMMISSION

Creation; Membership; Selection

21670. (a) The Legislature hereby finds and declares that:

(1) It is in the public interest to provide for the orderly development of each public use airport in this state and the area surrounding these airports so as to promote the overall goals and objectives of the California airport noise standards adopted pursuant to Section 21669 and to prevent the creation of new noise and safety problems.

(2) It is the purpose of this article to protect public health, safety, and welfare by ensuring the orderly expansion of airports and the adoption of land use measures that minimize the public's exposure to excessive noise and safety hazards within areas around public airports to the extent that these areas are not already devoted to incompatible uses.

(b) In order to achieve the purposes of this article, every county in which there is located an airport which is served by a scheduled airline shall establish an airport land use commission. Every county, in which there is located an airport which is not served by a scheduled airline, but is operated for the benefit of the general public, shall establish an airport land use commission, except that the board of supervisors of the county may, after consultation with the appropriate airport operators and affected local entities and after a public hearing, adopt a resolution finding that there are no noise, public safety, or land use issues affecting any airport in the county which require the creation of a commission and declaring the county exempt from that requirement. The board shall, in this event, transmit a copy of the resolution to the Director of Transportation. For purposes of this section, "commission" means an airport land use commission. Each commission shall consist of seven members to be selected as follows:

(1) Two representing the cities in the county, appointed by a city selection committee comprised of the mayors of all the cities within that county, except that if there are any cities contiguous or adjacent to the qualifying airport, at least one representative shall be appointed therefrom. If there are no cities within a county, the number of representatives provided for by paragraphs (2) and (3) shall each be increased by one.

(2) Two representing the county, appointed by the board of supervisors.

(3) Two having expertise in aviation, appointed by a selection committee comprised of the managers of all of the public airports within that county.

(4) One representing the general public, appointed by the other six members of the commission.

(c) Public officers, whether elected or appointed, may be appointed and serve as members of the commission during their terms of public office.

(d) Each member shall promptly appoint a single proxy to represent him or her in commission affairs and to vote on all matters when the member is not in attendance. The proxy shall be designated in a signed written instrument which shall be kept on file at the commission offices, and the proxy shall serve at the pleasure of the appointing member. A vacancy in the office of proxy shall be filled promptly by appointment of a new proxy.

(e) A person having an "expertise" in aviation: means a person who, by way of education, training, business, experience, vocation, or avocation has acquired and possesses particular knowledge of, and familiarity with, the function, operation, and role of airports, or is an elected official of a local agency which owns or operates an airport. The commission shall be constituted pursuant to this section on and after March 1, 1988.

Action by Designated Body Instead of Commission

21670.1. (a) Notwithstanding any other provision of this article, if the board of supervisors and the city selection committee of mayors in the county each makes a determination by a majority vote that proper land use planning can be accomplished through the actions of an appropriately designated body, then the body so designated shall assume the planning responsibilities of an airport land use commission as provided for in this article, and a commission need not be formed in that county.

(b) A body designated pursuant to subdivision (a) which does not include among its membership at least two members having an expertise in aviation, as defined in subdivision (e) of Section 21670, shall, when acting in the capacity of an airport land use commission, be augmented so that the body, as augmented, will have at least two members having that expertise. The commission shall be constituted pursuant to this section on and after March 1, 1988.

(c) (1) Notwithstanding subdivisions (a) and (b), and subdivision (b) of Section 21670, if the board of supervisors of a county and each affected city in that county each makes a determination that proper land use planning pursuant to this article can be accomplished pursuant to its subdivision, then a commission need not be formed in that county.

(2) If the board of supervisors of a county and each affected city makes a determination that proper land use planning may be accomplished and a commission is not formed pursuant to paragraph (1) of this subdivision, that county and the appropriate affected cities having jurisdiction over an airport, subject to the review and approval by the Division of Aeronautics of the department, shall do all of the following:

(A) Adopt processes for the preparation, adoption, and amendment of the comprehensive airport land use plan for each airport that is served by a scheduled airline or operated for the benefit of the general public.

(B) Adopt processes for the notification of the general public, landowners, interested groups, and other public agencies regarding the preparation, adoption, and amendment of the comprehensive airport land use plans.

(C) Adopt processes for the mediation of disputes arising from the preparation, adoption, and amendment of the comprehensive airport land use plans.

(D) Adopt processes for the amendment of general and specific plans to be consistent with the comprehensive airport land use plans.

(E) Designate the agency that shall be responsible for the preparation, adoption, and amendment of each comprehensive airport land use plan.

(3) The Division of Aeronautics of the department shall review the processes adopted pursuant to paragraph (2), and shall approve the processes if the division determines that the processes are consistent with the procedure required by this article and will do all of the following:

(A) Result in the preparation, adoption, and implementation of plans within a reasonable amount of time.

(B) Rely on the height, use, noise, safety, and density criteria that are compatible with airport operations, as established by this article, and referred to as the Airport Land Use Planning Handbook, published by the division, and any applicable federal aviation regulations, including, but not limited to, Part 77 (commencing with Section 77.1) of Title 14 of the Code of Federal Regulations.

(C) Provide adequate opportunities for notice to, review of, and comment by the general public, landowners, interested groups, and other public agencies.

(4) If the county does not comply with the requirements of paragraph (3) within 120 days, then the plan and amendments shall not be considered adopted pursuant to this article and a commission shall be established within 90 days of the determination of non-compliance by the division and a plan shall be adopted pursuant to this article within 90 days of the establishment of the commission.

(d) A commission need not be formed in a county that has contracted for the preparation of comprehensive land use plans with the Division of Aeronautics under the California Aid to Airports Program (Title 21 (commencing with Section 4050) of the California Code of Regulations), Project Ker-VAR 90-1, and that submits all of the following information to the Division of Aeronautics for review and comment that the county and the cities affected by the airports within the county, as defined by the plans:

(1) Agree to adopt and implement the comprehensive airport plans that have been developed under contract.

(2) Incorporated the height, use, noise, safety, and density criteria that are compatible with airport operations as established by this article, and referred to as the Airport Land Use Planning Handbook, published by the division, and any applicable federal aviation regulations, including, but not limited to, Part 77 (commencing with Section 77.1) of Title 14 of the Code of Federal Regulations as part of the general and specific plans for the county and for each affected city.

(3) If the county does not comply with this subdivision on or before May 1, 1995, then a commission shall be established in accordance with this article.

(e) (1) A commission need not be formed in a county if all of the following conditions are met:

(A) The county has only one public use airport that is owned by a city.

(B) (i) The county and the affected city adopt the elements in paragraph 2 of subdivision (d), as part of their general and specific plans for the county and the affected city.

(ii) The general and specific plans shall be submitted, upon adoption, to the Division of Aeronautics. If the county and the affected city do not submit the elements specified in paragraph (2) of subdivision (d), on or before May 1, 1996, then a commission shall be established in accordance with this article.

Applicability to Los Angeles County

21670.2 (a) Sections 21670 and 21670.1 do not apply to the County of Los Angeles. In that county, the county regional planning commission has the responsibility for coordinating the airport planning of public agencies within the county. In instances where impasses result relative to this planning, an appeal may be made to the county regional planning commission by any public agency involved. The action taken by the county regional planning commission on such an appeal may be overruled by a four-fifths vote of the governing body of a public agency whose planning led to the appeal.

(b) By January 1, 1992, the county regional planning commission shall adopt the comprehensive land use plans required pursuant to Section 21675.

(c) Sections 21675.1, 21675.2, and 21679.5 do not apply to the County of Los Angeles until January 1, 1992. If the comprehensive land use plans required pursuant to Section 21675 are not adopted by the county regional planning commission by January 1, 1992, Sections 21675.1 and 21675.2 shall apply to the County of Los Angeles until the plans are adopted.

Applicability to Mendocino County

SEC. 1. 21670.3 (a) Notwithstanding the deadlines in Sections 21671.5 and 21675.1, the commission in the County of Mendocino shall adopt the comprehensive land use plans required pursuant to Section 21675 by June 30, 1993, for all public airports in the county except the Willits Municipal Airport.

(b) Until the commission adopts a comprehensive land use plan, the city or county shall first submit all actions, regulations, and permits within the vicinity of a public airport to the commission for review and approval. Before the commission approves or disapproves any actions, regulations, or permits, the commission shall give public notice in the same manner as the city or county is required to give for those actions, regulations, or permits. As used in this section, "vicinity" means land which will be included or reasonably could be included within the plan. If the commission has not designated a study area for the plan, then "vicinity" means land within two miles of the boundary of a public airport.

(c) The commission may approve an action, regulation, or permit if it finds, based on substantial evidence in the record, all of the following:

(1) The commission is making substantial progress toward the completion of the plan.

(2) There is a reasonable probability that the action, regulation, or permit will be consistent with the plan being prepared by the commission.

(3) There is little or no probability of substantial detriment to or interference with the future adopted plan if the action, regulation, or permit is ultimately inconsistent with the plan.

(d) If the commission disapproves an action, regulation, or permit, the commission shall notify the city or county. The city or county may overrule the commission, by a two-thirds vote of its governing body, if it makes specific findings that the proposed action, regulation or permit is consistent with the purposes of this article, as stated in Section 21670.

(e) If a city or county overrules the commission pursuant to subdivision (d), that action shall not relieve the city or county from further compliance with this article after the commission adopts the plan.

(f) If a city or county overrules the commission pursuant to subdivision (d) with respect to a publicly owned airport that the city or county does not operate, the operator of the airport is not liable for damages to property or personal injury resulting from the city's or county's decision to proceed with the action, regulation or permit.

(g) A commission may adopt rules and regulations which exempt any ministerial permit for single-family dwellings from the requirements of subdivision (b) if it makes the findings required pursuant to subdivision (c) for the proposed rules and regulations, except that the rules and regulations may not exempt either of the following:

(1) More than two single-family dwellings by the same applicant within a subdivision prior to June 30, 1993.

(2) Single-family dwellings in a subdivision where 25 percent or more of the parcels are undeveloped.

(h) Until June 30, 1993, no action pursuant to Section 21679 to postpone the effective date of a zoning change, a zoning variance, the issuance of a permit, or the adoption of a regulation by a local agency, directly affecting the use of land within one mile of the boundary of a public airport, shall be commenced in the County of Mendocino.

(i) This section shall become inoperative on June 30, 1993, and is repealed on that date.

SEC. 2. In enacting Section 21670.3 of the Public Utilities Code pursuant to Section 1 of this bill, the Legislature finds and declares that:

(a) The Legislature has not extended the deadlines in Sections 21671.5 and 21675.1 of the Public Utilities Code for the Willits Municipal Airport.

(b) This act shall have no effect on the pending litigation brought by the City of Willits regarding the lack of a comprehensive land use plan for the Willits Municipal Airport.

(c) The Legislature does not intend to further extend the deadlines in Sections 21671.5 and 21675.1 of the Public Utilities Code for the County of Mendocino.

SEC. 3. The Legislature finds and declares that a special law is necessary and that a general law cannot be made applicable within the meaning of Section 16 of Article IV of the California Constitution because of the unique circumstances of the commission in the County of Mendocino. The facts constituting the special circumstances are:

There are unique problems involved for the commission in preparing the comprehensive land use plans with sufficient resources and broad public involvement, taking into consideration such factors as the county's natural resources and lands of high scenic values.

Airport Owned by a City, District, or County; Appointment of Certain Members by Cities and Counties

21671. In any county where there is an airport operated for the general public which is owned by a city or district in another county or by another county, one of the representatives provided by paragraph (1) of subdivision (b) of Section 21670 shall be appointed by the city selection committee of mayors of the cities of the county in which the owner of that airport is located, and one of the representatives provided by paragraph (2) of subdivision (b) of Section 21670 shall be appointed by the board of supervisors of the county in which the owner of that airport is located.

Term of Office; Removal of Members; Vacancies: Compensation: Staff Assistance; Meetings

21671.5 (a) Except for the terms of office of the members of the first commission, the term of office of each member shall be four years and until the appointment and qualification of his or her successor. The members of the first commission shall classify themselves by lot so that the term of office of one member is one year, of two members is two years, of two members is three years, and of two members is four years. The body which originally appointed a member whose term has expired shall appoint his or her successor for a full term of four years. Any member may be removed at any time and without cause by the body appointing him or her. The expiration date of the term of office of each member shall be the first Monday in May in the year in which his or term is to expire. Any vacancy in the membership of the commission shall be filled for the unexpired term by appointment by the body which originally appointed the member whose office has become vacant. The chairperson of the commission shall be selected by the members thereof.

(b) Compensation, if any, shall be determined by the board of supervisors.

(c) Staff assistance, including the mailing of notices and the keeping of minutes, and necessary quarters, equipment, and supplies shall be provided by the county. The usual and necessary operating expenses of the commission shall be a county charge.

(d) Notwithstanding any other provisions of this article, the commission shall not employ any personnel either as employees or independent contractors without the prior approval of the board of supervisors.

(e) The commission shall meet at the call of the commission chairperson or at the request of the majority of the commission members. A majority of the commission members shall constitute a quorum for the transaction of business. No action shall be taken by the commission except by the recorded vote of a majority of the full membership.

(f) The commission may establish a schedule of fees necessary to comply with this article. Those fees shall be charged to the proponents of actions, regulations, or permits, shall not exceed the estimated reasonable cost of providing the service, and shall be imposed pursuant to Section 66016 of the Government Code. Except as provided in subdivision (g), after June 30, 1991, a commission which has not adopted the comprehensive land use plan required by Section 21675 shall not charge fees pursuant to this subdivision until the commission adopts the plan.

(g) In any county which has undertaken by contract or otherwise completed land use plans for at least one-half of all public use airports in the county, the commission may continue to charge fees necessary to comply with this article until June 30, 1992, and, if the land use plans are complete by that date, may continue charging fees after June 30, 1992. If the land use plans are not complete by June 30, 1992, the commission shall not charge fees pursuant to subdivision (f) until the commission adopts the land use plans.

Rules and Regulations

21672. Each commission shall adopt rules and regulations with respect to the temporary disqualification of its members from participating in the review or adoption of a proposal because of conflict of interest and with respect to appointment of substitute members in such cases.

Initiation of Proceedings for Creation by Owner of Airport

21673. In any county not having a commission or a body designated to carry out the responsibilities of a commission, any owner of a public airport may initiate proceedings for the creation of a commission by presenting a request to the board of supervisors that a commission be created and showing the need therefor to the satisfaction of the board of supervisors.

Powers and Duties

21674. The commission has the following powers and duties, subject to the limitations upon its jurisdiction set forth in Section 21676:

(a) To assist local agencies in ensuring compatible land uses in the vicinity of all new airports and in the vicinity of existing airports to the extent that the land in the vicinity of those airports is not already devoted to incompatible uses.

(b) To coordinate planning at the state, regional, and local levels so as to provide for the orderly development of air transportation, while at the same time protecting the public health, safety, and welfare.

(c) To prepare and adopt an airport land use plan pursuant to Section 21675.

(d) To review the plans, regulations, and other actions of local agencies and airport operators pursuant to Section 21676.

(e) The powers of the commission shall in no way be construed to give the commission jurisdiction over the operation of any airport.

(f) In order to carry out its responsibilities, the commission may adopt rules and regulations consistent with this article.

Staff Training and Development

21674.5 (a) The Department of Transportation shall develop and implement a program or programs to assist in the training and development of the staff of airport land use commissions, after consulting with airport land use commissions, cities, counties, and other appropriate public entities.

(b) The training and development program or programs are intended to assist the staff of airport land use commissions in addressing high priority needs, and may include, but need not be limited to, the following:

(1) The establishment of a process for the development and adoption of comprehensive land use plans.

(2) The development of criteria for determining airport land use planning boundaries.

(3) The identification of essential elements which should be included in the comprehensive plans.

(4) Appropriate criteria and procedures for reviewing proposed developments and determining whether proposed developments are compatible with the airport use.

(5) Any other organizational, operational, procedural, or technical responsibilities and functions which the department determines to be appropriate to provide to commission staff and for which it determines there is a need for staff training and development.

(c) The department may provide training and development programs for airport land use commission staff pursuant to this section by any means it deems appropriate. Those programs may be presented in any of the following ways:

(1) By offering formal courses or training programs.

(2) By sponsoring or assisting in the organization and sponsorship of conferences, seminars, or other similar events.

(3) By producing and making available written information.

(4) Any other feasible method of providing information and assisting in the training and development of airport land use commission staff.

SEC. 2. The sum of one hundred thousand dollars ($100,000) is hereby appropriated from the Aeronautics Account in the State Transportation Fund to the Department of Transportation for the purposes of this act.

SEC. 3. This act is an urgency statute necessary for the immediate preservation of the public peace, health, or safety within the meaning of Article IV of the Constitution and shall go into immediate effect. The facts constituting the necessity are:

In order to assist airport land use commissions to comply with state law requiring the development and adoption of comprehensive land use plans for each public airport in California, and in order to provide for the orderly development of public airports and to provide adequate protection from incompatible land uses in the vicinity of public use airports at the earliest possible time, it is necessary that this act take effect immediately.

Airport Land Use Planning Handbook

SEC. 4. 21674.7. An airport land use commission that formulates, adopts or amends a comprehensive land use plan shall be guided by information prepared and updated pursuant to Section 21674.5 and referred to as the Airport Land Use Planning Handbook published by the Division of Aeronautics of the Department of Transportation.

SEC. 5. No reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution because the local agency or school district has the authority to levy service charges, fees, or assessments sufficient to pay for this program or level of service mandated by this act. Notwithstanding Section 17580 of the Government Code, unless otherwise specified in this act, the provisions of this act shall become operative on the same date that the act takes effect pursuant to the California Constitution.

Land Use Plan

21675. (a) Each commission shall formulate a comprehensive land use plan that will provide for the orderly growth of each public airport and the area surrounding the airport within the jurisdiction of the commission, and will safeguard the general welfare of the inhabitants within the vicinity of the airport and the public in general. The commission plan shall include and shall be based on a long-range master plan or an airport layout plan, as determined by the Division of Aeronautics of the Department of Transportation, that reflects the anticipated growth of the airport during at least the next 20 years. In formulating a land

use plan, the commission may develop height restrictions on buildings, specify use of land, and determine building standards, including soundproofing adjacent to airports, within the planning area. The comprehensive land use plan shall be reviewed as often as necessary in order to accomplish its purposes, but shall not be amended more than once in any calendar year.

(b) The commission may include, within its plan formulated pursuant to subdivision (a), the area within the jurisdiction of the commission surrounding any federal military airport for all of the purposes specified in subdivision (a). This subdivision does not give the commission any jurisdiction or authority over the territory or operations of any military airport.

(c) The planning boundaries shall be established by the commission after hearing and consultation with the involved agencies.

(d) The commission shall submit to the Division of Aeronautics of the department one copy of the plan and each amendment to the plan.

(e) If a comprehensive land use plan does not include the matters required to be included pursuant to this article, the Division of Aeronautics of the department shall notify the commission responsible for the plan.

Date of adoption; review of actions; approval or disapproval

21675.1. (a) By June 30, 1991, each commission shall adopt the comprehensive land use plan required pursuant to Section 21675, except that any county which has undertaken by contract or otherwise completed land use plans for at least one-half of all public use airports in the county, shall adopt that plan on or before June 30, 1992.

(b) Until a commission adopts a comprehensive land use plan, a city or county shall first submit all actions, regulations, and permits within the vicinity of a public airport to the commission for review and approval. Before the commission approves or disapproves any actions, regulations, or permits, the commission shall give public notice in the same manner as the city or county is required to give for those actions, regulations, or permits. As used in this section, "vicinity" means land which will be included or reasonably could be included within the plan. If the commission has not designated a study area for the plan, then "vicinity" means land within two miles of the boundary of a public airport.

(c) The commission may approve an action, regulation, or permit if it finds, based on substantial evidence in the record, all of the following:

(1) The commission is making substantial progress toward the completion of the plan.

(2) There is a reasonable probability that the action, regulation, or permit will be consistent with the plan being prepared by the commission.

(3) There is little or no probability of substantial detriment to or interference with the future adopted plan if the action, regulation, or permit is ultimately inconsistent with the plan.

(d) If the commission disapproves an action, regulation, or permit, the commission shall notify the city or county. The city or county may overrule the commission, by a two-thirds vote of its governing body, if it makes specific findings that the proposed action, regulation, or permit is consistent with the purposes of this article, as stated in Section 21670.

(e) If a city or county overrules the commission pursuant to subdivision (d), that action shall not relieve the city or county from further compliance with this article after the commission adopts the plan.

(f) If a city or county overrules the commission pursuant to subdivision (d) with respect to a publicly owned airport that the city or county does not operate, the operator of the airport shall be immune from liability for damages to property or personal injury from the city's or county's decision to proceed with the action, regulation, or permit.

(g) A commission may adopt rules and regulations which exempt any ministerial permit for single-family dwellings from the requirements of subdivision (b) if it makes the findings required pursuant to subdivision (c) for the proposed rules and regulations, except that the rules and regulations may not exempt either of the following:

(1) More than two single-family dwellings by the same applicant within a subdivision prior to June 30, 1991.

(2) Single-family dwellings in a subdivision where 25 percent or more of the parcels are undeveloped.

Failure to Approve or Disapprove

21675.2. (a) If a commission fails to act to approve or disapprove any actions, regulations, or permits within 60 days of receiving the request pursuant to Section 21675.1, the applicant or his or her representative may file an action pursuant to Section 1094.5 of the Code of Civil Procedure to compel the commission to act, and the court shall give the proceedings preference over all other actions or proceedings, except previously filed pending matters of the same character.

(b) The action, regulation, or permit shall be deemed approved only if the public notice required by this subdivision has occurred. If the applicant has provided seven days advance notice to the commission of the intent to provide public notice pursuant to this subdivision, then, not earlier than the date of the expiration of the time limit established by Section 21675.1, an applicant may provide the required public notice. If the applicant chooses to provide public notice, that notice shall include a description of the proposed action, regulation, or permit substantially similar to the descriptions which are commonly used in public notices by the commission, the location of any proposed development, the application number, the name and address of the commission, and a statement that the action, regulation, or permit shall be deemed approved if the commission has not acted within 60 days. If the applicant has provided the public notice specified in this subdivision, the time limit for action by the commission shall be extended to 60 days after the public notice is provided. If the applicant provides notice pursuant to this section, the commission shall refund to the applicant any fees which were collected for providing notice and which were not used for that purpose.

(c) Failure of an applicant to submit complete or adequate information pursuant to Sections 65943 to 65946, inclusive, of the Government Code, may constitute grounds for disapproval of actions, regulations, or permits.

(d) Nothing in this section diminishes the commission's legal responsibility to provide, where applicable, public notice and hearing before acting on an action, regulation, or permit.

Review of Local General Plans

21676. (a) Each local agency whose general plan includes areas covered by an airport land use commission plan shall, by July 1, 1983, submit a copy of its plan or specific plans to the airport land use commission. The commission shall determine by August 31, 1983, whether the plan or plans are consistent or inconsistent with the commission's plan. If the

plan or plans are inconsistent with the commission's plan, the local agency shall be notified and that local agency shall have another hearing to reconsider its plans. The local agency may overrule the commission after such hearing by a two-thirds vote of its governing body if it makes specific findings that the proposed action is consistent with the purposes of this article stated in Section 21670.

(b) Prior to the amendment of a general plan or specific plan, or the adoption or approval of a zoning ordinance or building regulation within the planning boundary established by the airport land use commission pursuant to Section 21675, the local agency shall first refer the proposed action to the commission. If the commission determines that the proposed action is inconsistent with the commission's plan, the referring agency shall be notified.

The local agency may, after a public hearing, overrule the commission by a two-thirds vote of its governing body if it makes specific findings that the proposed action is consistent with the purposes of this article stated in Section 21670.

(c) Each public agency owning any airport within the boundaries of an airport land use commission plan shall, prior to modification of its airport master plan, refer such proposed change to the airport land use commission. If the commission determines that the proposed action is inconsistent with the commission's plan, the referring agency shall be notified. The public agency may, after a public hearing, overrule the commission by a two-thirds vote of its governing body if it makes specific findings that the proposed action is consistent with the purposes of this article stated in Section 21670.

(d) Each commission determination pursuant to subdivision (b) or (c) shall be made within 60 days from the date of referral of the proposed action. If a commission fails to make the determination within that period, the proposed action shall be deemed consistent with the commission's plan.

Review of Local Plans

21676.5. (a) If the commission finds that a local agency has not revised its general plan or specific plan or overruled the commission by a two-thirds vote of its governing body after making specific findings that the proposed action is consistent with the purposes of this article as stated in Section 21670, the commission may require that the local agency submit all subsequent actions, regulations, and permits to the commission for review until its general plan or specific plan is revised or the specific findings are made. If, in the determination of the commission, an action, regulation, or permit of the local agency is inconsistent with the commission plan, the local agency shall be notified and that local agency shall hold a hearing to reconsider its plan. The local agency may overrule the commission after the hearing by a two-thirds vote of its governing body if it makes specific findings that the proposed action is consistent with the purposes of this article as stated in Section 21670.

(b) Whenever the local agency has revised its general plan or specific plan or has overruled the commission pursuant to subdivision (a), the proposed action of the local agency shall not be subject to further commission review, unless the commission and the local agency agree that individual projects shall be reviewed by the commission.

Marin County Override Provisions

21677. Notwithstanding Section 21676, any public agency in the County of Marin may overrule the Marin County Airport Land Use Commission by a majority vote of its governing body.

Airport Owner's Immunity

21678. With respect to a publicly owned airport that a public agency does not operate, if the public agency pursuant to Section 21676 or 21676.5 overrides a commission's action or recommendation, the operator of the airport shall be immune from liability for damages to property or personal injury caused by or resulting directly or indirectly from the public agency's decision to override the commission's action or recommendation.

Court Review

21679. (a) In any county in which there is no airport land use commission or other body designated to assume the responsibilities of an airport land use commission, or in which the commission or other designated body has not adopted an airport land use plan, an interested party may initiate proceedings in a court of competent jurisdiction to postpone the effective date of a zoning change, a zoning variance, the issuance of a permit, or the adoption of a regulation by a local agency, which directly affects the use of land within one mile of the boundary of a public airport within the county.

(b) The court may issue an injunction which postpones the effective date of the zoning change, zoning variance, permit, or regulation until the governing body of the local agency which took the action does one of the following:

(1) In the case of an action which is a legislative act, adopts a resolution declaring that the proposed action is consistent with the purposes of this article stated in Section 21670.

(2) In the case of an action which is not a legislative act, adopts a resolution making findings based on substantial evidence in the record that the proposed action is consistent with the purposes of this article stated in Section 21670.

(3) Rescinds the action.

(4) Amends its action to make it consistent with the purposes of this article stated in Section 21670, and complies with either paragraph (1) or (2) of this subdivision, whichever is applicable.

(c) The court shall not issue an injunction pursuant to subdivision(b) if the local agency which took the action demonstrates that the general plan and any applicable specific plan of the agency accomplishes the purposes of an airport land use plan as provided in Section 21675.

(d) An action brought pursuant to subdivision (a) shall be commenced within 30 days of the decision or within the appropriate time periods set by Section 21167 of the Public Resources Code, whichever is longer.

(e) If the governing body of the local agency adopts a resolution pursuant to subdivision (b) with respect to a publicly owned airport that the local agency does not operate, the operator of the airport shall be immune from liability for damages to property or personal injury from the local agency's decision to proceed with the zoning change, zoning variance, permit, or regulation.

(f) As used in this section, "interested party" means any owner of land within two miles of the boundary of the airport or any organization with a demonstrated interest in airport safety and efficiency.

Action to Postpone Effective Date of Zoning Change, Etc.

21679.5. (a) Until June 30, 1991, no action pursuant to Section 21679 to postpone the effective date of a zoning change, a zoning variance, the issuance of a permit, or the adoption of a regulation by a local agency, directly affecting the use of land within one mile of the boundary of a public airport, shall be commenced in any county in which the commission or other designated body has not adopted an airport land use plan, but is making substantial progress toward the completion of the plan.

(b) If a commission has been prevented from adopting the comprehensive land use plan by June 30, 1991, or if the adopted plan could not become effective, because of a lawsuit involving the adoption of the plan, the June 30, 1991, date in subdivision (a) shall be extended by the period of time during which the lawsuit was pending in a court of competent jurisdiction.

(c) Any action pursuant to Section 21679 commenced prior to January 1, 1990, in a county in which the commission or other designated body has not adopted an airport land use plan, but is making substantial progress toward the completion of the plan, which has not proceeded to final judgment, shall be held in abeyance until June 30, 1991. If the commission or other designated body adopts an airport land use plan on or before June 30, 1991, the action shall be dismissed. If the commission or other designated body does not adopt an airport land use plan on or before June 30, 1991, the plaintiff or plaintiffs may proceed with the action.

(d) An action to postpone the effective date of a zoning change, a zoning variance, the issuance of a permit, or the adoption of a regulation by a local agency, directly affecting the use of land within one mile of the boundary of a public airport for which an airport land use plan has not been adopted by June 30, 1991, shall be commenced within 30 days of June 30, 1991, or within 30 days of the decision by the local agency, or within the appropriate time periods set by Section 21167 of the Public Resources Code, whichever date is later.

(Revised 11/15/94)

Appendix C

Methods for Determining Concentrations of People

One criterion used in the *Airport Land Use Compatibility Plan* is the maximum number of people per acre that can be present in a given area at any one time. If a proposed use exceeds the maximum density, it will be considered inconsistent with ALUC policies. This appendix provides some guidance on how to make the people-per-acre determination.

The most difficult part of making a people-per-acre determination is estimating the number of people likely to use a particular facility. There are several methods that can be utilized, depending upon the nature of the proposed use:

- **Parking Ordinance** — The number of people present in a given area can be calculated based upon the number of parking spaces provided. Some assumption regarding the number of people per vehicle needs to be developed to calculate the number of people on-site. The number of people per acre can then be calculated by dividing the number of people on-site by the size of the parcel in acres. This approach is appropriate where the use is expected to be dependent upon access by vehicles.

- **Maximum Occupancy** — The Uniform Building Code can be used as a standard for determining the maximum occupancy of certain uses. The chart provided as Exhibit A is taken from the 1976 edition of the UBC (Table 33-A) and indicates the required number of square feet per occupant. The number of people on the site can be calculated by dividing the total floor area of a proposed use by the minimum square feet per occupant requirement listed in the table. The maximum occupancy can then be divided by the size of the parcel in acres to determine the people per acre.

  Surveys of actual occupancy levels conducted by the City of Sacramento have indicated that many retail and office uses are generally occupied at 50% of their maximum occupancy levels, even at the busiest times of day. Therefore, the number of people calculated for office and retail uses should be adjusted (50%) to reflect the actual occupancy levels before making the final people-per-acre determination.

- **Survey of Similar Uses** — Certain uses may require an estimate based upon a survey of similar uses. This approach is more difficult, but is appropriate for uses which, because of the nature of the use, cannot be reasonably estimated based upon parking or square footage.

Exhibit C1

Occupancy Levels

Uniform Building Code

	Use	Minimum Square Feet per Occupant
1.	Aircraft Hangars (no repair)	500
2.	Auction Room	7
3.	Assembly Areas, Concentrated Use (without fixed seats)	7
	Auditoriums	
	Bowling Alleys (assembly areas)	
	Churches and Chapels	
	Dance Floors	
	Lodge Rooms	
	Reviewing Stands	
	Stadiums	
4.	Assembly Areas, Less Concentrated Use	15
	Conference Rooms	
	Dining Rooms	
	Drinking Establishments	
	Exhibit Rooms	
	Gymnasiums	
	Lounges	
	Skating Rinks	
	Stages	
5.	Children's Homes	80
	Homes for the Aged	
6.	Classrooms	20
7.	Dormitories	50
8.	Dwellings	300
9.	Garage, Parking	200
10.	Hospitals and Sanitariums	80
	Nursing Homes	
11.	Hotels and Apartments	200
12.	Kitchen - Commercial	200
13.	Library Reading Room	50
14.	Locker Rooms	50
15.	Mechanical Equipment Room	300
16.	Nurseries for Children (Day -Care)	50
17.	Offices	100
18.	School Shops and Vocational Rooms	50
19.	Stores - Retail Sales Rooms	
	Basement	20
	Ground Floor	30
	Upper Floors	50
20.	Warehouses	300
21.	All Others	100

Examples:

A. The proposal is for a 60,000-square-foot two-story office building on 4 gross acres (including adjacent roads). The local parking ordinance requires one parking space for every 250 square feet of commercial space. Assuming that the use would generate one person per vehicle, the following calculations would derive the number of people per acre.

Steps:

1) 60,000 sq. ft. ÷ 1 vehicle per 250 sq ft. = 240 vehicles

2) 240 vehicles x 1.0 people per vehicle = 240 people expected at any one time.

3) 240 people ÷ 4 acres = 60 people per acre.

Under this example, the use would be estimated to generate 60 people per acre. In zones with limits of 100 people-per-acre, the use would be considered compatible assuming all other conditions were met.

B. The proposal is for a 12,000-square-foot store on a 63,000-square-foot parcel. Using the maximum occupancy table from the Uniform Building Code (Exhibit C1) and applying the assumption that the building is occupied at 50 percent of maximum nets results in the following calculations:

Steps:

1) 63,000 sq. ft. ÷ 43,560 sq. ft. (in an acre) = 1.45 acre.
2) 12,000 sq. ft. ÷ 30 sq. ft./occupant = 400 (max. building occupancy).
3) 400 max. bldg. occup. x 50% = 200 people expected at any one time.
4) 200 people ÷ 1.45 acre = 138 people per acre.

Under this example, 138 people per acre would represent a reasonable estimate. In zones with limitations of 100 people-per-acre or less, the use would be considered incompatible.

C. The proposal is for a 3,000-square-foot office on a 16,500-square-foot parcel. Again using the table in Exhibit C1 but assuming the actual occupancy level is 50% of the maximum indicated by the UBC code provides the following result:

Steps:

1) 16,500 sq. ft. ÷ 43,560 sq. ft. (acre) = 0.38 acre.
2) 3,000 sq. ft. ÷ 100 sq. ft./occupant = 30 (max. building occupancy).
3) 30 people maximum building occupancy x 50% (actual occupancy) = 15 people in the building at any one time.
4) 15 people ÷ 0.38 acres = 39 people per acre.

Under this example, the use would be estimated to generate 39 people per acre. In zones with occupancy limits of 100, the use would be considered compatible assuming all other conditions were met.

Appendix D

Compatibility Guidelines for Specific Land Uses

The compatibility evaluations listed below for specific types of land uses can be used by local jurisdictions as guidelines in implementation of the primary compatibility criteria listed in Table 2A. In case of any conflicts between these evaluations of specific land uses and the policies and criteria in Chapter 2 of this document, the contents of Chapter 2 shall prevail.

Zones	Compatibility			
Land Use	**A**	**B1/B2**	**C**	**D**
Agricultural Uses				
Truck and Specialty Crops	0	+	+	+
Field Crops	0	+	+	+
Pasture and Rangeland	0	+	+	+
Orchard and Vineyards	–	+	+	+
Dry Farm and Grain	0	+	+	+
Tree Farms, Landscape Nurseries and Greenhouses	–	0	+	+
Fish Farms	–	0	+	+
Feed Lots and Stockyards	–	0	+	+
Poultry Farms	–	0	+	+
Dairy Farms	–	0	+	+
Natural Uses				
Fish and Game Preserves	0	0	0	0
Land Preserves and Open Space	0	+	+	+
Flood and Geological Hazard Areas	0	+	+	+
Waterways: Rivers, Creeks, Canals, Wetlands, Bays, Lakes	0	0	0	+

– Incompatible
0 Potentially compatible with restrictions
+ Compatible

Zones Land Use	Compatibility A	 B1/B2	 C	 D
Residential and Institutional				
Rural Residential - 10 acres or more	–	+	+	+
Low Density Residential - 2 to 10 acre lots	–	0/+	+	+
Single Family Residential - lots under 2 acres	–	–	0	+
Multi Family Residential	–	–	0	+
Mobile Home Parks	–	–	0	+
Schools, Colleges and Universities	–	–	–	+
Day Care Centers	–	–	0	+
Hospitals and Residential Care Facilities	–	–	–	+
Recreational				
Golf Course	0	+	+	+
Parks - low intensity; no group activities	0	+	+	+
Playgrounds and Picnic Areas	–	0	+	+
Athletic Fields	–	0	+	+
Riding Stables	–	0	+	+
Marinas and Water Recreation	–	0	+	+
Health Clubs and Spas	–	–	0	+
Tennis Courts	–	0	+	+
Swimming Pools	–	0	0	+
Fairgrounds and Race Tracks	–	–	–	+
Resorts and Group Camps	–	–	0	+
Industrial				
Research and Development Laboratories	–	0	+	+
Warehouses and Distribution Facilities	–	0	+	+
Manufacturing and Assembly	–	0	0	+
Cooperage and Bottling Plants	–	0	+	+
Printing, Publishing and Allied Services	–	0	+	+
Chemical, Rubber and Plastic Products	–	–	0	+
Food Processing	–	–	0	+

– Incompatible
0 Potentially compatible with restrictions
+ Compatible

Zones Land Use	Compatibility A	B1/B2	C	D
Commercial Uses				
Large Shopping Malls (500,000+ sq.ft.)	–	–	0	+
Retail Stores (one story)	–	0	0	+
Retail Stores (two story)	–	–	0	+
Restaurants and Drinking Establishments (no take out)	–	0	0	+
Food Take-Outs	–	–	0	+
Auto and Marine Services	–	0	+	+
Building Materials, Hardware and Heavy Equipment	–	0	+	+
Office Buildings (one story)	–	0	+	+
Multiple-story Retail, Office, and Financial	–	–	0	+
Banks and Financial Institutions	–	0	+	+
Repair Services	–	0	+	+
Gas Stations	–	0	+	+
Government Services/Public Buildings	–	0	+	+
Motels (one story)	–	0	0	+
Hotels and Motels (two story)	–	–	0	+
Theaters, Auditoriums, and Assembly Halls	–	–	0	+
Outdoor Theaters	–	–	0	+
Memorial Parks/Cemeteries	–	+	+	+
Truck Terminals	–	+	+	+
Transportation, Communications, and Utilities				
Automobile Parking	0	+	+	+
Highway & Street Right-of-ways	0	+	+	+
Railroad and Public Transit Facilities	0	+	+	+
Taxi, Bus & Train Terminals	–	0	+	+
Reservoirs	–	0	0	+
Power Lines	–	0	0	+
Water Treatment Facilities	–	0	+	+
Sewage Treatment and Disposal Facilities	–	0	0	+
Electrical Substations	–	0	0	+
Power Plants	–	–	0	+
Sanitary Landfills	–	–	–	0

– Incompatible
0 Potentially compatible with restrictions
+ Compatible

Appendix E

Sample Easement and Deed Notice Documents

This *Airport Land Use Compatibility Plan* recommends the dedication of avigation or overflight easements or use of deed notices in selected areas around each of the airports in the county. The specific applications are as noted in the Primary Compatibility Criteria matrix, Table 2A.

Examples of three types of documents are presented on the following pages.

Exhibit D1 – Avigation Easement

Exhibit D2 – Overflight Easement

Exhibit D3 – Deed Notice

RECORDING REQUESTED BY:

County of Kern

WHEN RECORDED MAIL TO:

Director of Planning Department
County of Kern
2700 "M" Street, Suite 100
Bakersfield, CA 93301

APN_____
DEPT. REFERENCE_____

No Fee Document
(Public Entity Grantee,
Gov. Code Section 27383)

GRANT OF AVIGATION EASEMENT

For a valuable consideration, receipt of which is hereby acknowledged _____

_____

hereinafter referred to as "Grantor(s)," hereby grant(s) to the COUNTY OF KERN, a political subdivision of the State of California (hereinafter referred to as "County"), for the use and benefit of the public, a perpetual and assignable easement and right-of way, and certain rights appurtenant to said easement as hereinafter set forth, in, on and over the following described parcel of real property situated in the County of Kern, State of California, in which Grantor(s) hold(s) a fee simple estate, lying below, in whole or in part, the horizontal limits of an imaginary surface defined by those civil airport imaginary surfaces described in Federal Aviation Regulations, Part 77, whether applicable or not to the _____ Airport, situated in the County of Kern, State of California (hereinafter referred to as "Airport"), which said parcel on Grantor(s)' real property is described as follows:_____

_____

_____

_____

_____

That portion of said parcel of real property lying below the said imaginary surfaces described above is delineated by hatched lines on the map attached hereto as Exhibit "A" and incorporated by reference herein as though set forth.

It is agreed by Grantor(s) that he/they shall not hereafter erect, enlarge or grow, or permit or suffer to remain, any building, structure, or other object, or any tree, bush, shrub or other vegetation, within or into the airspace above said imaginary surfaces overlying said real property.

Grantor(s) hereby take(s) notice, without surrendering any rights to which he/they may otherwise be entitled in law or in equity, that aircraft using Airport will produce noise, light, electromagnetic emissions, radio transmissions, vibrations, fumes, particles and other effects incident to aviation which, in turn, might affect the free use and enjoyment of his/their property.

It is further agreed by Grantor(s) that the easement and rights hereby granted to County are for the purpose of ensuring that the airspace above the said imaginary surfaces shall remain free and clear of any building, structure or other object, and or any tree, bush, shrub or other vegetation, which could constitute an obstruction or hazard to the flight of aircraft of any kind within the airspace landing at and/or taking off from said Airport. These rights shall include, but not be limited to, the following:

1. The continuing and perpetual right of County or Airport operator, at Grantor(s)' sole cost and expense, to cut off, trim and/or prune those portions of any tree, bush, shrub and/or vegetation extending, projecting or infringing into, or upon or through the airspace above said imaginary surfaces.

2. The continuing and perpetual right of County or Airport operator, at Grantor(s)' sole cost and expense, to remove, raze, modify or destroy those portions of any building, structure or other object, infringing, extending or projecting into or upon said imaginary surfaces.

3. The right of County, at Grantor(s)' sole cost and expense, to mark and light, as obstructions to air navigation, any building, structure or other object, any tree, bush, shrub or other vegetation, that may at any time infringe, project or extend into or upon said imaginary surfaces.

4. The right of County or Airport operator for ingress to, egress from, and passage on or over any or all of Grantor(s)' real property for the above purposes. County or Airport operator may exercise its right of ingress and egress hereunder only after it sends Grantor(s) notice of its intent to enter Grantor(s)' property twenty-four (24) hours in advance, using the address specified herein, unless Grantor(s) requests County, in writing, to use a different address. County shall not be precluded from exercising its right of ingress and egress by the failure of Grantor(s) to receive notice if it has made a reasonable effort to notify Grantor(s). If, in the opinion of the Airport operator, an obstruction or hazard exists within or upon said imaginary surfaces overlying said real property, which creates an immediate danger to the flight of aircraft landing at and/or taking off from the Airport such that immediate action is necessary, County or Airport

operator may exercise its right of ingress and egress for the above purposes without notice to Grantor(s), and shall thereafter notify Grantor(s).

5. The right of flight or unobstructed passage of aircraft of any kind for the use and benefit of the public, above said imaginary surfaces, as may be inherent in the navigation or flight of aircraft now or hereafter used or known, using said airspace for landing at, taking off from, or operating from, to, at, on, over or in the proximity of the said Airport.

6. Acts in violation of Federal Aviation Regulations by users of the Airport shall not be considered acts allowing Grantor(s) or their successors in interest to terminate the easement granted hereby.

The easement granted herein, and all rights appertaining thereto, are granted unto the County, its successors and assignees, until said Airport shall be abandoned and ceased to be used for airport purposes for a period of at least five (5) years, at which time they shall automatically revert to Grantor(s).

Grantor(s) agree to defend at their own cost at County's request, to hold harmless, and to indemnify County from any liability for or based upon the exercise by any person or entity other than County of the easement rights granted herein.

It is understood and agreed by Grantor(s) that this easement and the covenants and restrictions contained herein shall run with the land described above and shall be binding upon the heirs, successors and assigns of Grantor(s). For purposes of this instrument, the above-described real property shall be the servient tenement and the Airport and any hereafter acquired property used by Airport shall be dominant tenement.

Dated:_____

GRANTOR:_____

GRANTOR:_____

Address:_____

_____

STATE OF CALIFORNIA)
) ss
COUNTY OF KERN)

On this _____ day of _____, in the year _____, before me, _____, the undersigned, personally appeared _____, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year in this Certificate first above written.

_____
Notary Public in and for the State of California

I certify that on _____ day of _____, 19_____, the Board of Supervisors of the County of Kern consented to the making of the foregoing avigation easement and consented to the recordation thereof by its duly authorized officer.

Dated this _____ day of _____, 19_____.

_____
Chairman of the Board of Supervisors

County of Kern, State of California

ATTEST:

Clerk of the Board

By_____
Deputy Clerk

Exhibit D2

Typical Overflight Easement

GRANTOR hereby grants to the _____ in _____, its successors or assigns, as owners of the [Name of Airport]_____, California, an overflight easement for the following purposes and granting the following rights:

(1) For the use and benefit of the public, and to the extent and in the manner consistent with safe operating procedures as provided under applicable governmental regulations, the right to make flights, and the noise inherent thereto, in airspace over the property described in Exhibit A (attached) in connection with landings, takeoffs, and general operation of the [Name of Airport].

(2) The right to regulate or prohibit the release into the air of any substance which would impair the visibility or otherwise interfere with the operations of aircraft such as, but not limited to, steam, dust, and smoke.

(3) The right to regulate or prohibit light emissions, either direct or indirect (reflective), which might interfere with pilot vision.

(4) The right to prohibit electrical emissions which would interfere with aircraft communication systems or aircraft navigational equipment.

This easement shall be effective from this date and run with the land until such time as the [Name of Airport] is no longer used as an airport.

The real property subject to this overflight easement is described as follows:

See Attachment "A"

DATED: _____ GRANTOR: _____

_____

By: _____

Exhibit D3

Sample Deed Notice

The following statement should be included on the deed for the subject property and recorded in by the County. This statement should also be included on any parcel map, tentative map or final map for subdivision approval.

> This property is in the area subject to overflights by aircraft using _____ airport, and as a result, residents may experience inconvenience, annoyance or discomfort arising from the noise of such operations. State law (public utilities code section 21670 et. Seq.) establishes the importance of public use airports to protection of the public interest of the people of the State of California. Residents of property near a public use airport should therefore be prepared to accept such inconvenience, annoyance or discomfort from normal aircraft operations. Any subsequent deed conveying parcels or lots shall contain a statement in substantially this form.

Glossary

ABOVE GROUND LEVEL (AGL): An elevation datum given in feet above ground level.

AIR CARRIER: A person who undertakes directly by lease, or other arrangement, to engage in air transportation. (FAR 1) (Also see Certificated Route Air Carrier)

AIR CARRIERS: The commercial system of air transportation, consisting of the certificated route air carriers, air taxis (including commuters), supplemental air carriers, commercial operators of large aircraft, and air travel clubs. (FAA Census)

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC): A facility established to provide air traffic control service to aircraft operating on IFR flight plans within controlled airspace, principally during the en route phase of flight. (AIM)

AIR TAXI: A classification of air carriers which directly engage in the air transportation of persons, property, mail, or in any combination of such transportation and which do not directly or indirectly utilize large aircraft (over 30 seats or a maximum payload capacity of more than 7,500 pounds) and do not hold a Certificate of Public Convenience and Necessity or economic authority issued by the Department of Transportation. (Also see commuter air carrier and demand air taxi.) (FAA Census)

AIR TRAFFIC CONTROL (ATC): A service operated by appropriate authority to promote the safe, orderly, and expeditious flow of air traffic. (FAR 1)

AIRPORT TRAFFIC CONTROL TOWER (ATCT): A terminal facility that uses air/ground communications, visual signaling, and other devices to provide ATC services to aircraft operating in the vicinity of an airport or on the movement area. (AIM)

AIRCRAFT ACCIDENT: An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage. (NTSB)

AIRCRAFT OPERATION: The airborne movement of aircraft in controlled or non-controlled airport terminal areas and about given en route fixes or at other points where counts can be made. There are two types of operations – local and itinerant. (FAA Stats)

AIRCRAFT PARKING LINE LIMIT (APL): A line established by the airport authorities beyond which no part of a parked aircraft should protrude. (Airport Design)

AIRPORT: An area of land or water that is used or intended to be used for the landing and taking off of aircraft, and includes its buildings and facilities, if any. (FAR 1)

AIRPORT ELEVATION: The highest point of an airport's usable runways, measured in feet above mean sea level. (AIM)

AIRPORT HAZARD: Any structure or natural object located on or in the vicinity of a public airport, or any use of land near such airport, that obstructs the airspace required for the flight of aircraft in landing or taking off at the airport or is otherwise hazardous to aircraft landing, taking off, or taxiing at the airport. (Airport Design)

AIRPORT LAYOUT PLAN: A scale drawing of existing and proposed airport facilities, their location on the airport, and the pertinent clearance and dimensional information required to demonstrate conformance with applicable standards.

AIRPORT RADAR SERVICE AREA (ARSA): Regulatory airspace surrounding designated airports wherein FAA Air Traffic Control provides radar vectoring and sequencing on a full-time basis for all IFR and VFR aircraft. (AIM)

AIRPORT REFERENCE POINT: A point established on an airport, having equal relationship to all existing and proposed landing and takeoff areas, and used to geographically locate the airport and for other planning purposes. (Airport Design)

AIRWAY/FEDERAL AIRWAY: A control area or portion thereof established in the form of a corridor, the centerline of which is defined by radio navigational aids. (AIM)

ALERT AREA: A special use airspace which may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft. (AIM)

APPROACH LIGHT SYSTEM (ALS): An airport lighting system which provides visual guidance to landing aircraft by radiating light beams in a directional pattern by which the pilot aligns the aircraft with the extended runway centerline during a final approach to landing. Among the specific types of systems are:

- LDIN – Lead-in Light System.
- MALSR — Medium-intensity Approach Light System with Runway Alignment Indicator Lights.
- ODALS – Omnidirectional Approach Light System, a combination of LDIN and REILS.
- SSALR – Simplified Short Approach Light System with Runway Alignment Indicator Lights. (AIM)

APPROACH SPEED: The recommended speed contained in aircraft manuals used by pilots when making an approach to landing. This speed will vary for different segments of an approach as well as for aircraft weight and configuration. (AIM)

AUTOMATED WEATHER OBSERVING SYSTEM (AWOS): Airport electronic equipment which automatically measures meteorological parameters, reduces and analyzes the data via computer, and broadcasts weather information which can be received on aircraft radios in some applications, via telephone.

AUTOMATIC DIRECTION FINDER (ADF): An aircraft radio navigation system which senses and indicates the direction to a L/MF nondirectional radio beacon (NDB) ground transmitter. (AIM)

AUTOMATIC TERMINAL INFORMATION SERVICE (ATIS): The continuous broadcast of recorded non-control information in selected terminal areas. (AIM)

BACK COURSE APPROACH: A non-precision instrument approach utilizing the rearward projection of the ILS localizer beam.

BASED AIRCRAFT: Aircraft stationed at an airport on a long-term basis.

BUILDING RESTRICTION LINE (BRL): A line which identifies suitable building area locations on airports.

CEILING: Height above the earth's surface to the lowest layer of clouds or obscuring phenomena that is reported as "broken", "overcast", or "obscuration" and is not classified as "thin" or "partial". (AIM)

CERTIFICATED ROUTE AIR CARRIER: An air carrier holding a Certificate of Public Convenience and Necessity issued by the Department of Transportation authorizing the performance of scheduled service over specified routes, and a limited amount of nonscheduled service. (FAA Census)

CIRCLING APPROACH/CIRCLE-TO-LAND MANEUVER: A maneuver initiated by the pilot to align the aircraft with a runway for landing when a straight-in landing from an instrument approach is not possible or not desirable. (AIM)

COMMERCIAL OPERATOR: A person who, for compensation or hire, engages in the carriage by aircraft in air commerce of persons or property, other than as an air carrier. (FAR 1)

COMPASS LOCATOR: A low power, low or medium frequency radio beacon installed at the site of the outer or middle marker of an instrument landing system (ILS). (AIM)

COMPASS ROSE: A circle, graduated in degrees, printed on some charts or marked on the ground at an airport. It is used as a reference to either true or magnetic direction. (AIM)

COMMUNITY NOISE EQUIVALENT LEVEL (CNEL): The noise rating adopted by the State of California for measurement of airport noise. It represents the average daytime noise level during a 24-hour day, measured in decibels and adjusted to an equivalent level to account for the lower tolerance of people to noise during evening and nighttime periods.

COMMUTER AIR CARRIER: An air taxi operator which performs at least five round trips per week between two or more points and publishes flight schedules which specify the times, days of the week and places between which such flights are performed. (FAA Census)

CONTROLLED AIRSPACE: Any of several types of airspace within which some or all aircraft may be subject to air traffic control. (FAR 1)

CONTROL ZONE: Controlled airspace surrounding one or more airports, normally a circular area with a radius of 5 statute miles plus extensions to include instrument arrival and departure paths. Most control zones surround airports with air traffic control towers and are in effect only for the hours the tower is operational.

DEMAND AIR TAXI: Use of an aircraft operating under Federal Aviation Regulations, Part 135, passenger and cargo operations, including charter and excluding commuter air carrier. (FAA Census)

DISPLACED THRESHOLD: A threshold that is located at a point on the runway other than the designated beginning of the runway. (See Threshold) (AIM)

DISTANCE MEASURING EQUIPMENT (DME): Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid. (AIM)

FAR PART 77: The part of the Federal Aviation Regulations which deals with objects affecting navigable airspace.

FAR PART 77 SURFACES: Imaginary surfaces established with relation to each runway of an airport. There are five types of surfaces: (1) primary; (2) approach; (3) transitional; (4) horizontal; and (5) conical.

FEDERAL AVIATION ADMINISTRATION (FAA): The United States government agency which is responsible for insuring the safe and efficient use of the nation's airspace.

FIXED BASE OPERATOR (FBO): A business operating at an airport that provides aircraft services to the general public, including but not limited to sale of fuel and oil; aircraft sales, rental, maintenance, and repair; parking and tiedown or storage of aircraft; flight training; air taxi/charter operations; and specialty services, such as instrument and avionics maintenance, painting, overhaul, aerial application, aerial photography, aerial hoists, or pipeline patrol.

FLIGHT SERVICE STATION (FSS): FAA facilities which provide pilot briefings on weather, airports, altitudes, routes, and other flight planning information.

GENERAL AVIATION: That portion of civil aviation which encompasses all facets of aviation except air carriers. (FAA Stats)

GLIDE SLOPE: An electronic signal radiated by a component of an ILS to provide descent path guidance to approaching aircraft.

GLOBAL POSITIONING SYSTEM (GPS): A space-based radio positioning, navigation, and time-transfer systsem being developed by the U.S. Department of Defense. This newly-emerging technology may eventually become the principal system for air navigation throughout the world.

HELIPAD: A small, designated area, usually with a prepared surface, on a heliport, airport, landing/takeoff area, apron/ramp, or movement area used for takeoff, landing, or parking of helicopters. (AIM)

INSTRUMENT APPROACH PROCEDURE: A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing or to a point from which a landing may be made visually. It is prescribed and approved for a specific airport by competent authority. (AIM)

INSTRUMENT FLIGHT RULES (IFR): Rules governing the procedures for conducting instrument flight. Also term used by pilots and controllers to indicate a type of flight plan. (AIM)

INSTRUMENT LANDING SYSTEM (ILS): A precision instrument approach system which normally consists of the following electronic components and visual aids: (1) Localizer; (2) Glide Slope; (3) Outer Marker; (4) Middle Marker; (5) Approach Lights. (AIM)

INSTRUMENT OPERATION: An aircraft operation in accordance with an IFR flight plan or an operation where IFR separation between aircraft is provided by a terminal control facility. (FAA ATA)

INSTRUMENT RUNWAY: A runway equipped with electronic and visual navigation aids for which a precision or non-precision approach procedure having straight-in landing minimums has been approved. (AIM)

ITINERANT OPERATION: An arrival or departure performed by an aircraft from or to a point beyond the local airport area.

LARGE AIRCRAFT: An aircraft of more than 12,500 pounds maximum certificated takeoff weight. (FAR 1)

LIMITED REMOTE COMMUNICATIONS OUTLET (LRCO): An unmanned, remote air/ground communications facility which may be associated with a VOR. It is capable only of receiving communications and relies on a VOR or a remote transmitter for full capability.

LOCALIZER (LOC): The component of an ILS which provides course guidance to the runway. (AIM)

LOCAL OPERATION: An arrival or departure performed by an aircraft: (1) operating in the traffic pattern, (2) known to be departing or arriving from flight in local practice areas, or (3) executing practice instrument approaches at the airport. (FAA ATA)

LORAN: An electronic ground-based navigational system established primarily for marine use but used extensively for VFR and limited IFR air navigation.

MARKER BEACON (MB): The component of an ILS which informs pilots, both aurally and visually, that they are at a significant point on the approach course.

MEAN SEA LEVEL (MSL): An elevation datum given in feet above mean sea level.

MEDIUM-INTENSITY APPROACH LIGHTING SYSTEM (MALS): The MALS is a configuration of steady-burning lights arranged symmetrically about and along the extended runway centerline. MALS may also be installed with sequenced flashers – in this case, the system is referred to as MALSF.

MICROWAVE LANDING SYSTEM (MLS): A precision instrument approach system providing a function similar to an ILS, but operating in the microwave spectrum. It normally consists of three components: azimuth station, elevation station, and precision distance measuring equipment.

MILITARY OPERATIONS AREA (MOA): A type of special use airspace of defined vertical and lateral dimensions established outside of Class A airspace to separate/segregate certain military activities from IFR traffic and to identify for VFR traffic where these activities are conducted. (AIM)

MINIMUM DESCENT ALTITUDE (MDA): The lowest altitude, expressed in feet above mean sea level, to which descent is authorized on final approach or during circle-to-land maneuvering in execution of a standard instrument approach procedure where no electronic glide slope is provided. (FAR 1)

MISSED APPROACH: A maneuver conducted by a pilot when an instrument approach cannot be completed to a landing. (AIM)

NAVIGATIONAL AID/NAVAID: Any visual or electronic device airborne or on the surface which provides point-to-point guidance information or position data to aircraft in flight. (AIM)

NONDIRECTIONAL BEACON (NDB): A 4 MF or UHF radio beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his bearing to or from the radio beacon and "home" on or track to or from the station. (AIM)

NONPRECISION APPROACH PROCEDURE: A standard instrument approach procedure in which no electronic glide slope is provided. (FAR 1)

NONPRECISION INSTRUMENT RUNWAY: A runway with an instrument approach procedure utilizing air navigation facilities, with only horizontal guidance, or area-type navigation equipment for which a straight-in nonprecision instrument approach procedure has been approved or planned, and no precision approach facility or procedure is planned. (Airport Design)

OBSTACLE: An existing object, object of natural growth, or terrain, at a fixed geographical location, or which may be expected at a fixed location within a prescribed area, with reference to which vertical clearance is or must be provided during flight operation. (AIM)

OBSTACLE FREE ZONE (OFZ): A volume of space above and adjacent to a runway and its approach lighting system if one exists, free of all fixed objects except FAA-approved frangible aeronautical equipment and clear of vehicles and aircraft in the proximity of an airplane conducting an approach, missed approach, landing, takeoff, or departure.

OBSTRUCTION: An object/obstacle, including a mobile object, exceeding the obstruction standards specified in FAR Part 77, Subpart C. (AIM)

OUTER MARKER: A marker beacon at or near the glide slope intercept position of an ILS approach. (AIM)

PRECISION APPROACH PATH INDICATOR (PAPI): An airport landing aid similar to a VASI, but which has light units installed in a single row rather than two rows.

PRECISION APPROACH PROCEDURE: A standard instrument approach procedure in which an electronic glide slope is provided. (FAR 1)

PRECISION INSTRUMENT RUNWAY: A runway with an instrument approach procedure utilizing an instrument landing system (ILS), microwave landing system (MLS), or precision approach radar (PAR). (Airport Design)

RELOCATED THRESHOLD: The portion of pavement behind a relocated threshold that is not available for takeoff and landing. It may be available for taxiing and aircraft. (Airport Design)

REMOTE COMMUNICATIONS AIR/GROUND FACILITY (RCAG): An unmanned VHF/UHF transmitter/receiver facility which is used to expand ARTCC air/ground communications coverage and to facilitate direct contact between pilots and controllers. (AIM)

REMOTE COMMUNICATIONS OUTLET (RCO) AND REMOTE TRANSMITTER/RECEIVER (RTR): An unmanned communications facility remotely controlled by air traffic personnel. RCO's serve FSS's. RTR's serve terminal ATC facilities. (AIM)

RESTRICTED AREA: Designated airspace within which the flight of aircraft, while not wholly prohibited, is subject to restriction. (FAR 1)

RUNWAY CLEAR ZONE: A term previously used to describe the runway protection zone.

RUNWAY EDGE LIGHTS: Lights used to define the lateral limits of a runway. Specific types include:

- HIRL – High-Intensity Runway Lights.
- MIRL – Medium-Intensity Runway Lights.

RUNWAY END IDENTIFIER LIGHTS (REIL): Two synchronized flashing lights, one on each side of the runway threshold, which provide a pilot with a rapid and positive visual identification of the approach end of a particular runway. (AIM)

RUNWAY PROTECTION ZONE: A trapezoidal area at ground level, under the control of the airport authorities, for the purpose of protecting the safety of approaches and keeping the area clear of the congregation of people. The runway protection zone begins at the end of each primary surface and is centered upon the extended runway centerline. (Airport Design)

RUNWAY SAFETY AREA: A cleared, drained, graded, and preferably turfed area symmetrically located about the runway which, under normal conditions, is capable of supporting snow removal, fire fighting, and rescue equipment and of accommodating the occasional passage of aircraft without causing major damage to the aircraft.

SMALL AIRCRAFT: An aircraft of 12,500 pounds or less maximum certificated takeoff weight. (FAR 1)

SPECIAL USE AIRSPACE: Airspace of defined horizontal and vertical dimensions identified by an area on the surface of the earth wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. (AIM)

STANDARD INSTRUMENT DEPARTURE (SID): A preplanned instrument flight rules (IFR) air traffic control departure procedure printed for pilot use in graphic and/or textual form. SID's provide transition from the terminal to the appropriate en route structure. (AIM)

STANDARD TERMINAL ARRIVAL ROUTE (STAR): A preplanned instrument flight rule (IFR) air traffic control arrival route published for pilot use in graphic and/or textual form. STARs provide transition from the en route structure to an outer fix or an instrument approach fix/arrival waypoint in the terminal area. (AIM)

STOPWAY: An area beyond the takeoff runway, no less wide than the runway and centered upon the extended centerline of the runway, able to support the airplane during an aborted takeoff, without causing structural damage to the airplane, and designated by the airport authorities for use in decelerating the airplane during an aborted takeoff. (FAR 1)

STRAIGHT-IN INSTRUMENT APPROACH — IFR: An instrument approach wherein final approach is begun without first having executed a procedure turn; it is not necessarily completed with a straight-in landing or made to straight-in landing weather minimums. (AIM)

TAXILANE: The portion of the aircraft parking area used for access between taxiways, aircraft parking positions, hangars, storage facilities, etc. (Airport Design)

TAXIWAY: A defined path, from one part of an airport to another, selected or prepared for the taxiing of aircraft. (Airport Design)

TERMINAL CONTROL AREA (TCA): Controlled airspace extending upward from the surface or higher to specified altitudes, within which all aircraft are subject to operating rules and pilot and equipment requirements specified in FAR Part 91. (AIM)

TERMINAL INSTRUMENT PROCEDURES (TERPS): Procedures for instrument approach and departure of aircraft to and from civil and military airports. There are four types of terminal instrument procedures: precision approach, nonprecision approach, circling, and departure.

TERMINAL RADAR SERVICE AREA (TRSA): Airspace surrounding designated airports wherein ATC provides radar vectoring, sequencing, and separation on a full-time basis for all IFR and participating VFR aircraft. (AIM)

THRESHOLD: The beginning of that portion of the runway usable for landing. (AIM) (Also see Displaced Threshold)

TOUCH-AND-GO: An operation by an aircraft that lands and departs on a runway without stopping or exiting the runway A touch-and-go is defined as two operations. (AIM)

TRAFFIC PATTERN: The traffic flow that is prescribed for aircraft landing at, taxiing on, or taking off from an airport. The components of a typical traffic pattern are upwind leg, crosswind leg, downwind leg, base leg, and final approach. (AIM)

TRANSIENT AIRCRAFT: Aircraft not based at the airport.

TRANSMISSOMETER: An apparatus used to determine visibility by measuring the transmission of light through the atmosphere. (AIM)

TRANSPORT AIRPORT: An airport designed, constructed, and maintained to serve airplanes having approach speeds of 121 knots or more. (Airport Design)

UNICOM (Aeronautical Advisory Station): A nongovernment air/ground radio communication facility which may provide airport information at certain airports. (AIM)

UTILITY AIRPORT: An airport designed, constructed, and maintained to serve airplanes having approach speeds less than 121 knots. (Airport Design)

VERY-HIGH-FREQUENCY OMNIDIRECTIONAL RANGE (VOR): The standard navigational aid used throughout the airway system to provide bearing information to aircraft. When combined with Tactical Air Navigation (TACAN) the facility, called VORTAC, provides distance as well as bearing information.

VISUAL APPROACH SLOPE INDICATOR (VASI): An airport landing aid which provides a pilot with visual descent (approach slope) guidance while on approach to landing. Also see PAPI.

VISUAL FLIGHT RULES (VFR): Rules that govern the procedures for conducting flight under visual conditions. The term "VFR" is also used by pilots and controllers to indicate type of flight plan. (AIM)

VISUAL GLIDE SLOPE INDICATOR (VGSI): A generic term for the group of airport visual landing aids which includes Visual Approach Slope Indicators (VASI), Precision Approach Path Indicators (PAPI), and Pulsed Light Approach Slope Indicators (PLASI). When FAA funding pays for this equipment, whichever type receives the lowest bid price will be installed unless the airport owner wishes to pay the difference for a more expensive unit.

VISUAL RUNWAY: A runway intended solely for the operation of aircraft using visual approach procedures, with no straight-in instrument approach procedure and no instrument designation indicated on an FAA-approved airport layout plan. (Airport Design)

WARNING AREA: Airspace which may contain hazards to nonparticipating aircraft in international airspace. (AIM)

SOURCES

FAR 1: Federal Aviation Regulations Part 1, Definitions and Abbreviations. (1993)

AIM: Airman's Information Manual, Pilot/Controller Glossary. (1993)

Airport Design: Federal Aviation Administration. *Airport Design*. Advisory Circular 150/5300-13. (1992)

FAA ATA: Federal Aviation Administration. *Air Traffic Activity*. (1986)

FAA Census: Federal Aviation Administration. *Census of U.S. Civil Aircraft*. (1986)

FAA Stats: Federal Aviation Administration. *Statistical Handbook of Aviation*. (1984)

NTSB: National Transportation Safety Board. *U.S. NTSB 830-3*. (1989)

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Appendix G

FINAL
Air Installations Compatible Use Zones Study Naval Air Weapons Station China Lake, California

April 2011

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Executive Summary

The issue of incompatible land use adjacent to military air installations is a growing concern to the Navy. The increase of incompatible land use and development around airfields, generally referred to as encroachment, has the potential to seriously constrain an installation's mission capability.

At the Naval Air Weapons Station China Lake (NAWS), land development in areas adjacent to Armitage Airfield has increased in recent years. Fortunately, this growth has not yet resulted in serious constraints on the NAWS mission. The opportunity still exists to proactively manage surrounding land use development to meet the growth needs of local communities and protect the sustainability of the NAWS mission through the implementation and maintenance of compatible land use policies and practices.

This Air Installations Compatible Use Zones (AICUZ) Study highlights this opportunity and offers recommended strategies and planning tools that can be applied by local agencies to promote compatible land use development before encroachment becomes a serious problem at NAWS. The study examines various planning parameters related to aircraft operations, noise, and safety, and provides an analysis of land use compatibility in both on- and off-base properties.

An AICUZ study was prepared and approved for NAWS in 1977 and updated in 2007. Kern County and the City of Ridgecrest evaluated the AICUZ recommendations and enacted compatible land use provisions into their zoning ordinances and General Plan documentation. NAWS maintains a positive relationship with local agencies and anticipates being able to work with local authorities to accomplish similar coordination and adoption of the results and recommendations of this 2011 AICUZ study update.

AICUZ studies should be updated when an air installation mission is modified, has a significant change in aircraft operations (i.e., the number of take-offs and landings), a change in the type of aircraft stationed and operating at the installation, or changes in flight paths or procedures. The 2007 AICUZ study adopted a shift of departure tracks 14D1, 21D1, 26D1 and 32D1 west of the Jacks Ranch Road “consolidated departure alternative.” Since the 2007 AICUZ study was completed, the aircraft mix projected to be stationed at NAWS, noise modeling assumptions, and operations modeled for their contribution to noise at NAWS have changed. Both the 2007 AICUZ and the 2011 AICUZ study update model

the operational tempo —a 25% increase in airfield and range flight operations— as the preferred operational scenario analyzed in NAWS' *Environmental Impact Statement for Proposed Military Operational Increases and Implementation of Associated Comprehensive Land Use and Integrated Natural Resources Management Plans*, completed in 2004 (hereafter referred to as the 2004 EIS). Since the 2007 AICUZ was completed, several noise studies have modeled operational changes at NAWS.

- A November 2008 noise study modeled Baker Range sorties, one-to-one replacement of the EA-6B Prowler with the EA-18G Growler, the introduction of the F-35 Lightning II (JSF) aircraft, a reduction of FA-18C/D “Legacy” Hornet and AV 8B Harrier aircraft operations, as well as a 25% increase in Armitage Airfield flight operations. This noise study also modeled the ground around NAWS as “acoustically hard” in order to more accurately reflect the desert surrounding the airfield. The hard-packed desert terrain/ground in the vicinity of Armitage Airfield is closer in impedance to the "acoustically hard" than "acoustically soft" impedance model setting. Soft impedance is primarily for grass-covered ground.

- The August 2009 noise study incorporated the changes modeled in the November 2008 noise study as well as the updated noise profiles for the F-35 aircraft and updated flight profiles and also modeled noise dispersion around departure flight tracks and noise at more points surrounding NAWS.

The currently adopted 2007 AICUZ study requires updating because of the changes modeled by the November 2008 and August 2009 noise studies and the updated F-35 Lightning II noise profiles and altered flight tracks. The changes in aircraft type and numbers, noise modeling assumptions, and operations influence the noise contours and accident potential zones (APZs) of NAWS.

Baker Range covers 121 square miles (313 square kilometers) in the western portion of North Range. Baker Range is used primarily for test and evaluation (T&E) and training for air-to-surface weapon systems (e.g., rockets, bombs, guns), but also supports weapons system software validation, weapons ballistics, fuse functioning, and pilot proficiency in air-to-surface weapons delivery. Most bombs, rockets, and gunnery used on Baker Range are inert; however, high explosive (HE) ordnance can be dropped on B1-A and B-2 target areas.

ES.1 Safety

This 2011 AICUZ study defines standard APZs and evaluates other key issues associated with flight safety in and around Armitage Airfield. In addition to the traditional APZs immediately surrounding the runways, the study addresses safety concerns within the flight route corridors used by aviators for approaches and departures to and from the airfield (defined as the Military Influence Area [MIA]) and the Baker Range sorties.

ES.2 Noise

The 2011 AICUZ study update reports the results of the February 2010 Wyle Noise Report, WR 08-08R (Wyle Laboratories, Inc. 2010). The 2010 noise study was initiated to investigate the noise contributions of the F-35 and to evaluate the technical modeling assumptions of the noise analysis presented in the 2007 AICUZ study.

This AICUZ study update includes noise modeled from Baker Range sorties and modeling assumptions that include terrain, ground impedance, and departure dispersion that more accurately reflect the noise generated from aircraft operations. Noise from Baker Range aircraft operations is included within this AICUZ study because departures from Baker egress sorties over-fly private land within Kern County at relatively low altitudes. Modeling assumptions for the 2011 AICUZ study update capture noise exposure that results from terrain surrounding NAWS (i.e., elevation gains and losses), attenuation of noise on vacant desert (referred to as ground impedance), and a greater number of dispersed flight tracks along primary departure corridors to more accurately reflect the way pilots fly.

The increase in noise exposure from the 2007 AICUZ study to the 2011 AICUZ study update is primarily attributed to incorporating Baker Range sorties as well as the terrain and ground impedance in the noise model for this report (Wyle Laboratories Inc. March 30, 2010). This 2011 AICUZ study update has been prepared in consideration of expected changes in mission, the number and type of aircraft, operational levels, and other aspects that will occur within the next five- to ten-year planning period (i.e., a 2015 to 2020 planning horizon). The projected scenario presented in this AICUZ study update is defined as the operational conditions expected to occur within the next five- to ten-year planning period, as described above. The 2011 AICUZ noise contours represent the noise environment at NAWS under the projected scenario.

ES.3 Land Use Compatibility

This study defines two different AICUZ planning areas surrounding Armitage Airfield. These include the AICUZ footprint and the MIA. The 2011 AICUZ footprint defines airfield and range operations noise and the accident potential footprint based on projected operations. The MIA, as defined in land use maps of the City of Ridgecrest 2010 General Plan Update, more thoroughly addresses regional safety issues. Using accepted Navy guidelines, current zoning designations in the 2011 AICUZ footprint are evaluated for land use compatibility. The results of the analysis show that several areas of concern are currently zoned to allow development of incompatible land uses.

ES.4 Recommendations

The following recommendations promote continued compatible development and seek to limit or prevent future incompatible development and potential encroachment resulting from changes in land use controls/zoning regulations.

Recommendations for NAWS Action

1. Amend NAWS Comprehensive Land Use Management Plan (CLUMP) to incorporate AICUZ operational profiles and noise and safety conditions into existing land management practices, including the site approval process, environmental review process, and Capital Improvements Program.

2. Maintain and enhance NAWS community information programs and AICUZ outreach efforts to address agency and public information needs.

3. Continue the implementation of the NAWS noise complaint response program to address and respond to public inquiries regarding NAWS air operations.

4. Continue implementation of the NAWS air operations noise abatement and aircrew education programs to minimize noise and flight safety impacts on and off-base.

5. Formalize flight safety incident database. Maintain database in accordance with Secretary of the Navy Instruction 5720.42F.

Recommendations for City and County Action

1. Continue to provide California Environmental Quality Act (CEQA) notifications to NAWS for review and comment on city and county discretionary land use actions, including General/Specific Plan amendments, Zone Changes, Tract Maps, Parcel Maps, Specific Development Plans, and Conditional Use Permits.

2. Amend and adopt the existing Kern County Airport Land Use Compatibility Plan (ALUCP) – Military Aviation Section for NAWS, to include specific criteria, policies, and maps for use in evaluating projects, and provide a copy of the amended ALUCP to Cal Trans Department of Aeronautics, School Districts, and Special Districts.

3. The 2007 AICUZ study MIA and land use compatibility recommendations have been adopted by the 2010 Ridgecrest General Plan Update. City and county planners are encouraged to maintain the MIA as a valid planning tool to ensure future mission compatibility and to consider the most recent AICUZ study during plan updates. Salient components of this AICUZ study should be added to the Military Sustainability Element of the Kern County General Plan and the proposed Indian Wells Valley Specific Plan. Planners are encouraged to develop and adopt specific policies and procedures to address compatible land uses (type, density, etc.) and air operations safety considerations (height obstructions, glare and smoke, electronic emissions, bird attractants, etc.), and to identify appropriate densities of new residential development and minimize sensitive types of land use within the flight corridors and areas of increased risk.

4. Develop and implement a policy requiring a site-specific evaluation for any proposed General Plan Amendments or zoning changes that would create residential projects or increase allowable density of existing designated residential development in an area identified as impacted by noise or safety concerns and require appropriate notification of potential aircraft noise and flight safety risk to realtors, buyers, sellers, and residents of land within the MIA and the 2011 ACIUZ footprint.

5. Create specific policies for the General/Specific Plan that address restrictions on the location of sensitive receptors such as schools, day care centers, apartments, hospitals, nursing homes, and senior living facilities in relation to noise contours.

Recommendations for Bureau of Land Management Action

Incorporate appropriate elements of this AICUZ study into the next amendment of the BLM's California Desert Conservation Area Plan. Involve NAWS in planning associated with the development of cooperative agreements, proposed changes to land use type or intensity, and sales and transfers related to excess land parcels located within or adjacent to the MIA.

Recommendations for all AICUZ Participants

Work with local and regional governments to implement the R-2508 Joint Land Use Study (JLUS). The R-2508 Airspace Complex JLUS identifies viable strategies to promote mutually compatible land use in proximity to NAWS and within the R-2508 airspace to reduce potential conflicts with the DoD military mission, sustain regional economic health, and protect public health and safety in the region.

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List of Abbreviations and Acronyms

AB	Assembly Bill
ABD	average busy day
AEA	airborne electronic attack
agl	above ground level
AICUZ	Air Installations Compatible Use Zones
AIMD	Aircraft Intermediate Maintenance Division
ALUCP	Airport Land Use Compatibility Plan
AMRAAM	Advanced Medium Range Air-to-Air Missile
ANSI	American National Standards Institute
APCD	Air Pollution Control District
APZ	accident potential zone
ASO	Air Safety Officer
ATCAA	Air Traffic Control Assigned Airspace
BASH	Bird/Aircraft Strike Hazard
BHC	Bird Hazard Condition
BHWG	Bird Hazard Working Group
BLM	Bureau of Land Management
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNIC	Commander Naval Installations Command
CLUMP	Comprehensive Land Use Management Plan
CNEL	Community Noise Equivalent Level

List of Abbreviations and Acronyms (cont.)

CZ	clear zone
DNL	day-night average sound level
dB	decibel
DoD	Department of Defense
DON	Department of the Navy
DPZ	drop potential zone
EIS	Environmental Impact Statement
EMCON	Emission Control
EMI	electromagnetic interference
EPMD	Environmental Planning and Management Department
FAA	Federal Aviation Administration
FAR	Floor Area Ratio
FAS	Federation of American Scientists
FCLP	Field Carrier Landing Practice
FLOLS	Fresnel Lens Optical Landing System
GP	General Plan
GPS	global positioning system
HARM	High-Speed Anti-Radiation Missile
HE	high explosive
HERO	Hazards of Electromagnetic Radiation to Ordinance
HIRL	High-Intensity Runway Light
IFR	Instrument Flight Rules
JDAM	Joint Direct Attack Munitions
JLUS	Joint Land Use Study
JSOW	Joint Standoff Weapon
MIA	Military Influence Area

List of Abbreviations and Acronyms (cont.)

MOA	Military Operations Area
msl	mean sea level
NAVAIR	Naval Air Systems Command
NAVFAC	Naval Facilities Engineering Command
NAWCWD	Naval Air Warfare Center Weapons Division
NAWS	Naval Air Weapons Station China Lake
NAWSINST	Naval Air Weapons Station Instruction
NLR	noise-level reduction
NM	nautical miles
NTC	National Training Center
OPNAVINST	Chief of Naval Operations Instruction
OPR	Office of Planning and Research
PAPI	Precision Approach Path Indicator
RA	Restricted Area
RDM	Runway Distance Marker
RDT&E	Research, Development, Test, and Evaluation
RSP	recreation, schools, and public use
SB	Senate Bill
SEL	sound exposure level
SUA	special use air space
TACAN	Tactical Air Navigation
TERPS	Terminal Instrument Procedures
TJS	Tactical Jamming System
UFC	Unified Facilities Criteria
U.S.C.	United States Code
V/STOL	Vertical/Short Takeoff and Landing

List of Abbreviations and Acronyms (cont.)

WSSA	Weapon System Support Activity

1 Introduction

Throughout the history of U.S. military aviation, airfields have often been located in relatively isolated areas surrounded by agricultural or other undeveloped land areas. As such, military aircraft test and training operations were able to accommodate evolving mission requirements with a minimum of constraint. This situation began to change during the post-World War II era as rapid population growth and economic development fueled the creation and expansion of civilian communities in closer proximity to military installations. As these communities grew, they increasingly encroached upon the once-isolated airfields. The problem of encroachment is a serious concern for the Navy because of potential impacts to established operational capabilities. Incompatible land use development in close proximity to military aircraft operations increases the safety risk and level of annoyance experienced by civilian populations. Navy experience has demonstrated that the presence of these factors invariably result in restrictions being imposed on the conduct of military operations, thereby adversely impacting the ability of an installation to fulfill its assigned mission. As a means to prevent these conditions, the Department of Defense (DoD) and the Navy have implemented the Air Installations Compatible Use Zones (AICUZ) program. The AICUZ program is intended to promote compatible land use at military installations and in surrounding communities and to protect the health, safety, and welfare of civilians and military personnel in areas adjacent to military airfields.

At Naval Air Weapons Station China Lake (NAWS), maintaining established operational capabilities at Armitage Airfield and Baker Range remains a high priority. Historically, off-base land uses in proximity to the airfield and related operational areas have not constrained the NAWS mission. However, the potential for significant increases in residential and commercial development throughout the Indian Wells Valley highlights the need to continue to manage growth in a manner that is compatible with the respective needs of the local communities and NAWS. By addressing land-use compatibility issues through local agency land use planning and decision processes, local agency officials and business leaders have an opportunity to plan for and manage future growth in a manner that will sustain the operational mission of NAWS, and accommodate the growth needs of local communities. In compliance with AICUZ program requirements, NAWS has prepared this AICUZ study update in a proactive effort to encourage and focus the development and application of community planning strategies to achieve mutually beneficial results for local communities and the installation.

The NAWS AICUZ study should be updated when there are significant changes in aircraft operations, a change in the type of aircraft, or changes in flight patterns or procedures. Noise studies are typically conducted to determine if minor changes in flight operations (e.g., changes in aircraft operations and bed-down scenarios) affect a community's exposure to noise, or to determine if a full AICUZ study is required. In the 2007 AICUZ study the preferred alternative and no action alternative in the *Environmental Impact Statement for Proposed Military Operational Increases and Implementation of Associated Comprehensive Land Use and Integrated Natural Resources Management Plans*, completed in 2004 (henceforth referred to as the "2004 EIS"), were modeled as the "prospective" and "baseline" conditions. The 2007 AICUZ study modeled the FA-18C/D "Legacy" Hornet, FA-18-E/F Super Hornet, EA-6B Prowler, and AV-8AB Harrier aircraft and adopted a consolidated departure track west of Jacks Ranch Road for routes 14D1, 21D1, 26D1, and 32D1 (see Section 3.4 and Figure 3-1 for further discussion of departure flight routes). The consolidated departure track includes a "heavy leg" associated with departure track 14D1 for when high temperatures degrade the ability of aircraft to conform to the consolidated departure track. Additionally, a proposed six-degree shift of the tactical air navigation (TACAN)/instrument approach route was evaluated by NAWS Air Operations and Safety personnel. NAWS determined that the proposed six-degree shift would present increased and unacceptable safety risks; therefore, the proposed shift was not adopted (NAWS 2007).

Since the 2007 AICUZ was completed, additional noise studies were conducted in 2008 and 2009. The November 2008 noise study prospective scenario modeled Baker Range sorties that had not been included in the 2007 AICUZ study as well as changes in aircraft and flight operations. Changes in aircraft and flight operations included the one-to-one replacement of the EA-6B Prowler for the EA-18G Growler, the introduction of the F-35 Lightning II (JSF) aircraft, a reduction of FA-18C/D "Legacy" Hornet and AV-8B Harrier aircraft operations, and a 25% increase in Armitage Airfield flight operations. Additionally, the November 2008 noise study modeled the ground surrounding NAWS as acoustically "hard" in order to more accurately reflect vacant desert. Acoustically "soft" ground is primarily for grass-covered ground (see the Wyle Noise Report WR 08-08 for more information on the 2008 noise study [Wyle Laboratories, Inc. 2008]).

The August 2009 noise study altered the modeling assumptions used for the November 2008 noise study. Changes in the noise model include dispersion around departure flight tracks as well as noise modeled at more points surrounding NAWS. Additionally, noise profiles for the F-35 Lightning II aircraft were updated, and flight profiles were altered to more accurately reflect the way pilots at NAWS fly. The results of the August 2009 noise study triggered the need for the 2011 AICUZ study update. (For more information on the August 2009 noise study see Wyle Noise Report WR 08-08R [Wyle Laboratories, Inc. August 2009]).Updated flight profiles, altered flight tracks, and changes modeled in the 2008 and 2009 noise reports were incorporated into a February 2010 noise report which is the basis of the 2011 AICUZ study update. The 2010 noise study was

initiated to investigate the noise contributions of the F-35 and to evaluate the technical modeling assumptions of the noise analysis presented in the 2007 AICUZ study. (For more information on noise modeling for the 2010 AICUZ study update see Wyle Noise Report WR 08-08R [Wyle Laboratories, Inc. February 2010].)

This study analyzes operational conditions of the 2007 AICUZ study and projected scenario. The projected scenario is defined as the mission, aircraft, operational levels, and other aspects expected to be incorporated into NAWS operations within the next five- to ten-year planning period. The 2007 AICUZ and projected scenario presented in this AICUZ study update include the 2007 AICUZ and projected Armitage Airfield flight operations and current and projected Baker Range sorties, and evaluates the noise and safety considerations associated with these operations. Noise from Baker Range aircraft operations are included within this AICUZ study due to low altitude over-flights of private land within Kern County associated with Baker egress sorties. This study defines an airfield and range operations noise and accident potential footprint— "AICUZ footprint"— based on projected operations. Land-use compatibility within each of these planning areas is then evaluated. The AICUZ study update concludes by presenting recommended strategies to encourage compatible development and avoid or mitigate incompatible development in the vicinity of NAWS.

This first section of the document introduces the background of the Navy AICUZ Program and the scope of this AICUZ study update. Section 2 provides an overview of the installation, Armitage Airfield, Baker Range, and associated military airspace. Section 3 presents a description of 2007 AICUZ and projected aircraft operations. Section 4 focuses on key safety issues associated with airfield operations, including obstruction clearance requirements, accident potential zones, and other elements of airfield safety. Section 5 describes the results of noise modeling conducted in support of this AICUZ study update, including 2007 AICUZ and projected noise conditions associated with established flight routes and current and projected noise associated with range sorties. Section 6 assesses land-use compatibility within the 2011 AICUZ footprint. Section 7 presents recommendations for specific planning strategies and other measures that can be implemented to encourage and preserve land-use compatibility consistent with the goals of the AICUZ Program.

1.1 Background

1.1.1 The AICUZ Program

In the early 1970s, the DoD established the AICUZ Program to protect the public's health, safety, and welfare and to prevent encroachment from degrading the operational capability of military air installations in meeting national security missions. The program also strives to protect the Navy's investment in air installations by safeguarding operational capabilities and pursuing cooperative efforts to minimize the effects of noise and accident potential by promoting compatible development on-base and in the communities located in the vicinity of air installations. The foundation of the AICUZ program is an active local command effort to

work with local, state, regional, other federal agencies, and the public to encourage compatible development of land adjacent to military airfields.

Under the AICUZ Program, noise exposure zones are generated from computer models that account for the types and tempo of aircraft operations, flight routes and profiles, and other operational characteristics that influence the noise produced in the airfield environment. These noise zones are displayed on noise contour maps that are used as a planning tool to show the potential level of noise exposure in the surrounding communities.

The AICUZ Program also identifies accident potential zones (APZs) as a planning tool for installation planners and local government agencies. APZs are areas where an aircraft-related mishap is most likely to occur if one occurs—they are not predictors of accidents. APZs encompass a portion of departure, arrival, and pattern flight routes flown by aircraft at NAWS. The identification of these areas is based on an analysis of historic operational data. APZs are determined according to standard criteria that focus on accident potential in the immediate vicinity of runways. As appropriate, AICUZ studies may also focus on flight safety issues in other nearby areas beyond the boundaries of traditional APZs, as determined by experiences of flight safety personnel at an air installation. This AICUZ study acknowledges safety risks associated with aircraft and weapons systems testing and related flight training operations conducted beyond the areas identified as traditional APZs.

In addition to encouraging land uses that are compatible with aircraft-related noise impacts and public health and safety considerations, the Federal Aviation Administration (FAA) and DoD also encourage military planners and local communities to prevent development or land uses that could endanger aircraft in the vicinity of the airfield. Accordingly, this AICUZ study also addresses the following considerations:

- Lighting (direct or reflected) that would impair pilot vision;
- Towers, tall structures, and vegetation that penetrate navigable airspace or are to be constructed near the airfield;
- Land uses that would generate smoke, steam, or dust;
- Land uses that would attract birds, especially waterfowl; and
- Electromagnetic interference (EMI) with aircraft communications, navigation, or other electrical systems.

The authority for implementation of the AICUZ Program at NAWS is derived from:

- U.S. DoD. *Instruction 4165.57, Air Installations Compatible Use Zones*, November 8, 1977
- U.S. DoD. *Instruction 4715.13 Department of Defense Noise Program.* November 15, 2005
- Chief of Naval Operations Instruction (OPNAVINST) 11010.36C, *Air Installations Compatible Use Zones Program*. October 9, 2008
- Secretary of the Navy *Instruction (SECNAVINST) 11011.47A, Acquisition, management, and disposal of real property and real property interests by the DoN*, February 23, 2006
- U.S. DoD. Unified Facilities Criteria (UFC) 3-260-01 Airfield and Heliport Planning and Design. November 17, 2008
- NAWS Instruction 3710.1D, "Air Operations Manual, Naval Air Weapons Station China Lake, California." August 16, 2007
- U.S. Department of Transportation. FAA Regulations, Code of Federal Regulations (CFR), Title 14, Part 77, Objects Affecting Navigable Airspace, 1992
- Code of Federal Regulations (CFR) Title 47, Chapter 102, *Federal Management Regulations*. July 1 2009 revision

1.1.2 Previous AICUZ Studies at NAWS China Lake

The first NAWS AICUZ Study was completed in 1977. The 1977 AICUZ Study analyzed several airfield operational scenarios and quantified noise and APZs for a preferred operational profile that established historical NAWS airfield flight patterns and air corridors. This study also addressed flight operations on the North Range and identified potential areas of noise and safety impacts called drop potential zones (DPZs). The 1977 AICUZ analyzed land-use compatibility within the AICUZ footprint, DPZs, and associated operational areas, and provided recommended land use strategies for minimizing incompatibilities with airfield and range flight operations.

The most recent NAWS AICUZ study was completed in May 2007. The AICUZ study analyzed the 2004 EIS preferred alternative as the baseline condition and adopted a consolidated departure track west of Jacks Ranch Road as the projected Armitage airfield flight operations scenario. No Baker range sorties were modeled in the 2007 AICUZ study. The 2007 study analyzed then current and projected noise impacts and flight safety considerations within the AICUZ footprint and for areas beyond the associated noise contours where mission-compatible land-use controls were considered necessary (Military Influence Area [MIA]).

1.1.3 2004 Environmental Impact Statement

This AICUZ study update provides an analysis of noise and safety issues associated with both the 2007 AICUZ and the projected operational tempo at NAWS. Both sets of operational conditions are described in detail in Section 3.0 and both are consistent with operational tempos analyzed in the base's 2004 EIS. The 2004 EIS evaluated three operational scenarios and identified a 25% increase in airfield and range flight operations as the preferred alternative.

1.2 Purpose and Scope of the 2011 AICUZ Study

This 2011 AICUZ study update implements the Navy's AICUZ Program at NAWS and is intended to replace the 2007 AICUZ study. This current study has been prepared in accordance with Navy AICUZ Program guidelines per OPNAVINST 11010.36C and addresses the 2007 AICUZ and projected noise impacts and flight safety considerations associated with Armitage Airfield flight operations and current and projected noise associated with Baker range sorties. Compatibility with other flight test and training operations by NAWS or its tenant commands (Naval Air Systems Command/Weapons Division, Marine Air Detachment, etc.) will be addressed through other planning efforts.

The purpose of this AICUZ study update is to promote compatibility between NAWS airfield operations and neighboring communities by:

- Protecting the health, safety, and welfare of civilians and military personnel by encouraging land use that is compatible with aircraft operations;
- Protecting the Navy's installation investment and NAWS mission support capabilities to meet current and evolving mission requirements;
- Reducing noise impacts and safety risks associated with aircraft operations;
- Informing the public and neighboring land management agencies about the AICUZ program and seeking cooperative efforts to minimize noise and safety effects by promoting compatible development in the vicinity of NAWS.

1.3 Responsibility for Land Use Compatibility

NAWS and local government agencies with planning and zoning authority share the responsibility for achieving and maintaining land use compatibility near the installation. Cooperative and proactive action by all parties is essential in order to achieve the goals of mutual long-term sustainability for NAWS and the surrounding communities.

NAWS has a responsibility to coordinate with local jurisdictions and stakeholders to facilitate a common understanding and appreciation for the issues contained in this AICUZ study update. The installation is also responsible for responding to any questions or concerns from the public associated with the contents or objectives of the 2011 AICUZ study update. In order to help implement proper planning actions so that impacts do not occur, the Navy has the responsibility to in-

form and cooperate with the planning departments of Kern, San Bernardino, and Inyo Counties and the City of Ridgecrest. New to this AICUZ study update, portions of Inyo County are identified as encumbered by noise contours from Armitage Airfield operations. However, the areas experiencing noise levels of 60 dB CNEL (community noise equivalent level) or greater are located entirely on-base and do not extend into the county. Should the information in this study become outdated (e.g., a significant change occurs in aircraft type or airfield operations), it is the responsibility of NAWS to update this AICUZ study.

Local government officials have the responsibility to protect the health, safety, and welfare of their residents. Accordingly, a strong focus on planning, zoning, and other land use management strategies to encourage and maintain compatibility with NAWS operations would represent a cost-effective and productive mechanism to protect the health and safety of local residents. Currently the City of Ridgecrest has adopted the MIA in land use maps of the 2010 General Plan Update. Additionally a Joint Land Use of the R-2508 Complex special use airspace (SUA) was completed in May 2008. The R-2508 Complex includes NAWS, Edwards Air Force Base (AFB), and Fort Irwin National Training Center (NTC).

The California Legislature recently passed several key bills creating new partnerships between state and local governments and military installations to seek solutions to minimize encroachment constraints imposed by incompatible land use. These bills address two parallel but complementary land use planning areas: long-term planning through the General Plan (GP) law and individual project review through both the California Environmental Quality Act (CEQA) and the California planning law. Specific legislation includes Senate Bills (SB) 1468, 1462, 926, and 375, and Assembly Bill (AB) 1108.

Both SB 1468 and SB 926 established requirements for city and/or county agencies to include analysis of potential impacts to military installations and airports (airfields) in the revision or update of their respective General Plans. General Plan updates must include revisions to the following elements: land use, open space, circulation, conservation, and noise and safety. Updates in the GP must consider the potential impacts of new growth on military readiness activities and are required to provide equal treatment of military airfields in their implementation of the Public Utility Code's land use compatibility requirements.

AB 1108 amended the CEQA to provide military agencies with CEQA notices during scoping from projects that require a general plan amendment and are of area-wide significance, adjacent to an installation or under a military impact area or special use airspace, or are required to be referred to an airport land use commission.

SB 1462 amended the Planning and Zoning Law and established the requirement for city and county agencies to create or amend their project review and approval processes to include the analysis of potential impacts of a proposed action on military installation activities, and to provide notice to the military installation

prior a legislative body approving or amending its GP. This bill requires local governments to revise their permit application forms and notify applicable branches of the military when proposed general plan actions and amendments and individual development projects may have an impact on military facilities and their operations. The notification requirements are triggered when projects and actions in the community would be located within 1,000 feet of a military installation, beneath a low-level flight path, or within special use airspace (described further in Section 2.5), which, in the case of NAWS, involves all land areas within the Indian Wells Valley. The Governor's Office of Planning and Research (OPR) and the California Resources Agency have developed an online planning tool to assist in that process.

SB 375 sets planning requirements for transportation commissions, planning departments, agencies, plans, and projects, and requires that preferred growth scenarios be taken into account in CEQA environmental reviews. The aim of SB 375 is to support the Clean Air Act by reducing greenhouse gas emissions through improved transportation policy choices, compact development, and expanded transit services. This bill may encourage farmland conversion to create more compact development. NAWS can encourage local communities to develop in ways compatible with SB 375 and the AICUZ program.

Additionally, local government officials, real estate professionals, and prospective sellers of real property in areas affected by NAWS operations have a responsibility to disclose to prospective buyers, developers, and residents of such properties that the land is subject to aircraft operations, including over-flights, varying levels of aircraft noise, and flight safety considerations.

1.4 Community Land Use Authority

The successful implementation of an AICUZ study depends on a community's willingness to implement and maintain management actions that promote mission compatible land uses. The authority to exercise control over land use and development resides with local governments in accordance with the California Government Code. Sections 65103 and 65800 of the Code provide the authority under which the City of Ridgecrest and the Counties of Kern and San Bernardino may implement planning policies and adopt zoning ordinances. Section 65103(b) of the Code specifies that planning agencies shall "implement the general plan through actions including, but not limited to, the administration of specific plans and zoning and subdivision ordinances." Section 65800 provides guidance regarding the scope of the authority of planning agencies in noting that the intention of the code is to "provide only a minimum of limitation in order that counties and cities may exercise the maximum degree of control over local zoning matters."

2 NAWS China Lake and Associated Airspace

This section provides an overview of the NAWS mission and the positive influence it has on the regional economy. Also described in this section are the characteristics of Armitage Airfield, Baker Range and the local and regional airspace used by military aircraft for test and training operations.

2.1 Location

NAWS is located in the upper Mojave Desert of southeastern California (Figure 2-1), approximately 150 miles northeast of Los Angeles. The base consists of two major land areas: the North Range, encompassing 950 square miles (606,926 acres), and the South Range, encompassing 760 square miles (503,510 acres). The North Range lies in portions of Inyo, Kern, and San Bernardino counties and the South Range is located entirely within San Bernardino County. The eastern perimeter of the South Range borders National Training Center (NTC) Fort Irwin and the National Aeronautics and Space Administration Goldstone Complex, and the northeast corner abuts National Park property. Bureau of Land Management (BLM) lands, including wilderness areas, are located adjacent to the NAWS boundary (North and South Ranges) and to the west, south and east of private land holdings in the Indian Wells Valley.

NAWS consists primarily of remote, unpopulated desert land. In addition to the extensive test and training areas, the base also contains approximately 75 square miles of developed areas, including Armitage Airfield, Mainsite, Propulsion Laboratories, and geothermal development, all of which are located in the North Range. The Mainsite and Headquarters areas are located in the southern portion of North Range (Figure 2-2). NAWS aircraft operations originate primarily from Armitage Airfield, located at the northern end of Mainsite. In addition to three runways, Armitage Airfield contains aircraft maintenance facilities, aircraft hangars, ordnance handling and storage facilities, ground support equipment maintenance facilities, and extensive research, development, test, and evaluation (RDT&E) facilities. Baker Range covers approximately 121 square miles along the western end of the North Range and is used primarily for military test and evaluation and training for air-to-surface weapon systems (e.g., rockets, bombs, guns) (NAWS February 2004). The southern portion of Baker Range is identified in Figure 2-2. Communities in the vicinity of Armitage Airfield and southern portions of the Baker Range include the incorporated City of Ridgecrest and unincor-

porated China Lake Acres (adjoining the southern boundary of North Range) as well as the unincorporated community of Inyokern (10 miles [16 kilometers] west of Mainsite). Ridgecrest is the population center for the northern part of the upper Mojave Desert and a major commercial center for the surrounding desert communities. This AICUZ study focuses on Ridgecrest and surrounding unincorporated portions of Kern and San Bernardino Counties.

2.2 Mission and Vision

The mission of NAWS is to provide the highest quality facilities, products and services to the Naval aviation air weapons RDT&E, acquisition, and training communities to meet current and evolving Navy and related DoD mission requirements. NAWS is part of Navy Region Southwest, San Diego, under the Commander Naval Installations Command (CNIC) and is the host for Naval Air Warfare Center Weapons Division (NAWCWD) under the Naval Air Systems Command (NAVAIR), along with other assigned tenants, activities, and transient units. Testing and training functions performed on-base include munitions delivery, tactics, electronic warfare, and Special Forces training. NAWS operates and maintains the base's facilities and provides support services, including airfields, and is responsible for managing all lands within the base's boundaries to support the mission of NAWCWD and other activities, maintaining environmental compliance, exercising responsible stewardship of public lands, providing safety and security services, and implementing the Navy's AICUZ program.

NAWS' vision for this AICUZ study update is to ensure the continued ability of NAWS to support current and evolving mission requirements while promoting the compatible growth and development of the surrounding community. The Navy refers to this condition as "sustainable readiness" and cites the following reasons for continued use of Armitage Airfield and Baker Range:

- The world remains a dangerous place and the nation needs forces at a high state of readiness;
- Readiness is maintained with continual development and acquisition of superior weapons systems, and the ready availability of high-quality test and training opportunities; and
- Forces require the weapons, support systems, and operational areas to "train as they fight."

2.3 Demographics and Regional Economic Influence

With an estimated 2009 population of 28,353 (including NAWS residents), Ridgecrest is currently the third largest city in Kern County (California Department of Finance 2009). From July 1, 2000 to July 1, 2008 the city population is estimated to have increased by 2.9%, thereby reversing a trend of declining population throughout the latter half of the 1990s (Table 2-1) (U.S. Census Bureau 2000). The regional economy in the Ridgecrest area is anchored by NAWS. With 4,298 civilian and 598 military employees, the installation is the largest

Ecology & Environment, Inc. GIS Department Project:
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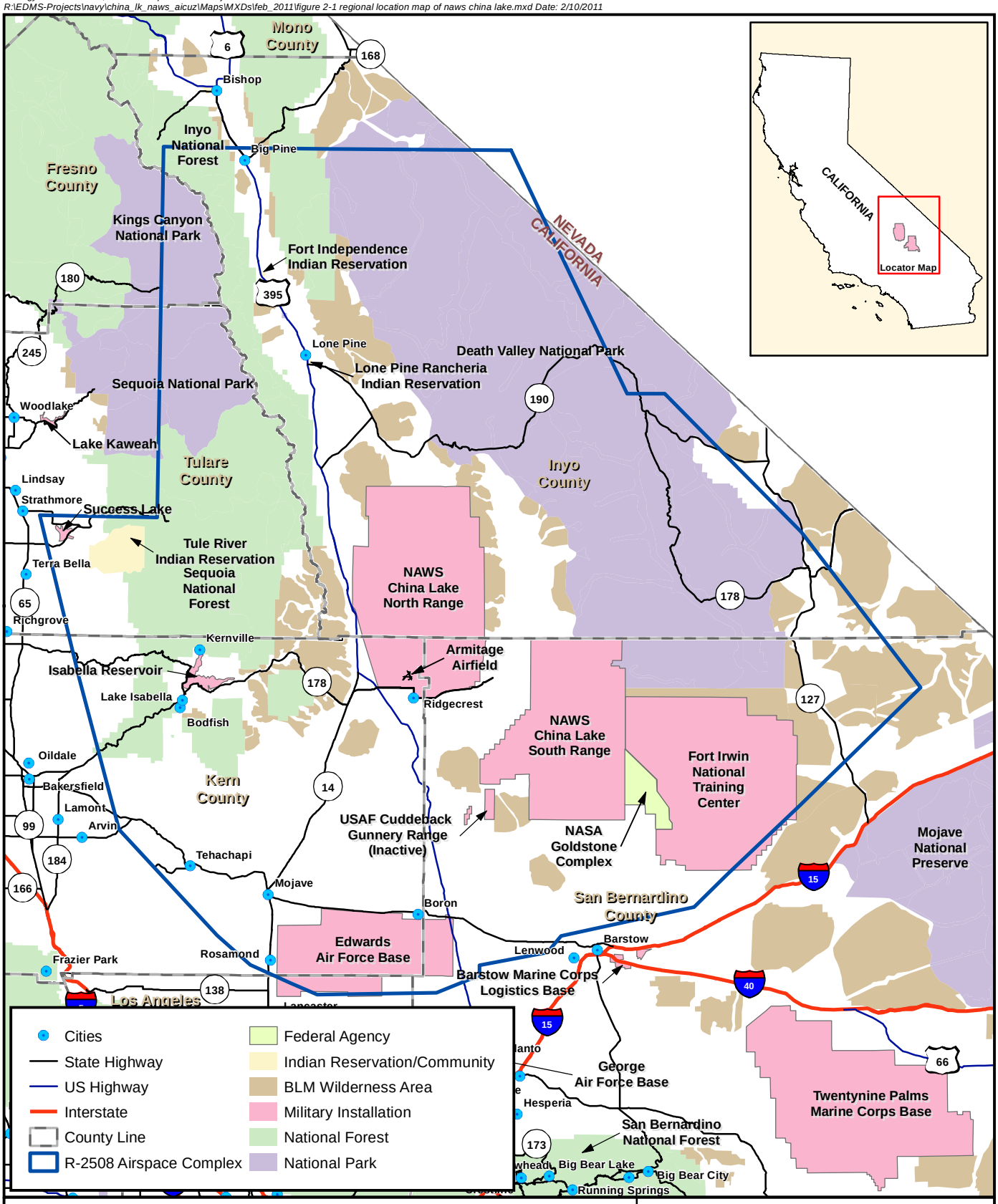

Figure 2-1
Regional Location Map of NAWS China Lake

NAWS China Lake
Ridgecrest, California

0 5 10 20 30 40 50
Miles
Scale 1:1,728,000

Ecology & Environment, Inc. GIS Department Project:
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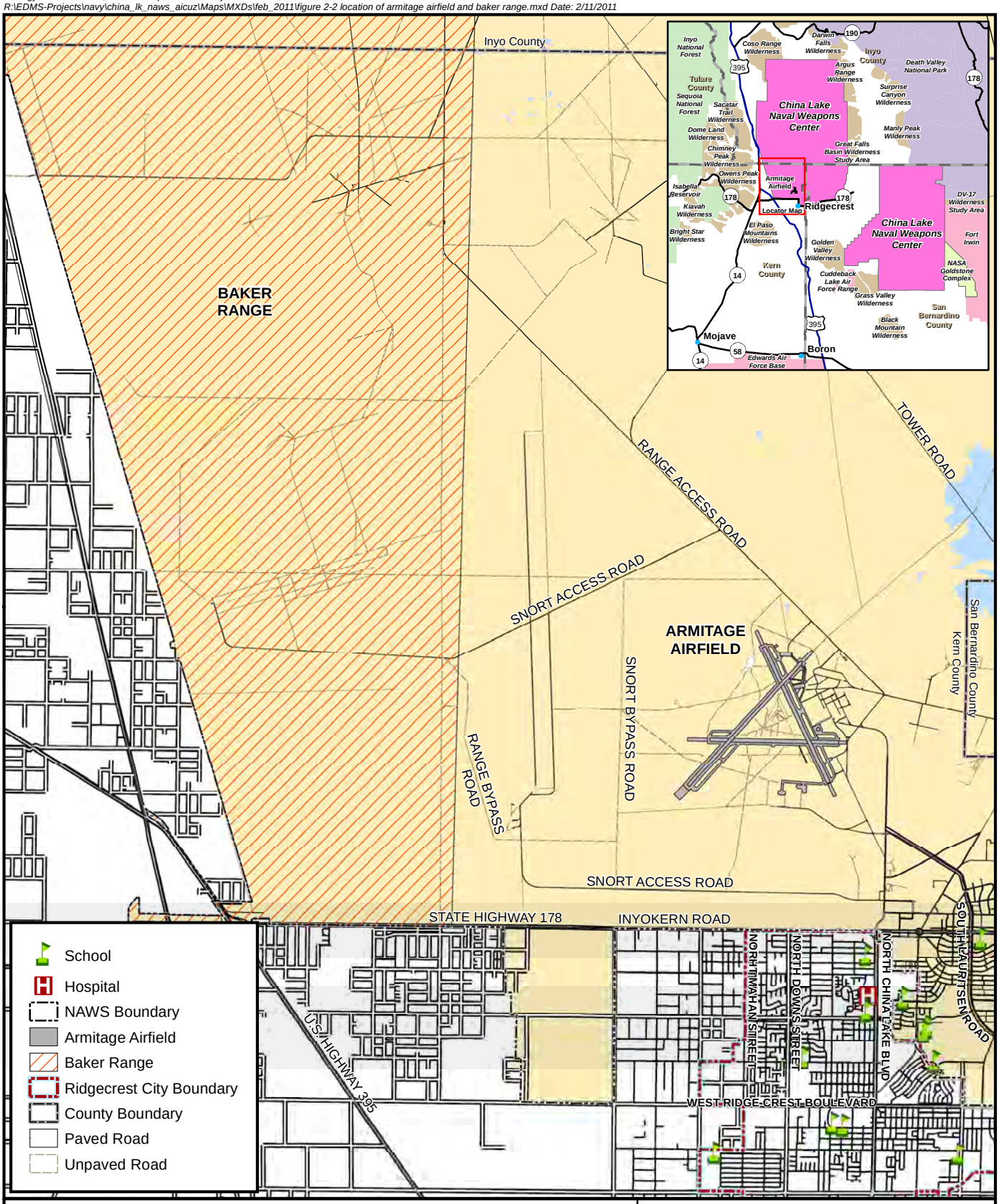

Figure 2-2
Location of Armitage Airfield and Baker Range

NAWS China Lake
Ridgecrest, California

0 0.25 0.5 1 1.5 2 2.5 3
Miles
Scale 1:100,000

employer in the area (Table 2-2) (Ridgecrest Chamber of Commerce 2010; NAWS April 29, 2010). The next largest employer is Searles Valley Minerals with 625 employees. The positive influence of NAWS on the local economy is also reflected in occupation and income data from the American Community Survey (U.S. Census Bureau 2006-2008a and 2006-2008b). According to the American Community Survey three-year estimates from 2006 to 2008, the median annual family income in Ridgecrest was $58,231, compared with a median of $50,819 countywide, while more than 58.7% of Ridgecrest families had incomes of $50,000 or more, compared with only 50.8% of families countywide.

Table 2-1 City of Ridgecrest Population Change (July 1, 2000 – 2008)

Year	Population	Percent Change
2000	24,926	--
2001	25,005	+0.3
2002	25,301	+1.2
2003	25,463	+0.6
2004	25,610	+0.6
2005	25,690	+0.3
2006	25,535	-0.6
2007	25,352	-0.7
2008	25,638	+1.1

Source: U.S. Census Bureau 2000.

Table 2-2 City of Ridgecrest Ten Largest Employers

Employer	Type of Business	No. of Employees
Naval Air Weapons Station China Lake & Tenant Commands	Defense RDT&E	4,298 (Civilian) 598 (Military)
Searles Valley Minerals	Soda Ash Products	625
Sierra Sands Unified School Dist	Education	620
Ridgecrest Regional Hospital	Acute-Care Hospital	340
Wyle Laboratories	Defense Contractor	280
SA-Tech (Systems Applic. & Tech)	Defense Contractor	187
Wal-Mart	Discount Dept Store	184
Cerro Coso Comm. College	Education	175
DART (Desert Area Resources & Trg)	Training and Social Services	164
AltaOne Federal Credit Union	Credit Union	161

Source Ridgecrest Chamber of Commerce 2010; NAWS April 29, 2010.

Military personnel who live on-base spend approximately 40% of their income in the local community. Those living off-base have higher spending levels due to rent, mortgage, and utility payments. Payroll expenditures at NAWS in 2005 totaled $359 million (NAWS 2005). Due to the lack of major cities in the vicinity, it is assumed that NAWS employees spend a majority of their income in the local community.

2.4 Airfield Description

This section presents a detailed description of airfield facilities and provides additional information related to operations conducted at Armitage Airfield.

2.4.1 Physical Setting and Features

- **Location**. The specific geographical location for Armitage Airfield is latitude 35° 28'N and longitude 117° 43'W. The airfield is situated approximately 4 nautical miles (NM) northwest of the City of Ridgecrest.

- **Hours of Operation.** The airfield is normally in operation from 6:00 a.m. to 10:30 p.m. (0600 to 2230) on most weekdays, but is closed every other Friday. The airfield normally does not operate on Saturdays and operations on Sundays do not begin until 3:00 p.m. (1500). Specific test or operational requirements may result in the airfield being opened outside of normal hours. Airfield operations may be suspended or curtailed temporarily by the Commanding Officer or designated representatives based on the following factors:
  - Condition of landing area and airfield repairs
  - Availability of crash and rescue equipment
  - Weather conditions hazardous to flight
  - Status of the navigational aid

- **Navigational Aid.** A Tactical Air Navigation (TACAN), NID Channel 53, is located on the airfield.

- **Airfield Elevation.** Field elevation is 2283 feet above mean sea level (msl), as measured at the approach end of Runway 03.

- **Runways.** The landing area consists of three runways.

	Runway 08/26	Runway 03/21	Runway 14/32
Length:	7,702 feet	9,993 feet	9,013 feet
Width:	200 feet	200 feet	200 feet
Magnetic headings:	077/257 (08/26)	028/208 (03/21)	140/320 (14/32)
Overruns:	1,000/1000 feet (08/26)	1,000/1,000 feet (03/21)	1,000/1,000 feet (14/32)

- **Helicopter Takeoff/Landing Areas.** Any runway or taxiway surface may be used for helicopter takeoffs and landings. Additionally, several helicopter pads are marked on the North West ramp area near Hangar 1. The compass rose may be used when traffic condition warrants, daylight only (unlighted).

- **Taxiways.** All taxiways are available for aircraft or ground vehicles, depending on their condition or on surface deterioration.

- **Runway/Taxiway Marking.** Runways and taxiways are marked following standard criteria as outlined in NAVAIR Manual 51-50AAA-2. A standard simulated carrier deck as defined in NAVAIR 51-50 AAA-2 is located approximately 310 feet from the approach end of Runway 21, left side.

- **Arresting Gear.** E-28 bi-directional arresting gear is installed on each runway.

2.4.2 Airfield Lighting System

- **Runway Lighting.** Variable high-intensity runway lights (HIRLs) are available for approach on all runways. The lights are operated by the control tower, simultaneously with the runway distance marker.

- **Fresnel Lens Optical Landing System (FLOLS).** MK-8/MOD 1 FLOLS are installed on the left side of Runways 28, 32, 14, and 21, approximately 1,000 feet from the threshold. Maintenance is done by the NAWS Air Operations Flight Support Branch in accordance with NAVAIR Manual 51-40ABA-14 (dated 15 Jan 96).

- **Precision Approach Path Indicator (PAPI).** A PAPI system is located 1000' from the approach end of Runways 08 and 26.

- **Arresting Gear Lighting.** E-28 arresting gear locations are identified by internally lit arresting gear markers.

- **Runway Distance Remaining Markers (RDM).** All runways have RDM located on either side. Each sign has a number (usually 1 thru 9) indicating how many feet of runway is remaining from the aircraft's current location. All signs are bi-directional.

- **Taxiway Lighting.** Standard variable-intensity blue taxiway edge lights are used on all taxiways.

- **Rotating Beacon.** A standard dual-peaked white and green rotating beacon is located atop the Beacon Tower; the beacon is operated continuously from sunset to sunrise, and during day light hours when the airfield is under Instrument Flight Rules (IFR).

- **Obstruction Lighting.** Obstructions in the vicinity of the airfield are marked with standard red lights.

2.4.3 Service Facilities and Capabilities

- **Maintenance Facilities.** The Aircraft Intermediate Maintenance Division (AIMD) is part of FRC West. The AIMD is located at various buildings at the airfield and is capable of performing intermediate-level maintenance functions

for tenant and transient units. Functions provided include emergency calibrations support, ground support equipment, tire and wheel build-up, and precision measuring equipment. A transient line crew assigned to NAWS Airfield Operations Department is available to assist in parking and routine servicing of transient aircraft.

- **Hangars.** Five hangars are located at Armitage Airfield; these are used for Test and Evaluation missions by VX-9, VX-31, FA-18 Weapon System Support Activity (WSSA), foreign military sales (FMS), and visiting squadrons and detachments.

- **Maintenance Run-up Areas.** The high-power run-up area is located off the parallel taxiway near the approach end of Runway 14. It is equipped with type X111 hold back fitting tested as per Military Handbook 1021-4. Lower power run-ups take place in several locations along the flight line.

- **Magnetic Compass Swing Sites.** The primary magnetic compass swing site is located at the compass rose on the south side midfield of Runway 26.

- **TACAN Checkpoints.** Six TACAN checkpoints are available at the approach end of each runway, on the taxiway prior to the hold short marker.

- **Windsocks.** Windsocks are located at the approach end of all runways. Additional windsocks are located atop Hangars 1 and 2.

- **Fuel, Oil, and Oxygen.** Refueling and oxygen servicing facilities are available for most military aircraft. Hot pit refueling is conducted on the diagonal taxiway near the approach of Runway 21 adjacent to Taxiway Echo.

- **Aircraft Wash Rack Area.** A wash rack is located south of the air terminal area near Taxiway 26.

2.5 Baker Range

- **Location.** Baker Range encompasses approximately 121 square miles along the western edge of the Northern Range. Baker Range includes areas under the F/A-18C/D Hornet, F/A-18E/F Super Hornet, and AV-8B Harrier Baker Range flight tracks. The area above Baker Range is restricted airspace (see Section 2.6.2, Restricted Areas, for more information).

- **Target areas.** Baker Range includes eight target areas located approximately 7 miles northwest of Runway 14/32. Baker Range target areas include B-1, B1-A, B1-D, B1-F, B-2, B-3 (two targets), and LB. Most bombs, rockets, and gunnery used on Baker Range are inert; however, high explosive (HE) ordnance can be dropped on B1-A and B-2 target areas.

- **Hours of Operation**. Baker range may be used during the hours Armitage Airfield is in operation, from 6:00 a.m. to 10:30 p.m. (0600 to 2230) on most weekdays, closed on Saturdays, and operating from 3:00 p.m. to 10:30 p.m. (1500 to 2230) on Sundays. Operational or test requirements may dictate airfield operations outside of normal hours and on weekends.

2.6 Airspace

Military airspace in the vicinity of NAWS includes three separate components: Military Operations Areas (MOAs), Restricted Areas (RAs), and Air Traffic Control Assigned Airspace (ATCAA). The complex of military airspace is collectively referred to as the R-2508 Complex (Figure 2-3). The R-2508 Complex covers approximately 20,000 square miles (51,800 square kilometers) and includes all airspace and associated land currently owned by DoD installations in the Upper Mojave Desert region.

The R-2508 Complex is managed by the R-2508 Joint Policy and Planning Board, which consists of the commander of the NAWCWD, the Air Force Flight Test Center at Edwards AFB, and NTC Fort Irwin. The responsibilities of the Board include overall operational policy and joint management and control of military activities within the Complex.

2.6.1 Military Operations Areas (MOAs)

MOAs are areas of airspace used to conduct non-hazardous aviation training activities and RDT&E of weapon systems technology. Low altitude navigation training, aerial refueling, formation and tactics training, air combat maneuvering, air-to-air intercepts, simulated close air support, and forward air controller training are representative of the type of activities typically conducted in MOA airspace. MOAs may be used by aircraft as staging areas for test or training activities before entering restricted airspace on approach to ground targets.

There are five MOAs located within the R-2508 Complex, and six MOAs located on the periphery. The five MOAs located within R-2508 are Saline, Panamint, Isabella, Owens, and Bishop. MOAs on the periphery of the Complex include Shoshone, Barstow, Buckhorn, Bakersfield, Porterville, and Deep Springs. The floor of the MOAs in the R-2508 Complex is 200 feet (61 meters) above ground level (agl and the ceiling is at 18,000 feet (5,486 meters) msl.

2.6.2 Restricted Areas (RAs)

RAs are three-dimensional areas of airspace established by the FAA to support special aircraft flight activities. Typically, RAs support such activities as military aviation training and other military-related operations, including air-to-ground and ground-to-ground ordnance training. RAs separate and segregate these activities from other, non-participating aircraft. RAs are used only by permitted military aircraft during scheduled hours. Other military air traffic, along with civilian air traffic, is not authorized to enter the RA when it is in use. There are seven RAs within the Complex, including the shared-use R-2508.

Armitage Airfield and Baker Range are located in R-2505, one of the seven restricted airspace areas in the R-2508 Complex. R-2505 contains an airfield, aerial bombing ranges, a guided missile range, and a number of ground ranges and other specialized areas. R-2505 airspace is scheduled through the NAWCWD Land Range Test Planning Office. All aircraft utilizing R-2505 are required to coordinate with the NAWCWD Airspace Surveillance Center. The Center informs the aircraft to contact the appropriate test conductor and continues to monitor the frequency and radar.

2.6.3 Air Traffic Control Assigned Airspace (ATCAA)

The ATCAA is the airspace between the top of the MOAs and the base of the R-2508 Complex. ATCAAs are also located above most of the peripheral MOAs to allow additional areas for segregation of military operations from Instrument Flight Rule traffic. Isabella and Panamint ATCAAs are set up within the boundaries of several RAs to be used as an air traffic control aid when the RAs are not active.

2.6.4 Civilian Airspace

In addition to military uses, civilian airports and commercial jet routes are also located within and in the vicinity of the R-2508 Complex. Commercial and general aviation aircraft operate under Visual Flight Rule conditions in the Complex's MOAs while remaining clear of RAs. Certain operators (such as Inyokern Airport) operate within the Complex on a non-interference basis. Other air carriers and civilian aircraft flying under Instrument Flight Rule conditions normally operate on structured routes on all sides of the R-2508 Complex. These routes include the main east-west high altitude structure entering the Los Angeles basin south of the Complex and a major north-south structure to the west. Real time coordination of the various airspace users allows daily use of the airspace without impacting NAWS mission requirements.

Twenty-five civilian airports are located either within or in the vicinity of the R-2508 Complex. Inyokern and Trona airports are located nearest Armitage Airfield. The Inyokern Airport provides commercial service and has three paved runways, the longest of which is approximately 7,100 feet (2,164 meters). The airport is located within the Isabella MOA, just to the west of R-2505 and R-2506. The Trona Airport is a general aviation airport that has a single paved runway approximately 4,300 feet (1,311 meters) long; it is located in the Panamint MOA between R-2505 and R-2524. There are no active operational agreements between NAWS and the Inyokern or Trona airports. However, there is a transition area for approaches and departures from Inyokern Airport. This transition area, known as the Inyokern Transition Area, was established by the FAA to segregate military users of the R-2508 Complex from the civilian aircraft operating out of Inyokern Airport. The Inyokern Transition Area is activated on a daily schedule and requires military aircraft to fly above it when activated.

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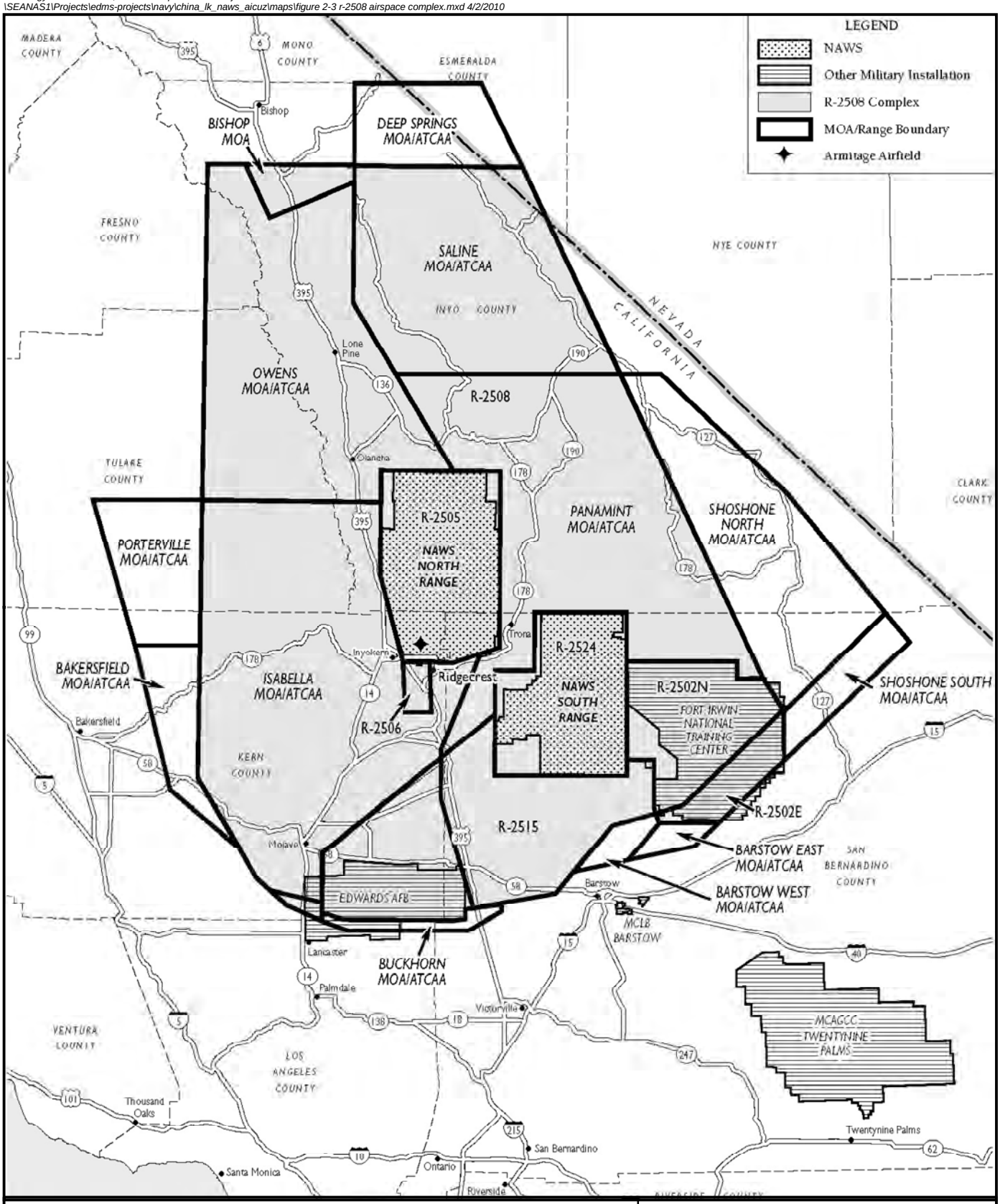

Figure 2-3
R-2508 Airspace Complex

NAWS China Lake
Ridgecrest, California

Not to scale

3 Aircraft Operations

This section describes the primary aircraft types operating at NAWS, the type and number of operations conducted by these aircraft, and the runways and flight routes used to conduct routine operations. Detailed operational data are presented for the 2007 AICUZ study and for projected operational conditions. Operational tempo is consistent with the 2004 EIS preferred alternative (NAWS February 2004). Aircraft arrival and departure flight routes and flight patterns are illustrated to identify the general location and configuration of aircraft operations. The 2007 AICUZ operational conditions include the consolidation and westward shift as well as the "heavy leg" departure flight tracks that were incorporated in the 2007 AICUZ projected scenario (NAWS May 2007).

3.1 Aircraft Types

The 2007 AICUZ and projected aircraft operations at Armitage Airfield are predominantly conducted by F-35, F/A-18C/D, F/A-18E/F, EA-6B, EA-18G, and AV-8B aircraft types and Other Military (OM) Jets, consisting of the F-16, T-39, and T-38. Other propeller, helicopter, general aviation, and heavy aircraft also use the airfield on a recurring basis, but such aircraft represent a much smaller proportion of total annual operations and do not contribute significantly to the airfield noise environment. Accordingly, only the six primary aircraft types and OM Jets have been analyzed in the 2007 AICUZ and projected scenario of this AICUZ study. Details about each of the primary aircraft types are provided below

3.1.1 F-35C Lightning II (Joint Strike Fighter)

The F-35C is the carrier variant of the F-35 Lightning II Joint Strike Fighter. The carrier variant incorporates stronger internal structure, larger landing gear, and larger wings for pilot control during carrier take-off and landings, as well as rugged exterior materials to reduce maintenance. All the F-35 variants are capable of air-to-air combat, advanced stealth to avoid detection, and sensor packages that make the F-35 able to locate and eliminate threats before its presence is known. The F-35C is expected to replace the FA-18C/D Hornet aircraft.

F-35C Lightning II (Joint Strike Fighter)

- **Manufacturer:** Lockheed Martin
- **Engines:** One P&W F135 or GE F136
- **Thrust:** 40,000 pounds (with after burner).
- **Length, Height, and Wing Span:** 51.5 feet, 14.9 feet, and 43 feet, respectively.
- **Speed:** Mach 1.6 (approximately 1,200 mph)
- **Armament:** A standard weapons load includes two AIM-120C air-to-air missiles and two 2,000-pound GBU-31 JDAM guided bombs (Lockheed Martin 2009).

3.1.2 F/A-18C/D Hornet

F/A-18C/D Hornet

The F/A-18C/D "Hornet" is a twin engine, multi-mission fighter/attack aircraft that can operate from either aircraft carriers or land bases. The F/A-18C is a single-seat aircraft and the F/A-18D is the two-seat version. The F/A-18 Hornet fulfills a variety of roles: air superiority, fighter escort, suppression of enemy air defenses, reconnaissance, forward air control, close and deep air support, and day and night strike missions. The F/A-18 replaced the F-4 Phantom II fighter and A-7 Corsair II light attack jet, and also replaced the A-6 Intruder as these aircraft were retired during the 1990s.

- **Manufacturer:** Boeing [McDonnell Douglas Aerospace]
- **Engines:** Two General Electric F404-GE-402 turbofan engines.
- **Thrust:** 36,000 pounds.
- **Length, Height, and Wing Span:** 56 feet, 15.3 feet, and 40.4 feet, respectively.
- **Speed:** Maximum - more than Mach 1.8; Cruise - more than Mach 1.0.
- **Armament:** 20 mm Vulcan cannon M61A1, Sidewinders, and Sparrow Advanced Medium Range Air-to-Air Missile (AMRAAM) (Federation of American Scientists 2006).

3.1.3 F/A-18E/F Super Hornet

F/A-18F Super Hornet

The F/A-18E/F "Super Hornet" is a single-seat (E) or two-seat (F), twin engine, multi-mission fighter/attack aircraft that fulfills the same types of roles as the C/D models. The F/A-18 Super Hornet, however, is 4.2 feet longer than earlier Hornets, has a 25% larger wing area, and carries 33% more internal fuel, which effectively increases mission range by 41% and endurance by 50%. The Super Hornet also incorporates two additional weapons stations, for a total of 11.

- **Manufacturer:** Boeing [McDonnell Douglas Aerospace].
- **Engines:** Two General Electric F414-GE-400 turbo-fan engines.
- **Thrust:** 44,000 pounds.
- **Length, Height, and Wing Span:** 60.3 feet, 16.0 feet, and 44.7 feet, respectively.
- **Speed:** Maximum - more than Mach 1.8.
- **Armament:** 20 mm Vulcan cannon M61A1, Sidewinders, Sparrow AMRAAM, Maverick air-to-ground missile, as well as a complete complement of "smart" weapons, including the Joint Direct Attack Munitions (JDAM) and the Joint Standoff Weapon (JSOW) (FAS 2006).

3.1.4 EA-6B Prowler

EA-6B Prowler

The EA-6B "Prowler" is designed for suppression of enemy air defenses in support of strike aircraft and ground troops by interrupting enemy electronic activity and obtaining tactical electronic intelligence within the combat area.

- **Manufacturer:** Grumman Aircraft Corporation.
- **Engines:** Two Pratt & Whitney J52-P408 turbofan engines.
- **Thrust:** 22,400 pounds.
- **Length, Height, and Wing Span:** 59 feet, 15 feet, and 53 feet, respectively.
- **Speed:** Maximum Mach 0.99.
- **Armament:** ALQ-99 Tactical Jamming System (TJS), High-Speed Anti-Radiation Missile (HARM) (FAS 2006).

3.1.5 EA-18G Growler

EA-18G Growler

The EA-18G "Growler" is a naval airborne electronic attack (AEA) aircraft designed for non-traditional electronic attack operations and suppression of enemy air defenses. The EA-18G capabilities include critical strike as well as pre-emptive, reactive, and escort tactical jamming systems and precision airborne electronic attack capabilities. The EA-18G will replace the Navy version of the EA-6B.

- **Manufacturer:** Boeing- Integrated Defense Systems.
- **Engine:** Two F414-GE-400 engines.
- **Thrust:** 44,000 pounds of thrust.
- **Length, Height and Wing Span:** 60.2 feet, 16 feet, and 44.9 feet, respectively.

- **Armament:** Nine weapons stations provide unique flexibility for carriage of weapons (Boeing 2009).

3.1.6 AV-8B Harrier

A Marine Corps aircraft, the AV-8B "Harrier" is a Vertical/Short Takeoff and Land (V/STOL) aircraft that was designed to replace the AV-8A and the A-4M light attack aircraft. Combining tactical mobility, responsiveness, reduced operating cost, and basing flexibility both afloat and ashore, V/STOL aircraft are particularly well-suited to the special combat and expeditionary requirements of the Marine Corps. The Harrier is scheduled to be replaced by the F-35B short-takeoff/vertical-landing variant of the Lightning II Joint Strike Fighter.

AV-8B Harrier

- **Manufacturer:** McDonnell Douglas Aircraft.
- **Engine:** One Rolls Royce Pegasus F402-RR-408A turbofan engine.
- **Thrust:** 22,200 pounds of thrust.
- **Length, height and Wing Span:** 46.3 feet, 11.6 feet, and 30.3 feet, respectively.
- **Speed:** Maximum Mach 0.98.
- **Armament:** One fuselage-mounted 25 mm gun system, Standard Air-to-Ground load: Six Mk 82, 500 pound bombs, Standard Air-to-Air load: Four Sidewinder missiles. Provisions for carrying up to 9,000 pounds of ordnance on seven stations (Federation of American Scientists 2006, GlobalSecurity.org 2006).

3.2 Armitage Airfield Flight Operations

3.2.1 Types and Timing of Armitage Airfield Operations

An airfield operation is any takeoff or landing at an airfield. The takeoff and landing may be part of a training maneuver (or "pattern") in the vicinity of the runways or may simply be a departure or arrival of an aircraft. Several basic flight operations conducted at Armitage Airfield are described below:

- **Departure.** An aircraft taking off from a runway.

- **Straight In Arrival.** An aircraft landing on a runway.

- **Overhead Arrival.** An expeditious arrival using visual flight rules. An aircraft generally approaches the runway 800 feet above ground level. Approximately halfway down the runway, the aircraft performs a 180-degree descending left turn to enter the landing pattern. Once established in the pattern, the aircraft lowers landing gear and flaps and performs a 180-degree descending left turn to land on the runway.

- **Carrier Break Arrival.** The maneuver is the same as the Overhead Arrival, except it is performed at 800 feet - simulating the standard approach made to an aircraft carrier.

- **TACAN Arrival.** The TACAN approach is flown using instruments in the cockpit that receive bearing and distance information from a ground unit.

- **Touch and Go.** An aircraft lands and takes off on a runway without coming to a full stop. After touching down, the pilot immediately goes to full power and takes off again.

- **Field Carrier Landing Practice (FCLP).** A touch and go maneuver conducted within the carrier box outlined on a runway. FCLPs are required training for all naval aviators before landing on a carrier. Although FCLP operations have historically occurred at NAWS, no FCLP operations have been performed in the past two years and therefore are not analyzed in the projected scenario (Wyle Laboratories, Inc. 2010a).

Airfield operations that occur at night are potentially more annoying than daytime operations. Accordingly, the time of day in which operations occur is an important parameter in the evaluation of aircraft operations data and in the modeling of the resulting noise exposure. Operations data are typically differentiated according to three daily time periods: day, evening, and night. Daytime operations are flown between the hours of 7:00 a.m. and 7:00 p.m., evening operations occur between 7:00 p.m. and 10:00 p.m., and night operations are flown between 10:00 p.m. and 7:00 a.m. Currently, less than 10 % of projected flight operations conducted at Armitage Airfield occurs in the evening or at night.

3.2.2 2007 AICUZ Armitage Airfield Operations

As analyzed in the 2004 EIS, the 2007 AICUZ operational conditions at Armitage Airfield comprise approximately 33,750 total annual airfield operations, which represent a 15-year average of annual flight operations. Approximately 98 % of these operations are flown by the FA-18C/D, F/A-18E/F, EA-6B, and AV-8B aircraft types described above. Based on their predominant contribution to the noise environment as compared with other aircraft, only the F/A-18C/D, F/A-18E/F, EA-6B, and AV-8B were included in the modeling of aircraft noise in the 2007 AICUZ (see Section 5). The remaining aircraft types that use Armitage Airfield do not contribute significantly to the noise environment (NAWS May 2007). In Table 3-1, annual operations data used in the AICUZ noise analysis are presented by type of operation and time of day for each of the four 2007 AICUZ aircraft types. As shown in Table 3-1, the four aircraft types conduct 33,169 annual flight operations under 2007 AICUZ conditions, of which more than 91 % occur during daytime.

Table 3-1 2007 AICUZ Modeled Annual Flight Operations[1] at Armitage Airfield

Aircraft	Operation Type	Day	Evening	Night	Total
F/A-18C/D	Departures	3,224	177	88	3,489
	Straight In Arrivals	528	76	3	607
	Overhead Arrivals	1,305	67	3	1,375
	Carrier Break Arrivals	878	46	3	927
	TACAN Arrivals	634	37	21	692
	Touch & Go	3,764	440	80	4,284
	FCLP	384	86	0	470
	Total	**10,717**	**929**	**198**	**11,844**
F/A-18E/F	Departures	3,489	189	92	3,770
	Straight In Arrivals	689	98	12	799
	Overhead Arrivals	1,705	88	12	1,805
	Carrier Break Arrivals	1,147	58	9	1,214
	TACAN Arrivals	70	3	3	76
	Touch & Go	4,080	470	86	4,636
	FCLP	518	0	0	518
	Total	**11,698**	**906**	**214**	**12,818**
EA-6B	Departures	939	6	6	951
	Straight In Arrivals	70	37	0	107
	Overhead Arrivals	543	46	0	589
	Carrier Break Arrivals	369	34	3	406
	TACAN Arrivals	101	6	3	110
	Touch & Go	2,550	250	6	2,806
	FCLP	500	280	6	786
	Total	**5,072**	**659**	**24**	**5,755**
AV-8B	Visual Flight Rule Departures	866	49	27	942
	Straight In Arrivals	37	0	3	40
	Overhead Arrivals	372	18	12	402
	Carrier Break Arrivals	134	6	3	143
	TACAN Arrivals	177	9	3	189
	Touch & Go	964	54	18	1,036
	FCLP	0	0	0	0
	Total	**2,550**	**136**	**66**	**2,752**
	Total	**30,342**	**2,631**	**502**	**33,169**

Source: Wyle Laboratories, Inc. March 23, 2010. Extrapolated from Wyle Laboratories, Inc. 2004.

Note:
[1] Patterns counted as one operation.
[2] Includes only F/A-18C/D, F/A-18E/F, EA-6B, and AV-8B flight operations.

3.2.3 Projected Armitage Airfield Operations

Annual modeled projected flight operations would total 22,763 (see Table 3-2). Similar to Table 3-1, Table 3-2 presents annual operations data used for the 2011 AICUZ. The projected aircraft mix includes the aircraft discussed in Section 3.1, Aircraft Types, excluding the EA-6B Prowler. Approximately 62 % of the mod-

eled flight operations are F/A-18E/F Super Hornet; 20% are F-35 Lightning II "Joint Strike Fighter"; 9% are F/A-18C/D "Legacy" Hornet; 4% are AV-8B Harrier; 2% are EA-18G Growler; and 2% are OM Jets. There are no modeled FCLP operations in the projected scenario and the remaining aircraft types that use Armitage Airfield do not contribute significantly to the noise environment (Wyle Laboratories Inc. 2010a). Evening and night operations would continue to represent less than 10% of the airfield flight operations.

Table 3-2 Projected Annual Flight Operations at Armitage Airfield

Aircraft	Operation Type	Day	Evening	Night	Total
F-35	Departures	1,831	157	43	2,031
	Straight-In Non-TACAN Arrivals	327	28	7	362
	Overhead Break Arrivals	820	69	19	908
	Carrier Break Arrivals	518	45	12	575
	TACAN Arrivals	165	13	4	182
	Touch & Go	446	37	11	494
	Total	**4,107**	**349**	**96**	**4,552**
F/A-18C/D	Departures	858	65	21	944
	Straight-In Non-TACAN Arrivals	72	5	1	78
	Overhead Break Arrivals	300	21	8	329
	Carrier Break Arrivals	152	11	4	167
	TACAN Arrivals	303	27	7	337
	Touch & Go	231	18	5	254
	Total	**1,916**	**147**	**46**	**2,109**
F/A-18E/F	Departures	5,726	508	128	6,362
	Straight-In Non-TACAN Arrivals	1,167	104	26	1,297
	Overhead Break Arrivals	2,655	236	59	2,950
	Carrier Break Arrivals	1,785	159	40	1,984
	TACAN Arrivals	118	10	3	131
	Touch & Go	1,335	119	30	1,484
	Total	**12,786**	**1,136**	**286**	**14,208**
EA-18G	Departures	181	20	4	205
	Straight-In Non-TACAN Arrivals	16	1	0	17
	Overhead Break Arrivals	89	10	3	102
	Carrier Break Arrivals	60	6	1	67
	TACAN Arrivals	18	3	0	21
	Touch & Go	40	5	1	46
	Total	**404**	**45**	**9**	**458**
AV-8B	Departures	382	17	14	413
	Straight-In Non-TACAN Arrivals	10	0	0	11
	Overhead Break Arrivals	182	8	6	196
	Carrier Break Arrivals	47	2	2	51
	TACAN Arrivals	177	9	6	192
	Touch & Go	121	6	4	131
	Total	**919**	**42**	**32**	**994**

Table 3-2 Projected Annual Flight Operations at Armitage Airfield

Aircraft	Operation Type	Day	Evening	Night	Total
OM Jet1	Departures	176	10	6	192
	Straight-In Non-TACAN Arrivals	43	3	1	47
	Overhead Break Arrivals	56	3	1	60
	Carrier Break Arrivals	29	1	1	31
	TACAN Arrivals	48	3	1	52
	Touch & Go	58	2	0	60
	Total	**410**	**22**	**10**	**442**
	Total	**20,542**	**1,741**	**479**	**22,763**

Source: Wyle Laboratories Inc. 2010b

Notes:
Day = 7:00 a.m. and 7:00 p.m.
Evening = 7:00 p.m. and 10:00 p.m.
Night = 10:00 p.m. and 7:00 a.m.

[1] OM Jets primarily include F-16, T-39 and T-38, modeled with AV-8B as a surrogate.
[2] Modeled as an F-35A.

3.3 Runway Utilization

Because of prevailing winds in the area, Runway 21 is the primary runway used at Armitage Airfield. Runway 32 is designated as the primary instrument runway and is the only runway used for the TACAN arrival pattern. Designation of Runway 32 as the primary instrument runway is in response to a need for simultaneous range and airfield operations and off-base development. Runway 26 is used by aircraft that cannot roll over arresting gear (such as the AV-8B, T-39 D, and Metro III). Runway 14 is used when winds are out of the southeast, or when Runway 21 is not available. Runway 08 and Runway 03 are rarely used, do not make up a significant proportion of runway use (less than 1%), and are therefore not included in subsequent discussion.

Under 2007 AICUZ conditions approximately 75% of F/A-18 and 78% of EA-6B aircraft operations occur on Runway 21 (Table 3-3). The majority of AV-8B flight operations (74 %) are conducted on Runway 26. Approximately 12% of F-18 and EA-6B operations and even smaller percentages of EA-6B and AV-8B operations are conducted on Runway 14.

Table 3-3 Runway Utilization by Aircraft: 2007 AICUZ

Runway	Aircraft			
	F/A-18C/D	F/A-18E/F	EA-6B	AV-8B
21	76%	75%	78%	16%
14	12%	12%	11%	8%
32	6%	7%	4%	2%
26	6%	6%	7%	74%
Total	**100%**	**100%**	**100%**	**100%**

Source: NAWS May 2007.

Under projected conditions, Runway 21 receives the most use by all aircraft, excluding the AV-8B Harrier (Table 3-4). The AV-8B Harrier primarily uses Runway 26. Overall, Runway 14 is used between 19% and 30% of the time by all

modeled aircraft. The F/A-18C/D "Legacy" Hornet uses Runway 14 the least and the EA-18G Growler uses Runway 14 the most. Runway 32 is used 25% or less by modeled aircraft and Runway 26 has a wide range of use, depending on the aircraft. The EA-18G Growler uses Runway 26 5% of the time, whereas Runway 26 is used 39% of the time by the AV-8B Harrier. The primary drivers of changes in runway utilization are prevailing winds and aircraft performance.

Table 3-4 Runway Utilization by Aircraft Projected Conditions

	Aircraft					
Runway	F-35	F/A-18C/D	F/A-18E/F	EA-18G	AV-8B	OM Jets
21	42%	45%	53%	57%	15%	34%
14	27%	19%	26%	30%	20%	28%
32	13%	23%	10%	8%	25%	18%
26	19%	12%	11%	5%	39%	20%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Wyle Laboratories, Inc. 2010.

Note: Figures may not total exactly due to rounding.

3.4 Flight Routes

Established Flight Route Profiles

As discussed above, several different types of flight operations (e.g., arrivals, departures, etc.) are conducted at Armitage Airfield. When conducting these operations, pilots follow one of the established flight routes that have been designated for each type of operation to the best of their ability. For example, aircraft taking off from the airfield will typically follow one of several established departure flight routes shown in Figure 3-1. Departure flight tracks were updated from the 2007 AICUZ report to reflect greater dispersion of departure traffic in order to more accurately reflect the way pilots fly. To model and illustrate dispersion of departure traffic, there are three subtracks (a, b, and c) for each departure track (illustrated by the fanlike dispersions at the bottom of Figure 3-1). Having several authorized flight routes available for each type of operation facilitates air traffic control at the airfield, allows variability in pilot training and flight test profiles, and provides flexibility in response to wind conditions and other factors. The choice of flight route for any given airfield operation will depend upon mission requirements, wind velocity and direction, the presence of other aircraft in the airspace, runway availability due to maintenance and/or construction, and other factors.

A designated flight route is the *predominant* flight path of an aircraft during a particular type of flight operation. The *actual* flight path followed by aviators will vary depending on wind velocity and direction, air density caused by ambient temperature, airspeed, mission load (fuel, ordnance, external configuration, etc.), and individual pilot performance. This potential variability in actual flight paths, which results in the creation of a "flight corridor" centered on each established flight route, is taken into consideration in the City of Ridgecrest adopted MIA (see Section 6.2 for more information).

Figure 3-2 illustrates the flight routes that have been designated for non-break and TACAN arrivals, while Figure 3-3 shows the overhead and carrier break arrival patterns, and Figure 3-4 displays the flight patterns used for Touch and Go operations. Tables 3-5 and 3-6 present the general flight route use for each of the primary aircraft types flown at Armitage Airfield under 2007 AICUZ and projected conditions.

Table 3-5 Flight Route Utilization by Aircraft: 2007 AICUZ

Flight Route	Aircraft			
	F/A-18C/D	F/A-18E/F	EA-6B	AV-8B
Departure	37%	37%	25%	42%
Straight-In Arrival	6%	8%	2%	2%
Overhead Arrival	15%	17%	15%	18%
Carrier Break Arrival	10%	12%	10%	6%
TACAN Arrival	7%	1%	3%	9%
Touch & Go	23%	23%	35%	23%
Field Carrier Landing Practice	2%	2%	10%	0%
Total	**100%**	**100%**	**100%**	**100%**

Source: NAWS May 2007

Table 3-6 Flight Route Utilization by Aircraft: Projected Conditions

Flight Route	Aircraft					
	F-35	F/A-18C/D	F/A-18E/F	EA-18G	AV-8B	OM Jets
Departures	45%	45%	45%	45%	42%	43%
Straight-In Non-TACAN Arrivals	8%	4%	9%	4%	1%	11%
Overhead Break Arrivals	20%	16%	21%	22%	20%	14%
Carrier Break Arrivals	13%	8%	14%	15%	5%	7%
TACAN Arrivals	4%	16%	1%	5%	19%	12%
Touch & Go	11%	12%	10%	10%	13%	14%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Wyle Laboratories, Inc. February 2010.

3.5 Engine Maintenance Tests

Aircraft ground run-ups are routine aircraft engine maintenance tests that require the operation of an engine at various power settings for several minutes. Idle, the lowest power setting, is used for the longest duration; low power setting is used for an intermediate amount of time; military and afterburner power settings are louder but are used for a very short duration.

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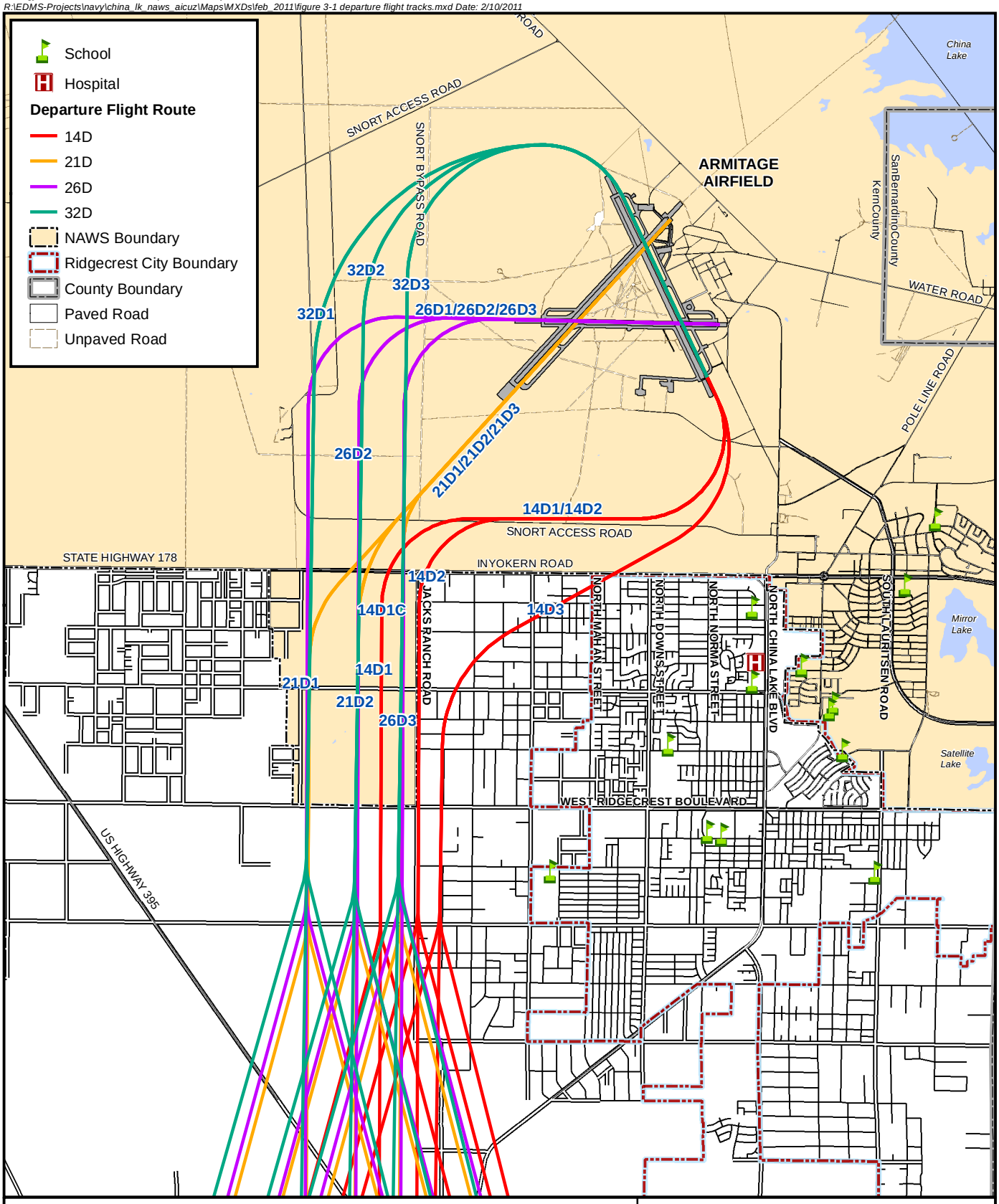

Figure 3-1
Departure Flight Routes

NAWS China Lake
Ridgecrest, California

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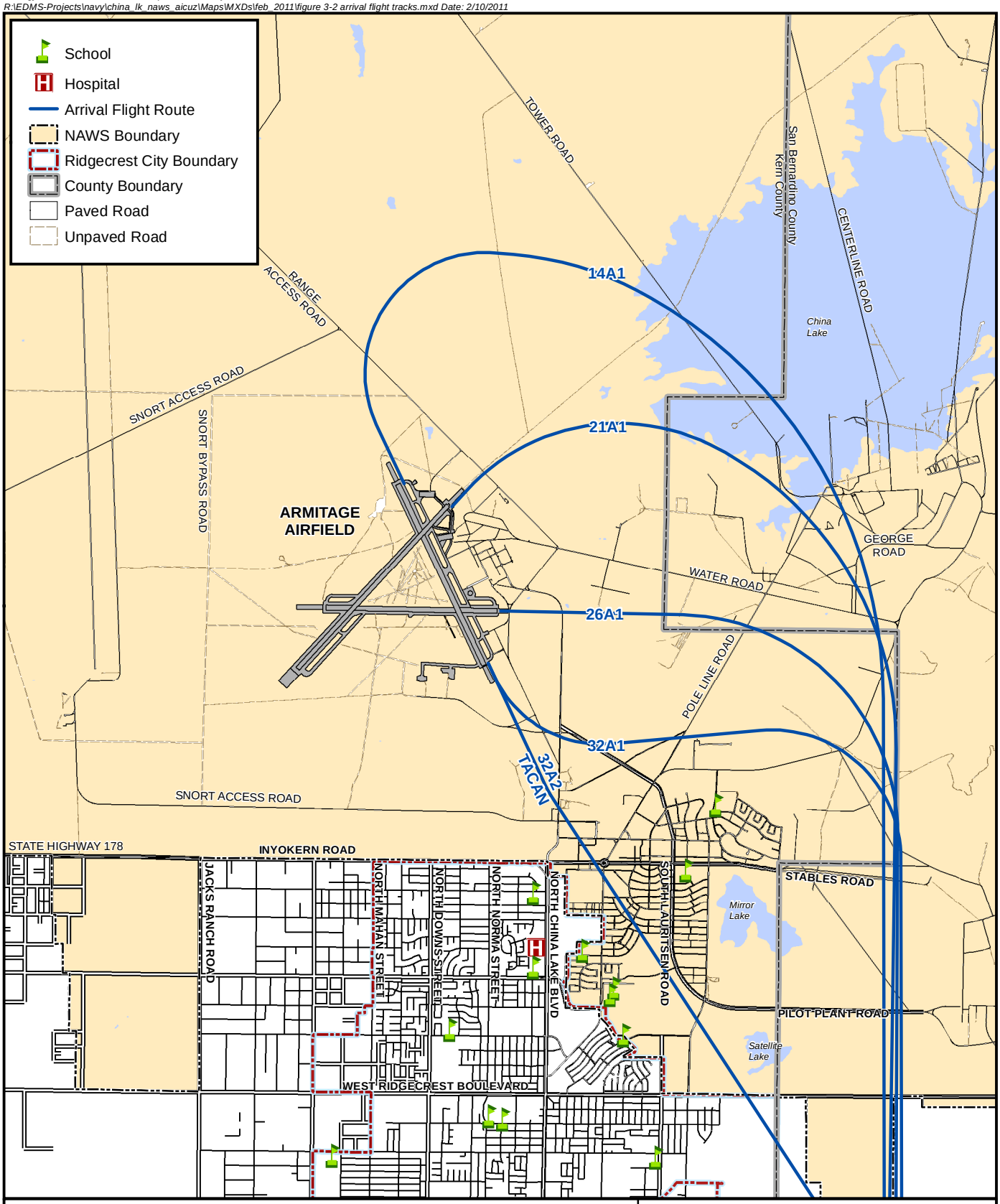

Figure 3-2
Arrival Flight Routes

NAWS China Lake
Ridgecrest, California

0 0.25 0.5 1 1.5 2 2.5
Miles
Scale 1:75,000

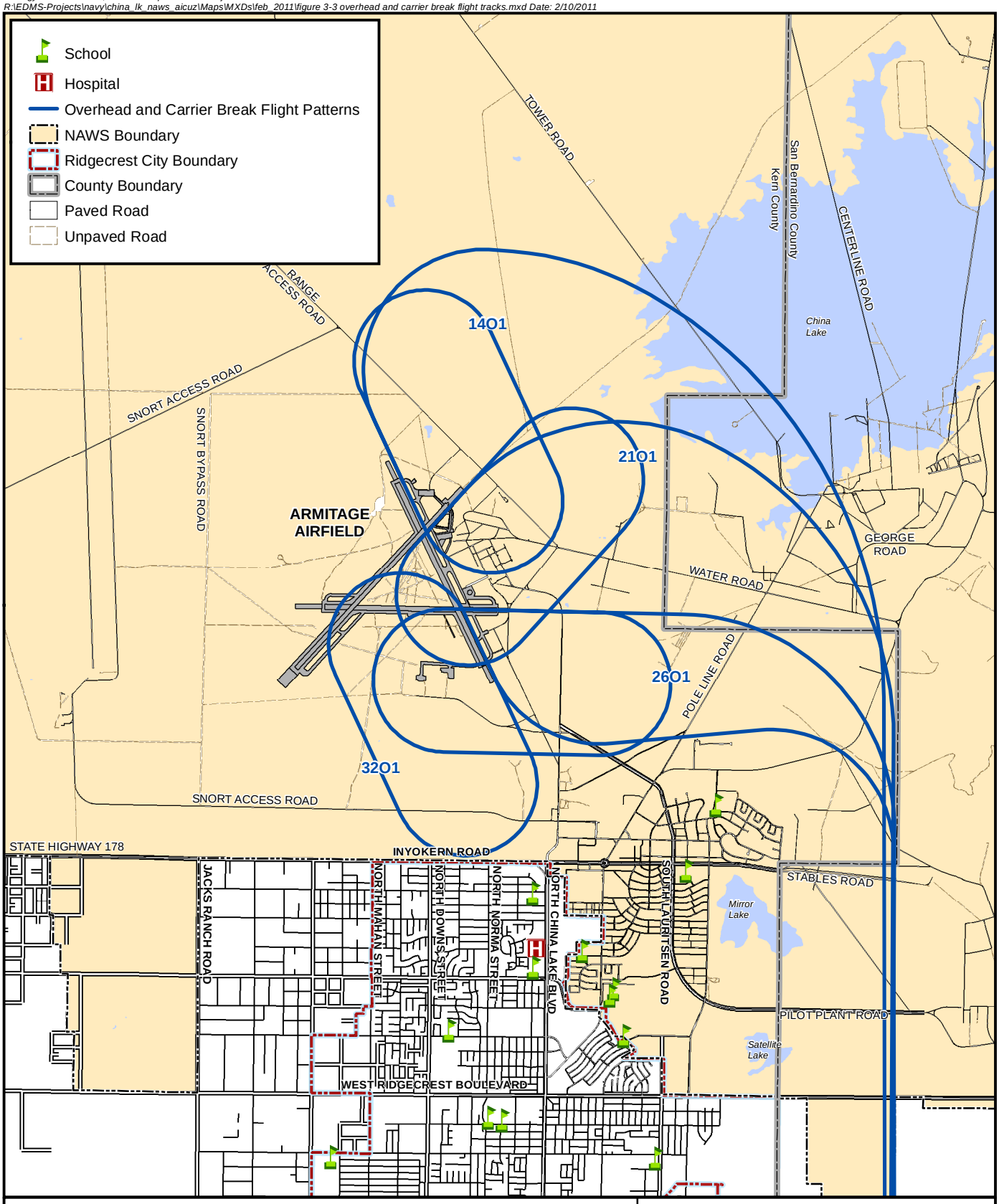

Figure 3-3
Overhead and Carrier Break Arrival Flight Patterns

NAWS China Lake
Ridgecrest, California

0 0.25 0.5 1 1.5 2 2.5
Miles
Scale 1:75,000

Ecology & Environment, Inc. GIS Department Project:
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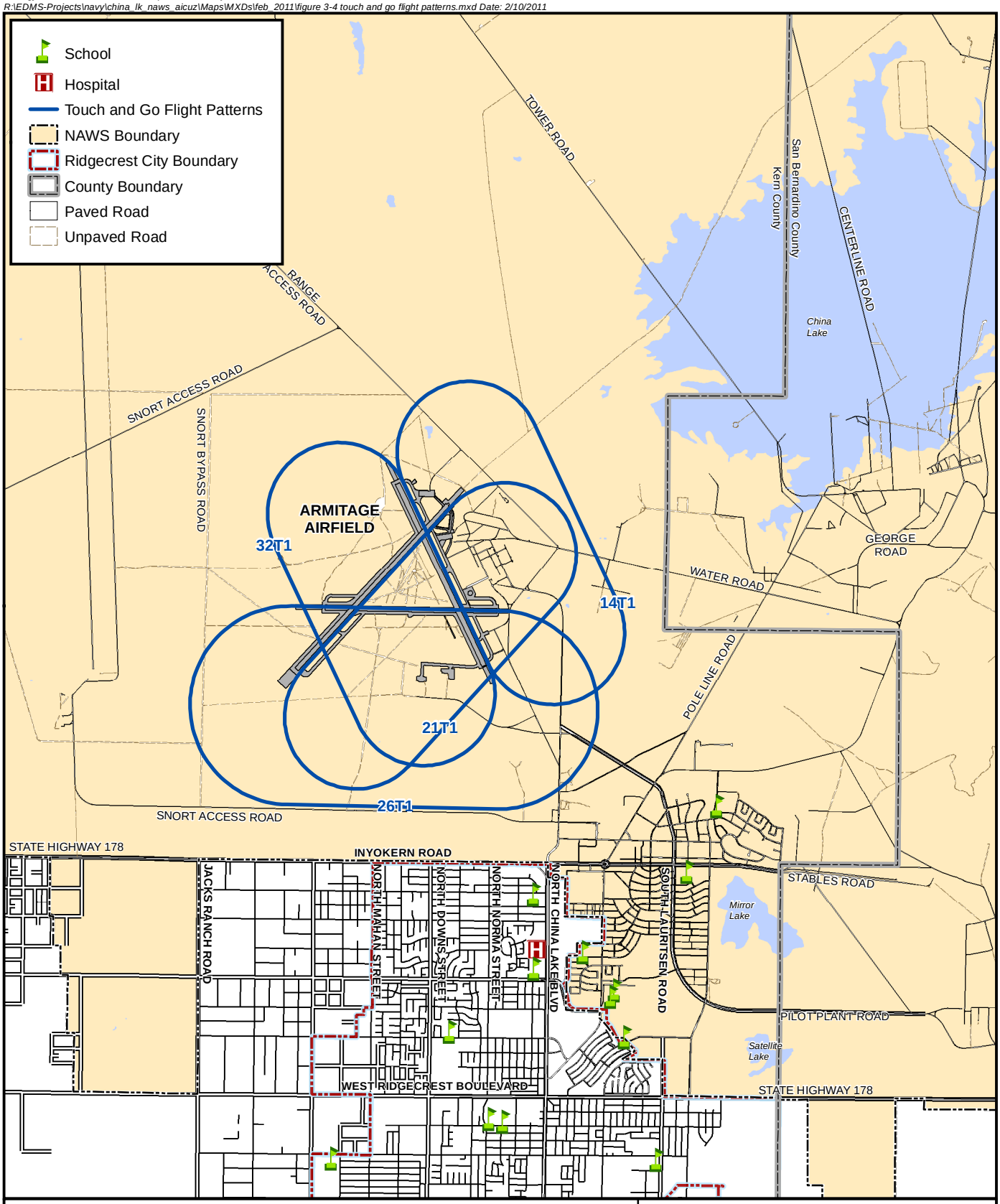

Figure 3-4
Touch and Go
Flight Patterns

NAWS China Lake
Ridgecrest, California

0 0.25 0.5 1 1.5 2 2.5
Miles
Scale 1:75,000

Under the 2007 AICUZ conditions these tests are performed on F/A-18C/D, F/A-18E/F, and EA-6B aircraft at the northern edge of the airfield at location HPTA (Figure 3-5), with the aircraft engine oriented to direct aircraft noise towards unpopulated areas. The 2007 AICUZ conditions include the performance of 18 annual tests on the F/A-18C/D aircraft, 19 on the F/A-18E/F, and 19 on the EA-6B (Table 3-7).

Table 3-7 Engine Maintenance Tests

Aircraft	Power Setting	Duration (minutes)	2007 AICUZ Annual Tests	Projected Annual Tests
F/A-18C/D	Idle	15	18	250
	Low	5	-	250
	Military	2.5	18	205
	Afterburner	2.5	18	205
F/A-18E/F	Idle	15	19	624
	Low	5	-	624
	Military	2.5	19	624
	Afterburner	2.5	19	624
EA-6B	Idle	15	19	-
	Military	2	19	-
E/A-18G	Idle	15	-	20
	Low	5	-	20
	Military	2.5	-	20
	Afterburner	2.5	-	20
F-35	High rpm, low-thrust	30	-	244
	High rpm, low-thrust	1.5	-	18
	Total		**149**	**3,748**

Source: NAWS May 2007 and Wyle Laboratories Inc. 2010.

NOTE:
Annual engine maintenance tests were estimated for the 2007 AICUZ study conditions. Projected annual engine maintenance tests are based on pilot interviews.

Modeled engine run-ups at Armitage Airfield increased due to revised/updated information gathered during the noise study site visit. Projected conditions include the performance of 250 annual tests on the F/A-18C/D aircraft (125 per the VX-9 and VX-31 squadrons), 624 annual tests on F/A-18E/F aircraft (312 per VX-9 and VX-31 squadrons), 20 annual tests on the E/A-18G aircraft (10 per VX-9 and VX-31 squadrons), as well as 244 30-minute high rpm, low-thrust annual tests and 18 1.5-minute high rpm, low-thrust on the F-35 aircraft. Squadron VX-9 performs tests at Hangar 1 and HPTA and squadron VX-31 performs tests at Hangar 3 and HPTA (Figure 3-5). Tests of the F-35 aircraft will occur at Hangars 1 and 3 as well as HPTA.

3.6 Baker Range Activity

3.6.1 Types and Timing of Operations/Sorties

Modeled aircraft conducting sorties at Baker Range proceed along Hornet and Harrier flight tracks to make multiple passes on target B-1 (see Figure 3-6). For this analysis it was assumed that each aircraft makes 12 passes on the target per sortie. Consistent with airfield operations, the daytime (7:00 a.m. and 7:00 p.m.), evening (7:00 p.m. and 10:00 p.m.), and night time (10:00 p.m. and 7:00 a.m.) percentages of Baker Range operations are 90 %, 8 %, and 2 %, respectively. Aircraft typically begin a target pass on a "run-in" ingress line at a minimum 1,000 feet above ground level (agl); the aircraft descends to a minimum 500 feet agl 1.5 nautical miles from the target and passes over the target at a minimum of 200 feet agl. Once past the target the aircraft makes a left 180 degree turn and climbs to 1,500 feet agl on the downwind leg. On the downwind leg, aircraft occasionally fly outside and west of the Baker Range boundary. The centerline of the Hornet downwind flight track coincides with the western NAWS boundary (see Figure 3-6).

3.6.2 Current Operations

The 2007 AICUZ study did not evaluate Baker Range flight operations. Therefore there is no 2007 AICUZ range activity with which to compare projected range activity. Since the projected scenario predicts range activity for a five- to ten-year planning period (i.e., range activity from 2015 to 2020), current operations are provided for comparison.

Current Baker Range activity includes approximately 3,556 ingress sorties (Table 3-8) that are conducted by AV-8B Harrier, F/A-18C/D "Legacy" Hornet, F/A-18E/F Super Hornet, and EA-6B Prowler aircraft (described in Section 3.1, Aircraft Types). EA-6B aircraft rarely use Baker Range and are not included in Table 3-8. Table 3-8 presents annual ingress sorties by time of day for each of the three primary aircraft. The noise study models Baker Range sorties as distributed on flight patterns: Hornet (small), Hornet (large), and Harrier (see Figure 3-6).

Table 3-8 Current Baker Range Activity

	Annual Ingress Sorties[1]			
Aircraft	Day[3]	Evening[3]	Night[3]	Total
AV-8B	343	30	8	381
F/A-18C/D[2]	857	76	19	953
F/A-18E/F[2]	2,000	178	44	2,223
Total	**3,200**	**284**	**71**	**3,557**

Source: Wyle Laboratories, Inc. 2010.

Notes:
Day = 7:00 a.m. and 7:00 p.m.
Evening = 7:00 p.m. and 10:00 p.m.
Night = 10:00 p.m. and 7:00 a.m.

[1] Assumed 12 Bombing Runs (passes or circuits) per ingress sortie
[2] Assumed split of 30%/70% among Legacy and Super Hornets.
[3] Day-Evening-Night split is 90%-8%-2%, based on airfield modeling.

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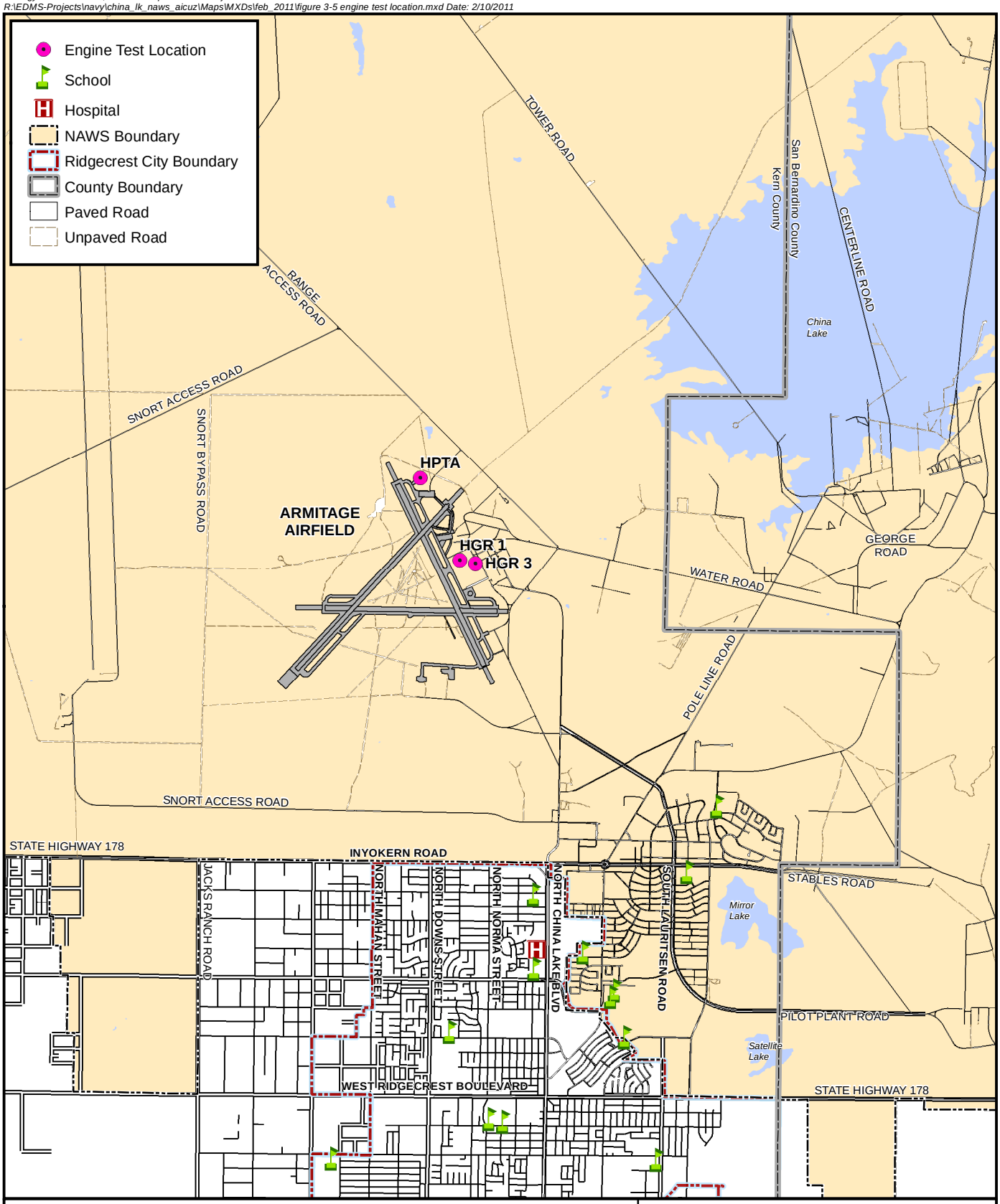

Figure 3-5
Engine Test Locations

NAWS China Lake
Ridgecrest, California

0 0.25 0.5 1 1.5 2 2.5
Miles
Scale 1:75,000

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\\SEANAS1\Projects\edms-projects\navy\china_lk_naws_aicuz\maps\figure 3-6 baker range flight patterns.mxd 4/2/2010

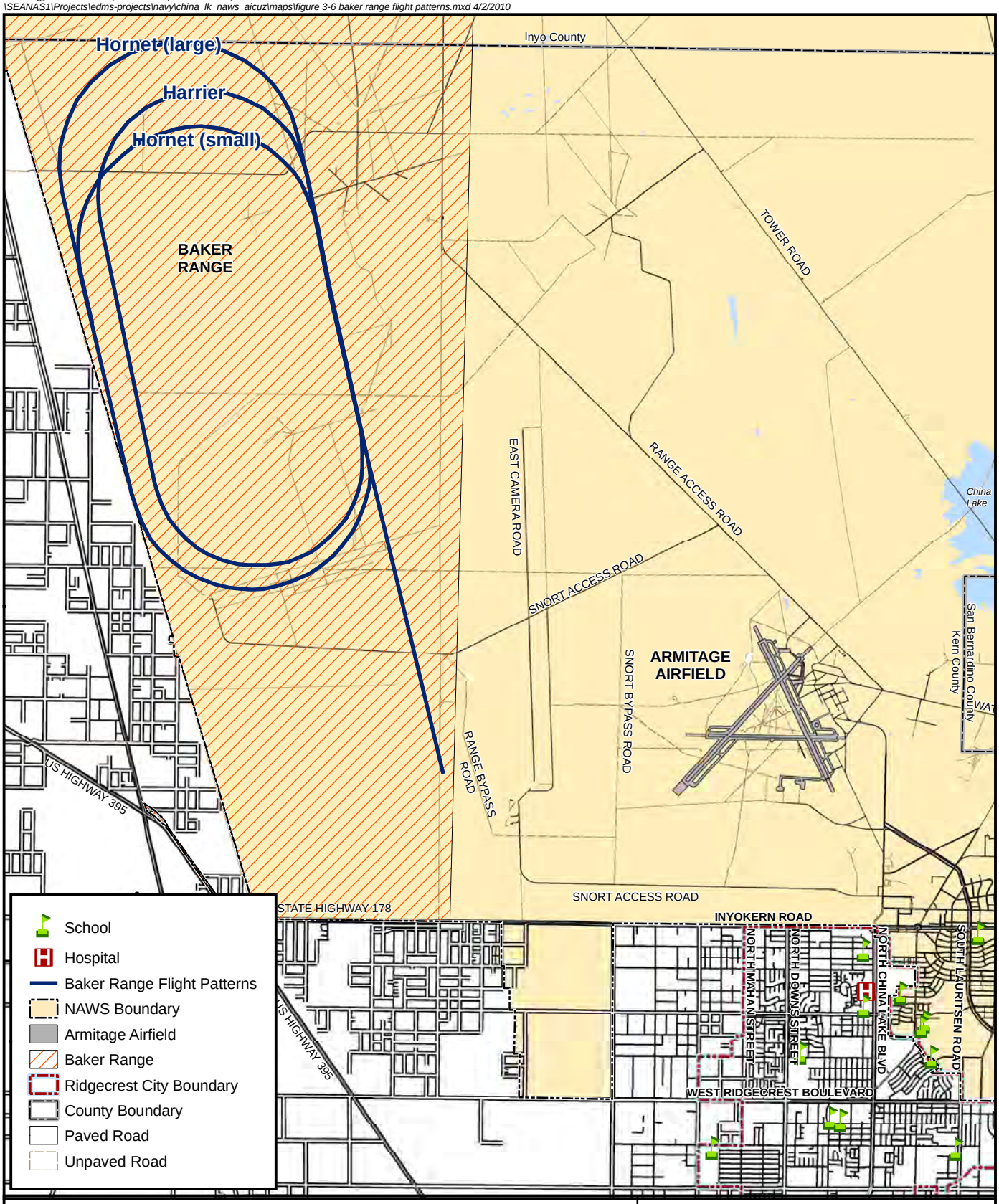

Figure 3-6
Baker Range Flight Patterns

NAWS China Lake
Ridgecrest, California

0 0.45 0.9 1.8 2.7
Miles
Scale 1:100,000

3.6.3 Projected Operations

Annual modeled projected Baker Range activity would total 4,446 sorties (see Table 3-9). Similar to Table 3-8, Table 3-9 presents annual ingress sorties by time of day for primary aircraft. Projected Baker Range sorties will be conducted by aircraft similar to those currently flown, with the addition of the F-35 Lighting II "Joint Strike Fighter." Overall projected Baker Range activity would increase by 25% from current conditions. The F-35 sorties would proportionally replace scaled-up AV-8B and F/A-18C/D sorties and comprise approximately 50 % of the total projected Baker Range sorties. AV-8B, F/A-18C/D, and F/A-18E/F would use proportionally similar flight tracks as those described in Section 3.6.1. The F-35 would use Hornet flight tracks for 71% of its sorties and Harrier flight tracks for 29% of its sorties.

Table 3-9 Projected Baker Range Activity

Aircraft	Annual Ingress Sorties[1]			
	Day[2]	Evening[2]	Night[2]	Total
AV-8B	115	10	3	128
F/A-18C/D	244	22	5	271
F/A-18E/F	1,642	146	37	1,825
F-35	2,000	178	44	2,222
Total	**4,001**	**356**	**89**	**4,446**

Source: Wyle Laboratories, Inc. 2010.

Notes:

Day = 7:00 a.m. and 7:00 p.m.
Evening = 7:00 p.m. and 10:00 p.m.
Night = 10:00 p.m. and 7:00 a.m.

[1] Assumed 12 bombing runs (passes or circuits) per ingress sortie
[2] Day-evening-night split is 90%-8%-2%, based on airfield modeling.
[3] Existing.

4 Safety

Safety is an essential element in AICUZ planning. The Navy has established policies, procedures, and programs to protect the public's safety and to promote compatible land use development in the vicinity of Navy airfields. These efforts focus on minimizing the risks from potential hazards and designating critical safety zones, where land uses that have increased hazard potential should be restricted or avoided. This section provides an overview of the following safety programs and hazard types:

- **Height Restrictions and Imaginary Surfaces**. Restrictions are placed on the height of structures that could obstruct or interfere with arrivals and departures, as illustrated in a series of imaginary surfaces that guide development in the vicinity of the airfield.

- **Accident Potential Zones (APZs)**. Specific areas that are designated and controlled near the ends of runways where the potential risk for aircraft accidents and mishaps is higher.

- **Tracking of Aircraft Incidents**. Strict reporting requirements and historical tracking and analysis of aircraft incidents and accidents are used to identify sources of hazards and influence the development of new flight rules and standard operating procedures to increase flight safety.

- **Electromagnetic Interference (EMI) and Hazards of Electromagnetic Radiation to Ordnance (HERO)**. Potential sources of electromagnetic radiation that could interfere with the functioning of aircraft systems and ordnance are monitored and restricted in the vicinity of the airfield.

- **Bird/Aircraft Strike Hazard (BASH)**. Strategies are developed and implemented to reduce the presence of bird species in the immediate vicinity of the airfield to reduce the likelihood of bird/aircraft collisions.

- **Lighting and Glare**. Planning restrictions and development review efforts are implemented to discourage sources of bright light and glare that can impair a pilot's vision during a flight.

- **Smoke and Dust**. Land use planning and control strategies are developed to discourage land uses that generate large quantities of dust, smoke, or other airborne emissions that can impair visibility in the airfield environment.

4.1 Height Restrictions and Imaginary Surfaces

Aircraft operations can be constrained by natural terrain and by manmade features such as buildings, towers, poles, and other potential obstructions to navigation. Height restrictions of man-made structures are necessary to ensure that no object will interfere with the safe operations of aircraft transiting the NAWS operating environment. An obstruction-free zone is needed for all runway surfaces and under all weather conditions. The horizontal planes and transitional surfaces of this zone, termed "Imaginary Surfaces," are defined to ensure that land development in proximity to critical operating areas will not penetrate these transitional surfaces and thereby represent an aviation hazard.

FAA, CFR Title 14, Part 77, Objects Affecting Navigable Airspace (PART 77) outlines a notification procedure for proposed construction or alteration of objects near airports that could affect navigable airspace. Naval Facilities Engineering Command (NAVFAC) Instruction P-80.3 (as well as PART 77) also defines the complex series of Imaginary Surfaces used for siting facilities on and near military airfields and determining obstructions or hazards to air navigation for these airfields. The U.S. standard for Terminal Instrument Procedures (TERPS) for airports is a joint Army, Navy, Air Force, Coast Guard, and FAA publication (OPNAVINST 3722.16C) that provides procedures to be used in analyzing the potential impact a proposed construction or alteration project may have on TERPS for an airfield, and if the proposal would create an obstruction to air navigation if constructed. The early analysis of construction or alteration proposals in areas identified near airfields could identify and help preclude an air navigation obstruction before it occurs.

An "obstruction" or "penetration" is defined as any ground surface, building, or other object that continues above an Imaginary Surface or under an established flight route. The heights of buildings and structures may be increased in proportion to the horizontal distance away from the runway -- as the horizontal ground distance increases, the vertical height along a particular Imaginary Surface may also increase. Man-made obstructions include structures (constructed before height restrictions) and air navigation equipment that is essential to airfield operations. Natural obstructions include vertical terrain such as hills. All obstructions must be approved by a special waiver, have appropriate lighting, and be recorded on all airspace maps. Some of the outlying terrain within the Imaginary Surface envelope is an obstruction because the ground elevation penetrates the Outer Horizontal Surface.

Imaginary Surfaces are defined according to the type of runways that exist at an airfield. The runways at Armitage Airfield are categorized as Class B since they support high-performance or heavier aircraft (such as F/A-18 and EA-6B). Figures 4-1 and 4-2 depict the Imaginary Surfaces that have been established for the

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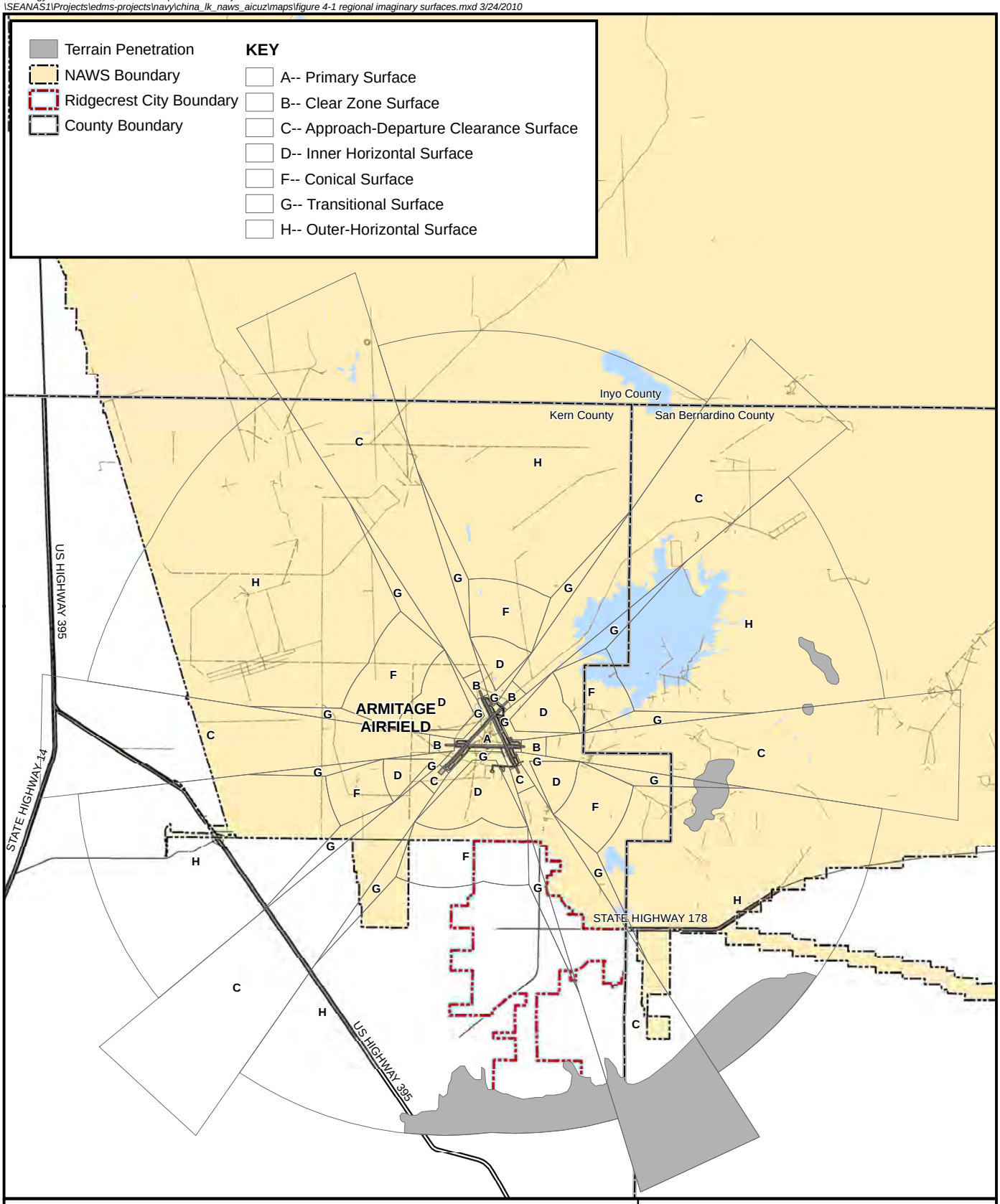

Figure 4-1
Regional Imaginary Surfaces

NAWS China Lake
Ridgecrest, California

0 0.5 1 2 3 4 5
Miles
Scale 1:75,000

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\SEANAS1\Projects\edms-projects\navy\china_lk_naws_aicuz\maps\figure 4-2 local imaginary surfaces.mxd 3/24/2010

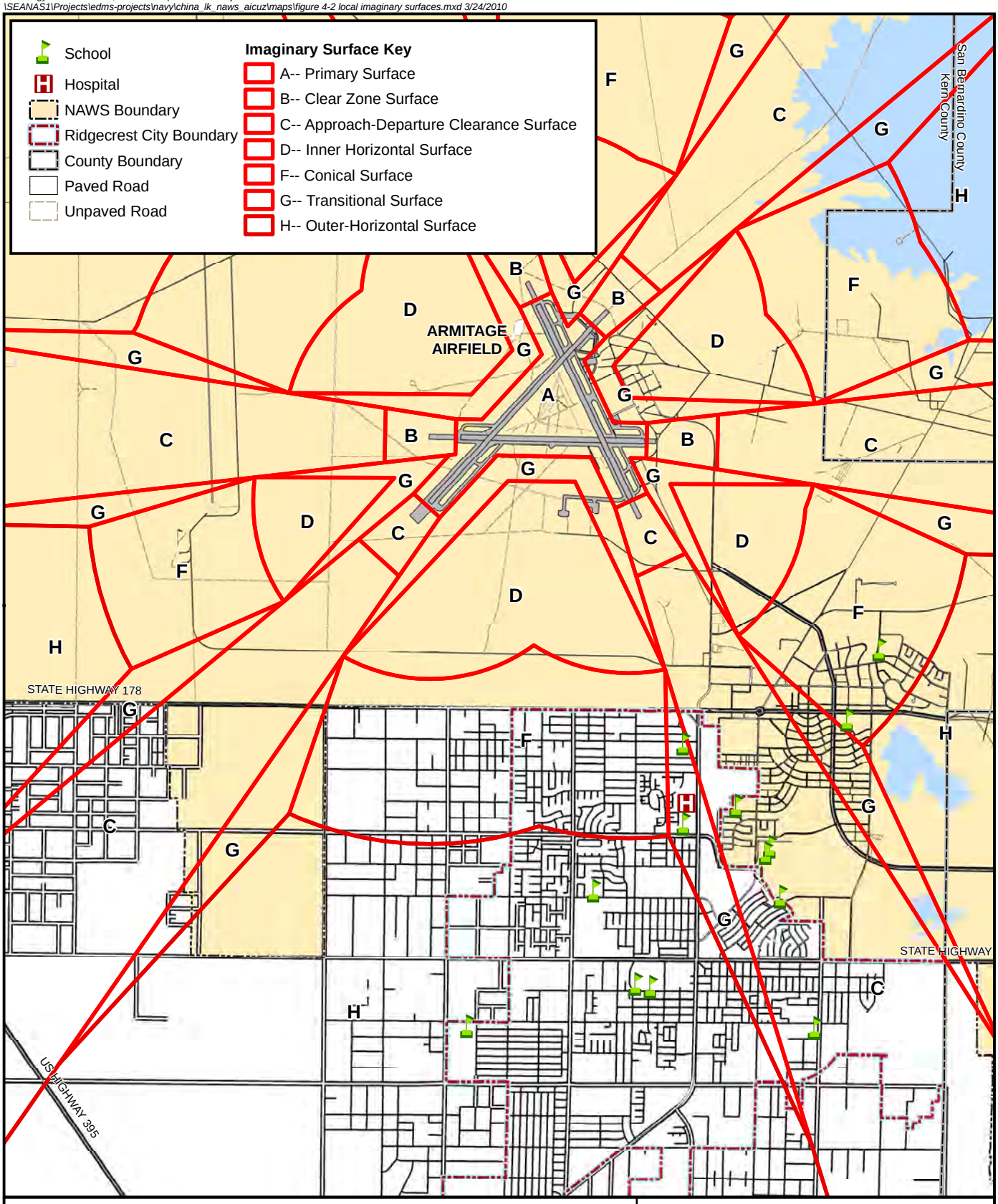

Figure 4-2
Local Imaginary Surfaces

NAWS China Lake
Ridgecrest, California

0 0.25 0.5 1 1.5 2
Miles
Scale 1:70,000

NAWS vicinity and the area surrounding Armitage Airfield. The following describes each Imaginary Surface defined for Class B runways:

- **Primary Surface.** A surface on the ground centered lengthwise on the runway and extending 200 feet (61 meters) beyond each end of the runway. The area beneath the primary surface is required to be free of obstructions. The width of the primary surface is 1,500 feet (457 meters).

- **Clear Zone Surface.** A fan-shaped surface, symmetrical about the runway centerline, adjacent to the runway thresholds and extending 3,000 feet (914 meters) from the runway ends. The clear zone surface starts with an inner width of 1,500 feet (457 meters) (same as that of the primary surface) and parallels the approach-departure clearance surface.

- **Approach-Departure Clearance Surface.** An inclined or combination inclined and horizontal plane symmetrical about the runway centerline. The plane flares outward and upward from the primary surface starting with the centerline elevation at the runway end. The slope of the surface is 50:1 until it reaches an elevation of 500 feet (152 meters) above the established airfield elevation and then extends horizontally to a point 50,000 feet (152,400 meters) from the point of beginning. The outer width is 16,000 feet (4,877 meters).

- **Inner Horizontal Surface.** An oval-shaped plane at a height of 150 feet (46 meters) above the established airfield elevation. It is constructed by scribing an arc with a radius of 7,500 feet (2,286 meters) about the runway centerline at each end of each runway and interconnecting these arcs with tangents.

- **Conical Surface.** An inclined plane that extends from the periphery of the Inner Horizontal Surface outward and upward at a 20:1 slope. It extends for a horizontal distance of 7,000 feet (2,134 meters) and a height of 500 feet (152 meters) above the established airfield elevation.

- **Outer Horizontal Surface.** A plane located 500 feet (152 meters) above the established airfield elevation, extending outward from the outer periphery of the conical surface for a horizontal distance of 30,000 feet (9,144 meters).

- **Transitional Surface.** Inclined planes that connect the primary surface and the approach-departure clearance surface to the inner horizontal surface, conical surface, outer horizontal surface, or other transitional surfaces. The slope of the plane is 7:1 outward and upward from the primary surface and approach-departure clearance surface, and is at right angles to both the runway centerline and runway centerline extended.

The published Airport Reference Point is utilized for obstruction evaluations of any proposed project in proximity to NAWS flight operations. Any proposed land use that exceeds 200 feet agl or penetrates the 100:1 slope extending 20,000 feet from the nearest point of the closest runway must be submitted to both the

FAA and NAWS for further review. Both agencies advise the local land use authority regarding safety impacts to ensure safety of flight for NAWS operations.

At Armitage Airfield, some of the outlying terrain within the Imaginary Surface is an obstruction because the ground elevation penetrates the Outer Horizontal Surface (see Figure 4-1). The land on the edge of the Outer Horizontal Surface south of the approach end of Runway 32 rises gradually from north to south and the obstruction takes in portions of Rademacher and Spangler Hills. The highest point in this area is approximately 3,100 feet (945 meters) above mean sea level, or about 300 feet (91 meters) above the outer horizontal surface.

Hills and buttes to the east of the airfield (at the approach end of Runway 26) also penetrate the Imaginary Surface. The closest of these is in the Lone Butte area, which rises to approximately 3,800 feet (1,158 meters) above mean sea level. A lighted radio tower is located on the top of this butte. However, these areas are not a major concern since an analysis of all flight routes shows aircraft arriving and departing to Armitage Airfield to the west of the Lone Butte area.

There are also 41 man-made obstructions at Armitage Airfield, although most of them are relatively minor. According to NAVAIR, waivers have been granted to allow their continued presence because the obstructions have either been in place for many years or because they are located near Runways 14/32 and 08/26, which are not used very often. The waivers note that all of the facilities shall be obstruction marked and lighted in accordance with FAA requirements.

4.2 Accident Potential Zones (APZs)

The APZs are areas in the immediate vicinity of airfield runways that warrant extra margins of safety because they have a higher potential for aircraft accidents. Based on historical accident and operations data throughout the military, APZs represent the generalized locations where a higher proportion of aircraft accidents have tended to occur over time. Although the likelihood of an accident at any given time or at any particular location is remote, the Navy recommends that certain land uses that concentrate large numbers of people, such as dense residential developments and schools, not be located within APZs. The designation and control of APZs increases public safety but cannot provide complete protection from aircraft accidents.

Criteria on APZs are found in OPNAVINST 11010.36C. The Navy recognizes three types of APZs for Class B runways: the clear zone, APZ I, and APZ II, defined as follows:

- **Clear Zone.** The trapezoidal area lying immediately beyond the end of the runway and outward along the extended runway centerline for a distance of 3,000 feet. For Navy and Marine Corps installations, the dimensions are 1,500 feet wide at the runway threshold and 2,284 feet wide at the outer edge. The clear zone is required for all active runway ends.

- **APZ I.** The rectangular area beyond the clear zone, which has a measurable potential for aircraft accidents relative to the clear zone. APZ I is provided under flight routes that experience 5,000 or more annual operations (departures or approaches). APZ I is typically 3,000 feet wide by 5,000 feet long and may be rectangular or curved to conform to the shape of the predominant flight route.

- **APZ II.** The rectangular area beyond APZ I (or the clear zone if APZ I is not used), which has a measurable potential for aircraft accidents relative to APZ I or the clear zone. APZ II is always provided where APZ I is required. The dimensions of APZ II are typically 3,000 feet wide by 7,000 feet long and, like APZ I, may be curved to correspond with the predominant flight route.

4.2.1 2007 AICUZ Accident Potential Zones

Figure 4-3 displays the APZs for 2007 AICUZ airfield operations at Armitage Airfield. Three primary surfaces and six clear zones extend over Runways 08/26, 03/21, and 14/32 and their runway ends. One straight APZ I extends from Runway end 03, a curved APZ I extends from Runway end 21, and two APZ Is extend south-eastward from clear zones associated with Runway 03/21. APZ IIs extend from all APZ Is and reflect the predominant flight tracks flown at Armitage Airfield. The closed loop APZ I and IIs extending from Runway 03/21 correspond to an FCLP flight track.

The 2007 AICUZ APZs extend over a total of 4,678 acres located entirely on-base. Approximately 1,564 acres are associated with airfield primary surfaces and clear zones, 1,359 acres are associated with APZ I, and 1,755 acres are associated with APZ II (see Table 4-1).

Table 4-1 Comparison of Accident Potential Zones (acres)

	2007 AICUZ	Projected	Change
Primary Surface	1,564	778	-4
Clear Zone		782	(approx. equal)
APZ I	1,359	689	-670
APZ II	1,755	964	-791
Total	**4,678**	**3,213**	**-1,465**

4.2.2 2011 AICUZ Accident Potential Zones

Figure 4-4 displays the APZs for projected airfield operations flown at Armitage Airfield. The APZs include three primary surfaces and six clear zones corresponding to Runways 08/26, 03/21, and 14/32 and their respective runway ends. Extending from Runway end 03, APZ I and APZ II correspond to departure flight operations from Runway 21. APZ I and APZ II extending from Runway end 21 represents non-break arrivals, overhead and carrier break arrivals, and arrivals from touch-and-go operations. The configuration of APZ I and APZ II corre-

sponds to the overhead and carrier break arrival flight track. The 2011 AICUZ APZs have two fewer APZ Is extending southeast from Runway 03/21 and one less closed loop APZ II east of runway 03/21 (see Figure 4-5). Fewer projected APZs are due to reduced total flight operations and elimination of FCLP flight operations (Wyle Laboratories Inc. February 2010).

The 2011 AICUZ APZs extend over a total of 3,213 acres located entirely on-base. Approximately 778 acres are associated with airfield primary surfaces, 782 acres are associated with clear zones, 689 acres are associated with APZ I, and 964 acres are associated with APZ II. The 2011 AICUZ APZs have decreased by 1,465 acres compared with the 2007 AICUZ APZs; APZ I has decreased by 670 acres, APZ II has decreased by 791 acres, and primary surfaces and clear zones have remained approximately equal (see Table 4-1).

4.3 Aircraft Incident History at Armitage Airfield

Military aircraft and weapons test and training operations are inherently dangerous, and various types of aircraft incidents occur occasionally. Aircraft incidents include all reportable accidents associated with aircraft and range from serious events, such as the loss of an aircraft, to less significant events (e.g., the accidental release of a piece of equipment from an aircraft). Between 1958 and 2010, 26 aircraft incidents associated with test and training operations occurred in the vicinity of Armitage Airfield. Table 4-2 describes each incident, and Figure 4-3 identifies the approximate location of each incident relative to the airfield and the established APZs. Of the 26 identified incidents, all but two occurred on NAWS property. Of the two incidents that occurred off-base, one (shown as Incident 23 in Table 4-2 and on Figure 4-3) involved an aircraft crash in the vicinity of what is now Faller School. The other incident (Incident 6 in Table 4-2 and on Figure 4-3) involved an aircraft crash east of County Line Road and south of Kendall Avenue. The cause of both crashes was attributed to engine failure. Of note, emergencies that occur during the takeoff phase of flight are more hazardous due to the aircraft being heavy, full of fuel, and slow airspeed, and if there is an engine failure or malfunction, the aircraft will have a reduced ability to gain altitude.

4.4 Aircraft Incident History at Baker Range

Similar to Armitage Airfield, sorties conducted at Baker Range are inherently dangerous and various types of aircraft mishaps occasionally occur. An historical record of mishaps specific to Baker Range has not been kept. Mishaps that occur are reported to the Safety Center and recorded in association with Armitage Airfield.

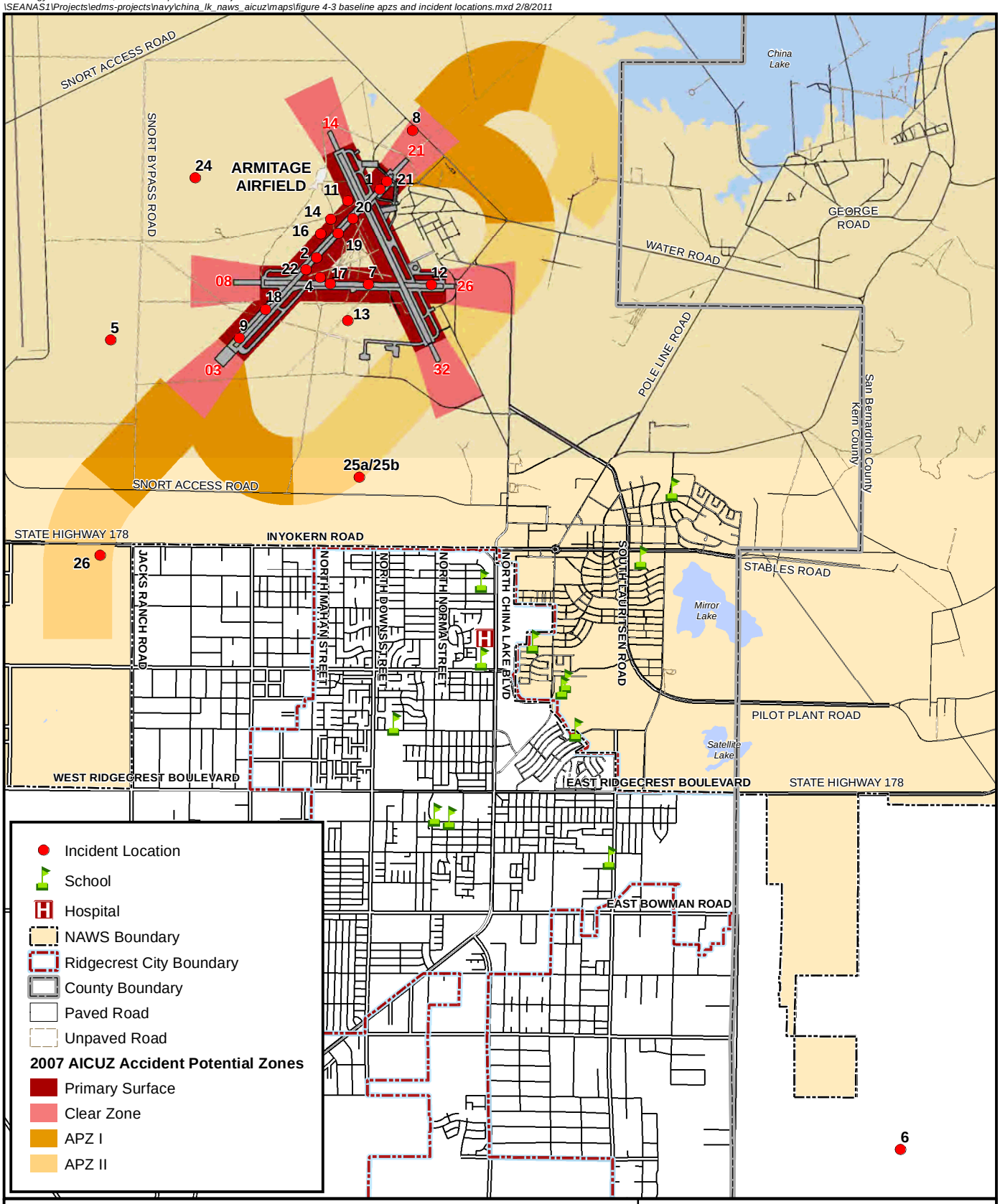

Figure 4-3
2007 AICUZ Accident Potential Zones and Incident Locations

NAWS China Lake
Ridgecrest, California

0 0.3 0.6 1.2 1.8 2.4
Miles
Scale 1:122,000

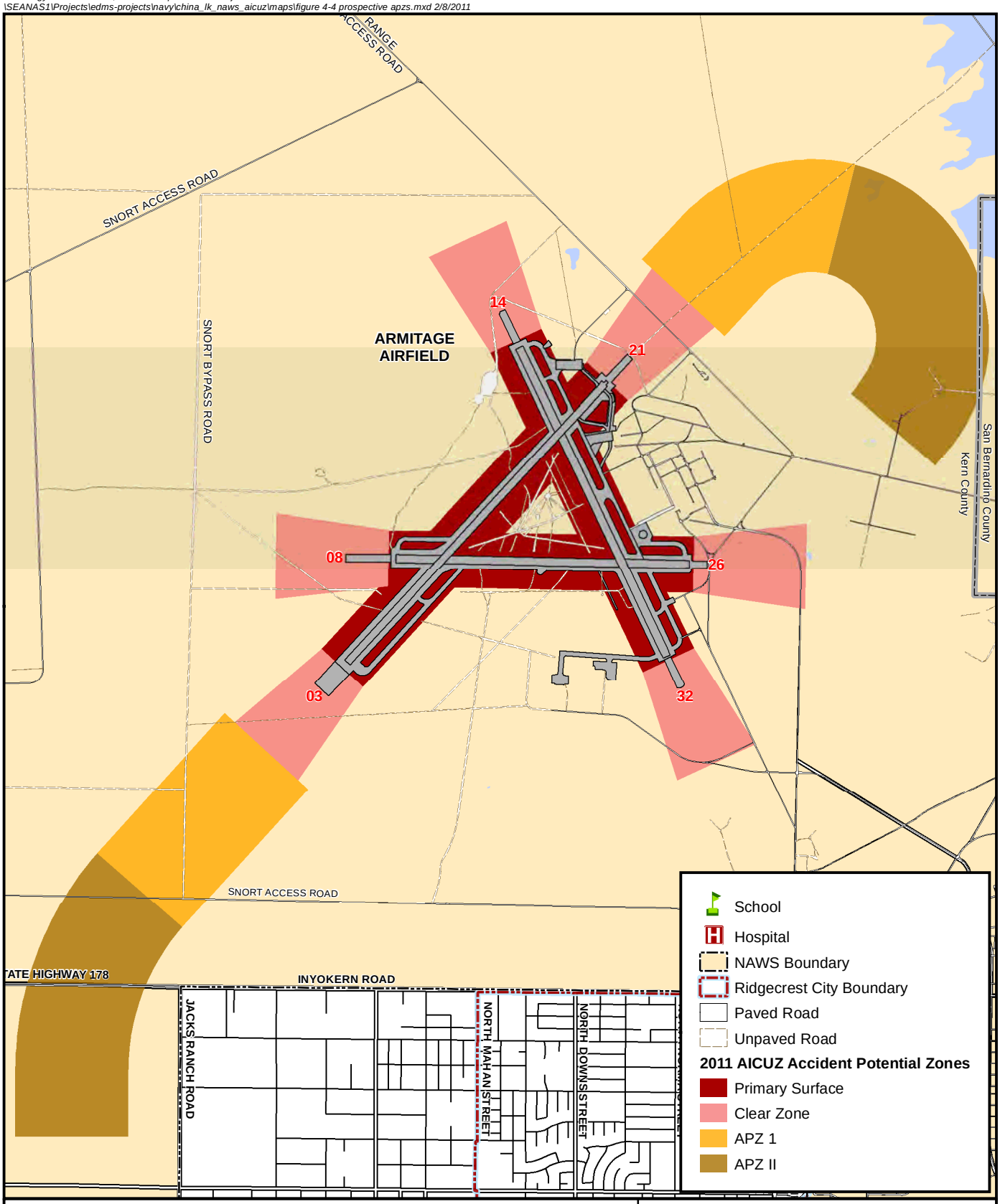

Figure 4-4
2011 AICUZ Accident Potential Zones

NAWS China Lake
Ridgecrest, California

0 0.25 0.5 1 1.5
Miles
Scale 1:44,000

Ecology & Environment, Inc. GIS Department Project:
R:\EDMS-Projects\navy\china_lk_naws_aicuz\Maps\MXDs\feb_2011\figure 4-5 baseline and prospective apzs.mxd Date: 2/10/2011

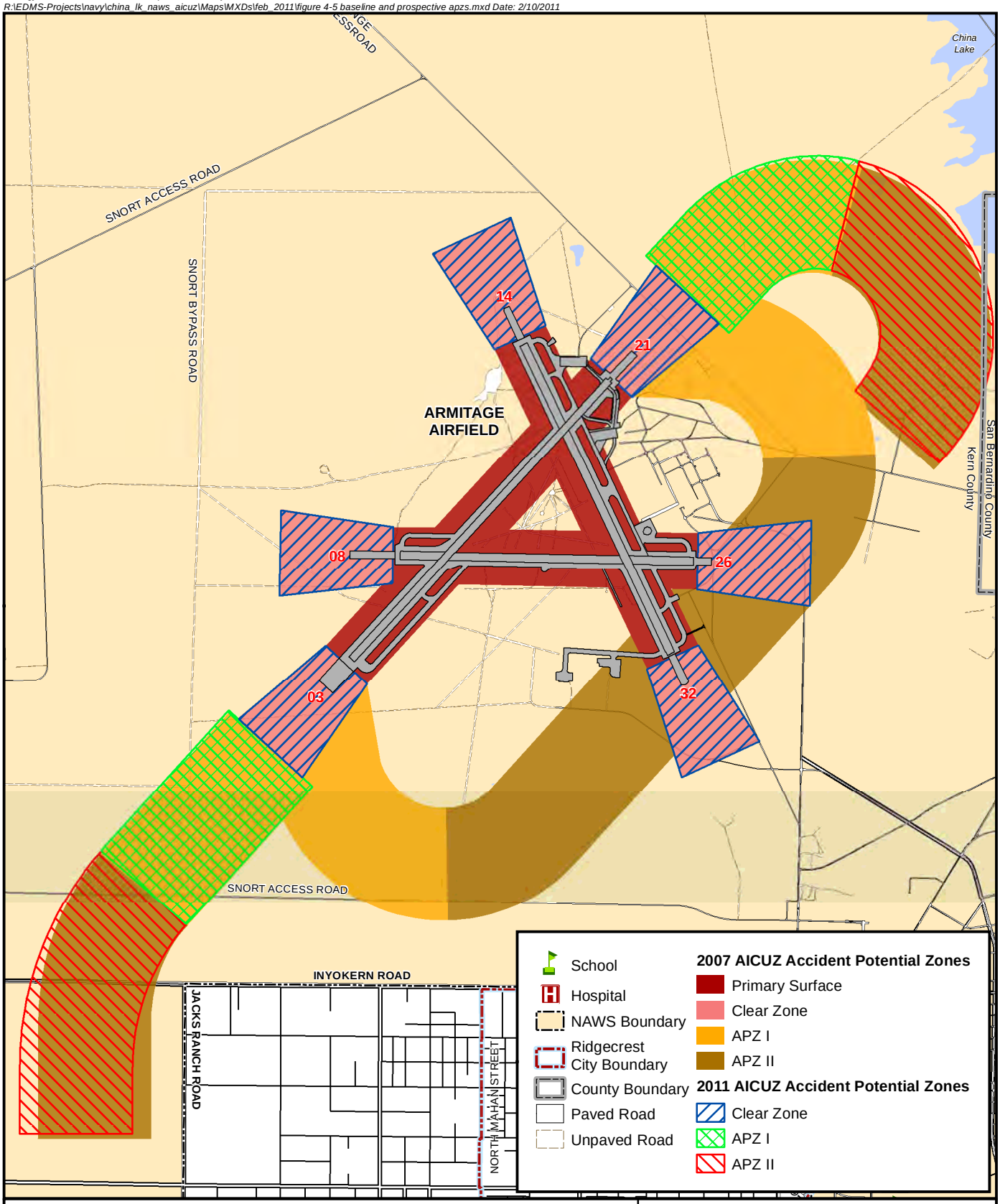

Figure 4-5
Comparison of 2007 and 2011 AICUZ Accident Potential Zones

NAWS China Lake
Ridgecrest, California

0 0.25 0.5 1 1.5
Miles
Scale 1:44,000

Table 4-2 Class A Mishaps in the Vicinity of Armitage Field

ID#	Aircraft	Date	Description	Location
1	GR-4	April 2008	Aircraft landed with gear up	See Figure 4-3
2	F-18	December 2003	Aircraft departed runway after landing	See Figure 4-3
3	AV-8B	June 1996	Departed controlled flight	Approx. 7-1/2 miles NW
4	F-18D	March 1996	Aircraft departed runway on landing	See Figure 4-3
5	QF-4N	1995	Post-take-off Crash (unmanned)	See Figure 4-3
6	AV-8B	September 1994	Post-takeoff, off-base crash	See Figure 4-3
7	AV-8B	February 1994	Un-commanded jettison of external stores on takeoff[1]	See Figure 4-3
8	F-18C	May 1993	Un-commanded release of test article[1]	See Figure 4-3
9	QF-86F	May 1992	Loss of aircraft component in flight	See Figure 4-3
10	Data not Available	May 1992	In-flight loss of test weapon (inert) component[1]	Approx. 7 miles W
11	QF-86F	April 1992	Departed runway after landing (unmanned)	See Figure 4-3
12	UH-1N	May 1991	Hard landing	See Figure 4-3
13	QF-86F	March 1991	In-flight loss of aircraft component[1]	See Figure 4-3
14	QF-4N	January 1991	Departed runway during take off (unmanned)	See Figure 4-3
15	F-18C	January 1991	Un-commanded in-flight release of ordnance (inert)[1]	Approx. 9 miles NW
16	QF-4N	September 1990	Departed runway during take off (unmanned)	See Figure 4-3
17	UH-1N	September 1990	Hard landing	See Figure 4-3
18	F-18	July 1990	In-flight loss of weapon (inert) component[1]	See Figure 4-3
19	AV-8B	September 1989	Electrical failure, gear-up landing	See Figure 4-3
20	A-7E	August 1985	Nose gear failure on landing	See Figure 4-3
21	QF-86F	October 1984	Landed short of runway (unmanned)	See Figure 4-3
22	A-4/A-4	1984	Collision on the runway, post-landing	See Figure 4-3
23	QF-86F	August 1979	Post-takeoff off-base crash	See Figure 4-3
24	QT-33	June 1976	Departed controlled flight (unmanned)	See Figure 4-3
25a/ 25b	A-6/A-7	June 1976	Landing pattern mid-air collision	See Figure 4-3
26	Data not Available	June 1958	Loss of test weapon (inert) after takeoff[1]	See Figure 4-3

Source: NAWS Air Operations 2006; NAWS 2010b

Notes:
[1] Equipment "drop."

4.5 Electromagnetic Interference and Radiation

New generations of military aircraft are highly dependent on complex electronic systems to perform critical flight and mission-related functions. This dependence on digital electronics, combined with higher clock rates, power-conserving signal levels, increased use of composite materials, onboard radar, communications transmitters, and lasers, increases the susceptibility of aircraft communication, navigation, and other electrical systems to electromagnetic interference (EMI). EMI is defined by the American National Standards Institute (ANSI) as any electromagnetic disturbance that interrupts, obstructs, or otherwise degrades or limits

the effective performance of electronics/electrical equipment. It can be induced intentionally, as in forms of electronic warfare, or unintentionally, as a result of spurious emissions and responses, such as high-tension power line leakage. EMI may also be caused by atmospheric phenomena, such as lighting and precipitation static, and non-telecommunications equipment, such as vehicles and industrial machinery. EMI may also affect aircraft weapons systems, which often include a myriad of digital electronics.

Hazards of electromagnetic radiation to ordnance (HERO) are also of concern. The HERO Assessment of NAWS China Lake (April 2006) addresses the effects of electromagnetic environments created by stationary and mobile/portable antenna/transmitter systems located in the vicinity of ordnance operations such as transportation, assembly, and loading operation areas. Analysis of the operating parameters of aircraft supported by NAWS indicates that they can produce electromagnetic environments that exceed the HERO susceptible and HERO unsafe/unreliable ordnance maximum allowable environments on the flight line and in the hangars. Details regarding the ordnance's susceptibility and the corresponding maximum allowable environments for given frequency ranges and ordnance operations are contained in Electromagnetic Radiation Hazards (Hazards to Ordnance) (NAVSEA 2005). The HERO Assessment report also provides HERO emission control (EMCON) guidance for operations involving HERO susceptible and HERO unsafe/unreliable ordnance. HERO EMCON or ordnance handling restrictions apply to all HERO susceptible ordnance operations and when HERO unsafe/unreliable ordnance is exposed to electromagnetic environments, EMCON is necessary.

4.6 Lighting and Glare

Bright lights, either directed or reflected, in the vicinity of an airfield can impair a pilot's vision, especially at night. A sudden flash from a bright light causes a spot or "halo" to remain at the center of the visual field for a few seconds or more, rendering a person virtually blind to all other visual input. This is particularly dangerous at night when the flash can destroy the eye's adaptation to darkness, typically requiring 40 to 45 minutes for total recovery. Spotlights and reflected light from glass-exterior buildings, as well as solar facilities that produce glare such as solar troughs, can also impair pilot vision. According to personnel at NAWS, there are no existing or expected major issues related to off-installation lighting in the vicinity of or on approach and departure routes to the airfield. While the effects of existing light sources and glare are not currently a significant operational concern, initiatives should be pursued on- and off-base to ensure that future sources are developed in

Bright lighting in the vicinity of an airfield can impair a pilot's vision and impact the approaches to lit runways such as the one shown above.

a manner that minimizes the potential for impacts to NAWS' test and training operations.

4.7 Smoke and Dust

Uncontrolled land uses around airfields that emit smoke, dust, or other air pollutants can impair visibility in the vicinity of the airfield, interfere with the safe operation of aircraft, and endanger the landing, takeoff, or maneuvering of aircraft at the airfield. The control of on- and off-base smoke and dust sources remains an important safety concern for airfield flight operations at NAWS.

Activities that generate smoke and dust off-base are controlled by the Air Pollution Control Districts (APCD) of Kern and San Bernardino Counties. Kern County Air Pollution Control District Rule 402 and Mojave Desert Air Pollution Management District Rule 403 require the implementation of dust control measures at construction and demolition sites and for other fugitive dust-producing activities both on- and off-base. Off-base smoke and dust emissions have not been a significant issue to airfield operations in the past. The continued implementation of emissions controls programs by the Kern County APCD is expected to maintain this situation.

Military events that create significant amounts of smoke near the airfield are sporadic and occur primarily during firefighter training exercises. These exercises are conducted on the weekends to minimize conflict with airfield operations. Range operations that produce dust and/or smoke are typically conducted at more remote locations and are associated with scheduled test or training events. Therefore, smoke and dust emissions from range operations are not currently a significant issue at Armitage Airfield. Continued diligence will be necessary to ensure that airfield operations are not impacted in the future by dust- and smoke-producing activities.

4.8 Bird Aircraft Strike Hazard (BASH)

Bird/Animal Aircraft Strike Hazard (BASH) plans are required by the DoD for military installations where there is a potential for conflict between military activity and wildlife. BASH plans contain installation-specific information and guidelines to minimize the potential for collisions between aircraft and birds or other animals. In September 2002, NAWS developed and formally implemented a BASH plan for air operations at Armitage Airfield. The plan complies with DoD and Navy directives, and is implemented through NAWS Instruction (NAWSINST) 3750.2. The program is designed to control birds, alert aircrew and operations personnel, and to provide increased levels of flight safety, especially during the critical phases of flight. This plan establishes specific procedures to reduce known and potential bird hazards on and around NAWS. The NAWS BASH program is designed to:

- Establish a Bird Hazard Working Group (BHWG) and designate responsibilities to its members.

- Establish training for appropriate base members concerning responsibilities and actions.
- Establish procedures to identify high hazard situations and to aid supervisors and aircrews in altering/discontinuing flying operations when required.
- Establish aircraft and airfield operating procedures to avoid high hazard situations.
- Provide a method for issuing information to all tenant and transient aircrews on bird hazards and procedures for bird avoidance.
- Establish passive techniques to decrease airfield attractiveness to birds.
- When necessary, establish active/static techniques to disperse birds from the airfield.
- Establish procedures for reporting damaging/non-damaging bird strikes.
- Establish procedures for collecting bird strike remains.

As noted above, a BHWG has been established and is responsible for organizing, implementing, monitoring, and updating the BASH Plan. The BHWG also reviews actual strike data, and prepares airfield operations for seasonal bird migration trends. It allows base offices affected by BASH risks the opportunity to meet and discuss possible solutions. The BHWG meets regularly with representatives from each organization concerned with bird hazards to share current BASH information and address BASH-related issues as they develop.

The most critical aspect of the BASH program is the aircrew notification and warning system. This system establishes procedures for the exchange of information between ground agencies and aircrews concerning the existence and location of birds that pose a hazard to flight safety. A standardized Bird Hazard Condition (BHC) is to be used at NAWS to warn aircrew and support personnel of the current bird threat to operations. These codes are identical to codes utilized by the United States Air Force.

Means for tracking BASH incidents is provided through adherence to bird strike reporting procedures. The procedures include reporting of bird strikes by aviators, completion of a Bird/Animal Strike Hazard Report, and notification of the Environmental Management Division (939-3238) or the NAWS Air Operations Air Safety Officer (ASO) once the form has been submitted to the Navy Safety Center. Bird strike information accumulated in the database allows for more accurate predictions to aviators regarding when the probability for bird activity is highest.

5 Noise

This section presents an overview of aircraft-related noise, including a description of the metrics and methodologies used to represent and evaluate noise in the vicinity of airfields. The section also describes the characteristics of the noise environment at Armitage Airfield and Baker Range, including the definition of the noise "footprint" associated with airfield and range operations (shown in the form of noise contour lines and noise zones plotted on a map). Also summarized is the history of noise complaints in the vicinity of Armitage Airfield and Baker Range, and the noise abatement procedures used to reduce the impact of aircraft noise.

5.1 What is Noise?

Noise is generally defined as unwanted sound. Sound is a physical phenomenon consisting of vibrations that travel through a medium, such as air, and are sensed by the ear. Whether sound is interpreted as pleasant (e.g., music) or unpleasant (e.g., jackhammers) depends largely on the listener's current activity, past experience, and attitudes toward the source of the sound. Sound is all around us; it is generally thought of as noise when it interferes with normal activities such as sleep and conversation. Individual responses to different sound levels can be influenced by many factors, including the following:

- Activity the individual is engaged in at the time of the event
- General sensitivity to sound
- Time of day
- Length of time an individual is exposed to a sound
- Predictability of sound
- Average temperature, inversions, and other weather phenomena.

Aircraft-related sound is often categorized as noise in communities surrounding airfields. The impact of aircraft noise is therefore a factor in the planning of future land use near airfields. Because the noise from military aircraft operations may impact surrounding land use, the Navy has defined noise zones and provided associated recommendations regarding compatible land use in the AICUZ program instruction. For the purposes of this study land uses encumbered by noise from Baker Range will be analyzed in accordance with Navy AICUZ Instruction (OPNAVINST) 11010.36C, Air Installations Compatible Use Zones Program, October 9, 2008.

The main sources of noise at air installations are generally related to in-flight operations and pre-flight and maintenance run-up operations. Computer models are used to develop noise contours for land use planning purposes based on information about these operations, including the following factors:

- Type of operation (e.g., arrival, departure, pattern)
- Number of operations per day
- Time of operation
- Flight route used
- Aircraft power settings, speeds, and altitudes
- Number and duration of maintenance run-ups
- Environmental data (temperature, humidity, and cloud cover)
- Topographical features of the area.

5.2 Characteristics of Sound

5.2.1 General Sound Measurement

The measurement of sound involves three basic physical characteristics: intensity, frequency, and duration. Intensity is a measure of the acoustic energy of the sound vibrations and is expressed in terms of sound pressure. The higher the sound pressure, the more energy carried by the sound and the louder the perception of that sound. Frequency is the number of times per second the air vibrates or oscillates. Low-frequency sounds are characterized as rumbles or roars, while sirens or screeches typify high-frequency sounds. Duration is the length of time the sound can be detected.

A logarithmic unit known as a decibel (dB) is used to represent the intensity of sound. Such a representation is called a sound level. A sound level of 10 dB is approximately the threshold of human hearing and is barely audible under extremely quiet conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above 120 dB begin to be felt inside the human ear as discomfort and above 140 dB as pain. Figure 5-1 illustrates the sound levels of typical human activities and noise sources.

Because of the logarithmic nature of the decibel unit, sound levels associated with different events cannot simply be added or subtracted. The combined sound level produced by two sounds of different intensity levels is only slightly higher than the higher of the two. For example:

$$60.0 \text{ dB} + 70.0 \text{ dB} = 70.4 \text{ dB}$$

And if two sounds of equal intensity are added, the sound level increases by 3 dB. For example:

$$60 \text{ dB} + 60 \text{ dB} = 63 \text{ dB}$$

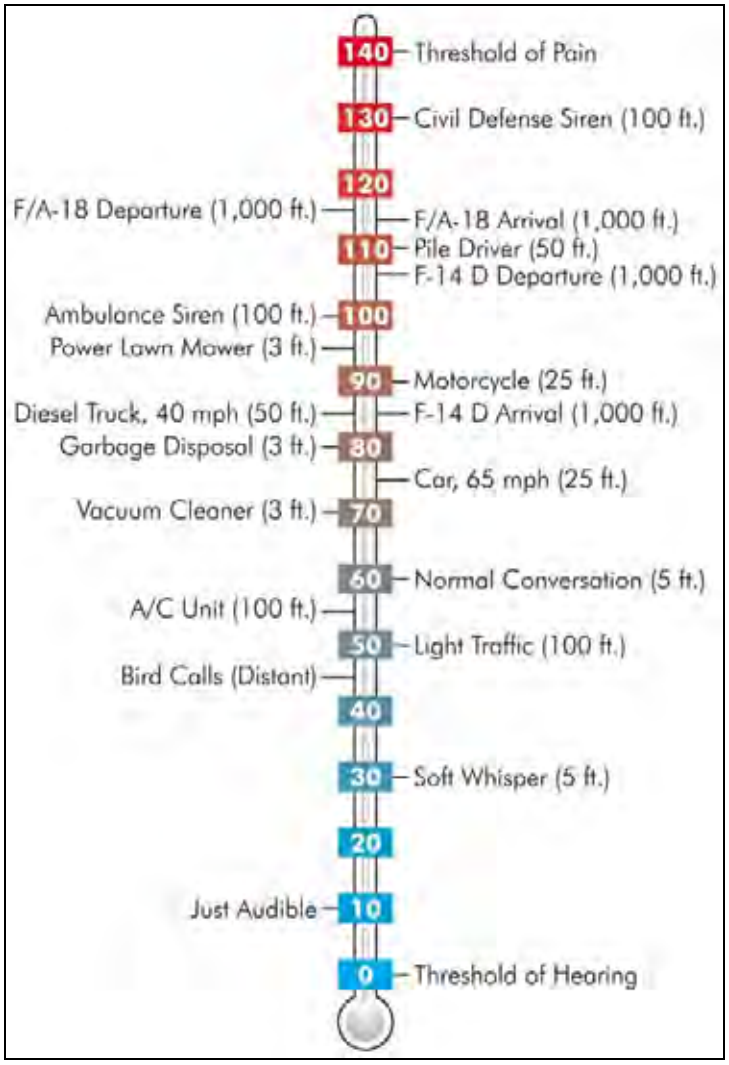

Figure 5-1 Sound Levels of Typical Sources and Environments

A change of 3 dB is the smallest change detected by the average human ear. An increase of about 10 dB is usually perceived as a doubling of loudness. This applies to sounds of all volumes. A small change in dB will not generally be noticeable. As the change in dB increases, the individual perception is greater, as shown in Table 5-1.

Table 5-1 Subjective Responses to Changes in Sound Levels

Change	Change in Perceived Loudness
1 dB	Requires close attention to notice
3 dB	Barely perceptible
5 dB	Quite noticeable
10 dB	Dramatic, twice or half as loud
20 dB	Striking, fourfold change

Source: NAWS May 2007.

Aircraft noise is expressed in terms of A-weighted sound levels, in units of A-weighted decibels, or dBA. A-weighting is a method of adjusting the frequency content of a sound event to closely resemble the way the average human ear responds to aircraft sound. The A-weighting scale is therefore considered to provide a good indication of the impact of noise produced by aircraft operations. All dB measurements throughout this AICUZ study update are in terms of A-weighted decibels.

5.2.2 Cumulative Noise Metrics

The sound environment around an air installation is typically described using a measure of cumulative exposure that results from all aircraft operations. The DoD-specified metric used to account for this is the day-night average sound level (DNL). In general, DNL (sometimes also denoted as L_{dn}) can be thought of as an accumulation of all of the sound produced by individual events that occur throughout a 24-hour period. The sound of each event is accounted for by an integration of the changing sound level over time. This integrated sound level metric for individual events is called the sound exposure level (SEL). The logarithmic accumulation of the SELs from all operations during a 24-hour period determines the DNL for the day at that location. DNL also takes into account the time of day the events occur. The measure recognizes that events during the nighttime hours may be more intrusive, and therefore more annoying, than the same events during daytime hours, when background sound levels are higher. To account for this additional annoyance, a penalty of 10 dB is added to each event that takes place during “acoustic” nighttime hours, defined as 10:00 p.m. to 7:00 a.m.

The State of California has developed a standard measure for describing environmental noise called the Community Noise Equivalent Level (CNEL). Like the DNL metric, the CNEL represents an accumulation and an averaging of all the noise produced by individual events occurring during a 24-hour period. The noise of each event is accounted for by integrating the changing sound level over time, such as when an aircraft approaches, flies overhead, and then continues off into the distance. The CNEL noise descriptor also takes into account the time of day the event occurs; however, in addition to applying a 10-db CNEL penalty to nighttime operations, the CNEL also weights those events taking place in the evening period (7:00 p.m. to 10:00 p.m.) as if they were 5 dB CNEL louder than daytime events.

Like the DNL metric, CNEL values around an airfield are presented for a 24-hour period referred to as an “average busy-day.” Average busy-day operations are calculated by dividing the annual operations by the number of annual average busy-days. This averaging is done to obtain a stable representation of the noise environment free of fluctuations in wind direction, runway use, temperature, aircraft performance, and total airfield operations, any one of which could significantly influence individual SELs from one day to the next. The accumulation of noise computed in this manner provides a quantitative tool for comparing overall noise environments and developing compatible land use plans. The dB CNEL

values are represented as contours connecting points of equal dB CNEL value, usually in 5-dB CNEL increments from 60 dB CNEL up to the highest contour values. Because NAWS is located in California, the CNEL metric is used in this AICUZ study update instead of the DNL. CNEL represents a slightly more conservative measure of potential noise exposure than the DNL because of the additional dB penalty associated with evening operations.

Noise levels of the loudest aircraft operations significantly influence the 24-hour average. For example, if one daytime aircraft overflight measuring 100 dB for 30 seconds occurs within a 24-hour period in a 50-dBA noise environment, the CNEL will be 65.5. If ten such 30-second aircraft overflights occur in daytime hours in the 24-hour period, the CNEL will be 75.4. Therefore, a few maximum sound events occurring during a 24-hour period will have a strong influence on the 24-hour CNEL even though lower sound levels from other aircraft between these flights could account for the majority of the flight activity.

Individuals do not "hear" CNEL. The CNEL contours used in this AICUZ study update are intended for land use planning, not to describe what someone hears when a single event occurs. As described above, single-event noise is described in terms of the SEL in units of dB (A-weighted). SEL is a metric that takes into account the amplitude of a sound and the length of time during which each noise event occurs. It thus provides a direct comparison of the relative intrusiveness among single noise events of different intensities and durations of aircraft over flights. Table 5-2 lists SEL values that indicate what a person on the ground would hear at representative distances from an aircraft flying overhead performing departure, break arrival, non-break arrival, and touch-and-go operations. Aircraft used for projected operations are provided in Table 5-2 for comparison.

Table 5-2 SEL Values for Representative Projected Flight Conditions at NAWS

	Projected Modeled Aircraft			
Condition [2]	F/A-18C/D	F/A-18E/F and EA-18G	F-35 [1]	AV-8B
Departure crossing Inyokern Rd 4000 ft msl [3]	111 dB	107 dB	110 dB	102 dB
Break Arrival at 4000 ft msl (1/4 mile north of Inyokern Rd)	89 dB	97 dB	90 dB	90 dB
Non-break Arrival at 4000 ft msl, gear down (1.8 miles south of Inyokern Rd)	98 dB	101 dB	92 dB	86 dB
Touch and Go at 1000 ft agl, gear down	105 dB	110 dB	108 dB	99 dB

Source: Wyle Laboratories 2010c.

Notes:
1) Modeled with F-35A (Edwards AFB data 2008).
2) 45 deg F, 48%RH, 30.10 in Hg; 2283 ft msl field elevation.
3) F/A-18E/F and EA-18G at 5000 ft msl; no afterburner for all aircraft.

Key:
agl = Above ground level.
msl = Mean sea level.

5.2.3 Noise Modeling Methodology

The Navy periodically conducts noise studies to assess the potential noise impacts of aircraft operations. The need to conduct a noise study is generally prompted by a change in aircraft operations; such changes may involve the number of operations, the number and type of aircraft using the airfield, or the flight routes used for airfield departures and arrivals. A noise study is also normally conducted as a part of an AICUZ study or an AICUZ study update. The Navy used NOISEMAP, MR_NMAP, and NMPlot computer models to generate noise contours around Armitage Airfield and Baker Range.

NOISEMAP Version 7 was used to calculate dB CNEL contours for airfield operations, based on variables such as **average busy day (ABD)** flight operations by aircraft type; flight tracks; acoustical periods of day, evening, and night; runway and flight route utilization; and flight profiles for each aircraft type (e.g., power settings, airspeed, use of flaps, etc.). These parameters, as well as pre-flight and maintenance run-up operations, and noise modeling assumptions establish the shape of the noise contours. Radar data, air traffic control (ATC) logs and interviews with ATC personal and pilots were used to update aircraft operations information for this AICUZ study. Departure flight tracks were also updated to more accurately reflect dispersion of departure traffic (see Figure 3-1). Noise modeled from dispersed flight tracks tends to be of lower intensity (dB CNEL) and extend a greater distance perpendicular to the flight track.

Average busy day (ABD)
ABD operations are calculated by dividing the annual operations by the number of annual ABDs. ABD is modeled because NAWS experiences variable periods of high- and low- operational use, corresponding to high- and low-noise levels. ABD reflects noise at NAWS during high-use periods.

For this AICUZ study update 213 ABDs were modeled.

Other inputs such as topography also affect the noise contours generated by computer model. Modeling inputs that change from the 2007 AICUZ study include terrain modeling and ground impedance.

- **Terrain Modeling.** This AICUZ study models the terrain rising to the south of the airfield by approximately 1,400 feet and decreasing by approximately 100 feet to the north relative to the airfield's elevation. This AICUZ study captures a 4 dB CNEL greater exposure in areas south of the airfield due to rising terrain.

- **Ground Impedance.** This AICUZ study models the ground impedance as acoustically "hard" to more accurately reflect the vacant desert in the vicinity of NAWS. This AICUZ study captures a 2 dB CNEL greater exposure for noise emitted from the main departure and arrival flight tracks due to "hard" ground impedance. Modeling "hard" ground impedance also contributes to an approximately 10 to15 dB CNEL increase in noise exposure north of the airfield relative to the 2007 AICUZ study.

The MR_NMAP Version 2.2 computer model was used to calculate dB CNEL contours resulting from Baker Range sorties. For NAWS, Baker Range sorties were modeled along specific Hornet and Harrier flight tracks (see Section 3.6.1 and Figure 3-6). Airspace information, flight tracks, flight profiles (average power settings, altitude distributions, and speeds), and number of sorties by time period are the basis of dB CNEL contours for Baker Range. The MR_NMAP program does not support topography modeling inputs such as the terrain and ground impedance used in the airfield modeling. The NMPlot computer model was used to logarithmically add the noise contours generated by NOISEMAP for Armitage Airfield operations and MR_NMAP for Baker Range sorties to create a single set of noise contours for this AICUZ study update. Inclusion of the Baker Range sorties into the noise model correspond to the 60 dB CNEL lobe and 65 dB CNEL contour of captured noise exposure northwest of the airfield extending into Kern County.

Noise modeled for the 2011 AICUZ study is substantially greater than that modeled in the 2007 AICUZ study (see Section 5.3.3, Comparison of 2007 AICUZ and 2011 AICUZ Noise Contours). The increased area encumbered by noise contours is primarily attributed to inclusion of Baker Range sorties as well as terrain and ground impedance noise model inputs. Baker Range sorties correlate to noise exposure captured northwest of the airfield, rising terrain south of the airfield correlates to a 4 dB CNEL increase in captured noise exposure in that area, and "hard" ground impedance contributes to a 10 to 15 dB CNEL increase in captured noise exposure north of the airfield. For comparison purposes, a theoretical doubling of all airfield and Baker Range operations would only correlate to a 3 dB CNEL increase in overall noise exposure.

Noise modeled by this 2011 AICUZ study update reflects the accumulation of aircraft; noise model, and operations changes reflected in the November 2008, August 2009, and February 2010 supplemental noise studies. Baker Range sorties, terrain, and "hard" ground impedance were not modeled in the 2007 AICUZ. The noise model used for the 2011 AICUZ study update more accurately reflects the noise environment at NAWS (Wyle Laboratories Inc. March 30, 2010).

5.3 Noise Zones

At a minimum, the DoD requires that noise contours in AICUZ studies be plotted for values of 60 dB CNEL and above (in 5 dB CNEL increments). Three general noise exposure zones are defined in the AICUZ program: Noise Zone 1 includes areas with less than 65 dB CNEL; Noise Zone 2 encompasses areas between 65 and 74 dB CNEL; and Noise Zone 3 covers areas exposed to 75 dB CNEL and higher. For the purposes of this AICUZ study, Noise Zone 1 is depicted as the area between the 60 and 65 dB CNEL contours, rather than including all lands outside (i.e., below) the 65 dB CNEL threshold.

5.3.1 2007 AICUZ Noise Contours

Figure 5-2 displays the noise contours and noise zones computed for the 2007 AICUZ study airfield operations flown on established flight routes at Armitage

Airfield. These contours include noise levels ranging from 60 dB CNEL (quietest) to more than 85 dB CNEL (loudest), with intermediate contours expressed in increments of 5 dBs CNEL. Figure 5-2 and Table 5-3 illustrate that the majority of 2007 AICUZ noise contours (modeled using the average busy day flight operations extrapolated from annual operations [Table 3-1]) are contained within the NAWS boundary. The highest noise levels occur in the immediate vicinity of the airfield primarily extending northeast and southwest from Runway 03/21. In general, noise steadily decreases with increasing distance from the airfield and associated flight routes. As shown in Figure 5-2, Noise Zone 3 is located entirely within NAWS boundaries. The 70 dB CNEL contour line extends off-base to include 31 acres of Kern County land immediately south of Inyokern Road and east of Jacks Ranch Road. The 65 dB CNEL and 60 dB CNEL contour lines cross the NAWS boundary into unincorporated Kern and San Bernardino County land as well as the northwest portion of the City of Ridgecrest.

Table 5-3 2007 AICUZ Noise Contours (acres)

dB CNEL Range	Off-Base	On-Base	Total
60-64	5,650	7,183	12,833
65-69	1,292	7,363	8,655
70-74	31	4,428	4,459
75-79	0	2,275	2,275
80-84	0	922	922
85+	0	776	776
Total	**6,973**	**22,947**	**29,920**

The 2007 AICUZ noise contours extend over 29,920 on- and off-base acres. A total of 5,650 acres of land outside the NAWS boundary is located between the 60 to 64 dB CNEL noise contours; 1,292 acres of land are located between the 65 to 69 dB CNEL noise contours; and 31 acres are located between the 70 to 74 dB CNEL contours (Table 5-3).

5.3.2 2011 AICUZ Noise Contours for Established Flight Routes

Figure 5-3 displays the noise contours and noise zones associated with the projected level of operations (modeled using the ABD flight operations extrapolated from annual operations [Table 3-2]) conducted on the established flight route profiles at Armitage Airfield and Baker Range. Figure 5-4 is also provided to illustrate the change in these 2011 AICUZ noise contours compared with the 2007 AICUZ noise contours depicted in Figure 5-2.

As shown in Figure 5-4, the 2011 AICUZ noise contours vary substantially from the 2007 AICUZ noise contours shown in Figure 5-2. The highest (Noise Zone 3) contours continue to occur primarily within the NAWS boundary. However, a small portion of the Noise Zone 3 (75 dB CNEL) contour extends off-base immediately south of Inyokern Road/ State Road (SR)-178 and east of Jacks Ranch

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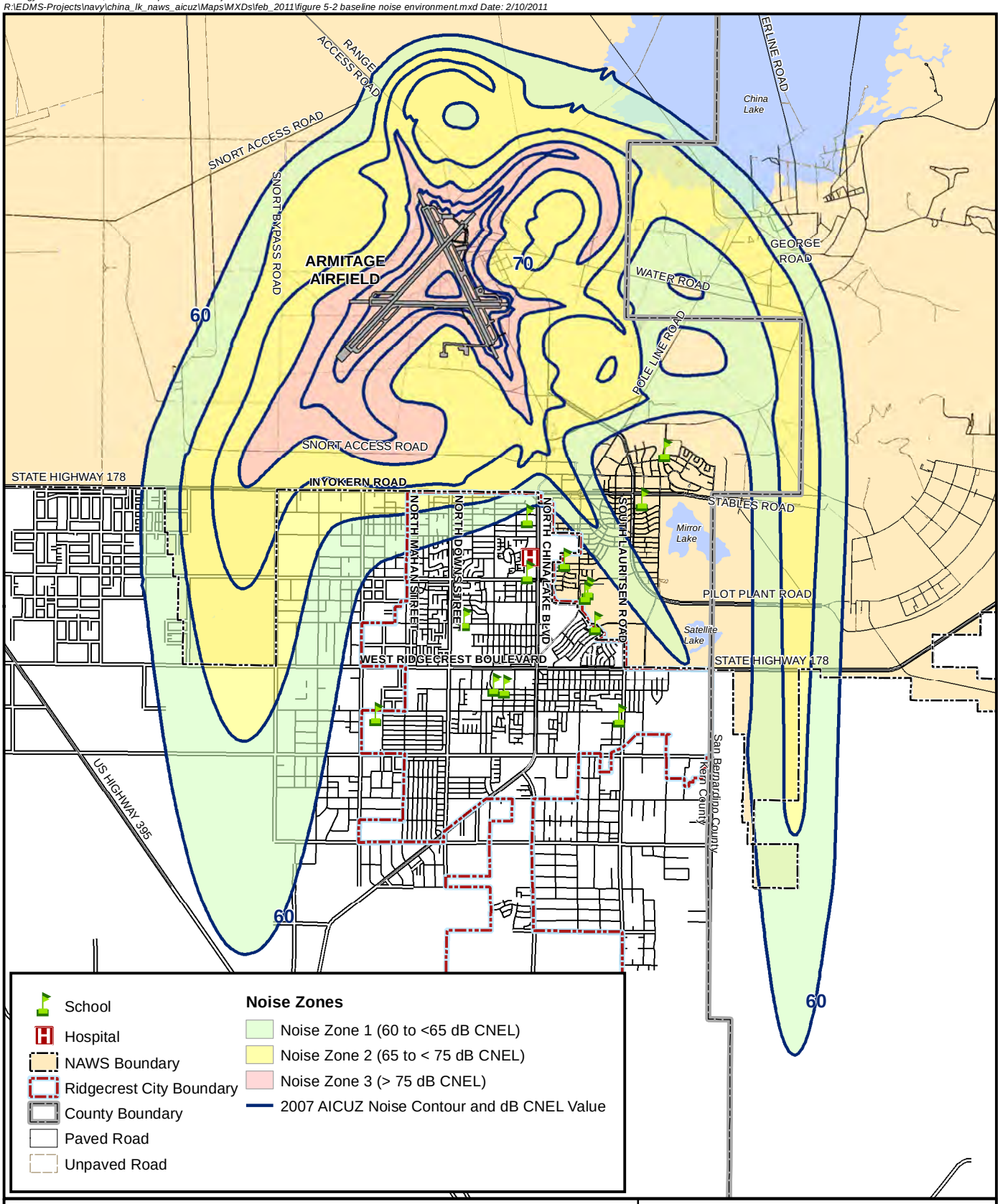

Figure 5-2
2007 AICUZ Noise Environment

NAWS China Lake
Ridgecrest, California

0 0.5 1 2 3
Miles
Scale 1:100,000

Ecology & Environment, Inc. GIS Department Project:
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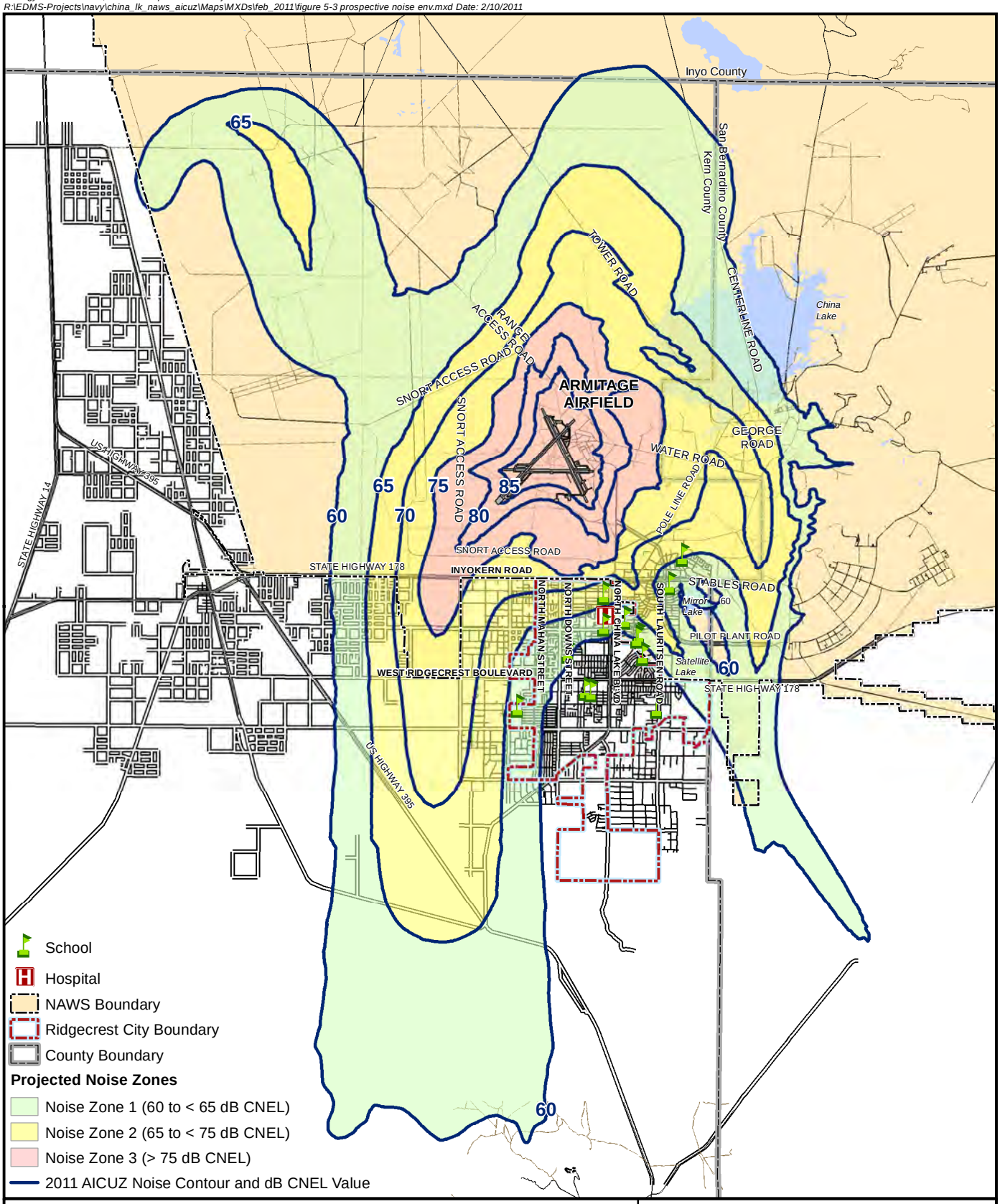

Figure 5-3
2011 AICUZ Noise Environment

NAWS China Lake
Ridgecrest, California

0 0.5 1 2 3 4 5 6
Miles
Scale 1:175,000

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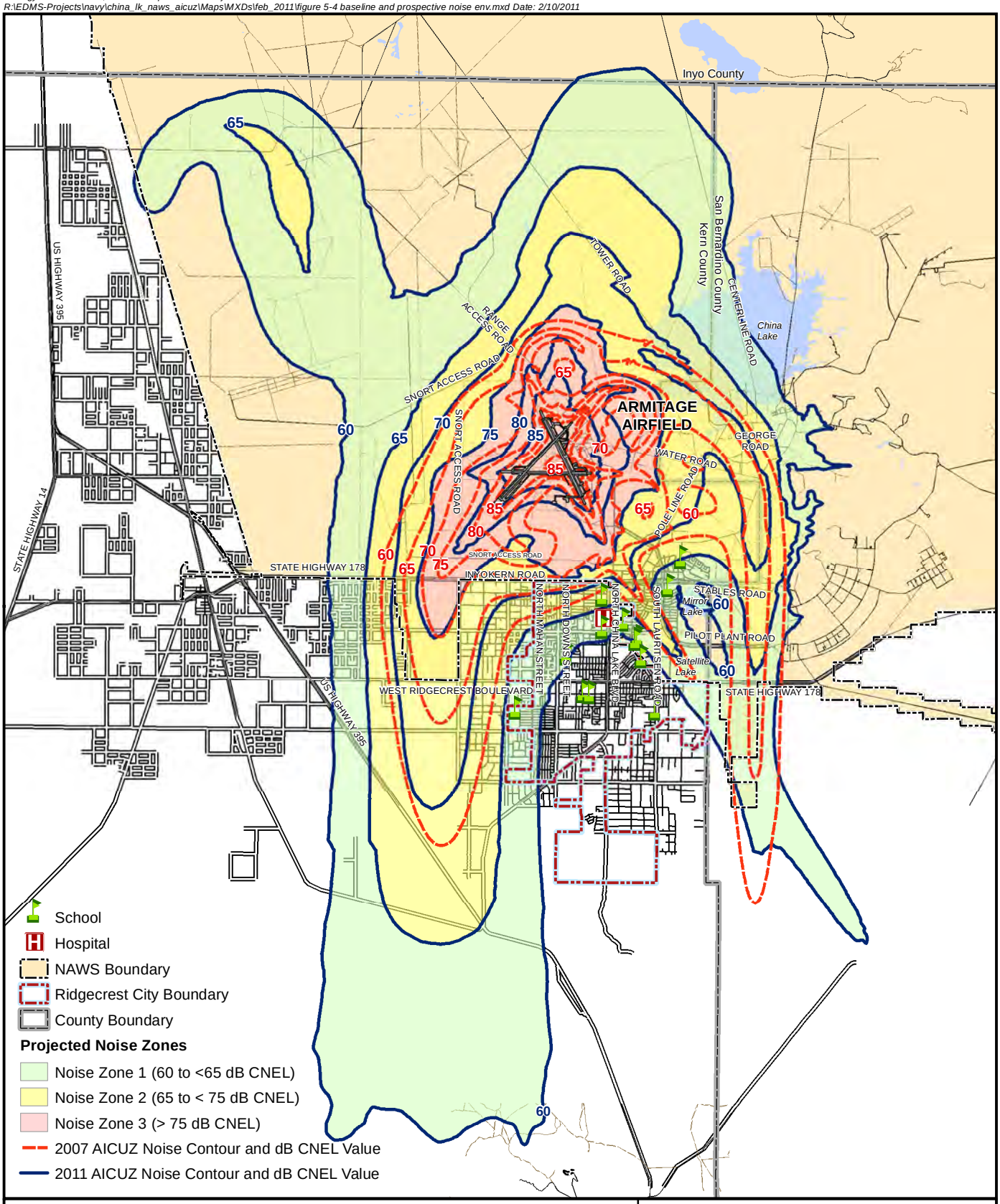

Figure 5-4
Comparison of 2007 and 2011
AICUZ Noise Contours

NAWS China Lake
Ridgecrest, California

0 0.5 1 2 3 4 5 6
Miles
Scale 1:175,000

Road. The projected scenario captures a 5 dB CNEL increase in this area from 2007 AICUZ conditions. On-base Noise Zone 3 extends farther in all directions, with the exception of a small area south of Runway approach 08 end along Snort Access Road.

Similar to Noise Zone 3, Noise Zone 2 contours extend farther in all directions both on- and off- base, with the exception of one area that decreases along Colin Road south of Inyokern Road/SR- 178; this area is located both within and adjacent to base boundaries in San Bernardino County. With the exception of areas along Colin Road, the projected 65 dB CNEL contour extends across a larger area than the 60 dB CNEL off-base 2007 AICUZ contour. This represents a 5 dB CNEL increase in areas previously modeled within the 60 dB CNEL 2007 AICUZ contour and a greater-than-5 dB CNEL for those areas in the projected 65 dB CNEL contour and outside the 2007 AICUZ 60 dB CNEL contour. On-base, the largest expansions of Noise Zone 2 occur north of the airfield and as a new 65 dB CNEL contour northeast of the airfield that is associated with Baker Range activities. The 65 dB CNEL "Baker Range" contour extends northwest and southeast of target B-1.

Noise Zone 1 (60 dB CNEL contour) extends farther in all directions from the 2007 AICUZ conditions. In Kern County the 60 dB CNEL off-base contour is generally commensurate with the area between Strecker Street in China Lake Acres and Sims Street in Ridgecrest, extending south to the mountains west of Searles. The 60 dB CNEL contour also extends slightly west of the base boundary south and east of Brown Road. In the City of Ridgecrest the off-base 60 dB CNEL contour generally extends west of Sims Street and diagonally north from the intersection of Ridgecrest Blvd and Randall Street to the intersection of Drummond Ave. and China Lake Blvd. In San Bernardino County the off-base 60 dB CNEL contour extends southeast to Trona Road. On-base, a single 60 dB CNEL contour extends outward from the 65 dB CNEL contour and over the airfield and the southern portions of Baker Range. The 60 dB CNEL contour extends in a hook shape west of Baker Range target B-1.

As shown in Table 5-4, a total of 21,195 acres off-base fall within the 60 to 64 dB CNEL noise range, 8,417 acres fall within the 65 to 69 dB CNEL noise range, 3,151 acres are located within the 70 to74 dB CNEL noise range, and 26 acres are within the 75 to79-dB CNEL noise range.

Table 5-4 Area under Projected Noise Contours (acres)

dB CNEL Range	Off-Base	On-Base	Total
60-64	21,195	27,542	48,737
65-69	8,417	11,824	20,241
70-74	3,151	9,875	13,027
75-79	26	6,490	6,516
80-84	0	2,424	2,424

Table 5-4 Area under Projected Noise Contours (acres)

dB CNEL Range	Off-Base	On-Base	Total
85+	0	1,934	1,934
Total	**32,789**	**60,089**	**92,878**

5.3.3 Comparison of 2007 AICUZ and 2011 AICUZ Noise Contours

Table 5-5 illustrates the aggregate differences between the 2007 AICUZ and 2011 AICUZ noise contours. The 60 dB CNEL projected noise contours increased by approximately 63,000 acres from the 2007 AICUZ study. As discussed in Section 5.2.3, Noise Modeling Methodology, the 2007 AICUZ study did not model Baker Range sorties or terrain and appropriate ground impendence to which increases in the noise contours are primarily attributed. The hard-packed desert terrain/ground in the vicinity is closer in impedance to "acoustically hard" than "acoustically soft" impedance. This study modeled the ground around NAWS as "acoustically hard" in order to more accurately reflect the desert surrounding the airfield. Therefore the increase in noise contours from the 2007 AICUZ study for the most part reflect the enhanced ability of the noise model to capture the noise environment rather than an increase in noise heard on the ground.

Noise contours in this AICUZ study update reflect the culmination of the number and type of aircraft, aircraft operations, and noise model changes evaluated in the November 2008, August 2009, and February 2010 supplemental noise studies. The modeling used in the 2011 AICUZ study update more accurately reflects the noise environment at NAWS.

Table 5-5 Comparison of Area Encumbered by Noise Contours (acres)

dB CNEL Range	2007 AICUZ	Prospective	Change
60-64	12,833	48,737	+35,904
65-69	8,655	20,241	+11,586
70-74	4,459	13,027	+8,568
75-79	2,275	6,516	+4,241
80-84	922	2,424	+1,502
85+	776	1,934	+1,158
Total	**29,920**	**92,878**	**+62,958**

5.4 Complaints and Noise Abatement Procedures

The Public Affairs Office of the Naval Air Warfare Center Weapons Division (NAWCWD) received 102 total complaints between January 2007 and March 2010 (Table 5-6). Of the 102 complaints received, seven originated from the City of Ridgecrest and six originated from Inyokern. Complaints received by NAWCWD include low-level flight, high noise, and supersonic complaints for the R-2508 Airspace Complex, under which the City of Ridgecrest and Inyokern lie (see Figure 2-3). Noise complaints originating from the City of Ridgecrest and

Inyokern are assumed to be the result of Armitage Airfield and Baker Range flight operations at NAWS.

As part of a coordinated effort to reduce the effects of noise on the community, NAWS participates in a variety of activities to increase public awareness and understanding of its mission. NAWS personnel regularly participate in project planning meetings in Ridgecrest, as well as in other surrounding communities. In addition, when possible, the public is provided with advance notice of testing activities that may generate excessive noise.

Table 5-6 R-2508 Airspace Complex Complaints

	2007	2008	2009	2010 (Jan. - Mar.)	Total
City of Ridgecrest	3	3	1	0	7
Inyokern	0	5	1	0	6
Other Areas	26	18	35	10	89
Total Complaints[1,2]	29	26	37	10	102
Total Number of Independent Events	14	19	27	10	70

Source: Naval Air Warfare Center Weapons Division 2010

[1] Complaints received by NAWCWD reflect flights from commands stationed at NAWS as well as out-of-area squadrons that fly in the R-2508 airspace complex

[2] Noise complaints reflect number of calls received by NAWCWD not number of over flights. Multiple noise complaints may refer to a single overflight (see total number of independent events).

Noise abatement procedures are also in place to minimize the effects of noise on the community (NAWS 2000). These procedures include:

- **General Noise Abatement Procedures.** General noise abatement procedures include the following:
  1. Local flight paths avoid populated areas whenever possible,
  2. When possible, aircraft approach the airfield from east of Ridgecrest,
  3. Touch-and-go operations are restricted to the minimum number needed for mission completion,
  4. Engine run-ups are conducted as far away from Ridgecrest as possible.

6 Land Use Compatibility Analysis

This section of the AICUZ study considers the potential noise and safety implications of projected airfield flight operations as a basis for evaluating land use compatibility within defined AICUZ planning areas. The section begins by acknowledging NAWS' adoption of the Consolidated Departure Alternative in the 2007 AICUZ study. The relevant planning areas are then defined, including an "AICUZ footprint" and "Military Influence Area." The section continues with an overview of the land use compatibility guidelines used in the analysis, followed by the results of the analysis for the 2011 AICUZ footprint.

6.1 Definition of the AICUZ Footprint

The AICUZ footprint encompasses noise contours of 60 dB CNEL and higher (i.e., Noise Zones 1, 2 and 3) as well as the primary surface, clear zones, and APZs I and II surrounding an airfield's runways. The AICUZ footprint is further defined as the minimum area within which land use controls are considered necessary to promote compatible land use development and to protect the health, safety, and welfare of those living on or near a military airfield. Figure 6-1 presents the 2011 AICUZ footprint for Armitage Airfield and Baker Range based on the projected level of airfield operations, run-up operations, and Baker Range sorties.

The 2011 AICUZ footprint can be compared with the 2007 AICUZ footprint (see Figures 4-3 and 5-2 for 2007 AICUZ APZs and 2007 AICUZ noise environment) to see how changes in aircraft types, flight route profiles, operations tempo, and other factors have influenced the shape of the footprint over time. Recommendations set forth in the 2007 AICUZ study have been adopted as policy guidance in the City of Ridgecrest's 2010 General Plan. The 2007 AICUZ addresses airfield operations only, whereas the 2011 AICUZ study includes range sorties as well as airfield operations. In general, the 2011 AICUZ footprint has expanded substantially in on- and off-base areas when compared with the 2007 AICUZ footprint.

As illustrated in Figure 6-1, the superimposed noise exposure levels and APZ boundaries create subzones within the AICUZ footprint, representing different combinations of noise and APZ exposure. The 2011 AICUZ footprint includes nine different subzones. The subzones with the highest noise and accident potential include combinations of the primary surfaces, clear zones, and APZ I with Noise Zone 3. APZ II areas at Armitage Airfield have a reduced but still measurable potential for aircraft incidents and occur in conjunction with Noise Zones 2

and 3 only. As shown in Figure 6-1, all of the areas that coincide with both noise zones and APZ areas occur within NAWS boundaries.

The AICUZ footprint also includes three subzones that occur outside the APZs. These subzones correlate with low to high noise exposure in Noise Zones 1, 2 and 3, respectively, but with lower potential for aircraft incidents than is assumed in the clear zones and APZs. Subzones that occur outside APZs are the only subzones that extend off-base. The off-base portion of the AICUZ footprint comprises 21,195 total acres of land associated with Noise Zone 1; 11,568 total acres of land associated with Noise Zone 2; and 26 total acres of land associated with Noise Zone 3. The amount of land within each of the 15 applicable 2011 AICUZ subzones at Armitage Airfield and Baker Range is displayed in Table 6-1.

Table 6-1 Land Area Within AICUZ Subzones (Acres): Projected Scenario

Accident Potential Zones		Noise Zones 1 60-64 dB CNEL	2 65-74 dB CNEL	3 75+ dB CNEL
Primary Surface		0	0	778
Clear Zone		0	0	782
APZ I		0	6	683
APZ II		0	24	940
Outside APZs	*On-base*	55,054	21,689	973
	Off-base	21,195	11,568	26

6.2 Definition of the Military Influence Area

According to the state's OPR, a MIA is "a formally designated geographic planning area where military operations may impact local communities and, conversely, where local activities may affect the military's ability to carry out its mission" (State of California 2006). The MIA concept is included in the California Advisory Handbook for Community and Military Compatibility Planning (State of California 2006), where it is acknowledged as a useful planning tool for accomplishing the following purposes:

- Promote an orderly transition between community and military land uses so that land uses remain compatible.
- Protect public health, safety, and welfare.
- Maintain operational capabilities of military installations and areas.
- Promote the awareness of the size and scope of military training areas in order to protect areas separate from the actual military installation (i.e., critical air and sea space) used for training purposes.

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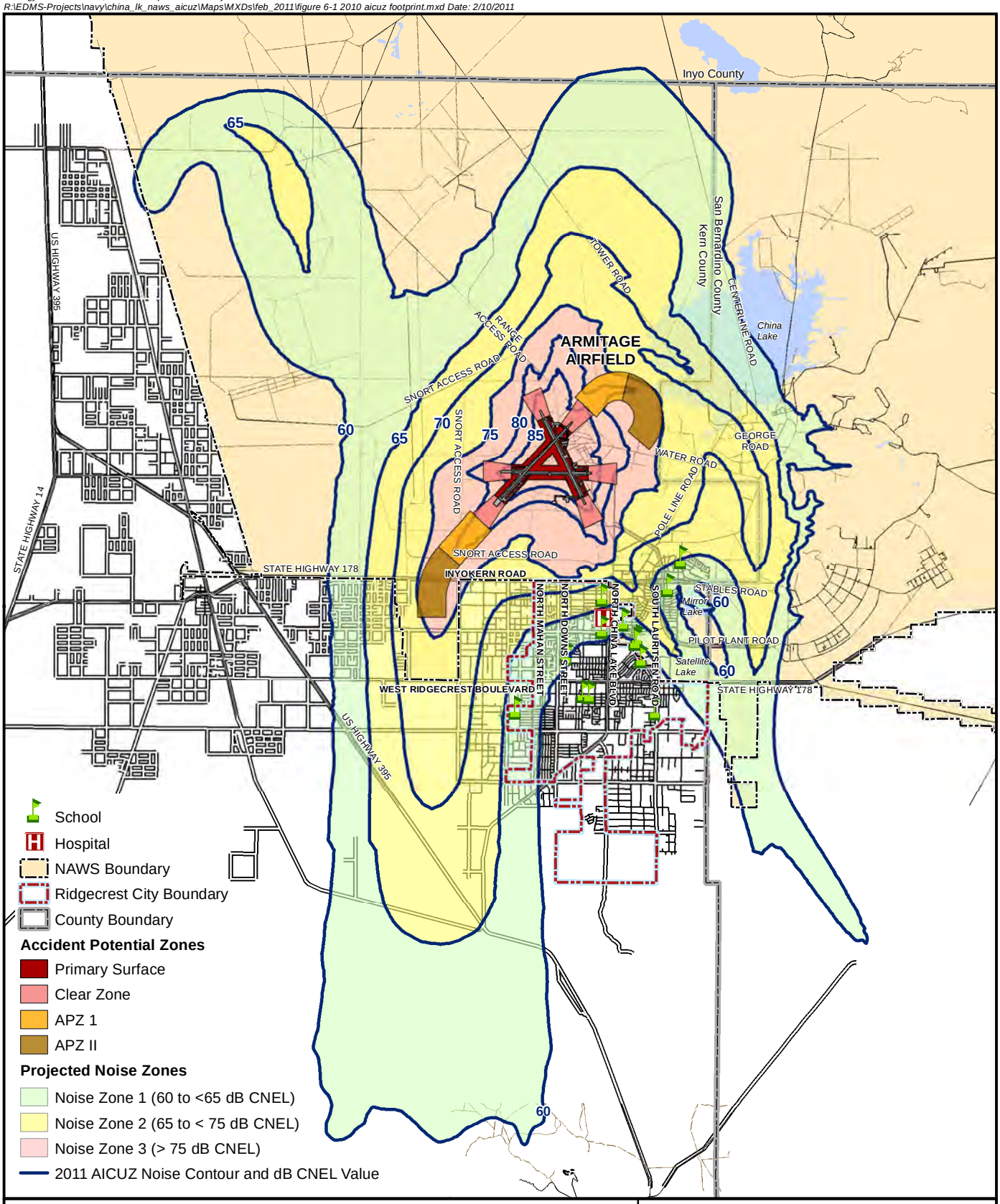

Figure 6-1
2011 AICUZ Footprint

NAWS China Lake
Ridgecrest, California

0 0.5 1 2 3 4 5 6
Miles
Scale 1:175,000

- Establish compatibility requirements within the designation area, such as requirements for sound attenuation, real estate disclosure, and navigation easements.

According to the OPR, an MIA should be incorporated into the local planning process through a community's general plan and zoning ordinance. NAWS recommends the designation of an MIA that is larger than the traditional AICUZ footprint in order to address flight safety issues beneath flight corridors and to encourage retention of a buffer zone of compatible land use in case of future expansion of the NAWS mission. The designation of an MIA is also consistent with Navy AICUZ Program guidelines as described in OPNAVINST 11010.36C. Figure 6-2 depicts the MIA as adopted in the 2010 City of Ridgecrest General Plan.

The MIA includes the 2007 AICUZ footprint and all land within the primary arrival and departure flight corridors. Noise Zone 1 of the 2007 AICUZ study was used as a proxy for potential expansion of the 2007 noise contours should NAWS experience future increases in operational tempo.

The geographical location and extent of future noise contours depends on the specific nature of future operations (e.g., runway distribution, aircraft type, type of operation, etc.). However, if these variables remained constant and only the number and frequency of operations were to increase, the 65 dB CNEL noise contour would tend to expand toward the 60 dB CNEL contour. Such an expansion could occur, for example, in conjunction with future Base Closure and Realignment (BRAC) initiatives required by Congress.

Land within the 2007 AICUZ primary flight corridors (beyond the standard APZs) was also included in the MIA in an effort to minimize the risks of aircraft accidents that can occur beyond the runway environment. In this area the establishment of criteria that limits the maximum number of dwellings is encouraged as a method of reducing the potential severity of an aircraft accident. Despite NAWS' efforts to establish and conform to specific flight routes that maximize avoidance of developed areas, some variation or deviation from established flight routes should be expected to occur in response to weather conditions, ambient temperature, mission loading of aircraft, and other factors discussed in Section 3.4. The MIA reflects this potential variation. The corridors are included because of the inherent risk of aircraft incidents (e.g., equipment drops, crashes, etc.).

As described in Section 4.3, two aircraft crashes previously occurred off-base, one each under the main departure and arrival corridors. (Although in the latter case the aircraft experienced problems during departure and was attempting to return to Armitage Airfield when it crashed.) These flight corridors represent areas where aircraft operations are concentrated and where accident potential and safety risks are inherently greater than in areas subject to infrequent overflights. Following release of the 1977 AICUZ study, acknowledgment of these increased risks resulted in the acquisition of additional land by NAWS to extend the base boundaries southward under parts of these two corridors. However, due to the inherent

variability of actual aircraft flight paths within each corridor, the area of increased risk remains larger than the area previously acquired and continues to extend off-base. Accordingly, NAWS recommends an MIA that includes larger portions of the primary flight corridors (including the diagonal TACAN corridor), as shown on Figure 6-2.

The MIA is a forward-looking planning designation provided in the hope that planning and development of local communities will seek to minimize future constraints on NAWS operations and to safeguard NAWS' mission capability. NAWS encourages local government planning authorities to:

- Adjust the MIA to meet Kern County, San Bernardino County, and the City of Ridgecrest planning needs.
- Recognize the MIA as an area of increased risk to public health and safety in their General Plans.
- Minimize new residential development within the flight corridor areas and minimize the density of other types of land use within these areas of increased risk.
- Require appropriate notification of aircraft noise and flight safety risk to real estate agents, buyers, sellers and residents of land within the flight corridor areas of the MIA.
- Continue to provide NAWS the opportunity to work with local planners on specific development proposals in the MIA to identify appropriate land use controls that will reduce public safety risks while meeting the growth needs of the community and providing for the long-term sustainability of the NAWS mission.

6.3 Land Use Compatibility Guidelines

The analysis of land use compatibility in AICUZ planning areas is based on federal government guidelines contained in OPNAVINST 11010.36C. These guidelines are used for land use planning and analysis by the Navy and other branches of the Department of Defense, the Environmental Protection Agency, the Department of Housing and Urban Development, and the Veterans Administration. The guidelines address land use compatibility as a function of both noise exposure and accident potential, and are presented in Appendix B.

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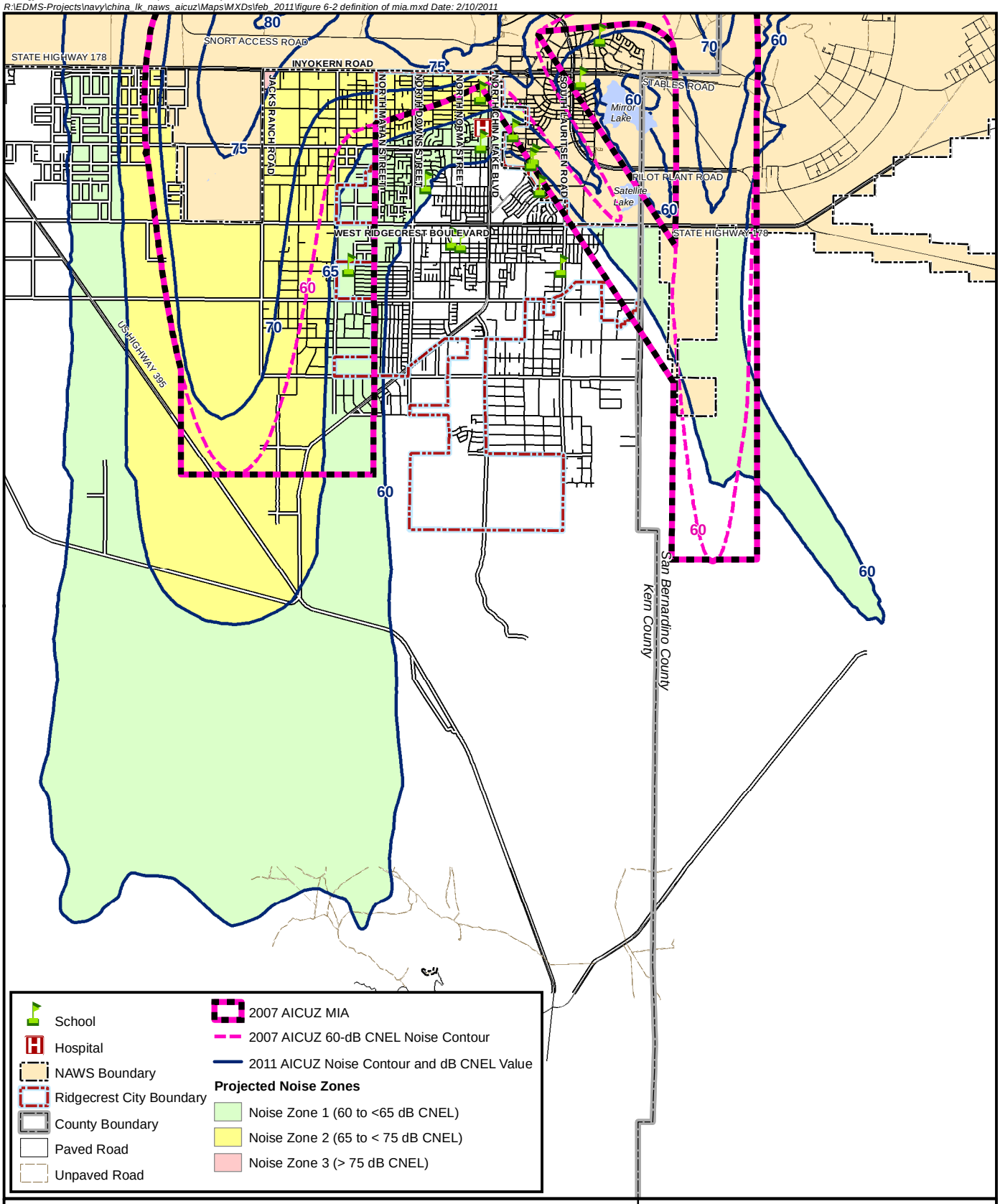

Figure 6-2
2007 Military Influence Area (MIA)
and 2011 AICUZ Noise Environment

NAWS China Lake
Ridgecrest, California

0 0.5 1 2 3 4
Miles
Scale 1:115,000

According to the guidelines for noise exposure, some land use categories (e.g., manufacturing/industrial) are deemed compatible at lower noise exposure levels (less than 70 dB CNEL) and compatible under specific conditions, i.e., "compatible with restrictions," at higher noise exposure levels. Compatible with restrictions generally requires the incorporation of additional noise attenuation measures in the design and construction of structures to achieve a greater Noise Level Reduction (NLR) than afforded by standard construction materials. These additional measures address noise reduction strategies for internal noise levels only and do not address increased noise exposure levels that may occur outside a dwelling.

Residential land use categories are incompatible with noise exposure levels at or above 75 dB CNEL (Noise Zone 3), incompatible with exceptions in areas within the 65 to 74 dB CNEL contour (Noise Zone 2), and compatible with restrictions within the 60 to 64 dB CNEL contour (Noise Zone 1). Residential uses are discouraged at noise exposure levels of 65-69 dB CNEL and strongly discouraged in areas of 70-74 dB CNEL, unless there is an absence of viable development options and a demonstrated community need could not be met without the development. Where a community determines that the residential development should be allowed, measures to achieve an NLR of at least 25 dB CNEL in areas affected by 65-69 dB CNEL, and an NLR of at least 30 dB CNEL in areas of 70-74 dB CNEL, should be incorporated into building codes and project approval requirements. Common measures used to achieve NLRs include using a higher grade of insulation and double-pane windows. Since normal permanent construction typically provides an NLR of 20 dB CNEL, the reduction requirements are sometimes stated as 5, 10, or 15 dB CNEL over standard construction.

Compatibility guidelines associated with APZ's are similarly defined. Conditions placed on the compatibility, compatible with restrictions, incompatible with exceptions, and incompatible designations are based on the densities of people and structures, so site-specific evaluation of varying densities may be needed. In order to assist installations and local governments, general suggestions as to floor/area ratios are provided as a guide to density in some categories. In general, land use restrictions that limit commercial, services, or industrial buildings or building occupants to 25 per acre in APZ I and 50 per acre in APZ II are the range of occupancy levels considered to be low density. Outside events should normally be limited to assemblies of not more than 25 people per acre in APZ I and maximum (Max) assemblies of 50 people per acre in APZ II.

In general, residential land use is incompatible with the accident potential in the CZ, APZ I, or APZ II; however, detached single-family housing with a maximum density of one to two dwelling units per acre (DU/acre) is compatible with restrictions with accident potential in APZ II.

Compatibility with Navy recommendations should be considered along with specific local land use development criteria by local governments in their decision making processes. The guidelines for suggested land use are also nationwide in scope. Since many air installations are in urban areas, these guidelines assume an

urban environment with higher levels of ambient "background" noise than might exist in rural and suburban areas. These compatibility guidelines are, therefore, sometimes modified at the local government level to address a specific local noise environment.

6.4 Compatibility Analysis for the AICUZ Footprint (Off-Base)

This section evaluates land use compatibility in off-base areas of the AICUZ footprint (on-base land use is addressed below in Section 6.7). Land use surrounding NAWS is represented by zoning designations adopted by the City of Ridgecrest and Kern and San Bernardino Counties. The compatibility of these local zoning designations with the noise and accident potential associated with NAWS operations is assessed based on the AICUZ guidelines contained in OPNAVINST 11010.36C (Appendix B). Zoning has been selected to represent local land use because:

- Zoning designations are required to be consistent with the underlying land use designation of a General Plan, therefore they are considered to be the most accurate indicator of current land use in an area, short of aerial photography and field surveys;

- Zoning designations are a reasonable indicator of intended future land use as they represent the guidelines by which cities and counties approve new development; and

- Compatibility analysis of land use zoning patterns is consistent with Navy AICUZ Program guidance.

Therefore, for the purposes of this land use compatibility analysis, zoning designations will be used for the analysis of off-base land use conditions. The methodology for identifying Navy compatibility guidelines that are equivalent to zoned land uses surrounding NAWS is provided in Appendix A.

6.4.1 Noise Exposure

Table 6-2 identifies the distribution of off-base land within the 2011 AICUZ footprint by land use classification and noise exposure range. The following is a discussion of the land use compatibility of specific areas within each noise range.

6.4.1.1 Kern County

As shown in Table 6-2, most of the off-base lands within the 2011 AICUZ footprint are located in the unincorporated area of Kern County (27,037 acres); 16,613 acres are within the 60 to 64 dB CNEL contour; 7,484 acres are within the 65 to 69 dB CNEL contour; 2,916 acres are within the 70 to 74 dB CNEL contour; and 24 acres are within 75 to 79 dB CNEL contour (Noise Zone 3). Noise Zone 3 only extends off-base in areas of unincorporated Kern County. The 24-acre parcel is located at the intersection of Inyokern Road and Jacks Ranch Road and is zoned for residential use in 2.5-acre estate parcels, as shown in Figure 6-3 and

6-3b. According to Navy recommendations, residential land use in this area is incompatible with this level of noise exposure and is strongly discouraged. In the event that county authorities determine that residential development in this area should be allowed, it is recommended that measures to achieve an NLR of 30 dB CNEL be incorporated into building codes and be made a condition of individual approvals.

Table 6-2 Off-base Land Use Classifications and Noise Exposure in the 2011 AICUZ Footprint (acres)

	dB CNEL Range					
	60-64	65-69	70-74	75-79	80-84	85+
Kern County Unincorporated						
Agriculture	8,795	581	549	0	0	0
Cultural/ Entertainment/ Rec.	134	593	34	0	0	0
Floodplain Primary	0	2	8	0	0	0
Manufacturing	0	4	108	0	0	0
Open Space	2,798	2,652	1,264	0	0	0
Residential	4,801	3,625	953	24	0	0
Services	85	27	1	0	0	0
Kern Co. Subtotals	**16,613**	**7,484**	**2,916**	**24**	**0**	**0**
City of Ridgecrest						
Cultural/ Entertainment/ Rec.	58	13		0	0	0
Manufacturing	152	46	39	0	0	0
Open Space	35			0	0	0
Residential	1,051	330	62	0	0	0
Services	205	111	35	0	0	0
Ridgecrest Subtotals	**1,502**	**500**	**136**	**0**	**0**	**0**
San Bernardino County Unincorporated						
Cultural/ Entertainment/ Rec.	2,123	0	0	0	0	0
Residential	236	0	0	0	0	0
San Bernardino Co Subtotal	**2,359**	**0**	**0**	**0**	**0**	**0**
Roads						
No Zoning (roads)	721	433	99	3	0	0
Total	**21,195**	**8,417**	**3,151**	**26**	**0**	**0**

Notes: Totals may not sum exactly due to rounding.

The 65 to74 dB CNEL noise range (Noise Zone 2) overlays 1,130 acres classified as agricultural, 627 acres classified as cultural/entertainment/recreation, 10 acres zoned as floodplain primary, 112 acres classified as manufacturing, 3,916 acres as open space, 4,578 acres as residential, and 28 acres as service. Agricultural, cultural/entertainment/recreation, manufacturing, and service land uses are considered compatible with restrictions within Noise Zone 2. Navy-recommended restrictions for these areas include NLR of 25 to 30 dB CNEL depending on noise exposure for residential and cultural/ entertainment/ recreation buildings. In areas of 70 to 74 dB CNEL noise exposure, an NLR of 25 is recommended for service and office areas of manufacturing land uses (see Figures 6-3b and 6-3e for more detailed information on land uses). The Navy recommends that residential land uses be classified as incompatible with exceptions within Noise Zone 2. These land uses include areas zoned in ¼-acre to 20-acre estate parcels and mobile home

parks and are generally located east of Clifford Street in China Lake Acres and areas in unincorporated Kern County west of North Mahan Street (directly west from the City of Ridgecrest) and west of Bradley Street (south of the City of Ridgecrest). Residential land uses are strongly discouraged. However, if the county authorities allow residential development in this area a NLR of 30 dB CNEL is recommended. Open space and floodplain primary land uses do not have noise recommendations.

In the 60 to 64 dB CNEL noise exposure range (Noise Zone 1), the 2011 AICUZ footprint includes 16,613 acres in unincorporated Kern County, distributed as shown in Table 6-2, across agriculture, culture/entertainment/recreation, open space, residential, and services land uses. Residential and culture/entertainment/ recreation land uses are considered compatible with restrictions within the 60 to 64 dB CNEL noise range. Recommendations for these land uses include outdoor and indoor noise mitigation measures. Residential land uses are generally located between Everett Street and North Calvert Blvd in China Lake Acres extending south from West Inyokern Road as well as areas south of Ridgecrest extending between Bradley Street and Sims Street to south of Highway 395 and includes parcels zoned for ¼-acre to 20-acre estate parcels (Figures 6-3b, 6-3e, and 6-3f). All other identified land uses within Noise Zone 1 are compatible or do not have Navy noise recommendations.

6.4.1.2 City of Ridgecrest

In the City of Ridgecrest the AICUZ footprint overlays areas west of Sims Street and diagonally north from the intersection of Ridgecrest Blvd and Randall Street to the intersection of Drummond Ave. and China Lake Blvd (see Figures 6-3b and 6-3c). This area corresponds to Noise Zone 1 (60 to 64 dB CNEL noise range) and Noise Zone 2 (65 to 74 dB CNEL noise range). Land uses in Noise Zone 2 include 13 acres zoned as cultural/entertainment/recreation, 85 acres zoned as manufacturing, 392 acres zoned as residential, and 146 acres zoned as services. Per the AICUZ compatibility guidelines, residential land use in this area is incompatible with exceptions with this level of noise exposure and is therefore discouraged. However, in the event that city authorities determine that additional residential development in this area should be allowed, it is recommended that measures to achieve an NLR of 30 dB CNEL in areas in the 70 to 74 dB CNEL noise range and an NLR of 25 dB CNEL in areas in the 65 to 69 dB CNEL noise range be incorporated into building codes and be made a condition of individual approvals. Residential land uses include 66 acres zoned medium density residential, the majority of which is located on the southeast block from Inyo Street and West Inyokern Road, the southeast block from West Ward Avenue and Downs Street, and the southwest block from Moyer Avenue and Knox Road. Areas zoned low-density residential (325 acres) are generally interspersed with areas zoned as services and located south of Ward Avenue to the 65 dB CNEL noise contour. Cultural/entertainment/recreation, manufacturing, and services land uses are considered compatible with restrictions with Navy recommendations. Restrictions for these areas are identical to those for similar land uses in Noise Zone 2 in unincorporated Kern County.

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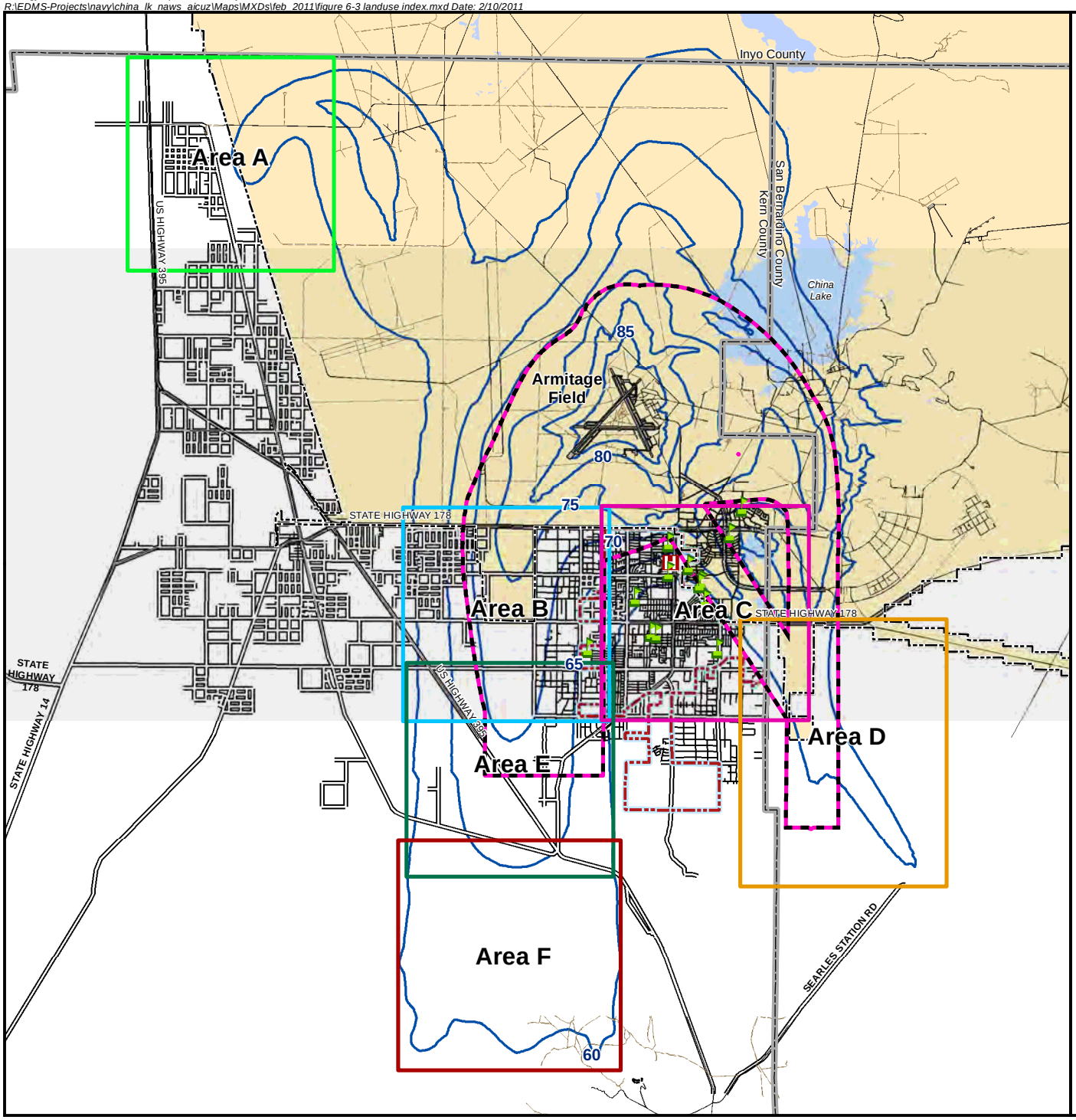
Figure 6-3
Off-Station Land Use
Figure Index

NAWS China Lake
Ridgecrest, California



School
Hospital
2011 AICUZ Noise Contour and dB CNEL Value
2007 Military Influence Area
NAWS Boundary
Ridgecrest City Boundary
County Boundary

Figure Locator

Area A (Figure 6-3a)
Area B (Figure 6-3b)
Area C (Figure 6-3c)
Area D (Figure 6-3d)
Area E (Figure 6-3e)
Area F (Figure 6-3f)

N

0 0.5 1 2 3 4 5
Scale 1:200,000 Miles

Ecology & Environment, Inc. GIS Department Project:
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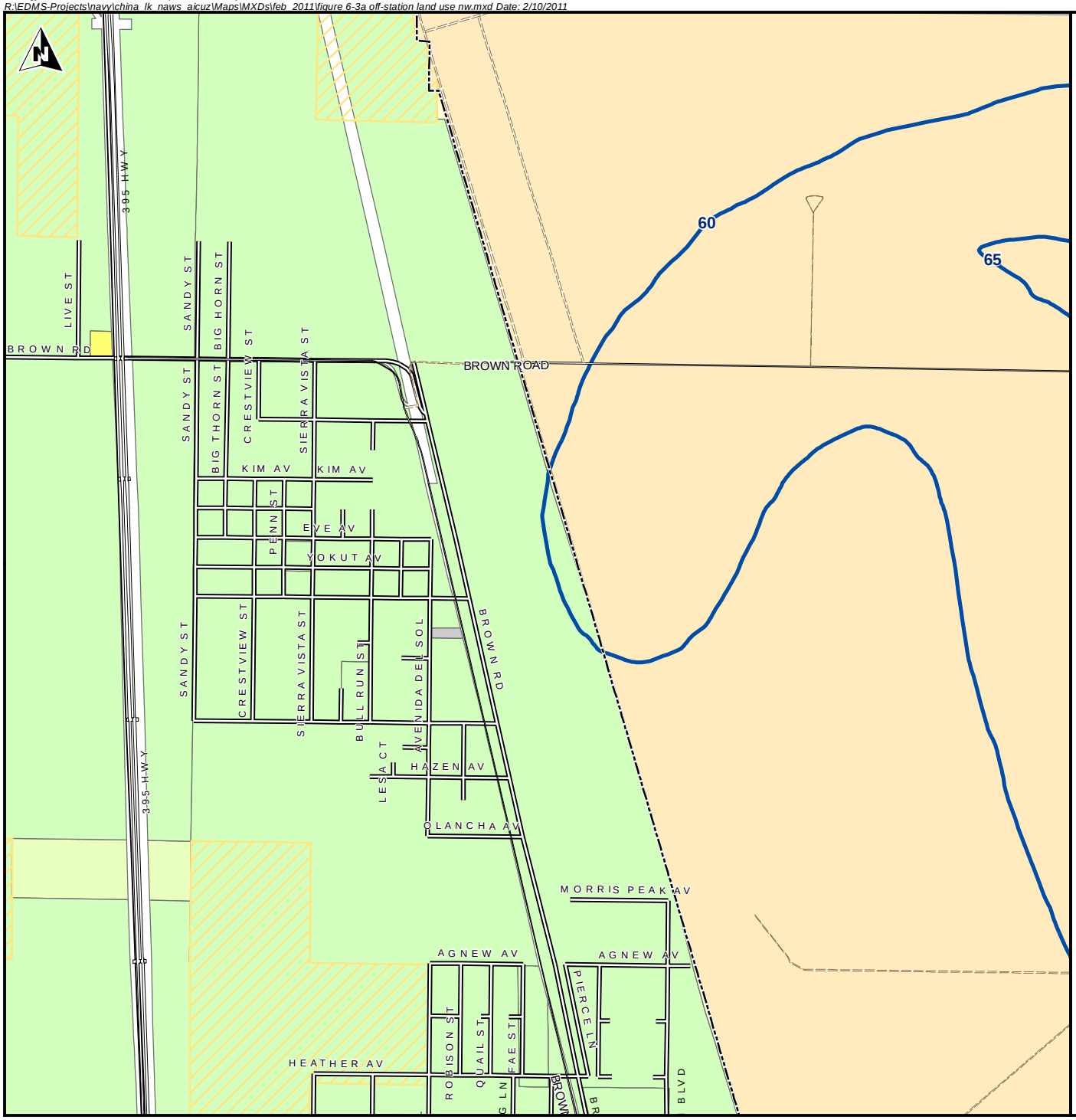

Figure 6-3a
Off-Station Land Use
North Northwest
(Area A)

NAWS China Lake
Ridgecrest, California

- 2011 AICUZ Noise Contour and dB CNEL Value
- NAWS Boundary
- Bureau of Land Management

Kern County Zoning

- A (Exclusive Agriculture)
- A-1 (Limited Agriculture)
- C-2 (General Commercial)
- M-1(Light Manufacturing)
- OS (Open Space)

0 0.125 0.25 0.5 0.75 1
Scale 1:39,000 Miles

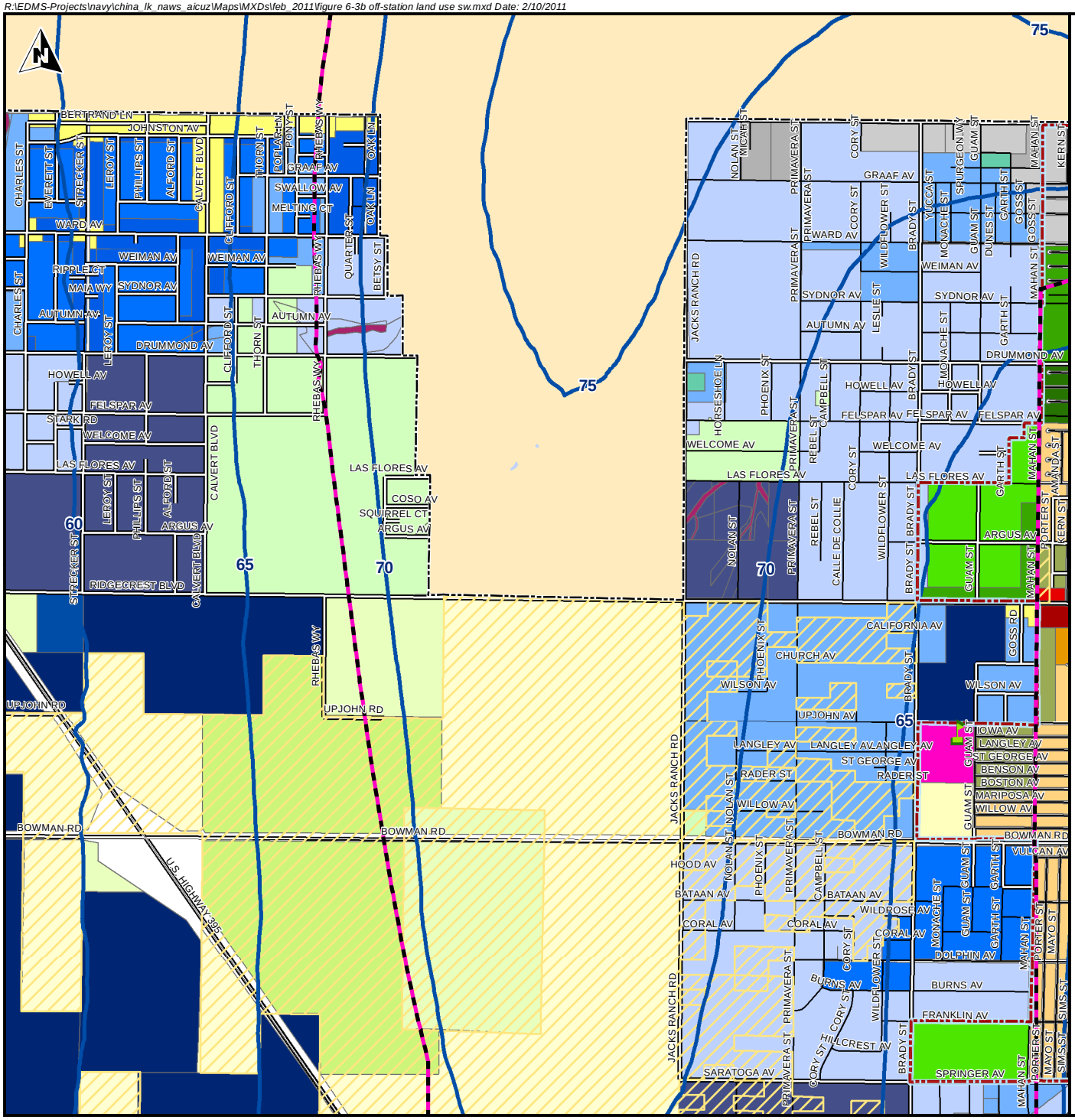

Figure 6-3b
Off-Station Land Use
Southwest
(Area B)

NAWS China Lake
Ridgecrest, California

School
2011 AICUZ Noise Contour and dB CNEL Value
NAWS Boundary
2007 Military Influence Area
Ridgecrest City Boundary
Bureau of Land Management

City of Ridgecrest Zoning

- A-5 (Agriculture)
- CG (Commercial/Office) & R-3 (Residential- Medium Density)
- CI (Civic and Institutional District)
- CN (Commercial/Office)
- CS (Commercial/Office)
- Commercial General
- E-1(Residential - Low Density)
- E-2 (Residential - Low Density)
- E-3 (Residential - Low Density)
- M-1(Light Manufacturing)
- M-2 (Medium Industrial)
- PO (Commercial/Office)
- R-1 (Residential- Low Density)
- R-2 (Residential- Low Density)
- R-3 (Residential- Medium Density)
- R-4 (Residential- High Density)
- RMH (Residental- Low Density)
- RSP (Recreation, Schools, Public Use)
- UR (Open Space)

Kern County Zoning

- A (Exclusive Agriculture)
- A-1 (Limited Agriculture)
- C-2 (General Commercial)
- E(20) (Estate 20 Acres)
- E(10) (Estate 10 Acres)
- E(5) (Estate 5 Acres)
- E (2 1/2) (Estate 2.5 Acres)
- E(1) (Estate 1 Acre)
- E(1/2) (Estate 0.5 Acres)
- E(1/4) (Estate 0.25 Acres)
- FPP (Flood Plain Primary)
- M-1(Light Manufacturing)
- M-2 (Medium Industrial)
- MP (Mobile Home Park)
- NR(20) (Natural Resource 20 Acres)
- OS (Open Space)

0 0.125 0.25 0.5 0.75 1
Scale 1:39,000 Miles

Ecology & Environment, Inc. GIS Department Project:
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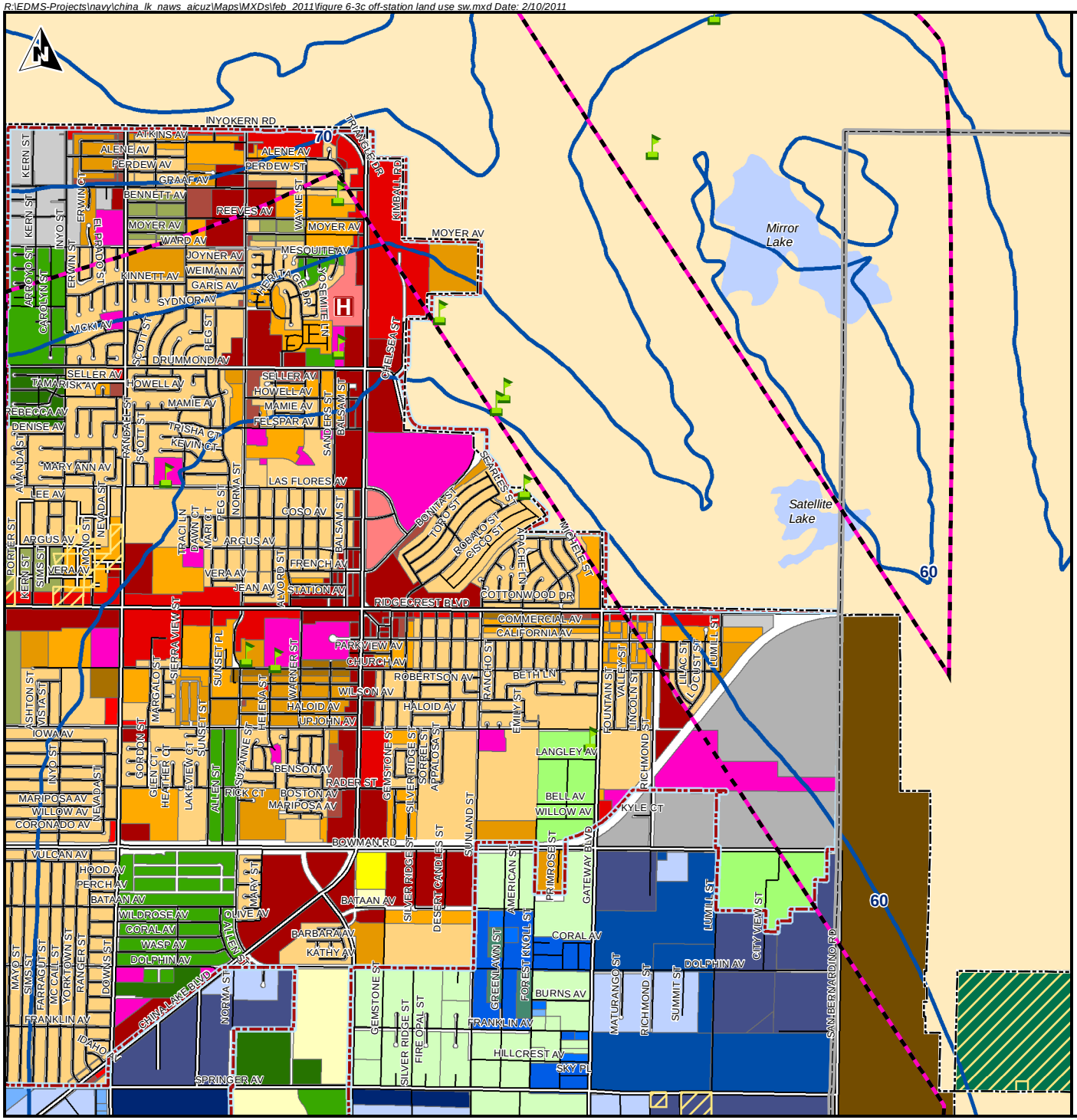

Figure 6-3c
Off-Station Land Use
Southwest
(Area C)

NAWS China Lake
Ridgecrest, California

School
Hospital
2011 AICUZ Noise Contour and dB CNEL Value
NAWS Boundary
2007 Military Influence Area
Ridgecrest City Boundary
County Boundary
Bureau of Land Management

City of Ridgecrest Zoning

- A-5 (Agriculture)
- CG (Commercial/Office) & R-3 (Residential- Medium Density)
- CI (Civic and Institutional District)
- CN (Commercial/Office)
- CS (Commercial/Office)
- Commercial General
- E-2 (Residential - Low Density)
- E-3 (Residential - Low Density)
- M-1(Light Manufacturing)
- M-2 (Medium Industrial)
- PO (Commercial/Office)
- R-1 (Residential- Low Density)
- R-2 (Residential- Low Density)
- R-3 (Residential- Medium Density)
- R-4 (Residential- High Density)
- RMH (Residental- Low Density)
- RSP (Recreation, Schools, Public Use)
- UR (Open Space)

Kern County Zoning

- A-1 (Limited Agriculture)
- C-1 (Neighborhood Commercial)
- E(20) (Estate 20 Acres)
- E(10) (Estate 10 Acres)
- E(5) (Estate 5 Acres)
- E (2 1/2) (Estate 2.5 Acres)
- E(1) (Estate 1 Acre)
- E(1/2) (Estate 0.5 Acres)
- E(1/4) (Estate 0.25 Acres)
- M-2 (Medium Industrial)
- MS (Mobile Home Subdivision)

San Bernardino County Zoning

- Resource Conservation
- Rural Living

0 0.125 0.25 0.5 0.75 1
Scale 1:39,000 Miles

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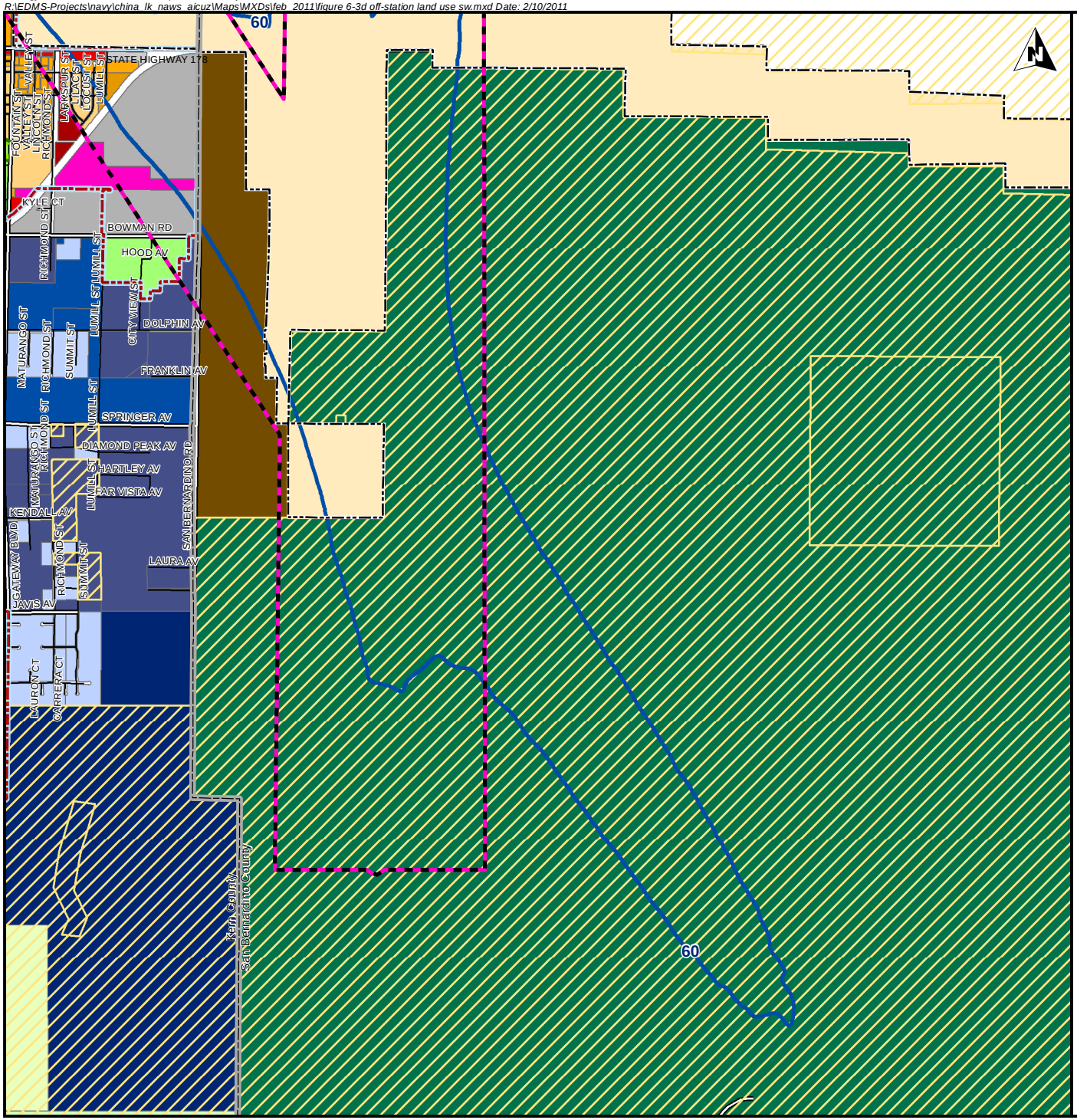

Figure 6-3d
Off-Station Land Use
Southeast
(Area D)

NAWS China Lake
Ridgecrest, California

School

Hospital

2011 AICUZ Noise Contour and dB CNEL Value

NAWS Boundary

2007 Military Influence Area

County Boundary

Ridgecrest City Boundary

Bureau of Land Management

City of Ridgecrest Zoning

- A-5 (Agriculture)
- CS (Commercial/Office)
- Commercial General
- M-1(Light Manufacturing)
- M-2 (Medium Industrial)
- R-1 (Residential- Low Density)
- R-2 (Residential- Low Density)
- R-3 (Residential- Medium Density)
- RSP (Recreation, Schools, Public Use)
- UR (Open Space)

Kern County Zoning

- A (Exclusive Agriculture)
- A-1 (Limited Agriculture)
- E(20) (Estate 20 Acres)
- E(10) (Estate 10 Acres)
- E(5) (Estate 5 Acres)
- E (2 1/2) (Estate 2.5 Acres)
- M-2 (Medium Industrial)

San Bernardino County Zoning

- Resource Conservation
- Rural Living

0 0.25 0.5 1 1.5
Scale 1:50,000 Miles

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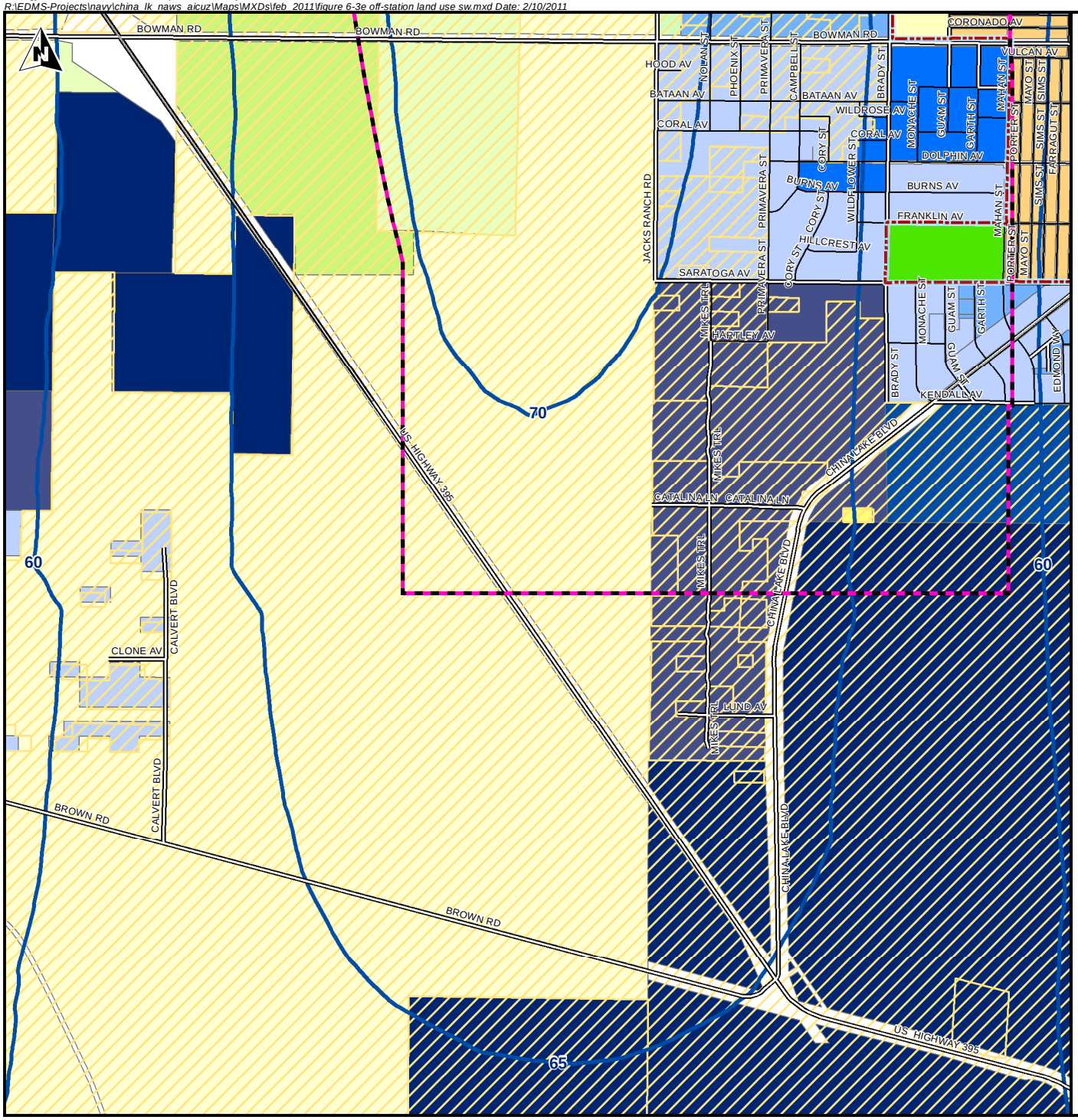

Figure 6-3e
Off-Station Land Use
South Central
(Area E)

NAWS China Lake
Ridgecrest, California

- 2011 AICUZ Noise Contour and dB CNEL Value
- 2007 Military Influence Area
- Ridgecrest City Boundary
- Bureau of Land Management

City of Ridgecrest Zoning

- E-1(Residential - Low Density)
- R-1 (Residential- Low Density)
- UR (Open Space)

Kern County Zoning

- A (Exclusive Agriculture)
- A-1 (Limited Agriculture)
- C-2 (General Commercial)
- E(20) (Estate 20 Acres)
- E(10) (Estate 10 Acres)
- E(5) (Estate 5 Acres)
- E (2 1/2) (Estate 2.5 Acres)
- E(1) (Estate 1 Acre)
- E(1/2) (Estate 0.5 Acres)
- E(1/4) (Estate 0.25 Acres)
- NR(20) (Natural Resource 20 Acres)
- OS (Open Space)

0 0.125 0.25 0.5 0.75 1
Scale 1:39,000 Miles

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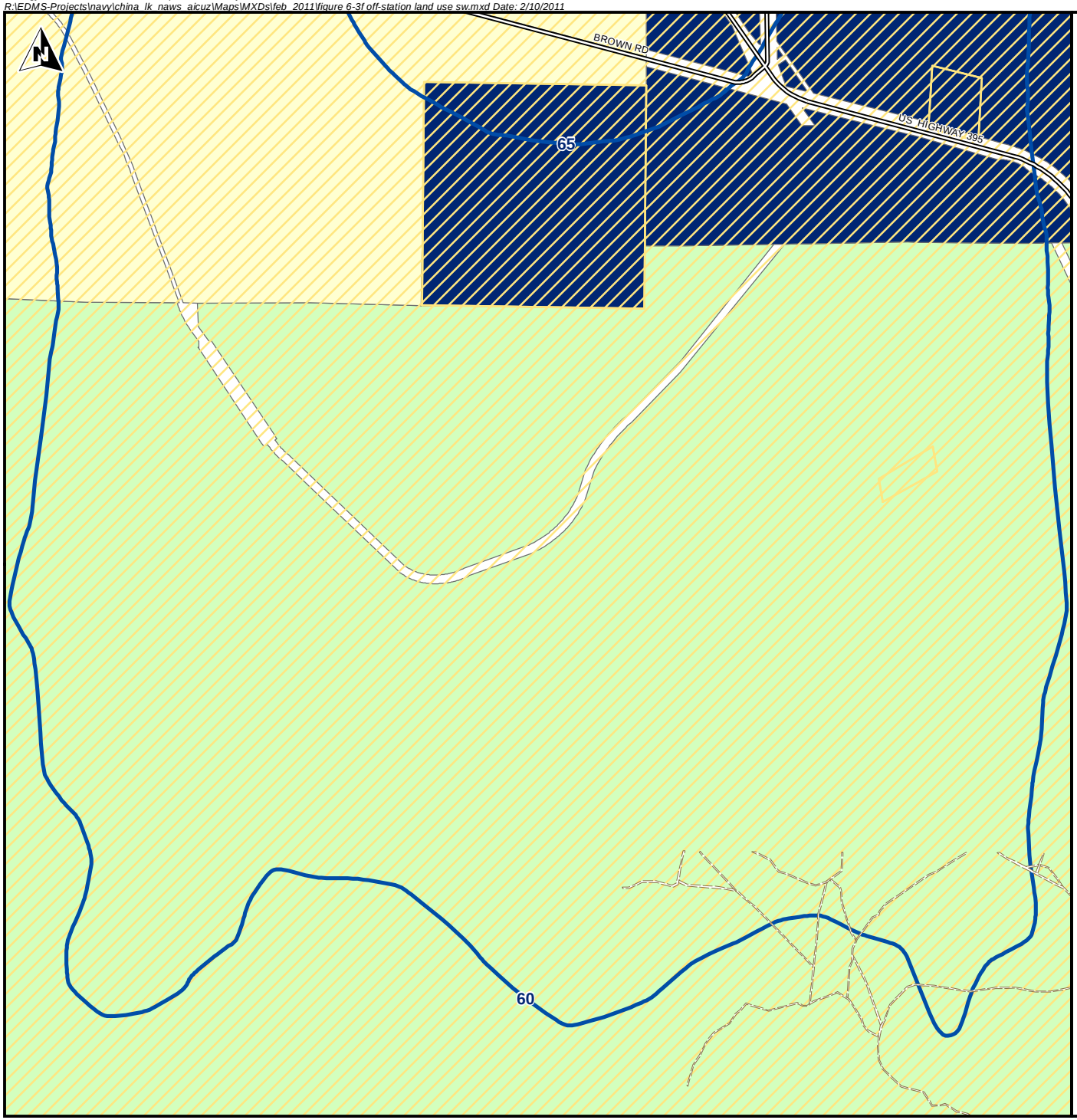

Figure 6-3f
Off-Station Land Use
South
(Area F)

NAWS China Lake
Ridgecrest, California

2011 AICUZ Noise Contour and dB CNEL Value

Bureau of Land Management

Kern County Zoning

A-1 (Limited Agriculture)

E(20) (Estate 20 Acres)

OS (Open Space)

0 0.125 0.25 0.5 0.75 1
Miles

Scale 1:42,000

Approximately 58 acres classified as cultural/entertainment/recreation, 152 acres classified as manufacturing, 35 acres classified as open space, 1,051 acres classified as residential, and 205 acres classified as services land uses are located in Noise Zone 1 in the City of Ridgecrest. Within Noise Zone 1 residential and cultural/entertainment/recreation land uses are considered compatible with restrictions. Residential land use in this area is predominantly zoned for low-density residential and occurs throughout the 60 to 64 dB CNEL noise contours. Cultural/entertainment/recreation land uses correspond to five RSP (recreation, schools, public use) zoned areas located at the corner of West Upjohn Ave and Guam Street (Faller Elementary School), at the corner of North Sierra View Street and West Las Flores Ave (Las Flores Elementary School), at the corner of Downs Street and West Vicki Ave (Luna Park), at the corner of Drummond Ave and China Lake Blvd.(Mesquite Continuation High School), and at the corner of San Bernardino Blvd. and East Radar Ave (Desert Memorial Park). Navy recommendations for residential and cultural/entertainment/recreation land use in Noise Zone 1 are identical to those for similar land uses and noise exposure in unincorporated Kern County. All other land uses in Noise Zone 1 are considered compatible or do not have Navy noise recommendations.

6.4.1.3 San Bernardino County

As shown in Figure 6-3d, the 2011 AICUZ footprint includes 2,359 acres extending southeast from the base to Trona Road. This land is zoned resource conservation (2,123 acres) and rural living (236 acres) and corresponds to cultural/entertainment/recreation and residential land use classifications. Cultural/entertainment/recreation and residential land use classifications are compatible with restrictions in Noise Zone 1. Restrictions for these areas are identical to those for similar land uses and noise exposure in unincorporated Kern County.

6.4.1.4 BLM Land Ownership

The 2011 AICUZ footprint includes approximately 4,533 acres of BLM land situated primarily in unincorporated Kern County and San Bernardino County (see Figure 6-3b, 6-3d, 6-3e, and 6-3f). Approximately 1,559 acres of BLM-owned land is within Noise Zone 1 (60 to 64 dB CNEL) and 2,974 acres are within Noise Zone 2 (65- to 74-dB CNEL). This land is currently undeveloped and is not influenced by Kern County, the City of Ridgecrest, or San Bernardino County zoning controls. Should this area ever be acquired from the BLM, county and city planners would be encouraged to maintain the area in an undeveloped state because of its location under the primary departure and arrival corridors.

6.4.2 Accident Potential

As depicted in Figure 6-1, the CZ and APZ portions of the 2011 AICUZ footprint are contained entirely within NAWS boundaries. Accordingly, land use compatibility with respect to accident potential is not an issue for city and county lands within the AICUZ footprint. The compatibility of on-base land use as it relates to accident potential is discussed in Section 6.5.2.

6.5 Compatibility Analysis for On-Base Land Use

6.5.1 Noise Exposure

Approximately 65 % of the 2011 AICUZ footprint and more than 99% of the land affected by noise exposure levels of 75 dB CNEL and above (Noise Zone 3) occurs within NAWS boundaries (Table 6-4). As indicated in Table 6-3 and Figure 6-4, most of this on-base land encumbered by the AICUZ footprint is classified as "not zoned" by the NAWS Master Plan or designated for operations use. For this analysis approximately 94 acres encumbered by the AICUZ footprint on-base in Inyo County are classified as "not zoned."

Table 6-3 Distribution of Noise Exposure in the 2011 AICUZ Footprint (acres)

dB CNEL Range	Off-Base	On-Base	Total
60-64	21,195	27,542	48,737
65-69	8,417	11,824	20,241
70-74	3,151	9,875	13,027
75-79	26	6,490	6,516
80-84	0	2,424	2,424
85+	0	1,934	1,934
Total	**32,789**	**60,089**	**92,878**

Other on-base land use designations within the 2011 AICUZ footprint include administration, community, housing, interim use, maintenance, medical, Research, Development, Test & Evaluation (RDT&E), recreation, supply, test/training, unplanned, and utilities. The distribution of on-base land uses exposed to various noise levels under projected conditions is shown in Table 6-4. Military-owned land uses are compatible with AICUZ guidelines; therefore, all current land uses on base are compatible with their respective noise exposure zones. Figure 6-4 identifies on-base land uses that occur within the 2011 AICUZ footprint.

Table 6-4 On-Base Land Use Classifications and Noise Exposure in the 2011 AICUZ Footprint (acres)

NAWS Master Plan Categories	dB CNEL Range					
	60-64	65-69	70-74	75-79	80-84	>85
Administration	2	38	0	0	0	0
Community	76	64	0	0	0	0
Housing	144	30	0	0	0	0
Interim Use	326	402	3	0	0	0
Maintenance	0	77	22	0	55	87
Medical	6	3	0	0	0	0
Operations	2,685	1,005	1,374	3,064	1,905	1,651
RDT&E	15	186	139	60	27	37
Recreation	22	258	0	0	0	0
Supply	264	0	40	0	3	74

Table 6-4 On-Base Land Use Classifications and Noise Exposure in the 2011 AICUZ Footprint (acres)

NAWS Master Plan Categories	dB CNEL Range					
	60-64	65-69	70-74	75-79	80-84	>85
Test/Training	0	0	0	0	0	23
Unplanned	55	0	0	0	0	0
Not Zoned/ No Zoning Designation	23,924	9,720	8,240	3,365	434	62
Utilities	23	39	57	0	0	0
Total	**27,542**	**11,824**	**9,875**	**6,490**	**2,424**	**1,934**

Notes: Totals may not sum exactly due to rounding.

6.5.2 Accident Potential

The APZs encompass 55 acres zoned as maintenance, 1,771 acres classified as operations, 13 acres classified RDT&E, and 1,374 acres that are classified "not zoned." APZ 2 encompasses the most area and has the lowest accident potential of the areas defined. Most of the area encumbered by clear zones and primary surfaces (89%) is designated for operations. Within APZ 1, 99 % is designated as either operations or "not zoned," and within APZ II more than 99% is designated "not zoned." Military-owned land uses are compatible with AICUZ guidelines; therefore, all current land use designations are compatible with their respective accident potential zones.

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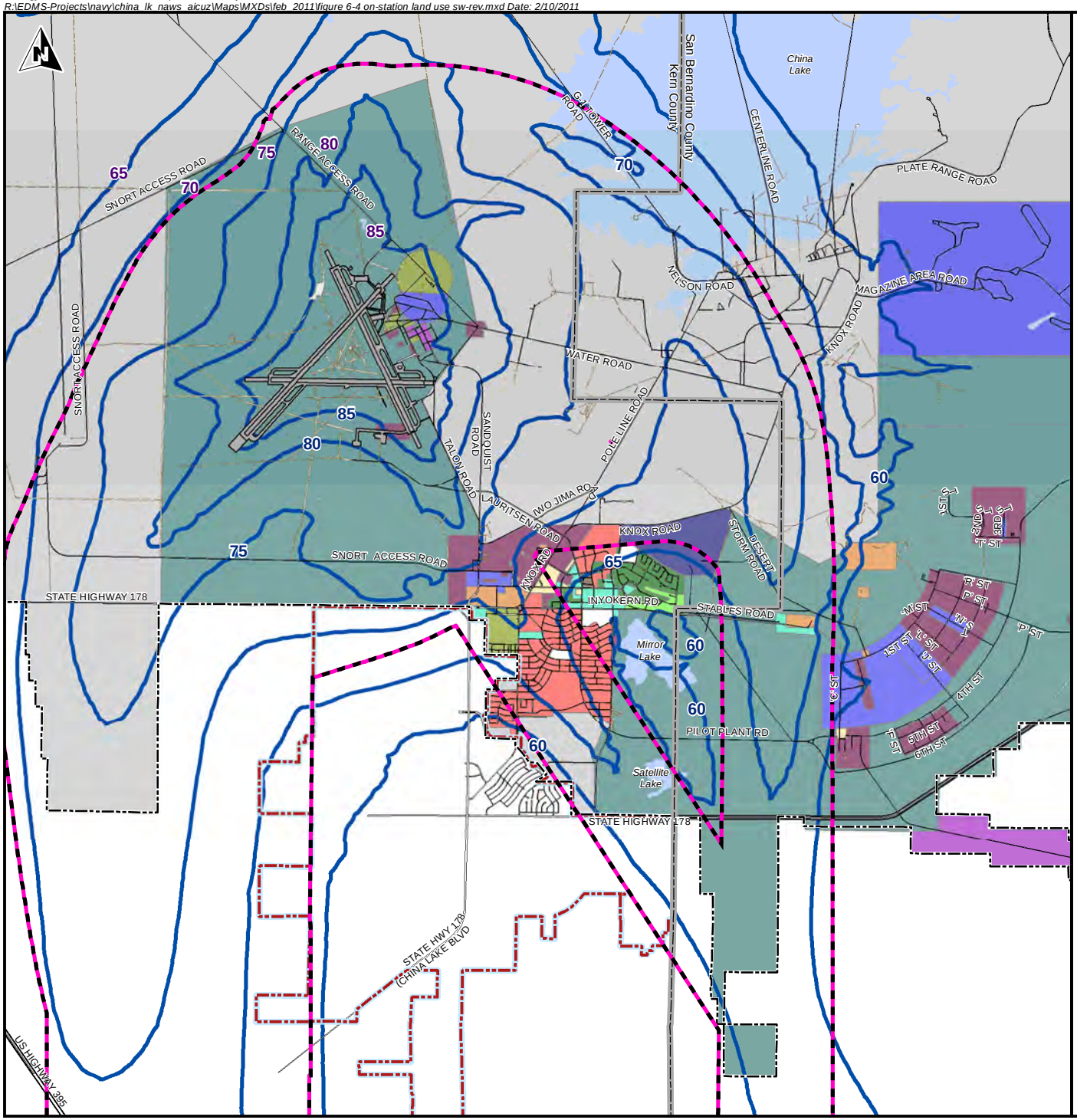

Figure 6-4
On-Station Land Use

NAWS China Lake
Ridgecrest, California

- 2011 AICUZ Noise Contour and dB CNEL Value
- 2007 Military Influence Area
- NAWS Boundary
- Ridgecrest City Boundary
- County Boundary

NAWS China Lake Landuse

- Administration
- Community
- Housing
- Interim Use
- Maintenance
- Medical
- Operations
- RDTE
- Recreation
- Supply
- Test/Training
- Unplanned
- Utilities
- Unzoned

0 0.5 1 2 3
Miles

Scale 1:90,000

7 AICUZ Implementation

This section summarizes potential strategies for the implementation of a successful AICUZ program at NAWS, and presents the recommendations of the NAWS AICUZ Working Group. These strategies and related recommendations represent a viable means to protect the public health and safety in local communities and promote mission compatible land use both on- and off-base. These goals can most effectively be accomplished by encouraging the active participation of all interested parties, including NAWS, local governments, private citizens, real estate professionals, and builders/developers.

Although the emphasis of the AICUZ program is traditionally focused on areas within the AICUZ footprint (defined to include APZs and all noise contours of 60 dB CNEL and above), NAWS is equally concerned about land use within the rest of the MIA. Maintaining land use compatibility within the MIA will enhance public safety because the MIA accounts for areas of increased safety risk and accident potential located outside the base boundary.

7.1 NAWS Implementation Plan

The NAWS AICUZ Program will be implemented through a NAWS Instruction that updates NAVWPNCEN INSTRUCTION 11010.3 under the leadership of the NAWS Commanding Officer. The updated Instruction will outline the full scope of actions to be implemented and the roles and responsibilities of participating offices or Codes.

7.2 Overview of Strategies and Programs that Facilitate AICUZ Planning

A variety of strategies and programs are available to NAWS officials and local government agencies to support implementation of the AICUZ program and promote the development and maintenance of compatible land uses within the NAWS planning area. Military installations and local government agencies with planning and zoning authority share the responsibility for preserving land use compatibility near a military air installation. Cooperative action by all parties is essential to ensure consistency for land use planning purposes.

AICUZ implementation strategies and programs fall into two basic categories: 1) actions that NAWS can take to maintain compatibility of flight operations with surrounding land uses; and 2) strategies available to local government agencies

and private entities to foster continued land use compatibility with NAWS operations. Implemented collectively, these strategies can be used to ensure that future land use in the vicinity of NAWS is planned and managed in accordance with the land use compatibility guidelines presented in Appendix B of this study.

7.2.1 Applicable Federal Laws and Regulations

The following federal laws and regulations provide an opportunity for NAWS to identify, comment on, and influence the direction of land uses on federal properties or projects in the vicinity of the installation.

7.2.1.1 National Environmental Policy Act of 1969

The National Environmental Policy Act requires full analysis and disclosure of the environmental effects resulting from proposed federal actions. The environmental impact review process provides an opportunity for the public and the Navy to comment on federal agency projects that may affect land use decisions on NAWS or the surrounding area.

7.2.1.2 Intergovernmental Review of Federal Programs

As a result of Presidential Executive Order 12372 (issued in July 1982 and amended in April 1983), all federal projects must be coordinated with state, regional, and local planning agencies. Through the state clearinghouse, NAWS is able to enter into the planning process and comment on local and state projects to ensure that land use planning initiatives are compatible with AICUZ land use compatibility guidelines.

7.2.1.3 Federal Mortgage Loans

Federally guaranteed mortgage loans from the Federal Housing Administration or the Department of Veterans Affairs are required to comply with Department of Housing and Urban Development guidelines (HUD Circular 1390.2, “Noise Abatement and Control, Department Policy and Implementation Responsibilities and Standards”) regarding home purchases that may be in areas subject to increased aircraft noise levels. Homes that are located in areas of increased noise levels or that do not meet certain noise level reduction requirements may not be eligible for loans.

7.2.1.4 Federally Funded Projects

General Services Administrations Federal Management Circular 75-2, “Compatible Land Uses at Federal Airfields,” allows NAWS to extend its land-use recommendations to federally funded projects in the vicinity. Specifically, it requires agencies sponsoring federally funded projects to ensure they are compatible with land-use plans of the air installation.

7.2.1.5 DoD Encroachment Protection Program

Title 10, U.S.C. § 2684a, authorizes the Secretary of Defense or the Secretary of a military department to enter into agreements with an eligible entity or entities to address the use or development of real property in the vicinity of, or ecologically related to, a military installation or military airspace, to limit encroachment or

other constraints on military training, testing, and operations. Eligible entities include a State, a political subdivision of a State, and a private entity that has, as its principal organizational purpose or goal, the conservation, restoration, or preservation of land and natural resources, or a similar purpose or goal. Encroachment Protection Agreements provide for an eligible entity to acquire fee title, or a lesser interest, in land for the purpose of limiting encroachment on the mission of a military installation and/or to preserve habitat off the installation to relieve current or anticipated environmental restrictions that might interfere with military operations or training on the installation. The DoD can share the real estate acquisition costs for projects that support the purchase of fee, a conservation, or other restrictive easement for such property. The eligible entity negotiates and acquires the real estate interest for encroachment protection projects with a voluntary seller. The eligible entity must transfer the agreed upon restrictive easement interest to the United States of America upon the request of the Secretary.

Encroachment Partnering

Under the Navy's Encroachment Partnering Program, NASCC should identify private land conservation organizations and/or government agencies to share the cost of land acquisition in order to preserve valuable natural habitat and restrict incompatible land use. Through partnerships, the Navy can work with local municipalities and decision-makers to identify areas where land acquisition and preservation buffers, in the form of either outright fee simple purchase or conservation easements, would be mutually beneficial.

7.2.2 Navy Land Use Management Strategies

7.2.2.1 Easement Acquisition

Easements may be acquired by the Navy to control the use of property and ensure compatible development. These easements are typically restrictive use easements or leaseholds. Restrictive use easements are acquired to guarantee that the development and use of property is limited to activities and structures that are consistent with the requirements of each AICUZ zone. Leaseholds are acquired to obtain exclusive property rights for specified periods of time. Easement acquisitions are used only if all other means of protecting the AICUZ are unavailable. Under 2007 AICUZ and projected conditions at NAWS, easement acquisitions are not currently required.

7.2.2.2 Land Acquisition

Land acquisition is the full ownership of property, which guarantees the Navy the complete and perpetual right to control what occurs on the property. Land acquisition is considered for properties that are essential for safe operations if all other means of protection are unavailable. Although this method has been used in the past to acquire land under the approach and departure corridors, under 2007 AICUZ and projected conditions, land acquisitions are not currently required at NAWS to protect the approach and departure corridors.

7.2.3 State and Regional Laws and Regulations

7.2.3.1 The California Environmental Quality Act (CEQA)

The CEQA requires that private and public projects undergo an environmental review for the analysis and disclosure of potential impacts of a proposed action. CEQA document reviews are used by agencies with land management authority to support their decision making processes. Participation in the CEQA process enables air stations to comment on projects that may adversely impact their missions and local governments to impose mitigation measures that reduce significant impacts.

7.2.3.2 California Department of Real Estate

The California Department of Real Estate prepares a subdivision Public Report for any proposed sale of five or more parcels. These reports are provided to the County Recorder's Office for distribution to prospective buyers and are intended to provide notes of any negative aspects (such as the location of property in an area of increased aircraft noise) to first purchasers of property in a subdivision.

7.2.3.3 Other State Legislation

Various Senate and Assembly bills have been passed that focus on military sustainability and the creation of partnerships between military installations and communities. The following is a description of bills that relate to enhanced AICUZ compatibility at NAWS.

- **Senate Bill 1468** amended by SB 926, is focused on long-term planning and specifies that cities and counties, when revising their general plans, must update five elements (land use, open space, circulation, conservation, and noise and safety) to consider military installations.

- **Senate Bill 1462** amends planning and zoning laws to grant public access to electronic mapping of military areas of concern, places the burden on the project applicant to review mapping and analyze impacts to the military, and provides military notice of a project when the proposed action is within 1000 feet of installations or beneath special use airspace or military training routes.

- **Senate Bill 375** sets planning requirements for transportation commissions, planning departments, agencies, plans, and projects and requires that preferred growth scenarios be taken into account in CEQA environmental reviews. The aim of SB 375 is to support the Clean Air Act by reducing greenhouse gas emissions through improved transportation policy choices, compact development, and expanded transit services. This bill may encourage farmland conversion to create more compact development. NAWS can encourage local communities to develop in ways compatible with SB 375 and the AICUZ program.

- **Assembly Bill 1108** amended the CEQA to provide military agencies with CEQA notices during scoping for projects that(a) require a general plan amendment and are of area-wide significance, (b) are adjacent to an installa-

tion, in an MIA, or under a special use airspace, or (c) are required to be referred to an airport land use commission.

7.2.4 City and County Strategies

Land use compatibility is a shared concern of the Navy, the public, and local government agencies who have planning and zoning authority. The decision makers for these agencies have the responsibility for taking actions that preserve land use compatibility. The cooperative actions of all participating agencies are essential to create and retain long term land use compatibility in the AICUZ planning area.

7.2.4.1 City and County Planning, Zoning, and Building Codes

The City of Ridgecrest and Kern County General Plans comprise several different elements. The Land Use, Noise, and Public Safety Elements can have a significant role in implementing the land use compatibility guidelines presented in the 2011 NAWS AICUZ Study update and can help ensure that future land use plans are compatible with aircraft flying activities. The City and County Zoning Ordinances prescribe which land uses are permissible for future off-base land development in the vicinity of NAWS. In addition, local building codes should be used to implement the noise-attenuation measures. Coordination of AICUZ land use compatibility guidelines with local zoning codes can ensure continued land use compatibility in the future.

7.2.4.2 Capital Improvements Program

Certain public improvements, such as major utilities, roadway improvements, or new rights-of-way, should encourage development in areas that do not conflict with AICUZ land use compatibility guidelines. Improvement programs should be coordinated to encourage development in areas away from increased levels of aircraft noise or increased accident potential.

7.2.4.3 Truth-in-Sales and Rental Ordinances

Truth-in-sales and rental ordinances provide a strategy of public disclosure pertaining to existing residential uses, proposed residential development, and subdivision approvals. Such disclosure is especially important in areas where aircraft flights and noise occur only during weekdays or during special training sessions. Under these circumstances, a potential buyer may be unaware of these conditions after conducting a visual inspection of a property.

7.2.4.4 Transfer and Purchase of Development Rights

The transfer of development rights allows the ownership of land to be separated from the right to build on it. This enables the transfer of development rights to areas where development would be compatible with the AICUZ program. Additionally, local government may consider the purchase of development rights.

7.2.4.5 Public Land Acquisition Programs

Public land acquisition programs can be used (as the conditions of the programs permit) for acquisition of land to support the AICUZ Program.

7.2.4.6 Health Code Programs

These programs protect people from adverse elements that may endanger them, including poor sanitary facilities, diseases, and inadequate or unsafe water supplies. The programs also can be used to protect people from noise impacts.

7.2.4.7 Special Planning Districts

Local governments have the power to create special districts for a special purpose, such as land-use control and protection of the environment and human health.

7.2.5 Private Sector Strategies

7.2.5.1 Real Estate Disclosure

Real estate disclosures allow prospective buyers, lessees, or renters of property in the vicinity of military operations areas to make informed decisions regarding the purchase or lease of property. The purpose is to protect the seller, real estate agent, buyer, local jurisdiction, and the military. Disclosure of aviation noise and safety zones is a very important tool in informing the community about expected impacts of aviation noise and the location of airfield safety zones, subsequently reducing frustration and anti-airfield criticism by those who were not adequately informed prior to purchase of properties within impact areas. The California Association of Realtors provides disclosure language typical for residences located near airports that is incorporated in each contract between buyer and seller.

7.2.5.2 Real Estate Professionals

Real estate professionals can ensure that prospective buyers or lessees are fully aware of what it means to be within a high-noise zone and/or APZ. Truth-in-sales and rental ordinances can be enacted to ensure adequacy in providing public disclosure of the impact in high noise and accident potential zones. They also can show prospective buyers and lessees a property at a time when noise exposure is expected to be at its worst.

7.2.5.3 Construction Loans to Private Contractors

This strategy encourages the review of AICUZ land use compatibility guidelines as part of a lender's loan approval process to private contractors for construction of new buildings. Prudent lending practices encourage banks to apply capital to the development of land compatible with AICUZ guidelines.

7.2.5.4 Mortgage Loan Requirements

This strategy requires the review of AICUZ compatibility guidelines by mortgage lenders for structures within the AICUZ noise contours. Under this strategy, approved residential mortgages would be discouraged for residential development in areas incompatible with AICUZ guidelines.

7.2.5.5 Private Citizens

Citizens should seek information on noise zones and APZs when purchasing land near a military installation, and consider the possible impacts before purchasing property.

7.3 Specific AICUZ Recommendations

The following section provides specific recommendations stemming from the results of this AICUZ study. The recommendations have been developed in partnership with the stakeholder agencies participating in the AICUZ Working Group.

7.3.1 Recommendations for NAWS Action

1. Amend NAWS Comprehensive Land Use Management Plan (CLUMP) to incorporate AICUZ operational profiles, and noise and safety conditions into existing land management practices, including the site approval process, environmental review process, and Capital Improvements Program.

2. Maintain and enhance NAWS community information programs and AICUZ outreach efforts to address agency and public information needs.

3. Continue the implementation of the NAWS noise complaint response program to address and respond to public inquiries regarding NAWS air operations.

4. Continue implementation of the NAWS air operations noise abatement and aircrew education programs to minimize noise and flight safety impacts on and off-base.

5. Formalize flight safety incident database. Maintain database in accordance with Secretary of the Navy Instruction 5720.42F.

7.3.2 Recommendations for City and County Action

1. Continue to provide CEQA notifications to NAWS for review and consideration of Navy comments on city and county discretionary land use actions, including General/Specific Plan amendments, Zone changes, Tract Maps, Parcel Maps, Specific Development Plans, and Conditional Use Permits.

2. In coordination with NAWS, amend and adopt the existing Kern County Airport Land Use Compatibility Plan (ALUCP) – Military Aviation Section for NAWS, to include specific criteria, policies, and maps for use in evaluating projects, and provide a copy of the amended ALUCP to Cal Trans Department of Aeronautics, School Districts, and Special Districts.

3. The 2007 AICUZ study's military influence area of interest and land use compatibility recommendations have been incorporated into the 2010 Ridgecrest General Plan Update. City and county planners are encouraged to maintain the MIA as a valid planning tool to ensure future mission compatibility, as well as to consider the most recent ACIUZ study during plan updates. Salient components of this AICUZ study should be added to the Military Sustainability Element of the Kern County General Plan and the proposed Indian Wells Valley Specific Plan. Planners are encouraged to develop and adopt specific policies and procedures to address compatible land uses (type, den-

sity, etc.) and air operations safety considerations (height obstructions, glare and smoke, electronic emissions, bird attractants, etc.), to identify appropriate densities of new residential development and minimize sensitive types of land use within the flight corridors and areas of increased risk. NAWS recommends city and county review and adjust as appropriate the MIA area of interest to meet their planning and management goals.

4. Develop and implement a policy requiring a site-specific evaluation for any proposed General Plan Amendments or zoning changes that would create residential projects or increase allowable density of existing designated residential development in an area identified as impacted by noise or safety concerns, and require appropriate notification of potential aircraft noise and flight safety risk to realtors, buyers, sellers, and residents of land within the flight corridor areas of the MIA.

5. Create specific policies for the General/Specific Plan that address restrictions on the location of sensitive receptors, such as schools, day care centers, apartments, hospitals, nursing homes, and senior living facilities in relation to noise contours.

7.3.3 Recommendations for BLM Action

Incorporate appropriate elements of this AICUZ study into the next amendment of the BLM's California Desert Conservation Area Plan. Involve NAWS in planning efforts associated with the development of cooperative agreements, proposed changes to land use type or intensity, sale and transfer related to excess land parcels located within or adjacent to the MIA.

7.3.4 Recommendations for all AICUZ Participants

Work with local and regional governments to implement the R-2508 Joint Land Use Study (JLUS). The R-2508 Airspace Complex JLUS identifies viable strategies to promote mutually compatible land use in proximity to NAWS and within the R-2508 airspace to reduce potential conflicts with the DoD military mission, sustain regional economic health, and protect public health and safety in the region.

8 References

Boeing- Integrated Defense Systems. 2009. EA-18G Airborne Electronic Attack Aircraft webpage available on the Internet at: http://www.boeing.com/defense-space/military/ea18g/index.html.

City of Ridgecrest Planning Department. 2010. Draft General Plan. http://ci.ridgecrest.ca.us/commdev.aspx?id=544 Accessed March 24, 2010. Department of the Navy, Office of the Chief of Naval Operations (OPNAV). 2008. OPNAV INSTRUCTION 11010.36C. Air Installations Compatible Use Zones [AICUZ] Program. 19 December.

Federation of American Scientists (FAS). 2006. Military Analysis Network website available on the Internet at: http://www.fas.org/man/dod-101/sys/ac/index.html.

GlobalSecurity.org, Alexandria, Virginia. Naval Air Weapons Station China Lake, California (NAWS). May 2007. Air Installation Compatible Use Zone Study. POC, Mr. John O'Gara, Land Use Planning Office, (760)939-3213.

GlobalSecurity.org. 2006. RAV-8B Harrier Specifications. Accessed May 14, 2010. at http://www.globalsecurity.org/military/systems/aircraft/av-8-specs.htm, Alexandria, Virginia.

Naval Air Warfare Center, Weapons Division. April 8, 2010. Personal Correspondence. Subject: RE: Updating noise complaints for the 2010 AICUZ update. Susan Read Public Affairs Office, China Lake, California with Natalie Seitz, Ecology and Environment, Inc. Seattle, Washington

Naval Air Weapons Station China Lake, California (NAWS). February 2004. Final Environmental Impact Statement for Proposed Military Operational Increases and Implementation of Associated Comprehensive Land Use and Integrated Natural Resources Management Plans, Volume 1. http://www.globalsecurity.org/military/facility/china-lake.htm. Accessed March 24, 2010.

_____. 2005. Statistical data from 31 December 2005, as reported in an undated PowerPoint briefing entitled "The Road Ahead," prepared on behalf of Captain Mark Storch, NAWS Commanding Officer.

_____. September 2006. Noise End of Year Reports.

_____. May 2007. Final Air Installation Compatible Use Zone Study, Naval Air Weapons Station, China Lake. Naval Air Weapons Station, China Lake, Ridgecrest, California.

_____. April 7, 2010b. Personal Correspondence. Subject: RE: data request. John R Davitz CIV NAWS China Lake, Ridgecrest California to Tim Fox, Community Planner & Liaison Officer NAWS China Lake, Ridgecrest, California.

_____. April 29, 2010. Personal Correspondence. Subject: AICUZ comments. Tim Fox, Community Planner & Liaison Officer NAWS China Lake, Ridgecrest, California to Robert Henderson, AICUZ/RAICUZ West Coast Center of Excellence NFEC SW Asset Management, San Diego, California.

Ridgecrest Chamber of Commerce. 2010. Ridgecrest Advantage. http://www.ridgecrestchamber.com/statsfrm.htm Accessed on March 12, 2010. Ridgecrest Chamber of Commerce, Ridgecrest, California.

State of California, Department of Finance, E-1 Population Estimates for Cities, Counties and the State with Annual Percent Change — January 1, 2008 and 2009. http://www.dof.ca.gov/research/demographic/reports/estimates/e-1/2008-09/. Accessed on March 12, 2010, State of California, Department of Finance, Sacramento, California, May 2009.

State of California. 2006. California Advisory Handbook for Community and Military Compatibility Planning. Governor's Office of Planning and Research. February.

U.S. Census Bureau. 2006-2008a. American Community Survey, Kern County California, S1901. Income in the Past 12 Months (In 2008 Inflation-Adjusted Dollars). http://factfinder.census.gov/servlet/STTable?_bm=y&-geo_id=05000US06029&-qr_name=ACS_2008_3YR_G00_S1901&-ds_name=ACS_2008_3YR_G00_&-redoLog=false. Accessed on March 12, 2010, U.S. Census Bureau, Washington, D.C.

_____. 2006-2008b. American Community Survey, Ridgecrest city. California, S1901. Income in the Past 12 Months (In 2008 Inflation-Adjusted Dollars). http://factfinder.census.gov/servlet/STTable?_bm=y&-geo_id=16000US0660704&-qr_name=ACS_2008_3YR_G00_S1901&-ds_name=ACS_2008_3YR_G00_. Accessed on March 12, 2010, U.S. Census Bureau, Washington, D.C.

_____. 2000. T1. Population Estimates [11], 2008 Population Estimates. http://factfinder.census.gov/servlet/DTTable?_bm=y&-geo_id=16000US0660704&-ds_name=PEP_2008_EST&-mt_name=PEP_2008_EST_G2008_T001 Accessed on March 12, 2010, U.S. Census Bureau, Washington, D.C., Wyle Laboratories, Inc. February 2010. WR-08-08R Aircraft Noise Study for Naval Air Weapons Station China Lake, California. Wyle Laboratories Inc., El Segundo, California.

Wyle Laboratories, Inc. 2004. Letter Report J/N 50268 to Mr. John O'Gara. NAWS China Lake CY 1998 Noise Contour, Including TACAN Approach to Runway 32. 27 April.

_____. November 2008. WR-08-08 Aircraft Noise Study for Naval Air Weapons Station China Lake, California. Wyle Laboratories Inc., El Segundo, California.

_____. August 2009. WR-08-08R Aircraft Noise Study for Naval Air Weapons Station China Lake, California. Wyle Laboratories Inc., El Segundo, California.

_____. February 2010. Draft Aircraft Noise Study for Naval Air Weapons Station China Lake, California. WR-08-08R. El Segundo, California: Wyle Laboratories, Inc.

_____. March 23, 2010a. Personal Correspondence. Subject: RE: China Lake Follow-up. Patrick Kester Wyle Laboratories Inc., El Segundo, California with Natalie Seitz, Ecology and Environment, Inc. Seattle, Washington

_____. March 30, 2010b. Personal Communication. Subject: Operations and noise comparison between the 2007 Naval Air Weapons Station China Lake (NAWS) Air Installations Compatibility Use Zones (AICUZ) Study and the February 2010 Wyle Report WR 08-08R. Patrick Kester, Wyle Laboratories Inc., El Segundo, California with Jan Brant and Natalie Seitz, Ecology and Environment, Inc. Seattle, Washington

_____. April 4, 2010. Personal Correspondence. Subject: China Lake SELs. Patrick Kester, Wyle Laboratories Inc., El Segundo, California with Natalie Seitz, Ecology and Environment, Inc. Seattle, Washington

A Land-Use Compatibility Methodology

The U.S. Department of the Navy (Navy) has developed land-use compatibility recommendations for accident potential zones (APZs) and noise zones. These recommendations, found in Chief of Naval Operations Instruction (OPNAVINST) 11010.36C, "Air Installations Compatibility Use Zones Program" (U.S. Department of the Navy 2008), are intended to serve as guidelines for both the placement of APZs and noise zones and the development of land uses around military air installations. The guidelines assume that noise-sensitive land uses (e.g., houses and schools) will be placed outside high-noise zones and that people-intensive uses (e.g., grocery shopping centers and restaurants) will not be placed in APZs. Certain land uses are considered incompatible with APZs and high-noise zones, while other land uses may be considered compatible, compatible with restrictions, or incompatible with exceptions. The land use compatibility analysis conducted for Naval Air Weapons Station China Lake (NAWS), California, was based on the Navy's land-use compatibility recommendations. To determine the compatibility of land uses within NAWS noise zones and APZs, this document examined zoned land uses near NAWS.

A.1 Existing Land Use Data

The noise zones and APZs associated with NAWS extend over Kern, San Bernardino, and Inyo counties as well as the City of Ridgecrest. NAWS provided zoning information for Kern County, San Bernardino County. Matrix Design Group, Inc. provided zoning information for the City of Ridgecrest. The 60 dB CNEL contour encumbers approximately 94.1 acres in Inyo County, which are located entirely within the NAWS base boundary. For the purposes of this analysis the 94.1 acres were assigned a zoning classification of on-base "Un-zoned" in accordance with surrounding similarly zoned land.

Kern County, San Bernardino County, and the City of Ridgecrest each use different zoning classification systems. Kern County zoning classifications use an alpha-numeric code that identifies a primary use, parcel sizes, and up to three combined and secondary uses. San Bernardino County zoning classifications use a single broad use per zoned area. The City of Ridgecrest uses an alpha-numeric zoning code that identifies one or multiple uses and intensity of use per zoned area.

OPNAVINST 11010.36C uses the Standard Land Use Coding Manual (SLUCM) to classify land use to assess compatibility with noise zones and APZs. The SLUCM relies on a two- to four-digit land-use coding system. Zoning provided for Kern County, San Bernardino County, and the City of Ridgecrest and the SLUCM are different coding systems and draw different distinctions between land uses. In order to asses the compatibility of land uses encumbered within the AICUZ footprint, each zoning code within the noise zones and APZs was assigned a SLUCM group code (see Table A-1).

SLUCM group codes standardize and generalize the Kern County, San Bernardino County, and the City of Ridgecrest zoning codes. SLUCM codes *11-Housing Units*, *39-Miscellaneous Manufacturing*, *59-Other Retail Trade*, *65-*

Professional Services, *76-Parks*, *81- Agriculture (except livestock)*, and *91-Undeveloped Land* provide representative compatibility recommendations for SLUCM groups 10, 20/30, 50, 60, 70, 80, and 90 respectively. The representative SLUCM codes reflect the majority of Kern County, San Bernardino County, and the City of Ridgecrest zoned uses as well as an average compatibility recommendation for each SLUCM group (see Appendix B for suggested land use compatibility). Areas located on-base are considered compatible with Navy recommendations.

A.2 Unclassified Areas

Zoning and NAWS Master Plan information provided classifications for more then 98 percent of the area encumbered by the AICUZ footprint. Aerial verification identified the majority of unclassified areas as roadways and areas located between zoning boundaries. For the purposes of this analysis these areas were classified as SLUCM use group *40-Transportation, communication, and utilities.* SLUCM code *42-Motor vehicle transportation* was used to determine compatibility recommendations for areas classified as SLUCM group 40.

Table A-1 Equated Zoning Codes to SLUCM Groups

SLUCM Group	Zoning Code
Kern County	
10 Residential	**E(1)** (Estate 1 Acre)
	E(1) MH (Estate 1 Acre, Mobile Home Combining)
	E(1) RS (Estate 1 Acre, Residential Suburban Combining)
	E(1) RS MH (Estate 1 Acre, Residential Suburban Combining, Mobile home Combining)
	E(1) RS MH FPS (Estate 1 Acre, Residential Suburban Combining, Mobile home Combining, Flood Plain Secondary Combining)
	E(1/2) RS MH (Estate 0.5 Acres, Residential Suburban Combining, Mobile home Combining)
	E(1/2) RS MH FPS (Estate 0.5 Acres, Residential Suburban Combining, Mobile home Combining, Flood Plain Secondary Combining)
	E(1/4) MH (Estate 0.25 Acres, Mobile Home Combining)
	E(1/4) MH FPS (Estate 0.25 Acres, Mobile home Combining, Flood Plain Secondary Combining)
	E(1/4) RS MH (Estate 0.25 Acres, Residential Suburban Combining, Mobile home Combining)
	E(10) (Estate 10 Acres)
	E(10) RS (Estate 10 Acres, Residential Suburban Combining)
	E (2 1/2) (Estate 2.5 Acres)
	E (2 1/2) MH (Estate 2.5 Acres, Mobile Home Combining)
	E (2 1/2) RL (Estate 2.5 Acres, Rural Living Combining)
	E(2 1/2) RS (Estate 2.5 Acres, Residential Suburban Combining)
	E(2 1/2) RS FPS (Estate 2.5 Acres, Residential Suburban Combining, Flood Plain Secondary Combining)
	E(2 1/2) RS MH (Estate 2.5 Acres, Residential Suburban Combining, Mobile home Combining)
	E(2 1/2) RS MH FPS (Estate 2.5 Acres, Residential Suburban Combining, Mobile home Combining, Flood Plain Secondary Combining)
	E(20) (Estate 20 Acres)
	E(20) RS (Estate 20 Acres, Residential Suburban Combining)
	E(20) RS FPS (Estate 20 Acres, Residential Suburban Combining, Flood Plain Secondary Combining)
	E(5) (Estate 5 Acres)
	E(5) FPS (Estate 5 Acres, Flood Plain Secondary Combining)
	E(5) RS (Estate 5 Acres, Residential Suburban Combining)
	E(5) RS FPS (Estate 5 Acres, Residential Suburban Combining, Flood Plain Secondary Combining)
	MP (Mobile Home Park)
20/30 Manufacturing	**M-1**(Light Manufacturing)
	M-1 D (Light Manufacturing, Architectural Design Combining)
	M-1 D FPS (Light Manufacturing, Architectural Design Combining, Flood Plain Secondary Combining)
	M-1 FPS (Light Manufacturing, Flood Plain Secondary Combining)
	M-2 (Medium Industrial)
	M-2 D (Medium Industrial, Architectural Design Combining)

Table A-1 Equated Zoning Codes to SLUCM Groups

SLUCM Group	Zoning Code
	M-2 D H (Medium Industrial, Architectural Design Combining, Airport Approach Height Combining)
60 Services	**C-2** (General Commercial)
	C-2 PD (General Commercial, Precise Development Combining)
70 Cultural, Entertainment and Recreational	**NR(20)** (Natural Resource 20 Acres)
80 Resource production and extraction	**A** (Exclusive Agriculture)
	A FPS (Exclusive Agriculture, Flood Plain Secondary Combining)
	A-1 (Limited Agriculture)
	A-1 FPS (Limited Agriculture, Flood Plain Secondary Combining)
	A-1 MH (Limited Agriculture, Mobile Home Combining)
	A-1 MH FPS (Limited Agriculture, Mobile Home Combining, Flood Plain Secondary Combining)
90 Other	**OS** (Open Space)
	FPP (Flood Plain Primary)
San Bernardino County	
10 Residential	Rural Living
70 Cultural, Entertainment and Recreational	Resource Conservation
City of Ridgecrest	
10 Residential	**E-1** (Residential - Low Density)
	E-2 (Residential - Low Density)
	E-3 (Residential - Low Density)
	R-1 (Residential- Low Density)
	R-2 (Residential- Low Density)
	R-3 (Residential- Medium Density)
	RMH (Residential- Low Density)
20/30 Manufacturing	**M-1** (Industrial)
	M-2 (Industrial)
60 Services	**CG** (Commercial/Office)
	CI (Civic and Institutional District)
	CN (Commercial/Office)
	CS (Commercial/Office)
	PO (Commercial/Office)
70 Cultural, Entertainment and Recreational	**RSP** (Recreation, Schools, Public Use)
80 Resource production and extraction	**A-5** (Agriculture)
90 Other	**UR** (Open Space)

B AICUZ Land Use Compatibility Guidelines

Table B-1 Suggested Land Use Compatibility in Noise Zones

SLUCM No.	Land Use Name	Suggested Land Use Compatibility						
		Noise Zone 1 (dB CNEL)		Noise Zone 2 (dB CNEL)		Noise Zone 3 (dB CNEL)		
		<55	55-64	65-69	70-74	75-79	80-84	85+
10	***Residential***							
11	Household units	Y	Y[1]	N[1]	N[1]	N	N	N
11.11	Single units: detached	Y	Y[1]	N[1]	N[1]	N	N	N
11.12	Single units: semidetached	Y	Y[1]	N[1]	N[1]	N	N	N
11.13	Single units: attached row	Y	Y[1]	N[1]	N[1]	N	N	N
11.21	Two units: side-by-side	Y	Y[1]	N[1]	N[1]	N	N	N
11.22	Two units: one above the other	Y	Y[1]	N[1]	N[1]	N	N	N
11.31	Apartments: walk up	Y	Y[1]	N[1]	N[1]	N	N	N
11.32	Apartments: elevator	Y	Y[1]	N[1]	N[1]	N	N	N
12	Group quarters	Y	Y[1]	N[1]	N[1]	N	N	N
13	Residential hotels	Y	Y[1]	N[1]	N[1]	N	N	N
14	Mobile home parks or courts	Y	Y[1]	N	N	N	N	N
15	Transient lodgings	Y	Y[1]	N[1]	N[1]	N[1]	N	N
16	Other residential	Y	Y[1]	N[1]	N[1]	N	N	N
20	***Manufacturing***							
21	Food and kindred products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
22	Textile mill products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
23	Apparel and other finished products; products made from fabrics, leather and similar materials; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
24	Lumber and wood products (except furniture); manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
25	Furniture and fixtures; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
26	Paper and allied products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
27	Printing, publishing, and allied industries	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
28	Chemicals and allied products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
29	Petroleum refining and related industries	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
30	***Manufacturing (continued)***							
31	Rubber and misc. plastic products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
32	Stone, clay, and glass products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
33	Primary metal products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
34	Fabricated metal products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
35	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks	Y	Y	Y	25	30	N	N
39	Miscellaneous manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
40	***Transportation, Communication and Utilities***							
41	Railroad, rapid rail transit, and street railway transportation	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
42	Motor vehicle transportation	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
43	Aircraft transportation	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
44	Marine craft transportation	Y	Y	Y	Y[2]	Y[3]	Y[4]	N

Table B-1 Suggested Land Use Compatibility in Noise Zones

SLUCM No.	Land Use Name	Suggested Land Use Compatibility						
		Noise Zone 1 (dB CNEL)		Noise Zone 2 (dB CNEL)		Noise Zone 3 (dB CNEL)		
		<55	55-64	65-69	70-74	75-79	80-84	85+
45	Highway and street right-of-way	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
46	Automobile parking	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
47	Communication	Y	Y	Y	25 [5]	30 [5]	N	N
48	Utilities	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
49	Other transportation, communication, and utilities	Y	Y	Y	25 [5]	30 [5]	N	N
50	***Trade***							
51	Wholesale trade	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
52	Retail trade – building materials, hardware, and farm equipment	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
53	Retail trade – shopping centers	Y	Y	Y	25	30	N	N
54	Retail trade – food	Y	Y	Y	25	30	N	N
55	Retail trade – automotive, marine craft, aircraft and accessories	Y	Y	Y	25	30	N	N
56	Retail trade – apparel and accessories	Y	Y	Y	25	30	N	N
57	Retail trade – furniture, home furnishings and equipment	Y	Y	Y	25	30	N	N
58	Retail trade – eating and drinking establishments	Y	Y	Y	25	30	N	N
59	Other retail trade	Y	Y	Y	25	30	N	N
60	***Services***							
61	Finance, insurance and real estate services	Y	Y	Y	25	30	N	N
62	Personal services	Y	Y	Y	25	30	N	N
62.4	Cemeteries	Y	Y	Y	Y[2]	Y[3]	Y[4,11]	Y[6,11]
63	Business services	Y	Y	Y	25	30	N	N
63.7	Warehousing and storage	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
64	Repair services	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
65	Professional services	Y	Y	Y	25	30	N	N
65.1	Hospitals, other medical fac.	Y	Y[1]	25	30	N	N	N
65.16	Nursing homes	Y	Y	N[1]	N[1]	N	N	N
66	Contract construction services	Y	Y	Y	25	30	N	N
67	Governmental services	Y	Y[1]	Y[1]	25	30	N	N
68	Educational services	Y	Y[1]	25	30	N	N	N
69	Miscellaneous	Y	Y	Y	25	30	N	N
70	***Cultural, Entertainment and Recreational***							
71	Cultural activities (& churches)	Y	Y[1]	25	30	N	N	N
71.2	Nature exhibits	Y	Y[1]	Y[1]	N	N	N	N
72	Public assembly	Y	Y[1]	Y	N	N	N	N
72.1	Auditoriums, concert halls	Y	Y	25	30	N	N	N
72.11	Outdoor music shells, amphitheaters	Y	Y[1]	N	N	N	N	N
72.2	Outdoor sports arenas, spectator sports	Y	Y	Y[7]	Y[7]	N	N	N
73	Amusements	Y	Y	Y	Y	N	N	N
74	Recreational activities (including golf courses, riding stables, water rec.)	Y	Y[1]	Y[1]	25	30	N	N

Table B-1 Suggested Land Use Compatibility in Noise Zones

SLUCM No.	Land Use Name	Suggested Land Use Compatibility						
		Noise Zone 1 (dB CNEL)		Noise Zone 2 (dB CNEL)		Noise Zone 3 (dB CNEL)		
		<55	55-64	65-69	70-74	75-79	80-84	85+
75	Resorts and group camps	Y	Y[1]	Y[1]	Y[1]	N	N	N
76	Parks	Y	Y[1]	Y[1]	Y[1]	N	N	N
79	Other cultural, entertainment and recreation	Y	Y[1]	Y[1]	Y[1]	N	N	N
80	***Resource Production and Extraction***							
81	Agriculture (except livestock)	Y	Y	Y[8]	Y[9]	Y[10]	Y[10,11]	Y[10,11]
81.5	Livestock farming	Y	Y	Y[8]	Y[9]	N	N	N
81.7	Animal breeding	Y	Y	Y[8]	Y[9]	N	N	N
82	Agricultural related activities	Y	Y	Y[8]	Y[9]	Y[10]	Y[10,11]	Y[10,11]
83	Forestry activities	Y	Y	Y[8]	Y[9]	Y[10]	Y[10,11]	Y[10,11]
84	Fishing activities	Y	Y	Y	Y	Y	Y	Y
85	Mining activities	Y	Y	Y	Y	Y	Y	Y
89	Other resource production or extraction	Y	Y	Y	Y	Y	Y	Y

Source: adopted from OPNAVINST 11010.36C, 2008.

Notes:

[1] General

a. Although local conditions regarding the need for housing may require residential use in these zones, residential use is discouraged in CNEL 65 to 69 and strongly discouraged in CNEL 70 to 74. The absence of viable alternative development options should be determined and an evaluation should be conducted locally prior to local approvals indicating that a demonstrated community need for the residential use would not be met if development were prohibited in these zones.

b. Where the community determines that residential uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 Decibels (dB) in CNEL 65 to 69 and NLR of 30 dB CNEL 70 to 74 should be incorporated into building codes and be in individual approvals; for transient housing a NLR of at least 35 dB should be incorporated in CNEL 75 to 79.

c. Normal permanent construction can be expected to provide an NLR of 20 dB; thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation, upgraded sound transmission class ratings in windows and doors and closed windows year round. Additional consideration should be given to modifying NLR levels based on peak noise levels or vibrations.

d. NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, design, and use of berms and barriers can help mitigate outdoor exposure, particularly from ground level sources. Measures that reduce noise at a site should be used wherever practical in preference to measures which only protect interior spaces.

[2] Measures to achieve an NLR of 25 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

[3] Measures to achieve an NLR of 30 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

[4] Measures to achieve an NLR of 35 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

[5] If the project or proposed development is noise sensitive, use indicated NLR; if not, land use is compatible without NLR.

[6] No buildings.

[7] Land use compatible provided special sound reinforcement systems are installed.

[8] Residential buildings require an NLR of 25.

[9] Residential buildings require an NLR of 30.

[10] Residential buildings not permitted.

[11] Land-use not recommended, but if the community decides use is necessary, hearing protection devices should be worn.

Key:

25, 30, or 35	=	The numbers refer to NLR levels. Land use and related structures generally compatible however, measures to achieve NLR of 25, 30, or 35 must be incorporated into design and construction of structure. However, measures to achieve an overall noise reduction do not necessarily solve noise difficulties outside the structure and additional evaluation is warranted. Also, see notes indicated by superscripts where they appear with on of these numbers.
CNEL	=	Community Noise Equivalent Level
N (No)	=	Land use and related structures are not compatible and should be prohibited.
NLR (Noise Level Reduction)	=	NLR (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
N^x – (No with exceptions)	=	The land use and related structures are generally incompatible. However, see notes indicated by the superscript.
SLUCM	=	Standard Land Use Coding Manual, U.S. Department of Transportation
Y (Yes)	=	Land use and related structures are compatible without restrictions.
Y^x – (Yes with restrictions)	=	The land use and related structures are generally compatible. However, see note(s) indicated by the superscript.

Table B-2 Suggested Land Use Compatibility in Accident Potential Zones

Air Installations Compatible Use Zones Suggested Land Use Compatibility in Accident Potential Zones[1]					
		Recommendations			
SLUCM No.	Land Use Name	CLEAR ZONE	APZ-I	APZ-II	Density
10	***Residential***				
11	Household units				
11.11	Single units: detached	N	N	Y[2]	Max density of 1-2 Du/Ac
11.12	Single units: semidetached	N	N	N	
11.13	Single units: attached row	N	N	N	
11.21	Two units: side-by-side	N	N	N	
11.22	Two units: one above the other	N	N	N	
11.31	Apartments: walk up	N	N	N	
11.32	Apartments: elevator	N	N	N	
12	Group quarters	N	N	N	
13	Residential hotels	N	N	N	
14	Mobile home parks or courts	N	N	N	
15	Transient lodgings	N	N	N	
16	Other residential	N	N	N	
20	***Manufacturing[3]***				
21	Food and kindred products; manufacturing	N	N	Y	Max FAR 0.56 in APZ II
22	Textile mill products; manufacturing	N	N	Y	same as above
23	Apparel and other finished products; products made from fabrics, leather and similar materials; manufacturing	N	N	N	
24	Lumber and wood products (except furniture); manufacturing	N	Y	Y	Max FAR of 0.28 in APZ I & 0.56 in APZ II
25	Furniture and fixtures; manufacturing	N	Y	Y	same as above
26	Paper and allied products; manufacturing	N	Y	Y	same as above
27	Printing, publishing, and allied industries	N	Y	Y	same as above
28	Chemicals and allied products; manufacturing	N	N	N	
29	Petroleum refining and related industries	N	N	N	
30	***Manufacturing[3] (continued)***				
31	Rubber and misc. plastic products; manufacturing	N	N	N	
32	Stone, clay, and glass products; manufacturing	N	N	Y	Max FAR 0.56 in APZ II
33	Primary metal products; manufacturing	N	N	Y	same as above
34	Fabricated metal products; manufacturing	N	N	Y	same as above
35	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks	N	N	N	
39	Miscellaneous manufacturing	N	Y	Y	Max FAR of 0.28 in APZ I & 0.56 in APZ II

Table B-2 Suggested Land Use Compatibility in Accident Potential Zones

Air Installations Compatible Use Zones Suggested Land Use Compatibility in Accident Potential Zones[1]					
		Recommendations			
SLUCM No.	Land Use Name	CLEAR ZONE	APZ-I	APZ-II	Density
40	***Transportation, Communication and Utilities*** [4,5]				
41	Railroad, rapid rail transit, and street railway transportation	N	Y[5]	Y	same as above
42	Motor vehicle transportation	N	Y[5]	Y	same as above
43	Aircraft transportation	N	Y[5]	Y	same as above
44	Marine craft transportation	N	Y[5]	Y	same as above
45	Highway and street right-of-way	N	Y[5]	Y	same as above
46	Auto parking	N	Y[5]	Y	same as above
47	Communication	N	Y[5]	Y	same as above
48	Utilities	N	Y[5]	Y	same as above
485	Solid Waste disposal (Landfills, incineration, etc.)	N	N	N	
49	Other transportation, comm., and utilities	N	Y[5]	Y	See Note 5
50	***Trade***				
51	Wholesale trade	N	Y	Y	Max FAR of 0.28 in APZ I & 0.56 in APZ II
52	Retail trade – building materials, hardware, and farm equipment	N	Y	Y	See Note 6
53	Retail trade[7] – shopping centers, Home Improvement Store, Discount Club, Electronics Superstore	N	N	Y	Max FAR of 0.16 in APZ II
54	Retail trade – food	N	N	Y	Max FAR of 0.24 in APZ II
55	Retail trade – automotive, marine craft, aircraft and accessories	N	Y	Y	Max FAR of 0.14 in APZ I & 0.28 in APZ II
56	Retail trade – apparel and accessories	N	N	Y	Max FAR of 0.28 in APZ II
57	Retail trade – furniture, home furnishings and equipment	N	N	Y	same as above
58	Retail trade – eating and drinking establishments	N	N	N	
59	Other retail trade	N	N	Y	Max FAR of 0.16 in APZ II
60	***Services***[8]				
61	Finance, insurance and real estate services	N	N	Y	Max FAR of 0.22 for "General Office/ Office park" in APZ II
62	Personal services	N	N	Y	Office uses only. Max FAR of 0.22 in APZ II.
62.4	Cemeteries	N	Y[9]	Y[9]	
63	Business services (credit reporting; mail, stenographic reproduction; advertising)	N	N	Y	Max FAR of 0.22 in APZ II
63.7	Warehousing and storage services	N	Y	Y	Max FAR of 1.0 in APZ I; 2.0 in APZ II

Table B-2 Suggested Land Use Compatibility in Accident Potential Zones

Air Installations Compatible Use Zones Suggested Land Use Compatibility in Accident Potential Zones[1]					
		Recommendations			
SLUCM No.	Land Use Name	CLEAR ZONE	APZ-I	APZ-II	Density
64	Repair Services	N	Y	Y	Max FAR of 0.11 in APZ I; 0.22 in APZ II
65	Professional services	N	N	Y	Max FAR of 0.22 in APZ II
65.1	Hospitals, nursing homes	N	N	N	
65.1	Other medical facilities	N	N	N	
66	Contract construction services	N	Y	Y	Max FAR of 0.11 in APZ I; 0.22 in APZ II
67	Governmental services	N	N	Y	Max FAR of 0.24 in APZ II
68	Educational services	N	N	N	
69	Miscellaneous	N	N	Y	Max FAR of 0.22 in APZ II
70	***Cultural, Entertainment and Recreational***				
71	Cultural activities	N	N	N	
71.2	Nature exhibits	N	Y[10]	Y[10]	
72	Public assembly	N	N	N	
72.1	Auditoriums, concert halls	N	N	N	
72.11	Outdoor music shells, amphitheaters	N	N	N	
72.2	Outdoor sports arenas, spectator sports	N	N	N	
73	Amusements- fairgrounds, miniature golf, driving ranges; amusement parks, etc.	N	N	Y	
74	Recreational activities (including golf courses, riding stables, water recreation)	N	Y[10]	Y[10]	Max FAR of 0.11 in APZ I; 0.22 in APZ II
75	Resorts and group camps	N	N	N	
76	Parks	N	Y[10]	Y[10]	same as 74
79	Other cultural, entertainment and recreation	N	Y[9]	Y[9]	same as 74
80	***Resource Production and Extraction***				
81	Agriculture (except livestock)	Y[4]	Y[11]	Y[11]	
81.5, 81.7	Livestock farming and breeding	N	Y[11,12]	Y[11,12]	
82	Agricultural related activities	N	Y[11]	Y[11]	Max FAR of 0.28 in APZ I; 0.56 in APZ II no activity which produces smoke, glare, or involves explosives
83	Forestry activities[13]	N	Y	Y	same as above
84	Fishing activities[14]	N[14]	Y	Y	same as above
85	Mining activities	N	Y	Y	same as above
89	Other resource production or extraction	N	Y	Y	same as above

Table B-2 Suggested Land Use Compatibility in Accident Potential Zones

Air Installations Compatible Use Zones Suggested Land Use Compatibility in Accident Potential Zones[1]					
		Recommendations			
SLUCM No.	Land Use Name	CLEAR ZONE	APZ-I	APZ-II	Density
90	***Other***				
91	Undeveloped Land	Y	Y	Y	
93	Water Areas	N^{15}	N^{15}	N^{15}	

Source: adopted from OPNAVINST 11010.36C, 2008.

Notes:

[1] A "Yes" or a "No" designation for compatible land use is to be used only for general comparison. Within each, uses exist where further evaluation may be needed in each category as to whether it is clearly compatible, normally compatible, or not compatible due to the variation of densities of people and structures. In order to assist installations and local governments, general suggestions as to FARs are provided as a guide to densities in some categories. In general, land-use restrictions which limit commercial, services, or industrial buildings or structure occupants to 25 per acre in APZ I and 50 per acre in APZ II are the range of occupancy levels, including employees, considered to be low density. Outside events should normally be limited to assemblies of not more than 25 people per acre in APZ I, and Maximum (MAX) assemblies of 50 people per acre in APZ II.

[2] The suggested maximum density for detached single-family housing is one to two Du/Ac. In a Planned Unit Development (PUD) of single-family detached units where clustered housing development results in large open areas, this density could possibly be increased provided the amount of surface area covered by structures does not exceed 20 percent of the PUD total area. PUD encourages clustered development that leaves large open areas.

[3] Other factors to be considered: Labor intensity, structural coverage, explosive characteristics, air pollution, electronic interference with aircraft, height of structures, and potential glare to pilots.

[4] No structures (except airfield lighting), buildings, or aboveground utility/communications lines should normally be located in the clear zone areas on or off the installation. The clear zone is subject to severe restrictions. See UFC 3-260-01, "Airfield and Heliport Planning and Design" dated 10 November 2001 for specific design details.

[5] No passenger terminals and no major aboveground transmission lines in APZ I.

[6] Within SLUCM Code 52, Max FARs for lumber yards (SLUCM Code 521) are 0.20 in APZ-1 and 0.40 in APZ-II. For hardware/paint and farm equipment stores, SLUCM Code 525, the Max FARs are 0.12 in APZ-1 and 0.24 in APZ-II.

[7] A shopping center is an integrated group of commercial establishments that is planned, developed, owned, or managed as a unit. Shopping center types include strip, neighborhood, community, regional, and super regional facilities anchored by small businesses, supermarket or drug store, discount retailer, department store, or several department stores, respectively. Included in this category are such uses as big box discount and electronics superstores. The Max recommended FAR for SLUCM 53 should be applied to the gross leasable area of the shopping center rather then attempting to use other recommended FARs listed in Table 2 under "Retail" or "Trade."

[8] Low intensity office uses only. Accessory use such as meeting places, auditoriums, etc., are not recommended.

[9] No chapels are allowed within APZ I or APZ II.

[10] Facilities must be low intensity and provide no tot lots, etc. Facilities such as clubhouses, meeting places, auditoriums, large classes, etc., are not recommended.

[11] Includes livestock grazing but excludes feedlots and intensive animal husbandry. Activities that attract concentrations of birds creating a hazard to aircraft operations should be excluded.

[12] Includes feedlots and intensive animal husbandry.

[13] Lumber and timber products removed due to establishment, expansion, or maintenance of clear zones will be disposed of in accordance with appropriate DoD Natural Resources instructions.

[14] Controlled hunting and fishing may be permitted for the purpose of wildlife management.

[15] Naturally occurring water features (e.g., rivers, lakes, streams, wetlands) are compatible.

Key:

Du/Ac- Dwelling Units per Acre = This metric is customarily used to measure residential densities.

FAR – Floor Area Ratio = A Floor area ratio is the ratio between the square feet of floor area of the building and the site area. It is customarily used to measure non-residential intensities.

N (No) = Land use and related structures are not normally compatible and should be prohibited.

N^x – (No with exceptions) = The land use and related structures are generally incompatible. However, see notes indicated by the superscript.

SLUCM = Standard Land Use Coding Manual, U.S. Department of Transportation

Y (Yes) = Land use and related structures are normally compatible without restrictions.

Y^x – (Yes with restrictions) = The land use and related structures are generally compatible. However, see notes indicated by the superscript.