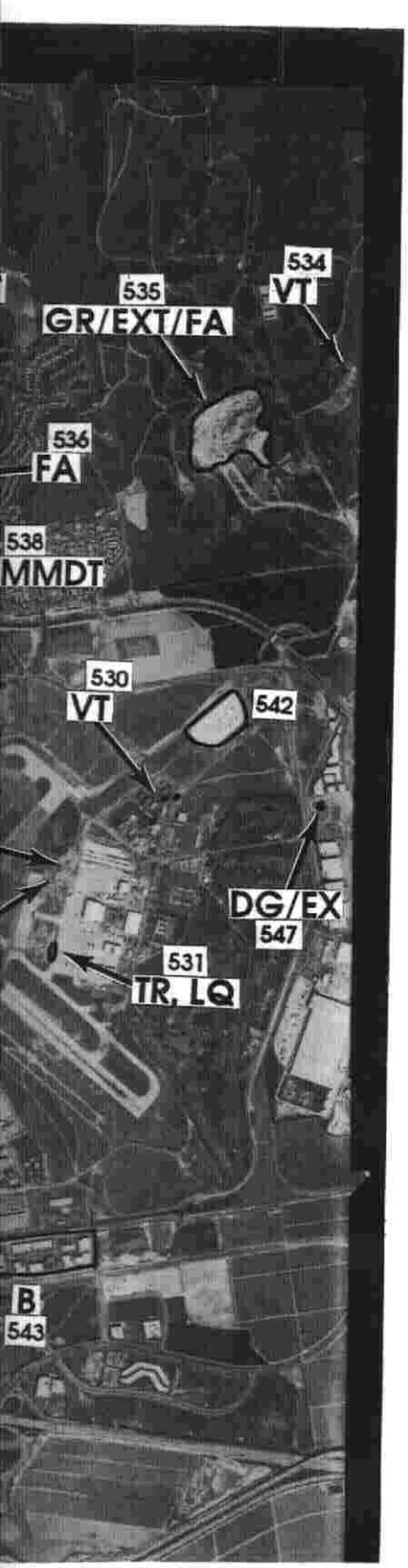
Previous



Aerial Photographic Interpretation
MCAS El Toro
Santa Ana, California
1988
Figure 24

Sheet 1 of 1
January 21, 1988
Photo Number 3697–161
Source:
U.S. Geological Survey

Prepared for:

Southwest Division
Naval Facilities Engineering Command
Contract N68711–92–D–4658

LEGEND:

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
B	Building	IM	Impoundment
D	Drums	LQ	Liquid
DB	Debris	LT	Light–Toned
DG	Disturbed Ground	M	Material
DK	Dark–Toned	MM	Mounded Material
EX	Excavation	OS	Open Storage
EXT	Extraction	R	Refuse
FA	Fill Area	ST	Stain
FBR	Fuel Bladder Revetment	TR	Trench
		UO	Unidentified Object
GR	Graded Area	VT	Vertical Tank
GS	Ground Scar	WS	Wet Soil
HT	Horizontal Tank		

N

3000' 0 3000' 6000'

1" = 2750'

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2.23 1988 PHOTOGRAPHS

FIGURE:	24
DATE:	21 JANUARY 1988
PHOTOGRAPH:	3697-161
NOTES:	The photographs are of a small scale and provide only partial coverage of the site.

c 522. There is disturbed ground (DG) at a construction site on the southeast side of Perimeter Road, between N 4th Street and N 6th Street. No additional investigation is recommended at this time.

c 523. Liquid (LQ) is flowing southwesterly across a parking area from Building 15, near West Marine Way and N 3rd Street. The flow discharges into a ditch (WS). Additional investigation is recommended.

c 524. Three possible vertical tanks (VT) are noted: two (2) are along the southerly side of Building 5, near S 3rd Street and West Marine Way; the third is in an open field southerly of Building 517, near S 5th Street and H Street. The tanks should be verified and their contents determined.

c 525. There is probable wet soil (WS) westerly of Building 52 and southerly of Building 692, near El Toro Boulevard and H Street. No additional investigation is recommended at this time.

c 526. There is an open storage (OS) area with possible drums (D) west of the Battery Acid Disposal Area (Site 14). Additional investigation is recommended. The current IR program field investigation of Site 14 should be expanded to include this area.

c 527. A vertical tank (VT) is located near the northwest corner of Building 121, near N 9th Street and P Street. Determination of the tank contents is recommended.

c 528. There is possible liquid (LQ) at the southerly corner of Building 369, near S 12th Street and N Street. Additional investigation is recommended.

c 529. Liquid (LQ) is flowing southeasterly into the parking area from the northwest corner of Building 307, near S 14th Street and K Street. The current IR program field investigation of the Petroleum Disposal Area (Site 10) or of the TAFDS area (Site 22) should be expanded to include this area.

c 530. There are three probable vertical tanks (VT): about 100 feet east of Building 442, near North Marine Way and N 3rd Street; about 200 feet west of Building 442; and at the north side of Building 1791. The tanks should be verified and their contents determined.

b 531. In the westerly portion of ACER (Site 19) there is a trench (TR) that is partially liquid (LQ) filled. No additional investigation is recommended at this time. The current IR program field investigation of the Site 19 area appears to be adequate, relative to the features noted here.

c 532. There are areas of wet soil (WS) and liquids (LQ) about 400 feet east-northeast of Building 617 (ACER, Site 19). These appear to be puddles of rain water. No additional investigation is recommended at this time.

c 533. There is probable liquid (LQ) adjacent to Building 617 at ACER (Site 19). The current IR program field investigation area should be expanded to include the feature.

b 534. There is a probable vertical tank (VT) in the staging area north of the Magazine Road Landfill (Site 2). Verification of the tank and determination of its contents are recommended.

a 535. The northeastern area of the Communication Station Landfill (Site 17) continues to be buried (FA) by the grading (GR) and extraction (EXT) operations on the ridge to the east. No additional investigation is recommended at this time. The current IR program field investigation of the Site 17 area appears to be adequate, relative to the features noted here.

c 536. The former extraction (EXT) area at the mouth of Agua Chinon Wash has been filled (FA). Potential contaminants may have been buried at the site. Additional investigation is not recommended unless contamination is detected at the site, or downgradient of the site, in areas of interest to the IR program.

c 537. At the developed former quarry (EXT) southeast of the South Coast Agriculture Field Station there are orange stains (ST) on the large, light colored pad in the northern area of the site. The pad was typically dark toned in earlier photographs. No additional investigation is recommended at this time, unless contamination is detected at the site, or downgradient of the site, in areas of interest to the IR program.

c 538. Stains (ST) and dark-toned mounded material (MMDT) are common at the industrial site at the southeastern corner of the South Coast Agriculture Field Station. Buildings (B) and disturbed ground (DG) are also noted. No additional investigation is recommended at this time, unless contamination is detected at the site, or downgradient of the site, in areas of interest to the IR program.

c 539. The Rodeo Area has expanded toward the northwest, where disturbed soil (DG), buildings (B) and light-toned mounded material (MMLT) can be seen. There is an area of disturbed ground (DG) along the southerly side of Irvine Boulevard that may be a backfilled trench (TR). There are also areas of disturbed ground west and northwest of the Rodeo Area. Investigation of the site history as a possible disposal area is recommended.

c 540. Several features can be observed at the industrial / agricultural area south of Lambert Reservoir. Dark-toned mounded material (MMDT) is located in the northern and southern portions of the site. There is probable liquid (LQ): at the southern edge of the northern mounded material; in the pond adjacent to the road in the southwestern portion of the site; and at the western corner of the southern mounded material. There are stains (ST) in the southwestern corner of the site. No additional investigation is recommended at this time unless contamination is detected near the site, or downgradient of the site, in areas of interest to the IR program.

c 541. No significant changes are noted at the South Coast Agriculture Field Station.

c 542. A light-colored pad, possibly concrete, was constructed west of Perimeter Road and Magazine Road. The purpose of the pad is unknown, but the area was probably graded (GR). No additional investigation is recommended at this time.

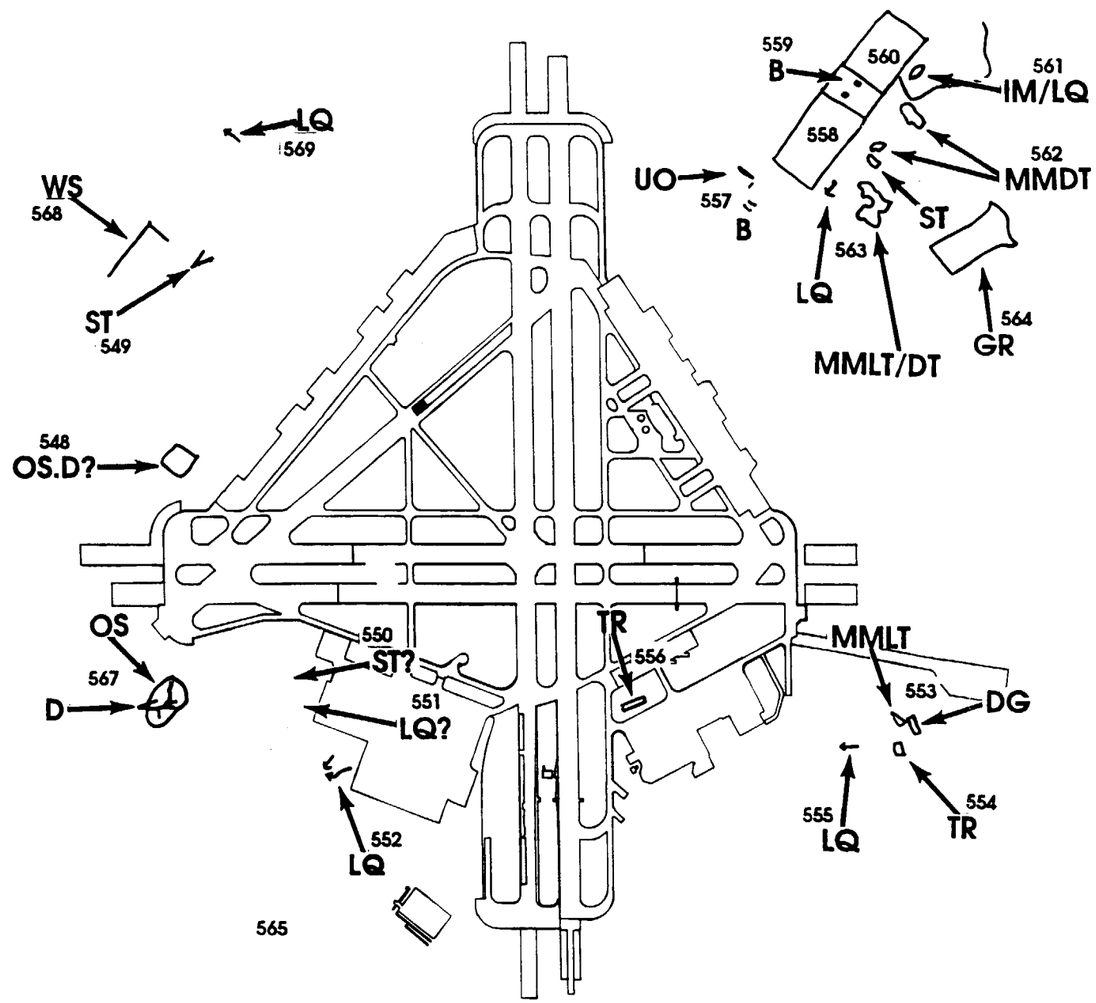
c 543. There has been industrial / commercial development (buildings (B) and grading (GR)) southwest of Building 360, between the railroad tracks and Interstate Highway 5. No additional investigation is recommended at this time, unless contamination is detected near the site, or downgradient of the site, in areas of interest to the IR program.

a 544. A pad, probably of concrete and asphalt was constructed immediately south of Crash Crew Pit No. 2 (Site 16). The site was probably graded (GR). No additional investigation is recommended. The current IR program field investigation of the Site 16 area appears to be adequate, relative to the features noted here.

c 545. The impoundment (IM), probably for irrigation water or flood control, on the northerly side of Irvine Boulevard, near the departure end of Runway 34R, is dry. No additional investigation is recommended at this time.

c 546. No significant changes are noted at the Rifle Range, or in its immediate vicinity.

c 547. There has been continued commercial and industrial development (buildings (B) and grading (GR)) along the southeastern border of the activity. No additional investigation is recommended at this time, unless contamination is detected near the site, or downgradient of the site, in areas of interest to the IR program.



1992 Airfield Outline
Used for Reference

Aerial Photographic Interpretation
MCAS El Toro
Santa Ana, California
1992

Figure 25

Sheet 1 of 1
January 20, 1992
Photo Number C85-11-12
Source:
Continental Aerial Photo, Inc.

Prepared for:

Southwest Division
Naval Facilities Engineering Command
Contract N68711-92-D-4658

LEGEND:

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
B	Building	IM	Impoundment
D	Drums	LQ	Liquid
DB	Debris	LT	Light-Toned
DG	Disturbed Ground	M	Material
DK	Dark-Toned	MM	Mounded Material
EX	Excavation	OS	Open Storage
EXT	Extraction	R	Refuse
FA	Fill Area	ST	Stain
FBR	Fuel Bladder Revetment	TR	Trench
GR	Graded Area	UO	Unidentified Object
GS	Ground Scar	VT	Vertical Tank
HT	Horizontal Tank	WS	Wet Soil

N

2000' 0 2000' 4000'

1" = 2000'

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ET25-1R1.DWG

2.24 1992 PHOTOGRAPHS

FIGURE: 25
DATE: 20 JANUARY 1992
PHOTOGRAPH: C85-11-12
NOTE: Copyrighted photograph, reproduction not authorized.

c 548. There is a large, about 350 feet by 350 feet in area, open storage (OS) area with possible drums (D) along the northwesterly side of Buildings 29 and 31, and surrounding the Suspended Fuel Tank area (Site 15). The current IR program field investigation of Site 15 should be expanded to include this area.

c 549. Possible stains (ST) can be seen westerly of Gate No.1, on the southerly side of Trabuco Road. Additional investigation is not recommended at this time.

a 550. There are probable stains (ST) in the Transformer Storage Area (Site 11) that appear to be included in the current IR program field investigation area. No additional investigation is recommended at this time.

a 551. There are probable liquids (LQ) flowing about 100 feet north of Building 386, near N Street and N Place. The site appears to be included in the area of the current IR program field investigation. No additional investigation is recommended at this time.

c 552. Liquid (LQ) is flowing southwesterly from Buildings 388 and 655, near the southeastern corner of the aircraft parking ramp, across the parking areas, and apparently into a drainage ditch. Investigation of the liquid discharge area is recommended.

c 553. Light-toned mounded material (MMLT) and disturbed ground (DG) can be observed about 400 feet and 600 feet easterly of Building 673, near N 3rd Street and East Marine Way. The mounded material appears to be soil, and the disturbed ground appears related to a possible construction site immediately to the south. No additional investigation is recommended at this time.

c 554. There is a trench (TR) about 600 feet southeast of Building 673, near N 3rd Street and North Marine Way. The purpose of the trench is unknown, and the site is partially revegetated. Because the site may possibly have been used to dispose of potential contaminants, additional investigation is recommended.

c 555. Liquid (LQ) can be seen flowing westerly from the northeastern end of Building 390, near El Toro Boulevard and N 3rd Street. Discoloration of the parking area adjacent to the flow suggests that this is a repeated event. Additional investigation is recommended to determine if contaminants of concern are typically discharged from this building.

a 556. The previously noted trench (TR) at ACER (Site 19) remains open. No additional investigation is recommended. The current IR program field investigation of Site 19 appears to be adequate, relative to the features noted here.

c 557. A new building (B) and unidentified object (UO) are observed at the Rodeo Area. The unidentified object (UO) appears to be either a vertical tank (VT) under construction or a circular, horse-training area or arena. Additional investigation is not recommended at this time.

c 558. All greenhouses have been removed (DG) from the southeastern portion of the South Coast Agriculture Field Station. No additional investigation is recommended at this time, unless contamination is detected near the site, or downgradient of the site, in areas of interest to the IR program.

c 559. A new support area (OS) has been established in the former greenhouse area at the South Coast Agriculture Field Station. Fuel, oil, solvents, pesticides, fertilizers, and other potential contaminants may be stored or used in the area. No additional investigation is recommended, unless contamination is detected at the site, or downgradient of the site, in areas of interest to the IR program.

c 560. Unidentified light- and dark-toned mounded material (MMLT, MMDT) cover much of the indicated area immediately northeast of the South Coast Agriculture Field Station. Additional investigation is not recommended at this time, unless contamination is detected near the site, or downgradient of the site, in areas of interest to the IR program.

c 561. The industrial / agricultural area south of Lambert Reservoir is largely covered by light- and dark-toned mounded material (MMLT, MMDT). An impoundment (IM) with liquid (LQ) is noted in the southwestern corner of the area. Additional investigation is not recommended at this time, unless contamination is detected near the site, or downgradient of the site, in areas of interest to the IR program.

c 562. In the developed former quarry area there are stains (ST) near the southwest border, and dark-toned mounded material (MMDT) in the southwestern area and in the northern graded-pad area noted on earlier photographs. Additional investigation is not recommended at this time unless contamination is detected near the site, or downgradient of the site, in areas of interest to the IR program.

c 563. There is wet soil (WS) and a southwesterly flow of liquid (LQ) from the northeast corner of the building in the industrial site adjacent to the southeast corner of the South Coast Agriculture Field Station. Unidentified light- and dark-toned mounded material (MMLT, MMDT) is located over much of the southeastern portion of the area. Additional investigation is not recommended at this time, unless contamination is detected near the site, or downgradient of the site, in areas of interest to the IR program.

c 564. Grading (GR) appears to be complete in the south-central area of the MCAS El Toro residential area. Additional investigation is not recommended at this time.

c 565. Commercial and industrial development (buildings (B) and grading (GR)) continues adjacent to the southwestern and southeastern borders of the activity. Additional investigation is not recommended at this time, unless contamination is detected near the site, or downgradient of the site, in areas of interest to the IR program.

a 566. No significant changes are noted at the Communication Station Landfill (Site 17), the Magazine Road Landfill (Site 2) or EOD Range (Site 1). Extraction (EXT) of the ridge between the Communication Station and Magazine Road Landfills appears to have ceased. Vegetation has been stripped from the area north of the Magazine Road Landfill. No additional investigation of these sites is recommended at this time. The current IR program field investigation of the Site 1 area appears to be adequate, relative to the features noted here. These areas are not indicated on the reproduced photograph overlay.

c 567. The open storage (OS) area at the intersection of the railroad tracks and Bee Canyon Wash may contain drums (D) in several locations. Additional investigation is recommended.

c 568. The cultivated field, west of Gate No.1 on Trabuco Road, contains two (2) perpendicular, dark lineations (DGDT), about 400 feet and 800 feet long. The lineations are probably plowed wet soil (WS). Additional investigation is not recommended at this time.

c 569. Liquid (LQ) is flowing toward the northwest from the Marine Exchange (Building 649). Additional investigation is not recommended at this time.

3.0 DATA COMPILATION

This section addresses the compilation of the sites of concern identified during this and the previous investigations (References A, B, C, D and E). The present investigation identified about 570 sites meeting the criteria discussed in Section 1 of this report. The USEPA (Reference B) identified about 600 additional sites. Because of the data density, the two data sets are compiled on separate maps (Plates 1 and 2). On the map depicting the USEPA sites of concern (Plate 1), several data points that occur in the same area may be combined under a single comment number. This action reduced the number of identified areas to about 300 (Plate 1) and illustrates the temporal and areal persistence of many features. The SAIC investigation map (Plate 2) identifies each site individually so that these new data may be readily identified and assessed using the appropriate photographs.

The compiled sites of concern are sequentially numbered on each plate. The site number can be cross referenced with the data in Appendix A (USEPA) or Appendix B (SAIC), as appropriate. The appendices identify the features and the year of the photograph on which the feature was observed. For the sites identified during the present investigation (Plate 2), the comment numbers correspond to those given in the aerial-photograph interpretation discussions (Section 2 of this report).

The sites and areas of potential concern identified on Plates 1 and 2 indicate the approximate locations and areal extents of the features. The reader is referred to the annotated photographs for the exact locations of the features. Multiple comment numbers are given for several sites on Plate 2. These multiple comments reflect changes at the site, or persistence of the identified features over time. Each comment refers to information identified on an aerial photograph taken during a particular year. The SAP Amendment RI/FS sites are indicated on Plates 1 and 2. Plate 2 also delineates general areas and areas of potential concern mapped during the present investigation and discussed in Section 2 of this report. The limits of the area represent the maximum extent of the feature, for example, a quarried area or open storage, that was identified on the photographs.

4.0 HISTORIC LAND USE

4.1 GENERAL LAND USE CATEGORIES AND DATA SOURCES

Maps illustrating the historic land use and boundaries of MCAS El Toro for five selected intervals during the period 1942 through 1991 are included here as Figures 26 through 30. The years depicted are: 1946, 1956, 1967, 1982, and 1991. The maps were compiled from: the aerial photographs obtained during the Reference A investigation; data developed by the USEPA (Reference B); and from Master Plan, development, plot plan, and other historic maps of the activity provided by the Navy. The aerial photographs are documented in Section 2 and Appendix D of this report. The maps are documented in Appendix C.

The maps illustrate seven general land use categories: commercial, industrial, residential, recreation, open/agriculture, airfield, and flight cone (clear area). These categories were distilled from the many, and sometimes imprecise or conflicting, land use classifications depicted on the various historic maps of MCAS El Toro, observed in the aerial photographs, or noted in the USEPA report. The use of fewer categories appeared to over generalize the data and induce additional conflicts. Subjectivity was commonly required in assigning specific land use areas to a particular general land use category. As a consequence, site-specific conflicts with the indicated land use can be expected.

The maps are intended to be general, to focus on areal rather than site-specific land uses, and are based on the available information. A conservative, environmental-hazard approach was used in assigning land use categories, especially in differentiating between industrial and commercial areas. If the information was inadequate to differentiate between these, the area was typically assigned to the industrial category.

Data from the aerial photographs, USEPA report (Reference B), and the various maps were assessed, and the identified or assumed land uses assigned to the above categories. Table 1 lists the general categories and examples of land uses contained within each category. Commercial includes areas that would typically be considered as business areas, for example administration, community support, and schools, that would generally not use or produce significant volumes of potential contaminants. Industrial areas include areas in which potential contaminants would typically be used, disposed, or stored. Residential includes the MCAS El Toro housing and barracks areas. Recreation includes designated recreational areas such as the Marine Memorial Golf Course, swimming pools and baseball fields. Open / agriculture is used for areas in which no other land use was noted. Airfield designates aircraft operation areas, including runways and most taxiways, but typically excluding maintenance areas which are considered as industrial areas. Portions of the airfield operations area could also be assigned to the industrial category, but for lack of additional information, they were typically not differentiated. Flight cone (clear area) delineates the aircraft approach and departure corridors.

The years for which land use maps were prepared were selected on the basis of information availability. Master plans, land use maps and various types of development maps were obtained for about 10 individual years over the period 1942 through 1991. These maps are collectively referred to as "land use maps" in this report. Data from these were supplemented with aerial photographs and the USEPA report (Reference B). On rare occasions, such as for 1946, it was necessary to combine data, such as land use, the flight cone, or the activity's boundaries, from different years, to prepare a complete land use map.

The primary sources of data were the land use maps. The quality and usefulness of the maps varied widely. Several of the maps were poor copies that were difficult to read. For maps depicting land use, there was a lack of uniformity in the categories. Some maps identified only the general purpose of buildings and areas. Future development indicated on the master plan and similar maps may not have occurred. These factors required subjectivity in the assignment of the land use categories presented here.

The aerial photographs were used to resolve conflicts that were noted in reviewing the maps. The inclusion of the photographic data resulted in the addition of several features not noted on the available maps, such as landfill areas. The data also helped in identifying the proper land use category. Although several conflicts could not be resolved, the maps are useful in obtaining a general overview of historic land use at the activity.

4.2 LAND USE MAPS

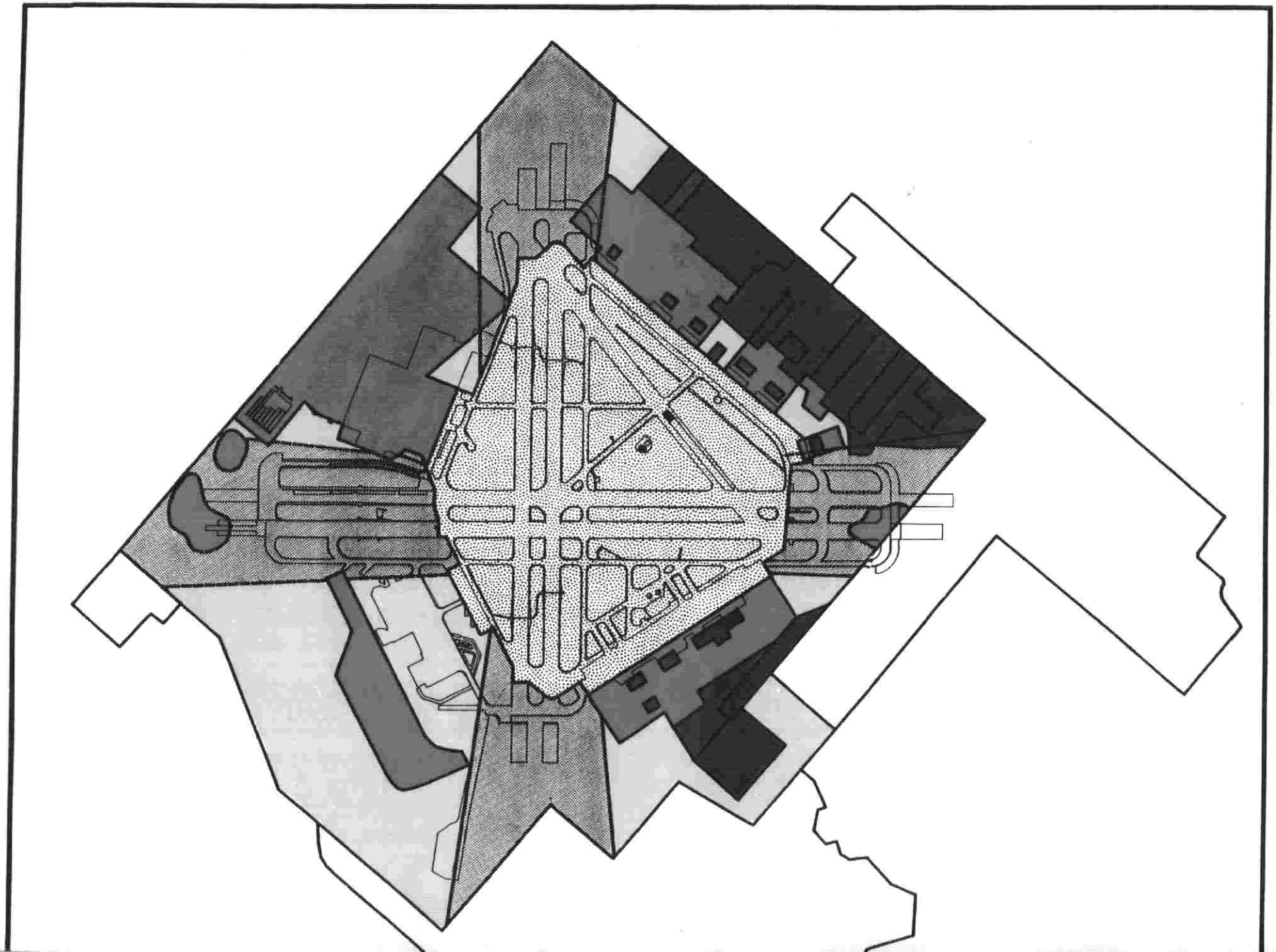
The MCAS El Toro land use maps for the years 1946, 1956, 1967, 1982, and 1991, are included here as Figures 26 through 30, respectively. Each map depicts an interpretation of the general land use that existed as of the year of the map. 1942 is the first year for which a land use map was available. Data from the 1942 map were combined with the 1946 aerial photography to develop the 1946 land use map (Figure 26). Therefore, 1946 is the base year from which comparisons of subsequent land use changes can be made.

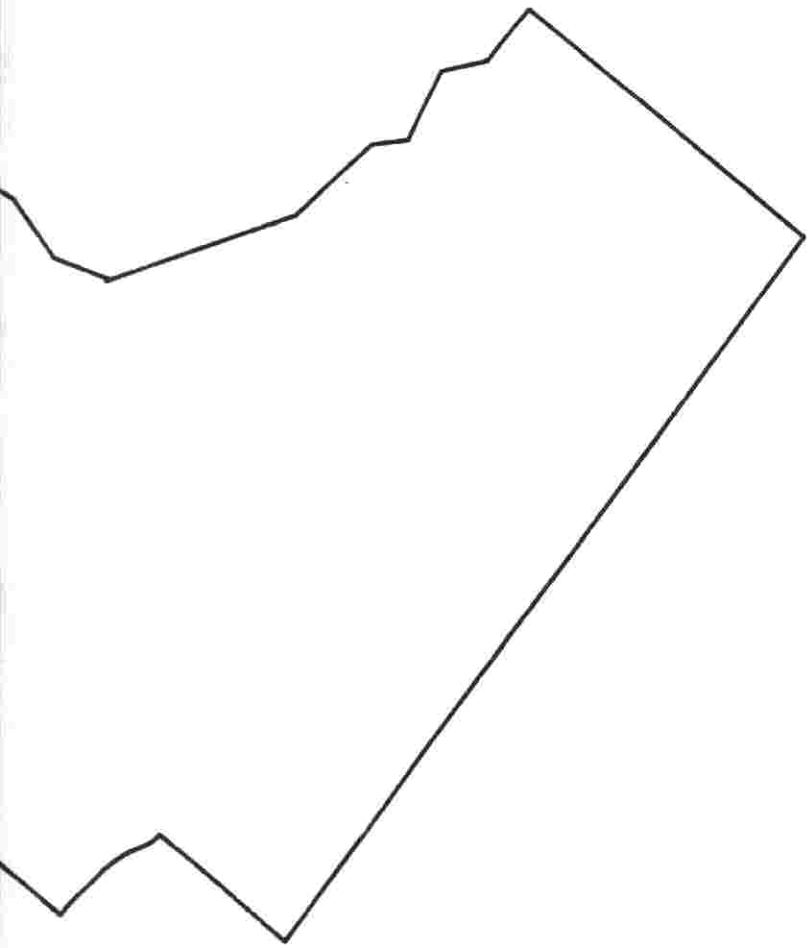
For consistency, and to ease comparison, the maps are presented at a common scale and are superposed on the 1992 activity boundary. The limits of the colored or patterned areas on each map indicates the boundary of the activity, which can be seen to vary over time. On all of the maps, the extended approach corridor (flight cone / clear area) for Runway 34 has been eliminated south of the activity. Excluding this area allowed for a larger map scale, and, therefore, the presentation of more detailed data. The excluded area was originally classified as open / agriculture until about 1980, when commercial / industrial and residential development began in the general area. This development was apparently unrelated to development within the boundaries of MCAS El Toro.

The land use maps (Figures 26 through 30) are color- and pattern-coded relative to the interpreted land use and, thus, are self explanatory. They are not discussed further.

Table 1. Land use Classification Categories

General Category	Examples of Identified Land use		
commercial	administration buildings	school	hospital
	Marine Exchange	bowling alley	chapel
	mess halls	bakery	general storage buildings
	parking areas	squadron headquarters	
industrial	warehouses	fuel storage areas	
	Auto Hobby Shop	storage buildings in industrial areas	
	ordnance storage areas	landfills	
	repair facilities	sewage treatment facilities	
	hangars	open storage areas	
	EOD Range	hazardous materials training areas	
residential	housing areas		
	barracks		
recreation	playing fields	park	
	Marine Memorial Golf Course	tennis courts	
	swimming pools	gymnasium	
open / agriculture	undeveloped areas		
	areas under cultivation		
airfield	all areas encompassed by the runways and taxiways		
flight cone (clear area)	identified aircraft approach and departure areas		





1946 Land Use Map

(Land Use Superposed on 1991 Base Map)

MCAS El Toro
Santa Ana, California

Figure 26
Sheet 1 of 1

Prepared for:

Southwest Division Naval Facilities Engineering Command

Contract N68711-92-D-4658

LEGEND:

- Commercial
- Industrial
- Residential
- Recreational
- Open/Agricultural
- Airfield
- Flight Cone (Clear Area)

N

2000' 0 2000'

1" = 2000'

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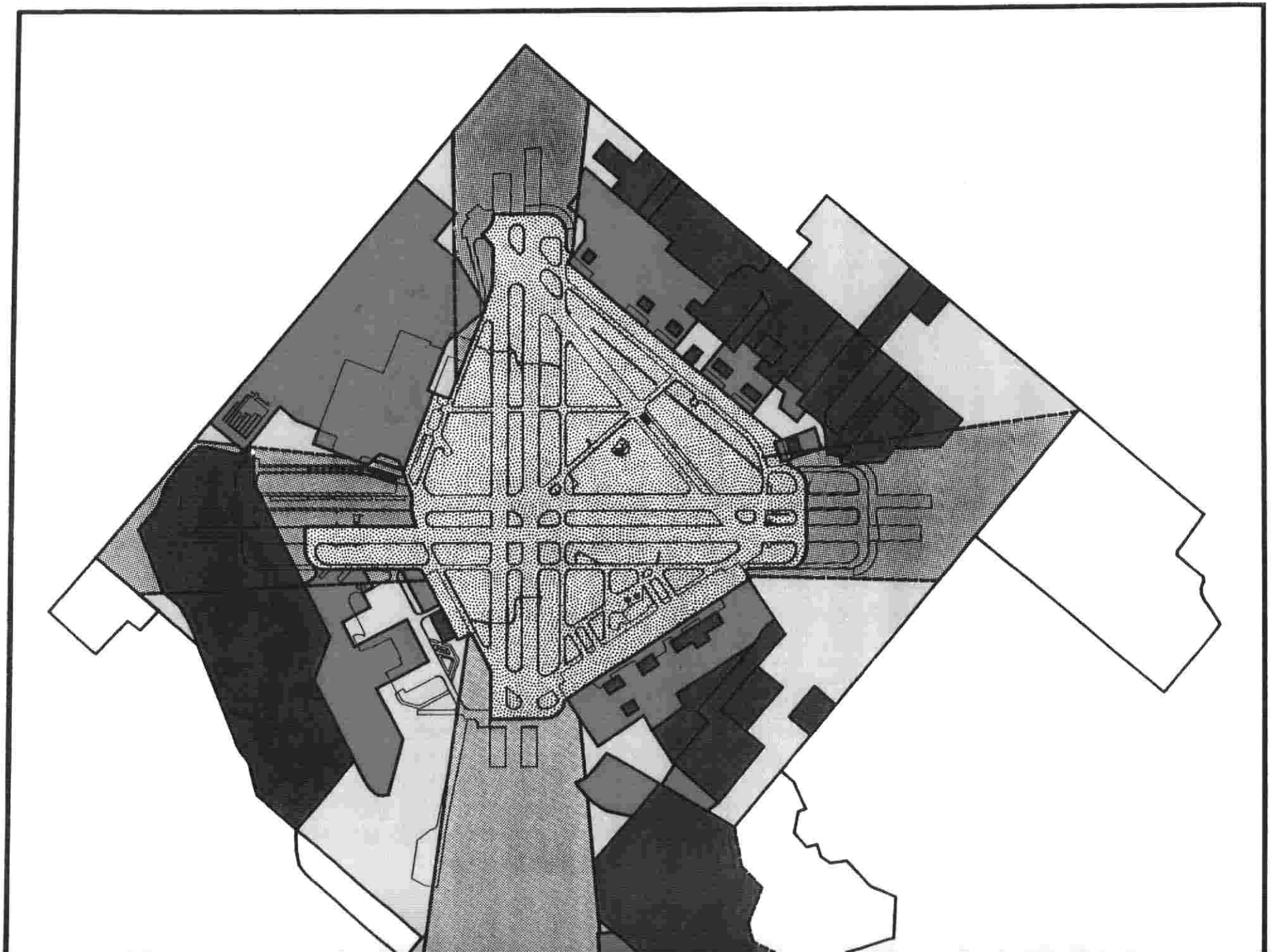

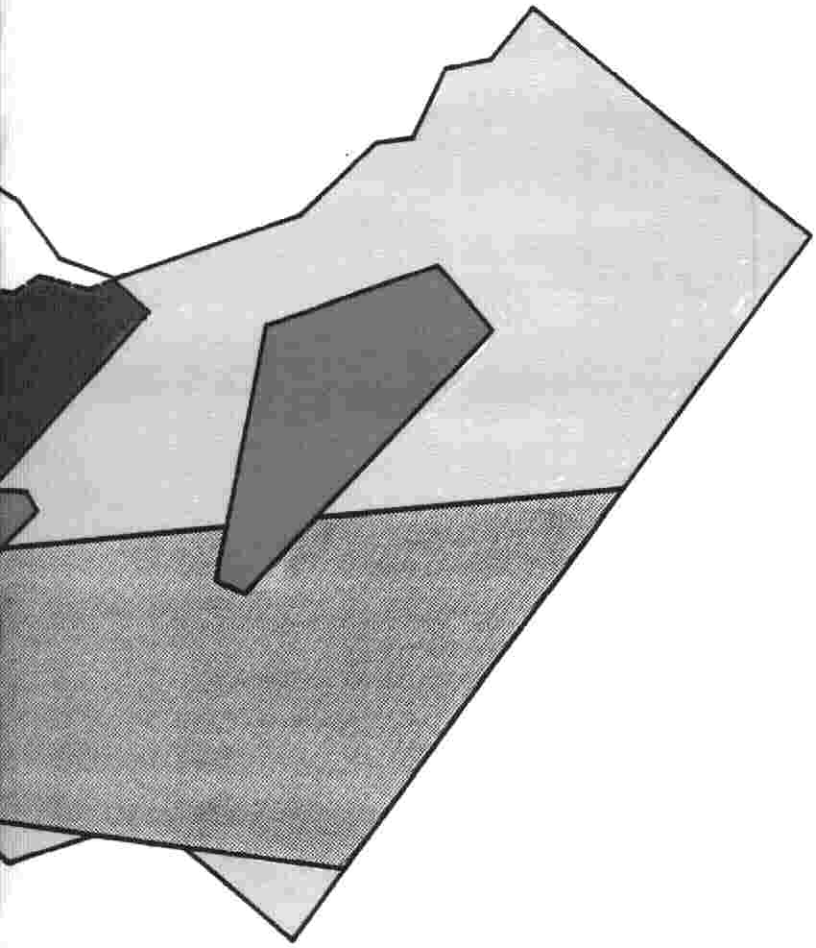

1956 Land Use Map

(Land Use Superposed on 1991 Base Map)

MCAS El Toro
Santa Ana, California

Figure 27
Sheet 1 of 1

Prepared for:

Southwest Division Naval Facilities Engineering Command

Contract N68711-92-D-4658

LEGEND:

- Commercial
- Industrial
- Residential
- Recreational
- Open/Agricultural
- Airfield
- Flight Cone (Clear Area)

N

2000' 0 2000'

1" = 2000'

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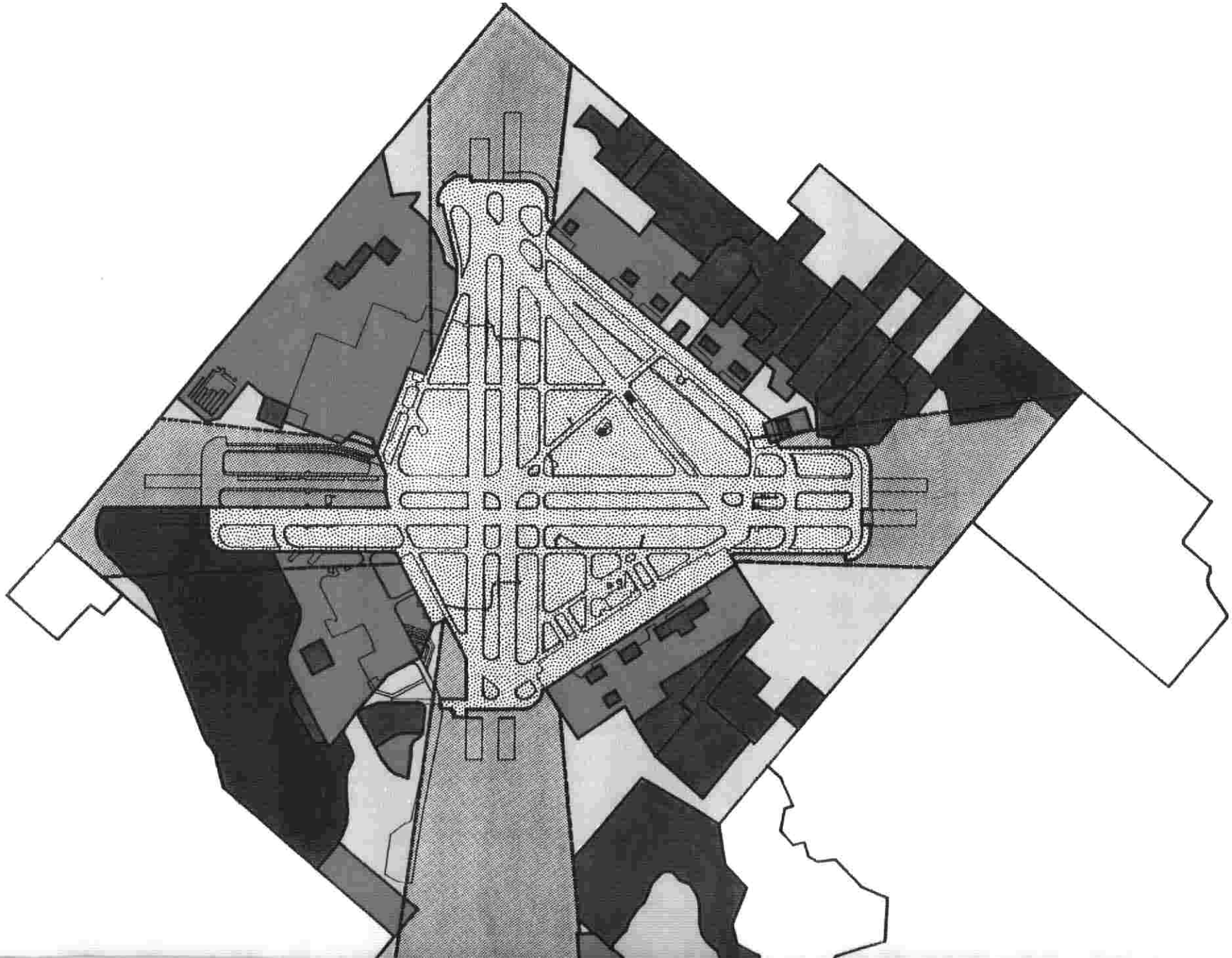

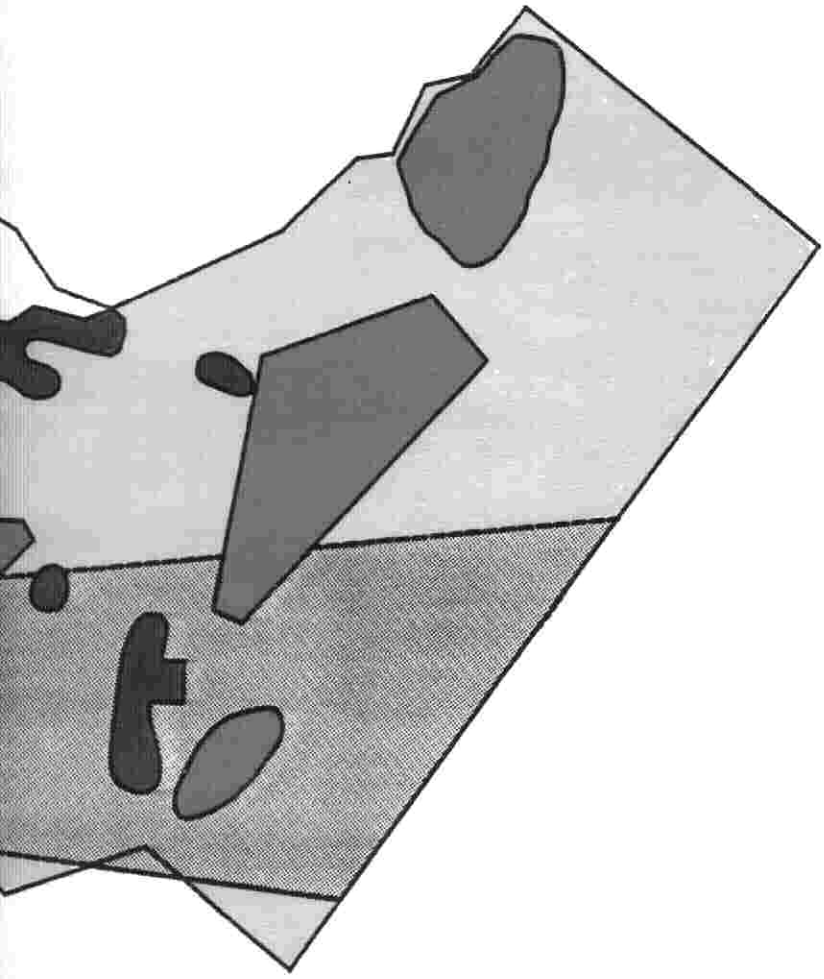

1967 Land Use Map

(Land Use Superposed on 1991 Base Map)

MCAS El Toro
Santa Ana, California

Figure 28
Sheet 1 of 1

Prepared for:

Southwest Division Naval Facilities Engineering Command

Contract N68711-92-D-4658

LEGEND:

- Commercial
- Industrial
- Residential
- Recreational
- Open/Agricultural
- Airfield
- Flight Cone (Clear Area)

N

2000' 0 2000'

1" = 2000'

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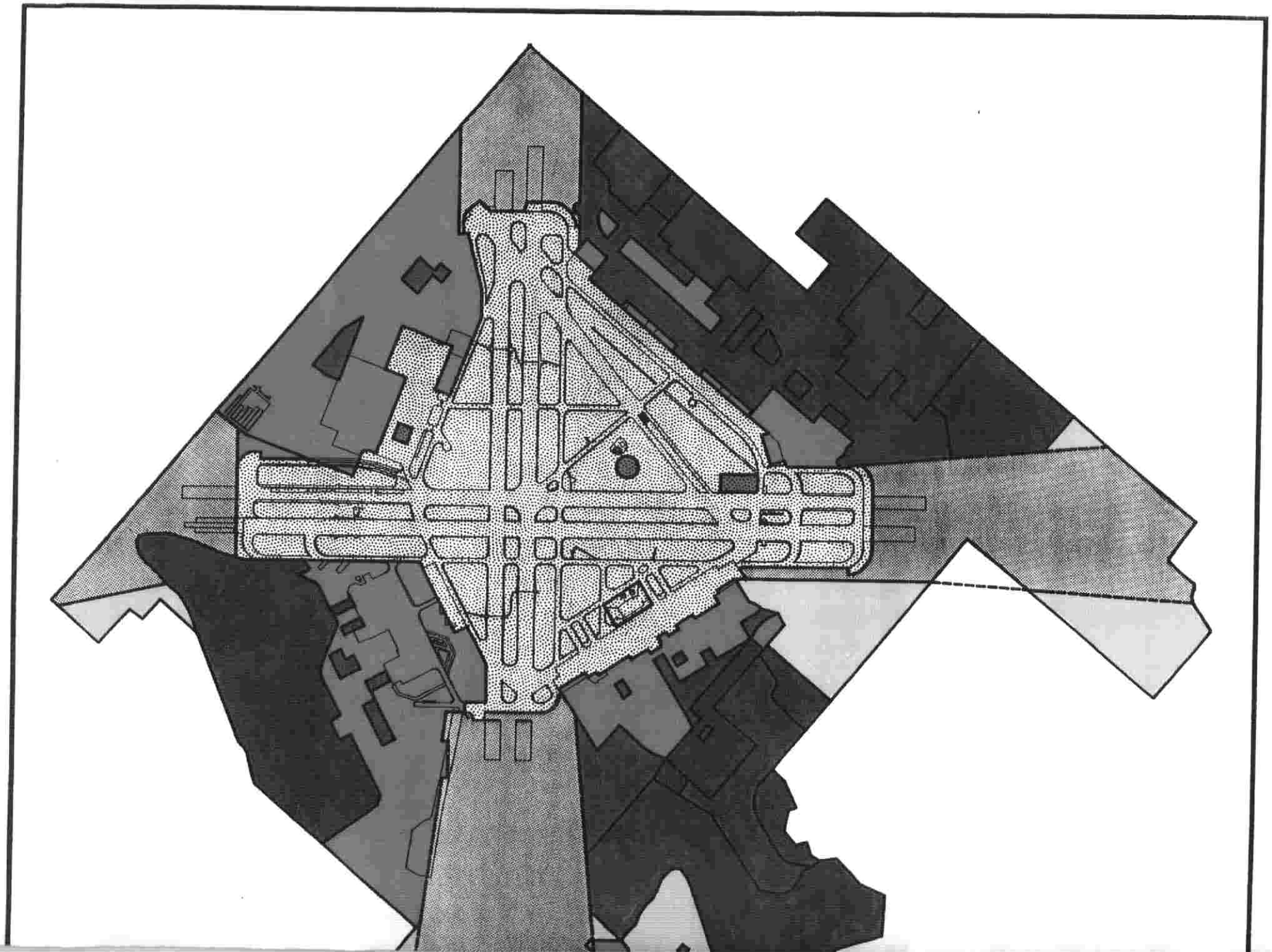

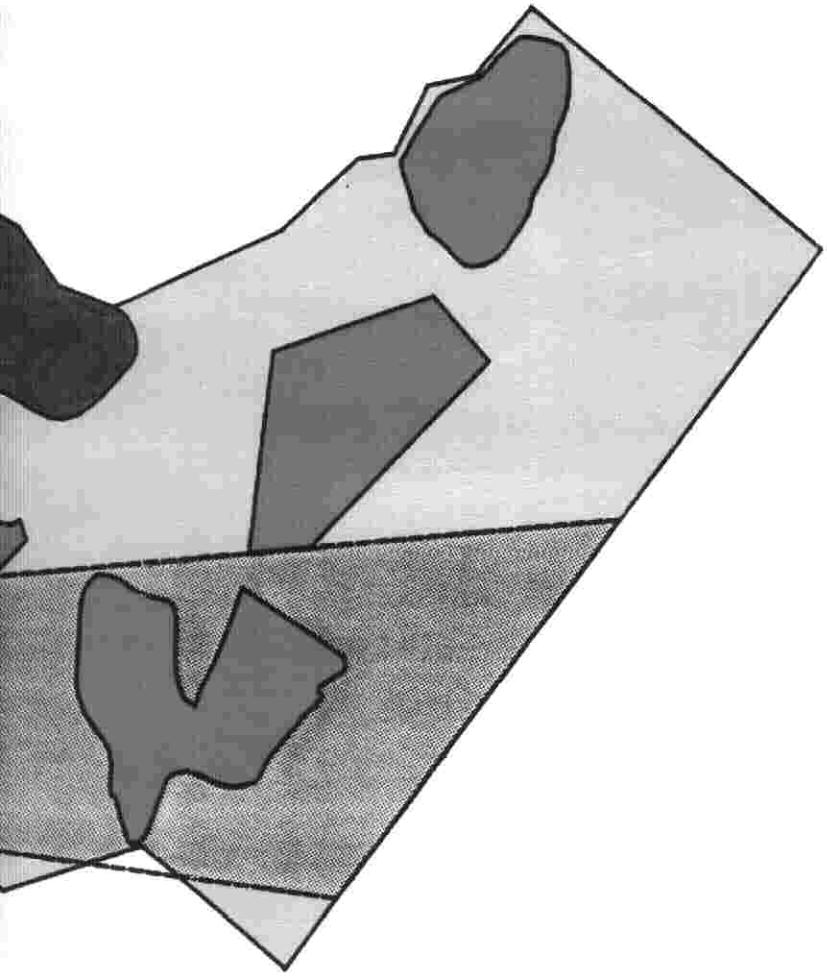

1982 Land Use Map

(Land Use Superposed on 1991 Base Map)

MCAS El Toro
Santa Ana, California

Figure 29
Sheet 1 of 1

Prepared for:

Southwest Division Naval Facilities Engineering Command

Contract N68711-92-D-4658

LEGEND:

- Commercial
- Industrial
- Residential
- Recreational
- Open/Agricultural
- Airfield
- Flight Cone (Clear Area)

N

2000' 0 2000'

1" = 2000'

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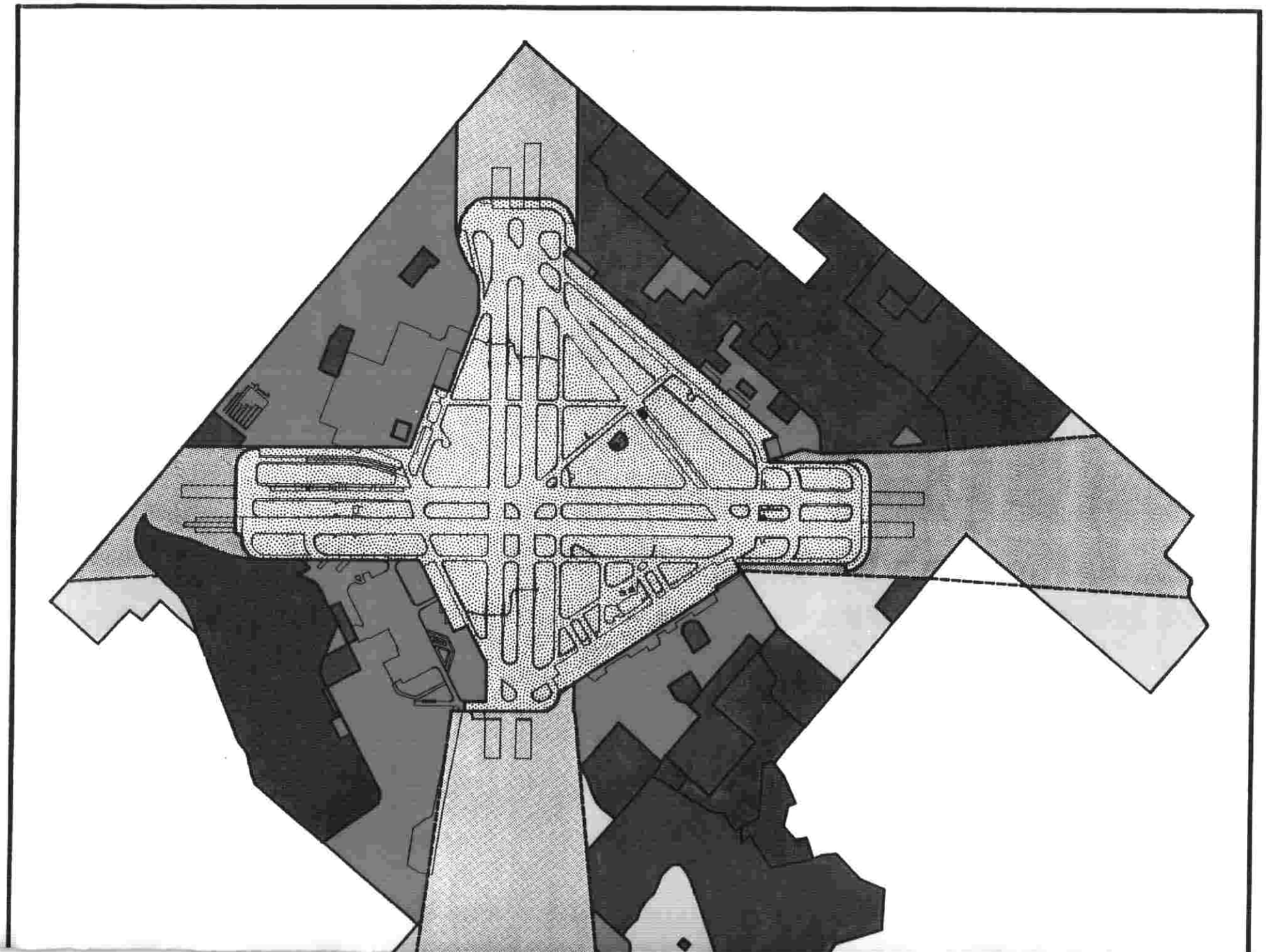

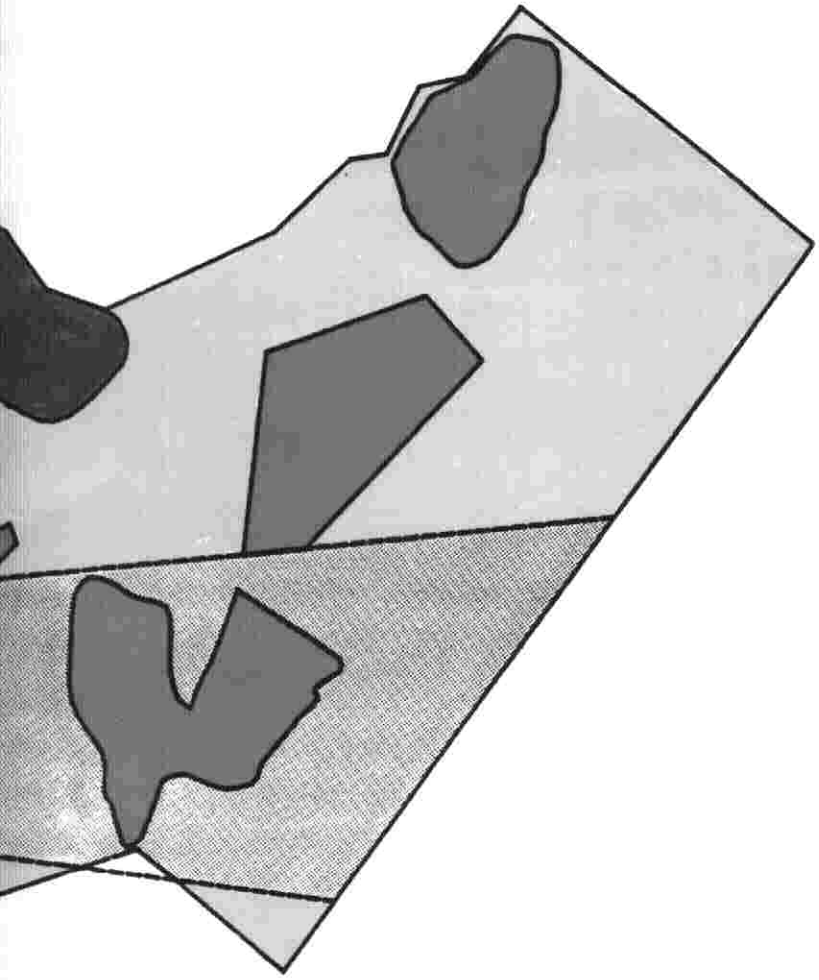

1991 Land Use Map

(Land Use Superposed on 1991 Base Map)

MCAS El Toro
Santa Ana, California

Figure 30
Sheet 1 of 1

Prepared for:

Southwest Division Naval Facilities Engineering Command

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LEGEND:

- Commercial
- Industrial
- Residential
- Recreational
- Open/Agricultural
- Airfield
- Flight Cone (Clear Area)

N

2000' 0 2000'

1" = 2000'

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5.0 DRAINAGE

5.1 INTRODUCTION

This section presents and discusses the drainage maps prepared for MCAS El Toro and the surrounding area. The maps were prepared using the aerial photographs obtained during earlier phases of this investigation. The nine years included in the drainage mapping are 1946, 1952, 1958, 1968, 1971, 1977, 1983, 1988 and 1992. Although mapping at five-year intervals was preferred (Reference A), the actual time intervals varied from three to ten years. The area mapped is approximately that of Figure 2, Reference B. The area is slightly rectangular in plan, with dimensions of about 4.2 miles by 4.5 miles and covers about 19 square miles. The drainage maps for some years do not cover this entire area because of incomplete aerial photograph coverage. Elevations range from about 200 feet (msl) along the western border of the area, to over 1200 feet in the northeastern corner.

The selection of years included in the drainage mapping was determined by the areal and stereographic coverages of the photographs, the photographic scale and resolution, and the recommended five-year mapping interval. Photographs for several years were eliminated from further consideration because they provided only partial areal coverage, or inadequate stereographic coverage. These factors are responsible for the ten year gap in the mapping, between 1958 and 1968.

Stereographic-photograph coverage is critical to surface-water drainage mapping. The exaggerated, three-dimensional representation of the topography provided by these photographs is an integral aspect of the mapping. Without this representation, topographic features are often difficult to identify, and determining surface-water flow directions, especially in areas of low-relief, may be impossible. In areas for which stereographic coverage was not available, data extrapolated from the adjoining stereographic-photograph pairs helped define the drainage details. In these areas, the drainage mapping data is typically less dense, and generally focuses only on the dominant drainages.

The scales of the selected photographs ranged from 1:20,000 to 1:36,000; photographs for two of the years have scales of 1:20,000, five have scales of 1:24,000, and the remaining photographs have scales of 1:33,000 and 1:36,000. Although useful for mapping the larger-scale features of the natural drainages and man-made improvements, the photographic scales were inadequate to map many small-scale or subtle features. In particular, determining drainage directions in the low-relief areas, including much of MCAS El Toro, was difficult. The smallest-scale photographs (1:33,000 and 1:36,000) provide less vertical exaggeration than the larger-scale photographs, and therefore, recognition of subtle topographic features using these photographs was even more difficult. All of the drainage maps included here are reproduced at a scale of 1:24,000.

The identification of surface-water drainage paths and the flow directions is affected by grading practices, vegetation, sun angle, season, photograph contrast, orientation of the feature relative to the illumination direction, topographic relief, and other factors. Drainage characteristics were most easily and reliably determined in the higher-relief, eastern portion of the mapped area where well-defined, natural drainages predominate. In low-relief areas, the direction of flow was often difficult to determine from the photographs. In these situations, data from the topographic maps were used to determine the most likely flow direction. If the data were equivocal, the drainage, but not a flow direction, is indicated on the map.

The impact of development and engineered drainage control increases over time, from being minimal over large portions of the area in 1946, to becoming dominant by 1992. In general, land use changed, over time, from natural, to agricultural, to limited development, and finally to fully developed. Each phase of this process affects the drainage. In the natural state the drainage follows geologically and geomorphically controlled paths. But, as the land use changes, artificial drainage control typically increases. In the extreme case of full development, the drainage is almost completely controlled by engineered drainage improvements.

Due to the scale and resolution of many of the photographs, small-scale, or otherwise subtle features, could often not be recognized. These features may be important for tracing the transport paths of potential contaminants. SAIC recommends that the Navy consult present and historical drainage maps and engineering plans that were prepared for drainage improvements and other site development at MCAS El Toro. Similar information for nearby areas may also be valuable. These data will provide detailed information regarding the locations, inlet and outlet areas, flow directions, and other characteristics of drainage features not discernible during the aerial photograph analysis.

Note that various drainage-related features may appear or disappear over time, that locations may vary slightly, and that occasionally, the indicated flow direction may reverse. While many of the changes reflect modifications to the drainage system, others may result from factors affecting the photograph interpretation process, or from distortion of the photographic image. The effects of photographic scale, resolution, illumination direction, vegetation and other factors were identified in a previous section of this report. In addition, the photographic process induces "radial" and other distortions into the image. That is, distortion of the image and dislocation of features from their geometrically-correct positions increases with increasing distance from the center of the photograph. These distortions and dislocations can be eliminated by special processing of the photographs, or by sophisticated photographic-analysis equipment. Neither option was available for this investigation, and only standard aerial photographs were used. The problem is exacerbated by the necessary use of aerial photographs not specifically planned for use as stereographic pairs. As a consequence, drainage features from different years, or from different photographs taken during the same year, may not match perfectly if superposed.

The drainage maps included here as Figures 31 through 39 illustrate specific drainage-related features, as well as the general drainage patterns. These data were digitized from the transparent photograph overlays and processed using an AutoCAD system. Due to the photographic distortions, sometimes severe, that were discussed in the previous paragraph, it was not practicable to accurately represent all of the mapped drainages on the 1992 topographic base map. While the accuracy was acceptable in the low-gradient areas that comprise much of the area, the accuracy markedly degenerates in the high-gradient areas toward the east. Consequently, rather that attempting to artificially rectify the drainage data relative to the geometrically-correct topographic map, the data are presented with minimal manual adjustment, and without the topographic base.

In spite of the possible shortcomings of using and presenting unrectified mapping data, the maps depict a acceptably-accurate, qualitative representation of the individual drainages and the integrated drainage patterns. All of the maps are produced at a scale of 1:24,000, regardless of the scale of the original photograph. Each map contains a representation of the MCAS El Toro airfield area for location and orientation purposes. The reader is referred to the original photographs to determine the exact location and character of any features depicted on the drainages maps.

5.2 DRAINAGE MAPS

This section briefly discusses the salient drainage features observed during the aerial photograph analysis and drainage mapping. These maps depict drainage paths and patterns discernible at the scales and resolutions of the available photographs, and with the analytical equipment used during the investigation. To avoid excessive detail in plotting natural drainage paths, the maps do not always illustrate the lowest-order drainages that could be recognized. Where practicable, all improved and artificial drainages are indicated, regardless of size. Drainage maps for the years 1946, 1952, 1958, 1968, 1971, 1977, 1983, 1988 and 1992 are included as Figures 31 through 39, respectively. The maps depict only the drainages, with limited cultural features for orientation purposes.

On each drainage map, natural drainages are indicated by dashed lines, with arrows illustrating the flow direction of the surface water. All of the natural drainages appear to be ephemeral, that is, water does not typically flow during the entire year. Artificially enhanced drainages and engineered drainage controls are depicted by solid lines with flow direction arrows. A change from a dashed to a solid line indicates that the natural drainage was improved or intercepted by an engineered drainage. Locally, dashed drainage lines abruptly terminate at the edge of developed areas. In actuality, the drainage is probably intercepted by engineered controls, such as brow ditches, an inlet structure, or other drainage improvement, but these could not be identified on the photographs.

Several observations are common to most, if not all, of the drainage maps. Prior to the 1946 photographs, the earliest photographs analyzed, several natural drainages had been altered for agricultural and drainage control purposes. The alterations included reservoir construction, channel improvements, channel diversions for irrigation, construction of irrigation channels, construction of drainage diversion channels and berms, storm drain construction, and road construction. These features typically persist to the present and have commonly been incorporated into subsequent land development activities.

By 29 December 1946, the date of the earliest photographs analyzed during this investigation, the major drainage patterns and engineering controls affecting MCAS El Toro and the adjacent areas had been established. Changes noted relative to later photographs are generally refinements of, and additions to, this existing, basic drainage system. The drainage maps are self explanatory, and as such, are not discussed in detail.

The drainage map for 1946 (Figure 31) indicates that the pre-development natural drainage was toward the west and southwest, generally normal to the topographic contours depicted on the topographic maps of the area. After leaving the topographically-confined drainages of the higher-relief areas to the east, surface waters typically flowed across alluvial fans and within pre-existing channels from which the water either percolated or eventually discharged into the higher-order regional streams. Discharge from Bee Canyon, Round Canyon, Agua Chinon Wash and Borrego Canyon was largely controlled by artificial or improved channels. Water from some of the lowest-order streams was locally intercepted and directed subparallel to the topographic contours for irrigation. Several of the drainage improvements were for agricultural purposes, but most were directly related to the development of MCAS El Toro.

Many natural drainages were cut off by drainage or irrigation improvements, but the drainage path below the diversion point is commonly indicated. Surface water will often concentrate in these drainage remnants and continue its downgradient flow. Some of these diversions were later breached, and the original, natural drainage re-established. As a consequence, the original, natural discharge routes may be of interest to later investigations. Locally, stream capture or drainage improvements, may result in apparent cross-cutting of streams.

In addition to controlling the primary drainages (Bee Canyon / Round Canyon and Agua Chinon Wash), numerous other drainage improvements can be seen at MCAS El Toro. These include open storm drains, inlet and outlet structures, drainage diversions and interceptors, runway and taxiway drainages and other features. The pattern of the airfield drainage depicted on the drainage map is not as readily apparent on many later photographs where continued improvement of the area is evident. Some of the areas adjacent to the runways and taxiways may be, or have been, sump areas from which runoff was allowed to percolate, or enter subsurface drains. The photographic evidence is not definitive.

It appears that nearly all of the drainage that leaves MCAS El Toro ultimately discharges into Bee Canyon Wash, Agua Chinon Wash, Borrego Canyon Wash, or the Marshburn

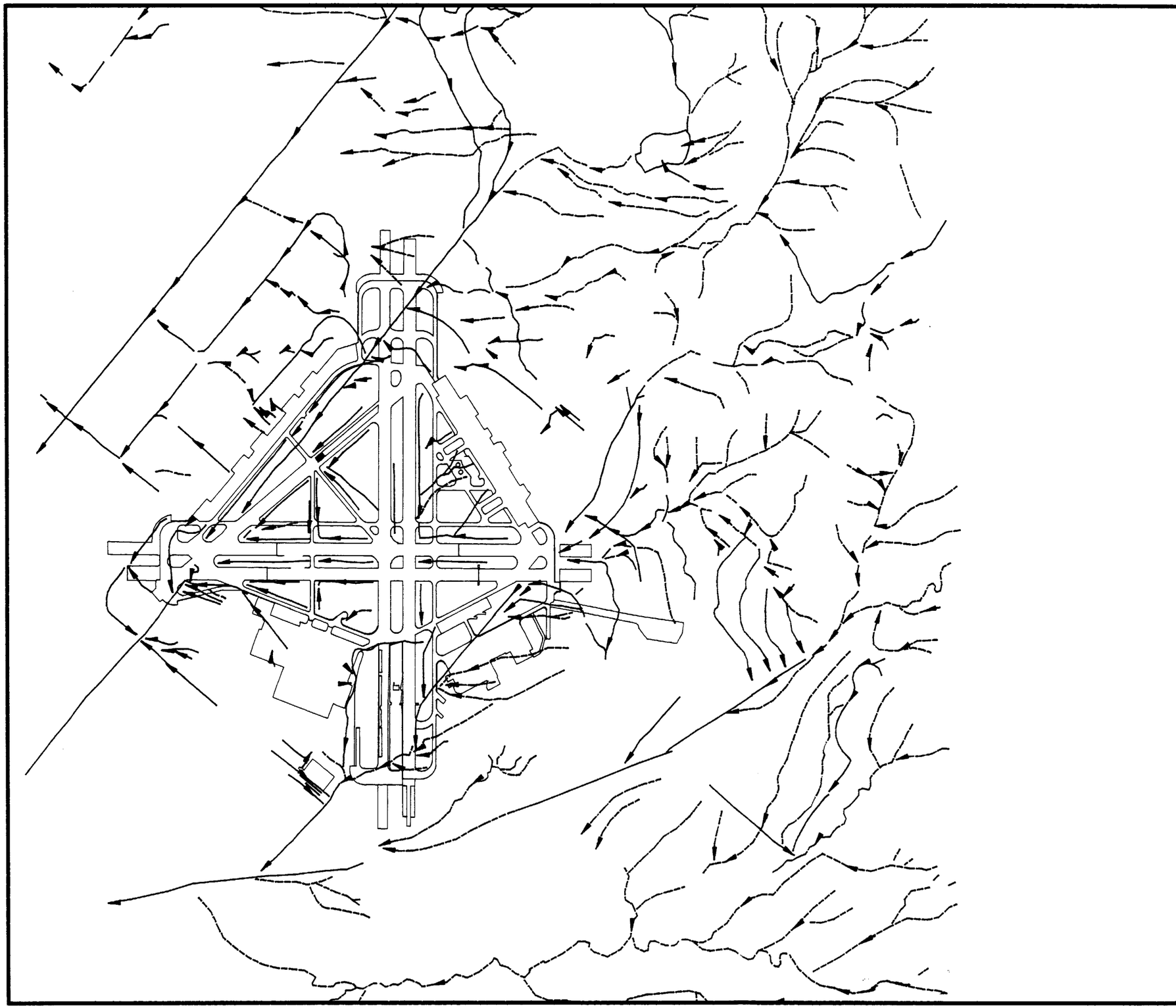
Channel. Several inlet and outlet structures for the major storm drains leading to these channels were identified; but many smaller-scale inlet and outlet structures that must exist could not be recognized at the scale and resolution of the photographs. It is assumed, that within the boundaries of MCAS El Toro, most nuisance and storm water flows overland, along streets, and within secondary or unimproved drainages until it is intercepted by the storm drain system, or percolates into the soil. With the exception of streets, most of these pathways could not be identified during the present investigation.

Only minor changes to the overall drainage pattern are noted in the drainage map for 1952 (Figure 32). Construction of the residential area had begun near the mouth of Agua Chinon Wash. The construction truncated or forced the improvement of natural drainages in this area. Markedly increased agricultural development is also noted. No significant changes were noted for drainage-map year 1958 (Figure 33), except that Interstate Highway 5 is under construction. The next drainage map, 1968 (Figure 34), similarly indicates only minor changes. The first, large, commercial development noted in the area, International Raceway is in operation, but this affects drainage only near the southwestern corner of the activity. East of the activity, the County Industrial Farm and sewage disposal facility have been built, but affect only a limited area.

In drainage-map year 1971 (Figure 35), mass grading and development is noted about one mile southeast of MCAS El Toro, but no other significant impacts on the overall drainage are noted. By drainage-map year 1977 (Figure 36), additional residential development is noted at the mouth of Agua Chinon Wash. This necessitated mass grading of the site, interception of minor natural drainages, and the construction of an underground storm drain to convey flood waters from Agua Chinon Wash. Residential development and mass grading are also continuing southeast of the activity. After an area is mass-graded and fully developed, the natural drainage is completely disrupted, and typically, only the major, surface-drainage controls can typically be identified. As a consequence, the smaller-scale drainage features are usually not noted on the maps.

By drainage-map year 1983 (Figure 37), there has been extensive mass grading and commercial / industrial and residential development southeast of MCAS El Toro. Development and drainage modifications in the immediate vicinity of the activity are limited to International Raceway and an apparent warehouse complex near the southern tip of the activity. By drainage-map year 1988 (Figure 38), much of the area south of the activity has undergone extensive grading and residential and commercial / industrial development. Elsewhere, agricultural activities have continued, but significant changes to the overall drainage pattern are not noted.

The 1992 (Figure 39) drainage map is similar to the 1988 (Figure 38) map, except that a markedly larger area has been graded and developed. No other significant modifications to the overall drainage pattern are noted.



DRAINAGE MAP

Aerial Photographic Interpretation
MCAS El Toro
Santa Ana, California

1946

Figure 31

Sheet 1 of 1
December 29, 1946
Photo Numbers GS-CP-8-100
and GS-CP-8-101

Source:
U.S. Geological Survey

Prepared for:

Southwest Division
Naval Facilities Engineering Command
Contract N68711-92-D-4658

LEGEND:

SYMBOL	DESCRIPTION
	Natural Drainage
	Improved or Artificial Drainage

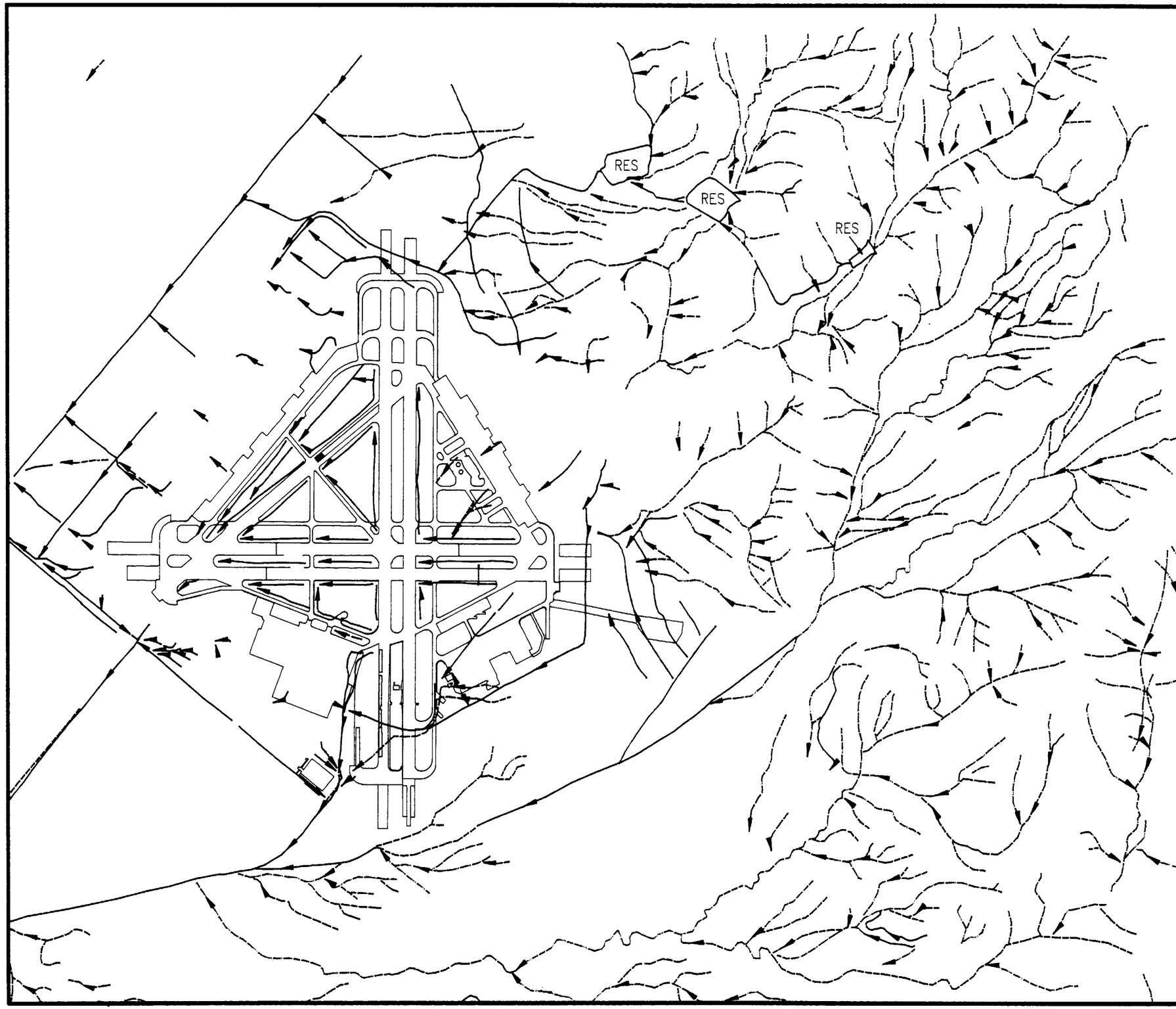
N

2000' 0 2000'

1" = 2000'
APPROXIMATE SCALE

Science Applications International Corporation
® An Employee-Owned Company

DM31-1R1.DWG



DRAINAGE MAP

Aerial Photographic Interpretation
MCAS El Toro
Santa Ana, California

1952

Figure 32

Sheet 1 of 1
December 12, 1952
Photo Numbers AXK-2K-140, AXK-2K-141, AXK-3K-36, and AXK-3K-37
Source:
U.S. Department of Agriculture

Prepared for:

Southwest Division
Naval Facilities Engineering Command
Contract N68711-92-D-4658

LEGEND:

SYMBOL	DESCRIPTION
	Natural Drainage
	Improved or Artificial Drainage

2000' 0 2000'

1" = 2000'
APPROXIMATE SCALE

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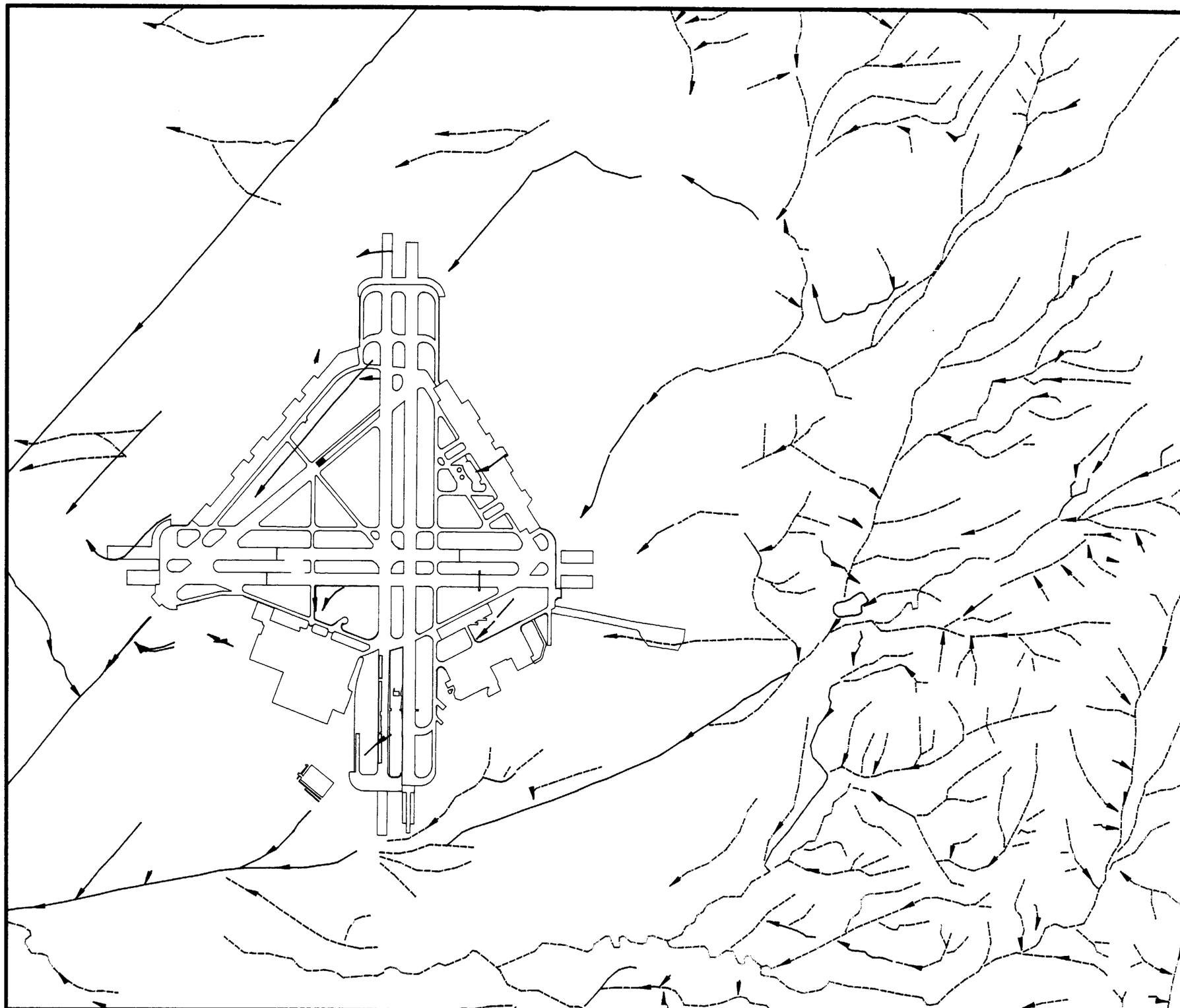
DM32-1R1.DWG

136



DRAINAGE MAP

Aerial Photographic Interpretation
MCAS El Toro
Santa Ana, California

1958

Figure 33

Sheet 1 of 1
January 17, 1958
Photo Numbers C-23023/5-108, C-23023/5-110, C-23023/8-13, and C-23023/8-14
Source: Whittier College, Whittier, California

Prepared for:

Southwest Division
Naval Facilities Engineering Command
Contract N68711-92-D-4658

LEGEND:

SYMBOL	DESCRIPTION
	Natural Drainage
	Improved or Artificial Drainage

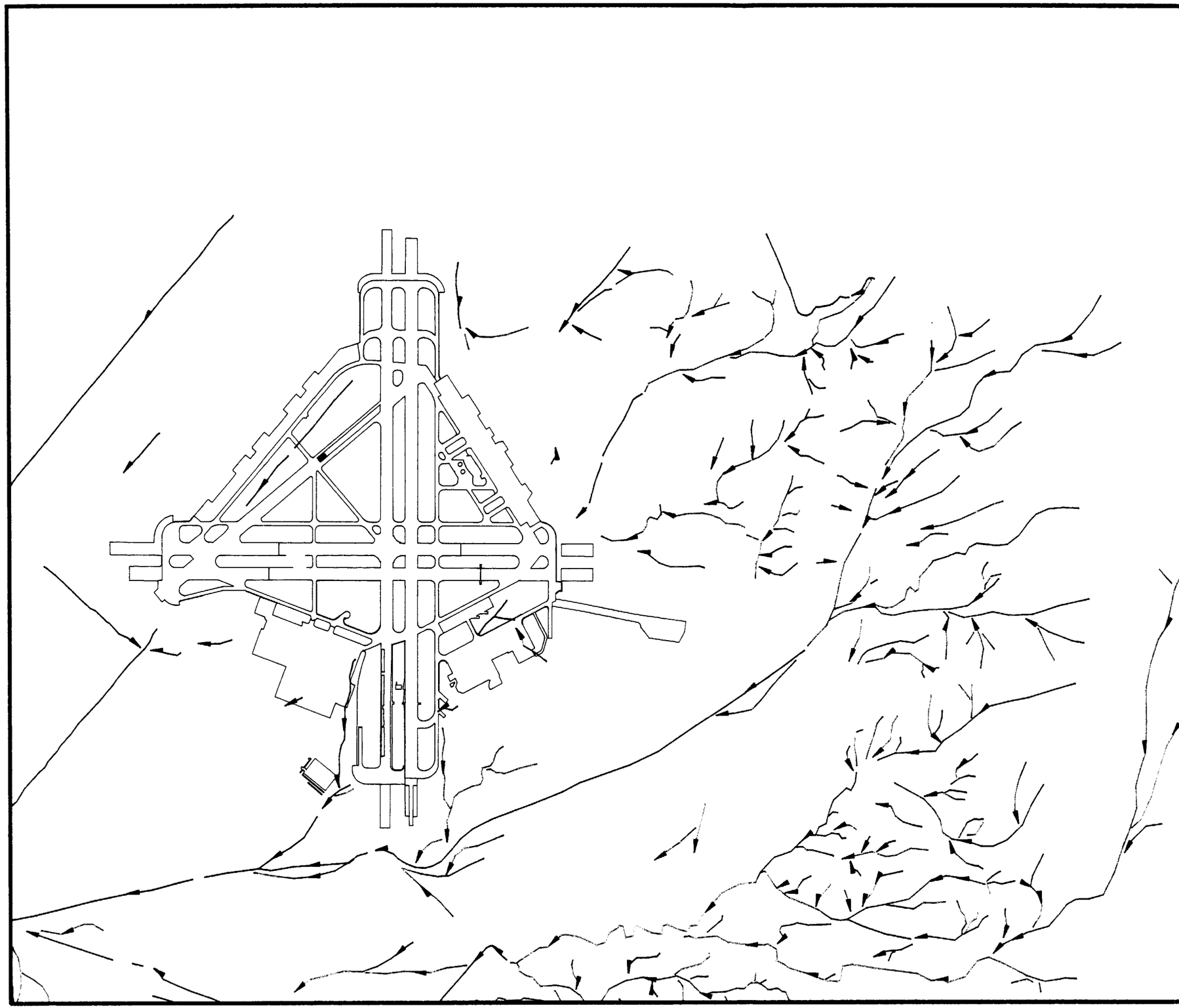
N

2000' 0 2000'

1" = 2000'
APPROXIMATE SCALE

Science Applications International Corporation
® An Employee-Owned Company

DM33-1R1.DWG



DRAINAGE MAP

Aerial Photographic Interpretation
MCAS El Toro
Santa Ana, California

1968

Figure 34

Sheet 1 of 1
August 28, 1968
Photo Numbers 2400-4-4, 2400-4-5, 2400-4-27, and 2400-4-29
Source: Map and Imagery Library, University of California, Santa Barbara

Prepared for:

Southwest Division
Naval Facilities Engineering Command
Contract N68711-92-D-4658

LEGEND:

SYMBOL	DESCRIPTION
	Natural Drainage
	Improved or Artificial Drainage

2000' 0 2000'
1" = 2000'
APPROXIMATE SCALE

Science Applications International Corporation
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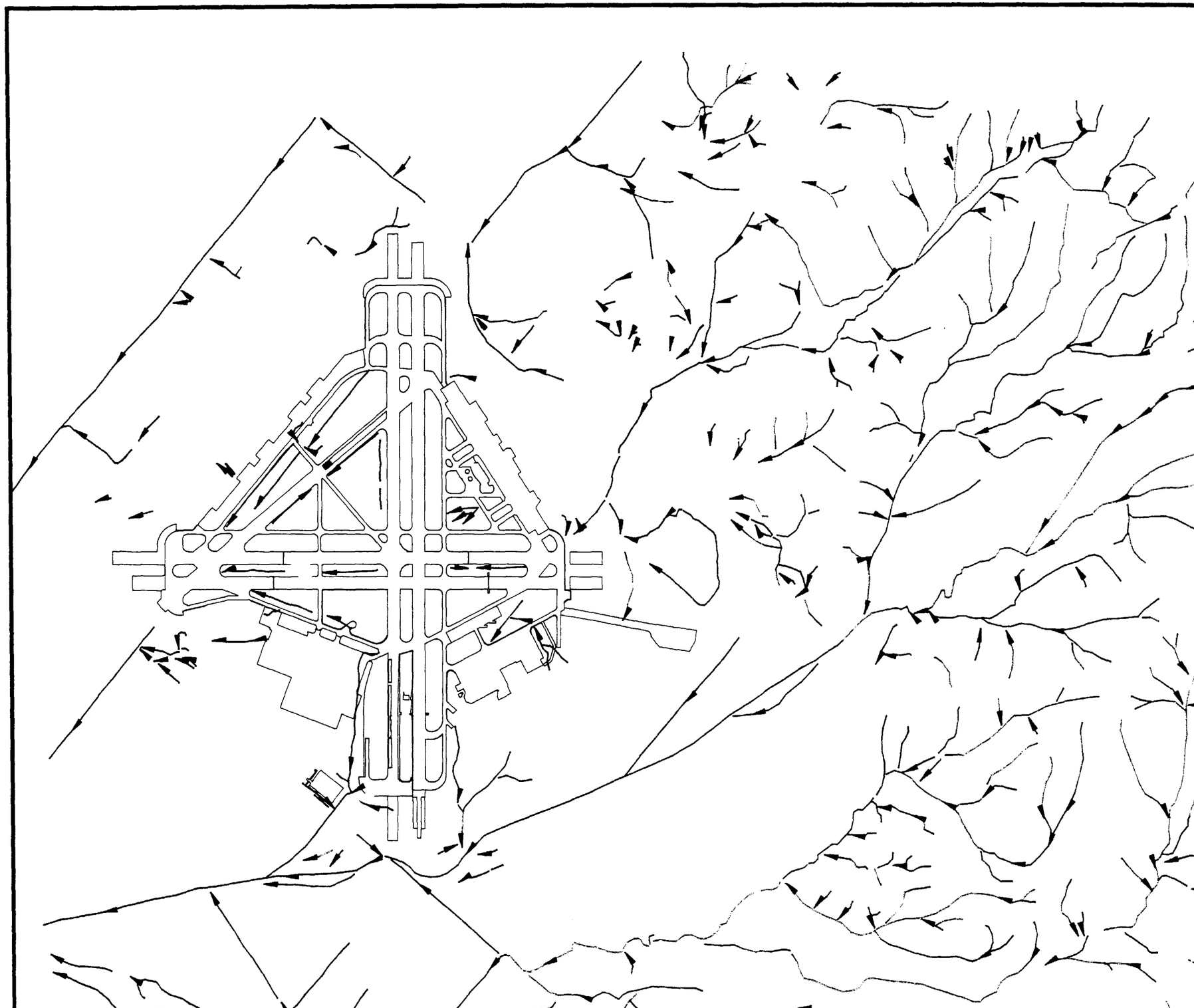
DM34-1R1.DWG



DRAINAGE MAP
Aerial Photographic Interpretation
MCAS El Toro
Santa Ana, California

1971

Figure 35
Sheet 1 of 1
May 19, 1971
Photo Numbers AXK-1MM-62, AXK-1MM-64, AXK-1MM-70, and AXK-1MM-72
Source:
U.S. Department of Agriculture

Prepared for:

Southwest Division
Naval Facilities Engineering Command
Contract N68711-92-D-4658

LEGEND:

SYMBOL	DESCRIPTION
	Natural Drainage
	Improved or Artificial Drainage

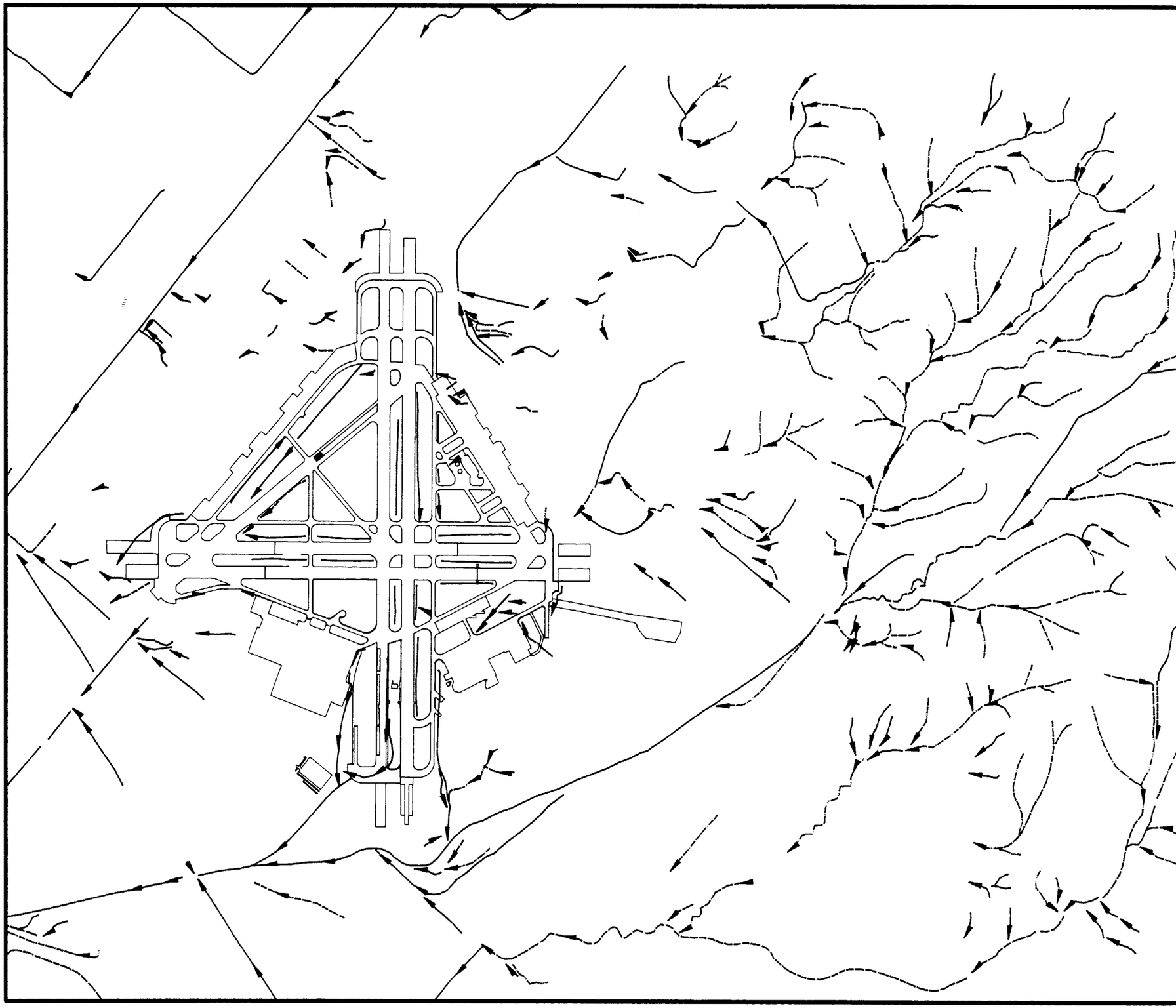
N

2000' 0 2000'

1" = 2000'
APPROXIMATE SCALE

Science Applications International Corporation
® An Employee-Owned Company

DM35-1R1.DWG



DRAINAGE MAP
Aerial Photographic Interpretation
MCAS El Toro
Santa Ana, California

1977

Figure 36
Sheet 1 of 1
January 24, 1977
Photo Numbers 181–10–17, 181–10–18, 181–11–18, and 181–11–19
Source:
Continental Aerial Photo, Inc.

Prepared for:

Southwest Division
Naval Facilities Engineering Command
Contract N68711–92–D–4658

LEGEND:

SYMBOL	DESCRIPTION
	Natural Drainage
	Improved or Artificial Drainage

2000' 0 2000'
1" = 2000'
APPROXIMATE SCALE

Science Applications International Corporation
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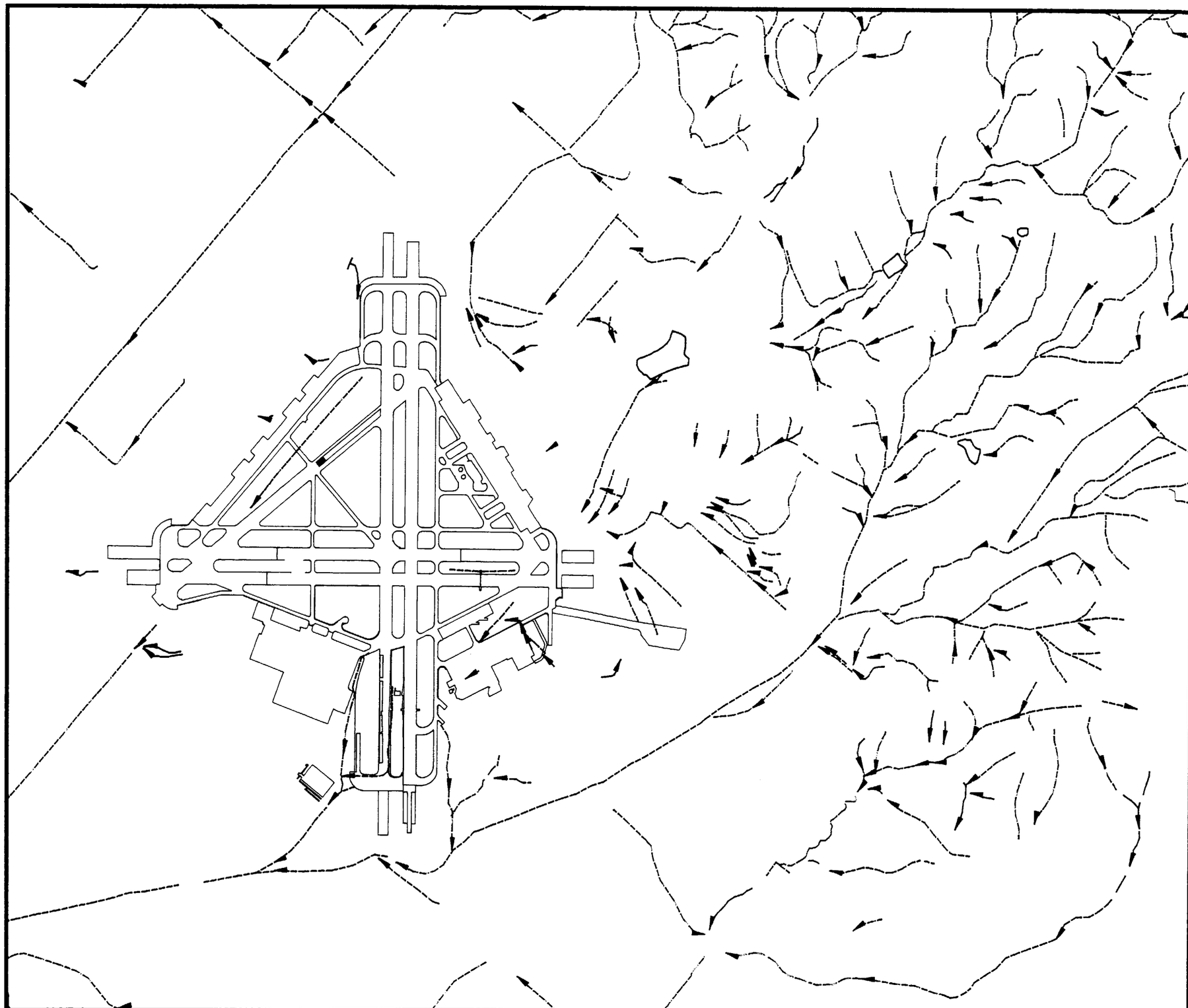
DM36–1R1.DWG



DRAINAGE MAP
Aerial Photographic Interpretation
MCAS El Toro
Santa Ana, California

1983

Figure 37
Sheet 1 of 1
April 2, 1983
Photo Numbers 218-10-20, 218-10-23, 218-11-20, and 218-11-21
Source:
Continental Aerial Photo, Inc.

Prepared for:

Southwest Division
Naval Facilities Engineering Command
Contract N68711-92-D-4658

LEGEND:

SYMBOL	DESCRIPTION
	Natural Drainage
	Improved or Artificial Drainage

N

2000' 0 2000'

1" = 2000'
APPROXIMATE SCALE

Science Applications International Corporation
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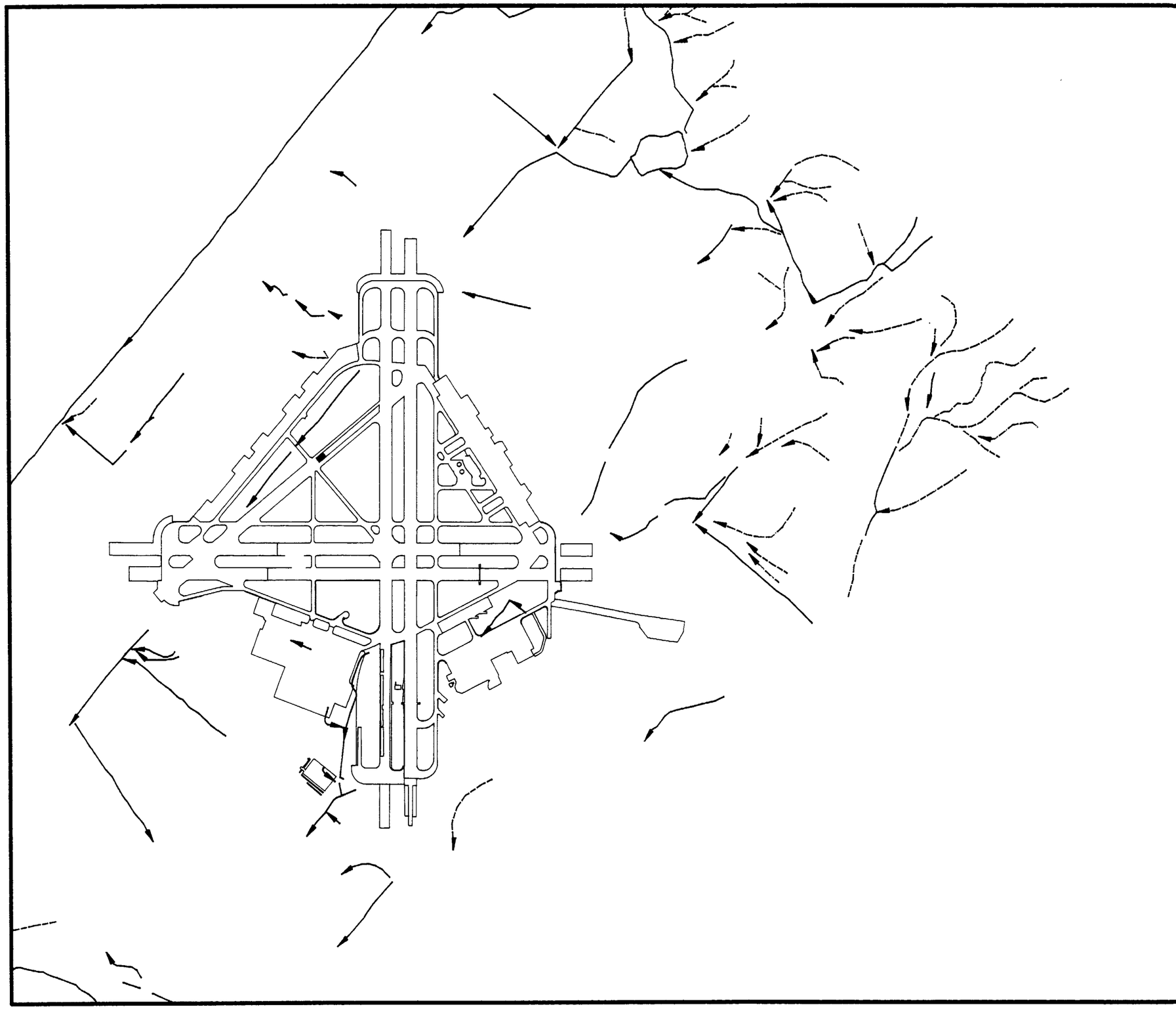
DM37-1R1.DWG



DRAINAGE MAP
Aerial Photographic Interpretation
MCAS El Toro
Santa Ana, California

1988

Figure 38
Sheet 1 of 1
January 21, 1988
Photo Number 3697–161

Source:
U.S. Geological Survey

Prepared for:

Southwest Division
Naval Facilities Engineering Command
Contract N68711–92–D–4658

LEGEND:

SYMBOL	DESCRIPTION
	Natural Drainage
	Improved or Artificial Drainage

2000' 0 2000'
1" = 2000'
APPROXIMATE SCALE

Science Applications International Corporation
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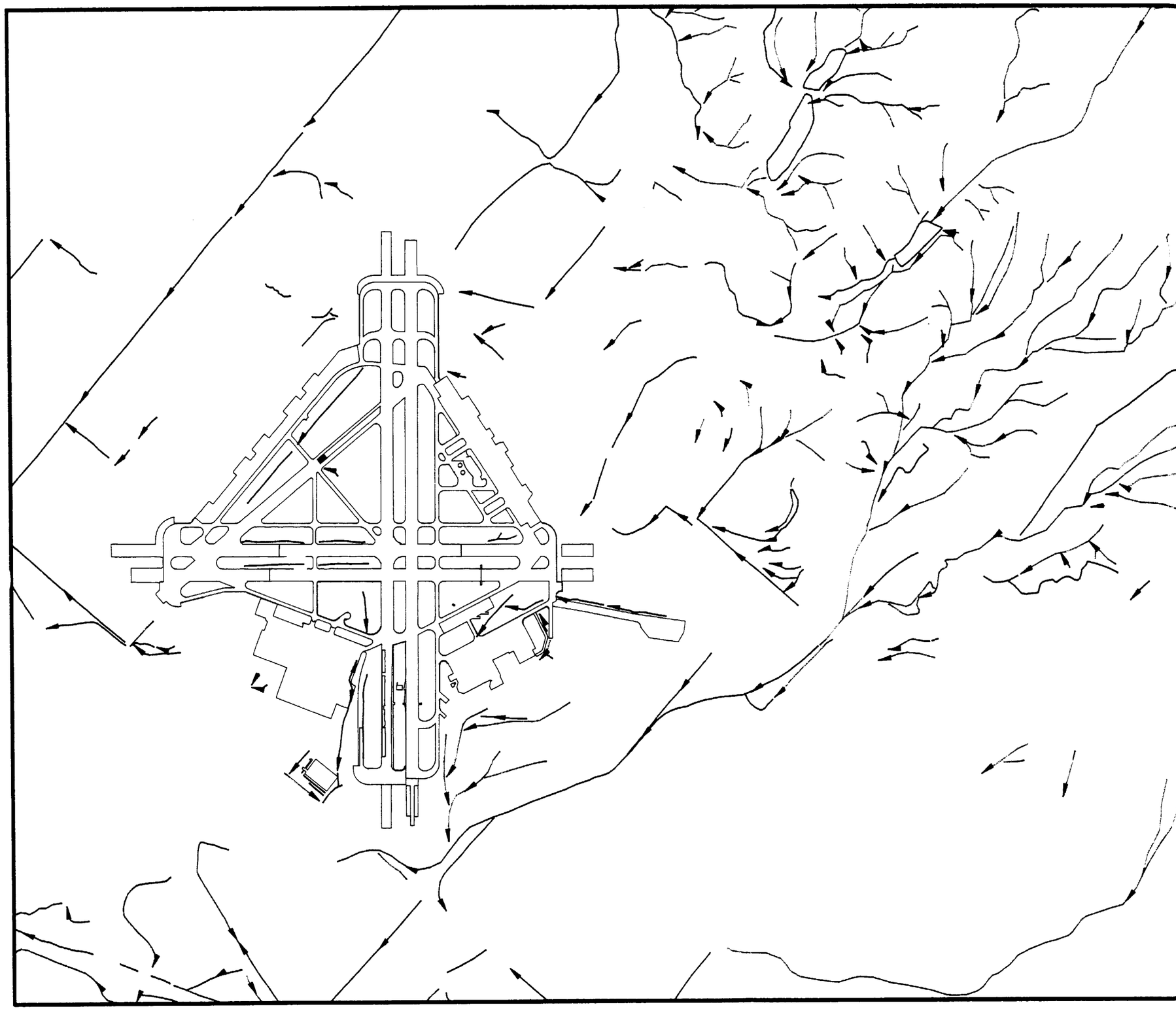
DM38–1R1.DWG



DRAINAGE MAP
Aerial Photographic Interpretation
MCAS El Toro
Santa Ana, California

1992

Figure 39
Sheet 1 of 1
January 20, 1992
Photo Numbers C85-10-8, C85-10-10, C85-11-10, and C85-11-12
Source:
Continental Aerial Photo, Inc.

Prepared for:

Southwest Division
Naval Facilities Engineering Command
Contract N68711-92-D-4658

LEGEND:

SYMBOL	DESCRIPTION
	Natural Drainage
	Improved or Artificial Drainage

2000' 0 2000'
1" = 2000'
APPROXIMATE SCALE

Science Applications International Corporation
An Employee-Owned Company

DM39-1R1.DWG

APPENDIX A

SITES OF POTENTIAL CONCERN IDENTIFIED BY USEPA (Reference B)

Symbol Legend

Symbol	Description	Symbol	Description
B	Building	IM	Impoundment
D	Drums	LQ	Liquid
DB	Debris	LT	Light-toned
DG	Disturbed ground	M	Material
DK	Dark-toned	MM	Mounded material
EX	Excavation	OS	Open storage
EXT	Extraction	R	Refuse
FA	Fill area	ST	Stain
FBR	Fuel bladder revetment	TR	Trench
GR	Graded area	UO	Unidentified object
GS	Ground scar	VT	Vertical tank
HT	Horizontal tank	WS	Wet soil
C	Container		

COMMENT	YEAR	OBSERVATIONS
1.	1952	LQ,TR
2.	1952	EX
3.	1952	MT MM
4.	1952	PROB ST
5.	1952	POSS ST
6.	1952	ST
	1965	ST
7.	1952	PROB PIT
	1965	POSS ST
8.	1965	POSS ST
	1970	ST
	1980	ST
9.	1965	POSS LQ
10.	1965	ST
	1970	WS
	1986	PROB ST
	1991	PROB FA, ST
11.	1965	ST
12.	1965	ST, DG
13.	1965	ST
	1970	ST
	1980	ST
	1991	ST

14.	1965	POSS PITS
15.	1970	LQ
16.	1970	PROB LQ
17.	1970	WS
18.	1970	POSS WS
19.	1970	ST
	1980	LQ
	1991	TR
20.	1970	ST
21.	1970	FBR
22.	1970	WS
	1980	PROB ST
23.	1970	ST
	1980	PROB LQ
	1991	ST
24.	1970	V, WS
25.	1970	POSS ST
	1991	POSS ST
26.	1970	ST
	1991	PROB ST
27.	1970	OS, LT M
28.	1970	WS
	1991	DG
29.	1980	DG, PROB LQ, GR
30.	1980	POSS LQ
31.	1980	LQ
32.	1980	ST
33.	1980	LT MM
34.	1980	POSS WS
	1991	POSS ST
35.	1980	PROB ST
36.	1980	POSS LT M
37.	1986	WS
38.	1991	POSS D
39.	1991	LT M
40.	1991	DG, MT M, OS
41.	1991	PROB D, C
42.	1991	ST
43.	1991	TR
44.	1991	LQ, OS
45.	1991	DB, ST
46.	1991	POSS PIT
47.	1952	ST, LQ
	1965	PROB ST, PROB HT
48.	1952	ST, POSS LQ
49.	1952	POSS VT

50.	1952	POSS ST
51.	1952	EX
52.	1952	ST
53.	1952	DK M, LT M
54.	1952	PIT
55.	1952	M
56.	1965	ST
57.	1965	ST
	1986	VT
	1991	VT
58.	1965	ST
	1991	PROB D, OS
59.	1965	ST
	1980	POSS VT
	1986	VT
61.	1965	VT
	1970	VT
	1986	VT
	1991	VT
62.	1970	HT
63.	1970	PROB ST
64.	1970	ST
	1991	POSS ST
65.	1970	D
66.	1970	ST
67.	1970	PROB R, PROB ST
68.	1970	PROB VT
69.	1970	PROB ST, PROB HT
	1980	POSS HT
70.	1970	ST
	1980	POSS ST
	1986	PROB ST
71.	1970	ST
	1980	POSS ST
72.	1970	ST,OS
73.	1980	ST
74.	1980	POSS ST
75.	1980	DG
76.	1991	PIT
77.	1991	POSS D, OS
78.	1991	PROB D, OS
79.	1991	POSS ST
80.	1991	Ferrocene spill area
81.	1991	POSS LQ, ST
82.	1970	LT, DK MM, LT MM, GS
	1986	PROB TR

	1991	POSS TR SCARS
83.	1970	TR
	1986	PROB TR
84.	1970	TR
	1981	ST, POSS PITS
85.	1970	(2) DK AREAS, LT MM
	1981	ST, TR
86.	1970	TR, GS
	1981	PROB PITS, POSS IM W/ LQ
	1986	PROB PIT W/ LQ
	1991	POSS HT
87.	1970	2 POSS TR
88.	1970	PIT
	1970	GR
89.	1970	GR
90.	1970	(2) DK AREAS
91.	1970	(2) POSS TR, DK Rectangular Object
	1981	TR
92.	1970	B, GS
93.	1970	(3) POSS TR, ST
94.	1981	IM
	1986	IM
	1991	IM
95.	1981	(4) POSS PITS, LQ within PROB PIT, FA, PIT
	1991	GS, REV, MM
96.	1981	POSS PITS
	1991	MM
97.	1981	PROB TR, POSS TR
	1991	TR
98.	1981	PITS, TR W/LQ
	1991	TR
99.	1981	PROB TR
	1991	ST, PIT
100.	1981	PROB TR, TR
101.	1981	PROB PITS MM
102.	1981	TRW/LQ, PROB PITS, PIT
	1986	PIT, TR
	1991	GS/MM, PROB PITS
103.	1981	LT MM
104.	1981	PROB TR
105.	1981	GS
	1986	PIT
106.	1986	TR, PROB PIT
107.	1986	PITS
	1991	CRATERS

108.	1986	TR
109.	1986	PROB TR
110.	1991	MM
111.	1991	POSS TR SCARS
112.	1991	MM, PROB PIT
113.	1991	POSS TR
114.	1952	VT
	1965	VT
	1970	VT
	1980	VT
	1986	VT
	1991	VT
115.	1952	DK M, OS
116.	1952	ST
117.	1952	LT M
118.	1952	ST(Along road length)
	1980	ST
119.	1952	R, ST
	1970	ST
	1980	PROB ST
120.	1952	R
	1965	POSS ST, R
	1970	R, ST
	1980	LT M/R
	1986	R
	1991	R, 2 VT
121.	1952	PROB LQ, POSS TR
	1980	PROB ST
	1986	ST
122.	1952	ST
	1970	ST/LQ
	1980	ST
123.	1952	POSS HT
	1965	POSS HT
	1970	PROB HT
124.	1952	PROB ST
125.	1952	TR
126.	1952	DK M
	1970	ST
	1991	ST
127.	1952	Sludge drying beds
128.	1952	5 IM
	1965	5 IM
	1970	5 IM
129.	1952	2 IM
	1965	2 IM

	1970	2 IM
	1991	HT
130.	1952	ST, VT
	1965	VT
	1970	VT
131.	1952	IM, VT
132.	1952	POSS ST
	1991	(5) POSS D
133.	1965	POSS ST
	1970	PROB D, ST
	1991	ST
134.	1965	POSS ST
	1991	POSS VT
135.	1965	ST/DKM
	1970	ST
136.	1965	PROB ST, POSS WS
	1970	ST, LQ
137.	1965	ST/DK M
	1970	ST
138.	1965	POSS WS
139.	1965	FBR
	1970	FBR, ST, LQ
140.	1965	DK M
	1970	M
141.	1965	ST
	1970	ST
	1991	ST
142.	1965	ST/LQ
	1970	LQ
143.	1965	ST
144.	1965	ST
	1970	ST
	1980	ST
	1986	ST
145.	1965	ST
	1970	ST/LQ
	1980	POSS LQ
146.	1952	POSS TR
	1965	ST
	1970	ST
	1980	ST
	1986	ST
	1991	ST
147.	1965	ST
	1970	ST
148.	1965	POSS ST

	1991	PROB D
149.	1965	POSS ST
	1970	ST
150.	1965	PROB ST
	1980	PROB ST
151.	1965	POSS ST
	1970	ST
152.	1970	PROB VT, 16 D, 8 D, POSS D
153.	1970	4 D
	1980	ST
154.	1970	1 POSS D
155.	1970	5 D
156.	1970	LQ, ST
	1991	POSS ST
157.	1970	HT
158.	1970	ST
159.	1970	POSS D
160.	1970	D
161.	1970	D, POSS D, OS
162.	1970	POSS ST, 14 VT
163.	1970	LQ
164.	1970	POSS D, ST
165.	1970	ST
	1980	ST
166.	1970	ST, D
167.	1970	M
168.	1970	ST/LQ
169.	1970	CO
170.	1970	ST
	1986	ST
	1991	18 POSS D, ST
171.	1970	MT M
172.	1970	ST/LQ
	1991	POSS VT
173.	1970	ST, POSS LQ
	1980	POSS LQ
174.	1970	PROB D W/ ST
175.	1970	POSS VT
176.	1965	VT
	1970	VT, ST
177.	1970	ST
	1986	ST
	1991	ST, LQ
178.	1970	ST
179.	1980	ST
180.	1980	ST/LQ

181.	1980	POSS LQ
182.	1980	POSS LQ
	1991	LQ
183.	1980	LT M
	1986	PROB LQ
184.	1980	FBR
	1986	FBR
185.	1965	ST
	1986	ST
186.	1986	ST
	1991	ST
187.	1986	LQ
188.	1986	LQ
	1991	ST
189.	1986	ST
190.	1986	LQ, POSS LQ
191.	1986	POSS LQ
192.	1991	ST
193.	1991	POSS LQ
194.	1991	ST, 3 VT
195.	1991	14 POSS VT, ST
196.	1991	LQ
197.	1991	2 PROB VT
198.	1986	ST
	1991	ST
199.	1952	PROB ST
200.	1952	ST
	1970	ST
	1986	LQ
201.	1952	POSS PIT
202.	1952	(2) VT
203.	1952	POSS WS
204.	1952	LT MM
205.	1965	From Top FA, CRANE, DK M, LT M, TR
206.	1965	POSS LQ
207.	1965	ST
208.	1965	VT
	1970	VT
	1980	VT
	1986	VT
	1991	VT
209.	1965	PROB LDA
210.	1965	VT
	1980	VT
211.	1965	FBR, POSS LQ
	1970	FBR, ST

	1980	FBR, POSS ST
	1986	FBR, LQ, Possible Fuel Bladders
	1991	PITS, TR, LQ
212.	1965	FBR
	1970	FBR
213.	1965	ST
	1970	PROB D
214.	1970	POSS LQ, POSS ST
215.	1965	ST
	1970	PROB D, ST
216.	1965	PROB LQ, OS
	1970	PROB D, OS
217.	1970	POSS TR
218.	1970	ST
219.	1970	VT
	1980	VT
	1986	ST
	1991	VT
220.	1970	PROB D, WS, LQ
	1980	ST
221.	1970	VT
	1980	ST
	1986	ST
222.	1970	ST, ST W/ POSS D
223.	1970	POSS ST
224.	1970	GR
225.	1970	D
226.	1970	LQ
227.	1970	ST W/LQ
228.	1970	POSS PIT W/ LQ, ST, D
229.	1970	PITS
230.	1970	VT
231.	1970	LQ
	1980	ST
232.	1970	PROB D, OS
233.	1970	ST
	1980	ST
234.	1970	FBR, ST
	1991	PITS
235.	1980	DG, POSS IM W/LQ
236.	1980	MT MM
237.	1980	DG
238.	1980	POSS ST
239.	1980	GR REV
240.	1980	GR/DG
241.	1980	ST

242.	1986	POSS IM
243.	1986	POSS PITS W/ WS
244.	1986	PROB LQ
245.	1986	POSS ST
246.	1991	DK AREA
247.	1991	DG
248.	1991	ST
249.	1991	POSS D
250.	1991	DK, MT AND LT M
251.	1991	D
252.	1991	ST, POSS VT
253.	1970	Pipeline
	1980	POSS Pipeline
	1991	7 POSS Pipelines
254.	1991	PITS, TR
255.	1980	ST
	1991	ST
256.	1970	TR
257.	1970	ST
258.	1970	R
	1986	ST
	1991	ST
259.	1970	FA/LT MM
260.	1970	LT MM, ST
261.	1970	FA/LT, DK MM
262.	1970	R, FA/LT MM
263.	1970	TR, PROB ST
264.	1970	EXT
265.	1970	R
	1980	ST
	1986	ST
266.	1970	ST
	1991	LQ
267.	1970	ST
	1991	LT MM
268.	1970	ST
	1991	POSS TR
269.	1970	ST
	1991	ST
270.	1970	ST
	1980	ST
	1986	POSS ST
	1991	(75) D, ST
271.	1970	EXT
	1980	EXT
	1991	EXT

272.	1970	DB
	1991	POSS PITS, GS
273.	1970	POSS PITS
274.	1970	FA W/DB, MT, DK MM, R
	1986	FA
275.	1970	FA W/DB, MT, DK MM, R
	1980	LQ
276.	1970	GR
	1986	GR, FA
277.	1970	POSS TR W/ DK LQ
	1980	ST
	1986	ST
278.	1970	POSS TR W/LQ
279.	1970	FA
280.	1970	Possible Smoke Plume, R
	1986	POSS ST
281.	1970	ST, DK MM, DK Circular Objects
282.	1970	DB, DK LQ
	1991	PIT
283.	1970	Additional R and ST
284.	1980	FA/GS
	1986	REV FA
	1991	REV FA
285.	1980	REV FA
	1986	REV FA
	1991	REV FA
286.	1980	LT, DK MM
	1986	GR,FA
287.	1980	ST
	1991	ST
288.	1980	ST
289.	1980	ST
	1986	(2) PITS
290.	1980	ST
	1991	M
291.	1980	DK MM
292.	1980	LT MM
293.	1980	EXT
294.	1986	TR
295.	1986	ST
296.	1986	POSS ST
297.	1986	VT
298.	1986	VT
299.	1986	GS
300.	1991	FA/DK MM
301.	1991	(10) D

302.	1991	UO W/ POSS ST, UO
303.	1970	DB, ST
	1991	DB, ST
304.	1991	DB
305.	1991	HT within REV
306.	1991	LT PROB C
307.	1991	TR
308.	1991	ST
309.	1986	LT MM
	1991	PROB MM
310	1970	LT MM
	1986	PROB FA
311	1980	LT MM
	1986	FA
	1991	LT MM, UO (Red)
312	1991	POSS TR
313	1991	DB, REV GR
314	1991	UO (Orange) w stain
315	1980	MM

APPENDIX B

SITES OF POTENTIAL CONCERN IDENTIFIED BY SAIC (Reference A)

Symbol Legend

Symbol	Description	Symbol	Description
B	Building	IM	Impoundment
D	Drums	LQ	Liquid
DB	Debris	LT	Light-toned
DG	Disturbed ground	M	Material
DK	Dark-toned	MM	Mounded material
EX	Excavation	OS	Open storage
EXT	Extraction	R	Refuse
FA	Fill area	ST	Stain
FBR	Fuel bladder revetment	TR	Trench
GR	Graded area	UO	Unidentified object
GS	Ground scar	VT	Vertical tank
HT	Horizontal tank	WS	Wet soil

Comment number refers to sites of potential concern indicated on Plate 2 and corresponds to the aerial-photograph analysis comments in Section 2 of this report. The lower-case letter preceding each comment number indicates the following: (a), verification of a feature identified in Reference B and occurring within the SAP Amendment RI/FS site boundaries; (b), features identified during the present investigation that occur within the SAP Amendment RI/FS site boundaries; and (c), sites outside of the SAP Amendment RI/FS site boundaries.

COMMENT		YEAR	OBSERVATIONS
c	1.	1946	EX
c	2.	1946	FA
c	3.	1946	GR, MMDT
c	4.	1946	B, EX
c	5.	1946	VT
c	6.	1946	EX, WS, LQ
c	7.	1946	ST
c	8.	1946	EX
c	9.	1946	B
c	10.	1946	EXT
c	11.	1946	B
c	12.	1946	ST
c	13.	1946	ST
c	14.	1946	OS, D
c	15.	1946	TR, LQ, R
b	16.	1946	MMLT, MMDT, TR

a	17.	1946	VT
c	18.	1946	TR, FA, DG
b	19.	1946	ST
c	20.	1946	EXT
c	21.	1946	OS, D
c	22.	1946	ST
a	23.	1946	ST
c	24.	1946	VT
c	25.	1946	OS
c	26.	1946	OS, D, MMDT, MMLT, UO
a	27.	1946	OS, D, MMDT, MMLT, UO
c	28.	1946	OS, D, MMDT, MMLT, UO
a	29.	1946	ST
c	30.	1946	OS
b	31.	1946	ST
c	32.	1946	VT, WS, ST
c	33.	1946	VT
c	34.	1946	VT
c	35.	1946	UO, VT, M
c	36.	1946	VT
a	37.	1946	LQ
c	38.	1946	VT
c	39.	1946	IM
a	40.	1946	VT
b	41.	1946	OS, D
b	42.	1946	ST
b	43.	1946	OS,D
c	44.	1946	ST, OS
b	45.	1946	WS, ST, OS
c	46.	1946	WS, ST, OS
c	47.	1946	OS, D
b	48.	1946	ST, LQ
b	49.	1946	D, OS
c	50.	1946	OS
c	51.	1946	MMDT
c	52.	1946	OS, R, EX, FA
c	53.	1946	LQ
c	54.	1946	B
c	55.	1946	MMLT
c	56.	1946	ST
b	57.	1946	No activity
c	58.	1946	TR
c	59.	1946	IM
c	60.	1952	B, VT
c	61.	1952	UO

c	62.	1952	EXT
c	63.	1952	EX
c	64.	1952	EXT
c	65.	1952	GR
c	66.	1952	TR
c	67.	1952	VT
c	68.	1952	TR
c	69.	1952	MMLT
c	70.	1952	TR, LQ
c	71.	1952	GR
c	72.	1952	HT, VT
c	73.	1955	TR, EX
c	74.	1955	DG
c	75.	1955	B
c	76.	1955	EX, B
c	77.	1955	OS, D
c	78.	1955	TR, WS
a	79.	1955	OS
c	80.	1955	ST
c	81.	1955	TR, DG
c	82.	1955	OS
c	83.	1955	ST
c	84.	1955	VT
b	85.	1955	VT
c	86.	1955	OS
c	570.	1955	OS
c	87.	1958	EX, MMLT
c	88.	1958	IM
c	89.	1958	ST, TR
c	90.	1958	LQ, WS
c	91.	1958	DG, EX
c	92.	1958	WS
c	93.	1958	OS, D, LQ
c	94.	1958	VT
b	95.	1958	EXT
b	96.	1958	GS
b	97.	1958	No significant changes
c	98.	1958	TR
c	99.	1960	B, DG, IM, WS, EX
c	100.	1960	DG, EX, TR
c	101.	1960	EX, ST, WS, MMDT
c	102.	1960	D
c	103.	1960	VT, IM, LQ

c	104.	1960	GR
c	105.	1960	ST, WS
c	106.	1960	EXT, GR
c	107.	1960	EX, DG
c	108.	1960	VT, EX
c	109.	1960	VT
c	110.	1960	ST, WS
c	111.	1960	UO
c	112.	1960	TR
c	113.	1960	ST
c	114.	1960	WS, LQ
c	115.	1960	WS, LQ
b	116.	1960	ST, TR, LQ
c	117.	1960	ST
c	118.	1960	UO
c	119.	1961	VT
c	120.	1961	WS, LQ
c	121.	1961	EX, EXT
c	122.	1961	VT
c	123.	1961	HT
b	124.	1961	WS, LQ
c	125.	1961	WS
c	126.	1961	WS
c	127.	1961	ST, WS
c	128.	1961	WS, LQ
c	129.	1961	IM, VT
c	130.	1961	ST, DG
b	131.	1961	LQ
b	132.	1961	ST
c	133.	1964	UO, ST, WS, EX
c	134.	1964	MMLT
c	135.	1964	TR, DG
c	136.	1964	VT
c	137.	1964	ST
c	138.	1964	OS, ST, D
c	139.	1964	ST
c	140.	1964	ST
c	141.	1964	ST, LQ
c	142.	1964	ST
c	143.	1964	EX
c	144.	1964	TR, EX
c	145.	1967	WS, LQ
c	146.	1967	LQ

c	147.	1967	ST
c	148.	1967	DG
c	149.	1967	LQ
c	150.	1967	ST, LQ
c	151.	1967	No significant changes
c	152.	1967	EXT
c	153.	1967	DG, B
c	154.	1967	B, DG
c	155.	1967	DG
c	156.	1967	EXT, R, LQ
c	157.	1967	EXT, FA
c	158.	1967	No activity
c	159.	1967	EXT, DG, ST, OS
c	160.	1967	LQ, IM, B
c	161.	1967	DG, TR
c	162.	1967	ST
c	163.	1967	EX, LQ
c	164.	1967	EX, LQ
c	165.	1967	OS, D
c	166.	1967	VT
a	167.	1967	ST
c	168.	1967	OS, D
c	169.	1967	EX
a	170.	1967	ST
c	171.	1967	VT
c	172.	1967	ST, D
c	173.	1967	FBR, ST
c	174.	1967	LQ
c	175.	1968	IM
c	176.	1968	EXT
c	177.	1968	EX
c	178.	1968	ST, WS
c	179.	1968	LQ, WS
c	180.	1968	ST, WS
a	181.	1968	WS
a	182.	1968	WS, LQ
c	183.	1968	ST
c	184.	1968	ST
c	185.	1968	VT
c	186.	1968	ST
c	187.	1968	OS
c	188.	1968	MM,R
c	189.	1968	EX, LQ
c	190.	1968	ST, WS
a	191.	1968	ST

a	192.	1968	R
a	193.	1968	GR
a	194.	1968	EXT, ST, VT
a	195.	1968	FA, EX
c	196.	1968	LQ
c	197.	1971	MMLT
a	198.	1971	LQ
a	199.	1971	LQ
b	200.	1971	ST
c	201.	1971	D, OS
b	202.	1971	WS, LQ
c	203.	1971	LQ
c	204.	1971	ST
a	205.	1971	VT, ST
a	206.	1971	WS, LQ
c	207.	1971	ST, WS
c	208.	1971	UO
c	209.	1971	B
c	210.	1971	MMLT
c	211.	1971	B, VT
c	212.	1971	B, VT
c	213.	1971	B
c	214.	1971	VT, ST
c	215.	1971	DG, MMDT, UO
c	216.	1971	VT
c	217.	1971	MM, DG
b	218.	1971	TR, LQ, EX, DG
c	219.	1971	DG, TR, MM, EX
c	220.	1971	IM, LQ, VT, TR
b	221.	1971	No Significant changes
c	222.	1971	EXT
c	223.	1971	HT, IM
c	224.	1971	VT
a	225.	1971	LQ
c	226.	1971	OS, D
c	227.	1971	ST
c	228.	1973	OS
c	229.	1973	DG, WS, ST
c	230.	1973	WS, LQ
c	231.	1973	ST
c	232.	1973	ST
c	233.	1973	OS
c	234.	1973	ST
c	235.	1973	ST, UO, VT

c	236.	1973	EX, DG, HT
c	237.	1973	WS
c	238.	1973	OS
c	239.	1973	WS
c	240.	1973	ST
c	241.	1973	ST
c	242.	1973	OS
c	243.	1973	WS
a	244.	1973	VT
c	245.	1973	EX
c	246.	1973	EX, FA
c	247.	1973	OS
b	248.	1973	VT, LQ
c	249.	1973	MMLT, DG
c	250.	1973	WS, OS, UO
c	251.	1973	OS
c	252.	1973	EX
c	253.	1973	VT
b	254.	1973	TR, HT
c	255.	1973	HT, OS, TR, R, LQ, EX
b	256.	1973	R
c	257.	1973	GR
c	258.	1973	WS, ST, HT
c	259.	1973	VT
c	260.	1973	DG, EX
c	261.	1973	MMLT, MMDT, MM
c	262.	1973	No significant changes
c	263.	1973	TR, DG
c	264.	1973	IM, LQ
c	265.	1973	GR, FA
c	266.	1973	R
c	267.	1973	DG
c	268.	1973	DG, TR
c	269.	1973	No significant changes
c	270.	1974	LQ
c	271.	1974	D
c	272.	1974	ST, WS
c	273.	1974	DG
c	274.	1974	ST
c	275.	1974	ST
c	276.	1974	IM, LQ, ST, VT
c	277.	1974	MMLT, MMDT, DG, D
a	278.	1974	ST
c	279.	1974	ST
c	280.	1974	MMLT

c	281.	1974	WS
a	282.	1974	MMLT, FA
a	283.	1974	WS, ST
c	284.	1974	D, OS
c	285.	1974	LQ
c	286.	1974	TR, ST, B, VT
c	287.	1974	EX
c	288.	1974	DG, MM
c	289.	1974	WS, ST, LQ, D
c	290.	1974	No significant change
c	291.	1974	No significant change
a	292.	1974	TR, UO
c	293.	1974	WS, LQ
a	571.	1974	No significant changes.
c	294.	1975	LQ
c	295.	1975	MMLT
c	296.	1975	LQ
c	297.	1975	DG, FA
c	298.	1975	WS
c	299.	1975	No significant changes
a	300.	1975	LQ
c	301.	1975	MM, FA
c	302.	1975	WS
c	303.	1975	WS, LQ
c	304.	1975	LQ
c	305.	1975	D, OS
b	306.	1975	ST
c	307.	1975	VT
c	308.	1975	D
c	309.	1975	D, OS
c	310.	1975	MMDT
c	311.	1975	ST, LQ
c	312.	1975	IM, DG, EX
c	313.	1975	OS, D
c	314.	1975	DG
b	315.	1975	MMDT, MMLT
b	316.	1975	TR, FA
c	317.	1975	UO, VT
c	318.	1975	ST
c	319.	1975	TR
c	320.	1975	No significant changes
c	321.	1975	WS
c	322.	1975	No significant change
c	323.	1975	No significant change
	324.	1975	No significant change

c	325.	1975	GR, FA
c	326.	1975	No significant change
c	327.	1975	VT
a	328.	1975	ST, WS, LQ
c	329.	1975	B, OS
c	330.	1975	ST
a	572.	1975	No significant change
c	331.	1976	OS, D
c	332.	1976	ST
c	333.	1976	ST, LQ
c	334.	1976	LQ
c	335.	1976	ST
c	336.	1976	WS, LQ
c	337.	1976	ST, LQ
c	338.	1976	ST
c	339.	1976	ST
c	340.	1976	VT
c	341.	1976	LQ
c	342.	1976	WS, LQ
c	343.	1976	WS
a	344.	1976	ST
c	345.	1976	ST
c	346.	1976	LQ, WS
c	347.	1976	LQ
c	348.	1976	D, OS
a	349.	1976	LQ, OS
c	350.	1976	WS, ST, LQ
c	351.	1976	WS, LQ
c	352.	1976	VT
c	353.	1976	OS, ST, WS
c	354.	1976	WS, LQ
c	355.	1976	ST, DG
c	356.	1976	No significant change
c	357.	1976	LQ
c	358.	1976	LQ, D
a	359.	1976	No significant change
c	360.	1976	ST
a	573.	1976	No significant change
a	574.	1976	No significant change
c	361.	1977	LQ
c	362.	1977	LQ, ST
c	363.	1977	LQ
c	364.	1977	MMLT
b	365.	1977	D

c	366.	1977	WS, LQ
b	367.	1977	MMLT, WS
c	368.	1977	TR
c	369.	1977	LQ
c	370.	1977	GR, DS, MMDT
c	371.	1977	No significant change
c	372.	1977	WS, LQ
b	373.	1977	No significant change
b	374.	1977	TR, LQ
b	375.	1977	No significant change
c	376.	1977	No significant change
c	377.	1978	MMLT
c	378.	1978	LQ
a	379.	1978	LQ
a	380.	1978	LQ
c	381.	1978	ST, LQ
c	382.	1978	WS, ST
a	383.	1978	LQ
a	384.	1978	LQ
c	385.	1978	D, OS
c	386.	1978	D, OS
c	387.	1978	D, OS
a	388.	1978	LQ
c	389.	1978	HT
a	390.	1978	LQ
a	391.	1978	LQ
c	392.	1978	UO, TR
c	393.	1978	No significant changes
c	394.	1978	No significant changes
b	395.	1978	MM
a	396.	1978	TR, GR, EXT
c	397.	1978	VT, GR, TR
a	398.	1978	MM, GR
c	399.	1978	LQ
c	400.	1978	No significant changes
c	401.	1978	No significant changes
c	402.	1978	No significant changes
c	403.	1979	ST, WS, GR, OS
c	404.	1979	LQ
c	405.	1979	WS, ST
b	406.	1979	OS
b	407.	1979	OS
c	408.	1979	VT
a	409.	1979	D

a	410.	1979	ST
c	411.	1979	DG
a	412.	1979	ST
c	413.	1979	DG
c	414.	1979	OS
c	415.	1979	ST, WS, OS
c	416.	1979	IM, FA, EX
c	417.	1979	EX, ST
c	418.	1979	VT
c	419.	1979	No significant changes
c	420.	1979	LQ
c	421.	1979	No significant changes
c	422.	1979	LQ
c	423.	1979	No significant changes
c	424.	1979	No significant changes
c	425.	1979	No significant changes
c	426.	1979	No significant changes
c	427.	1980	OS, B, DB
c	428.	1980	B
c	429.	1980	ST
c	430.	1980	No significant changes
c	431.	1980	OS, D
c	432.	1980	ST, LQ
a	433.	1980	No significant changes
c	434.	1980	DG, GR
c	435.	1980	B, ST
c	436.	1980	B, GR
c	437.	1980	OS, B
c	438.	1981	No significant changes
c	439.	1981	No significant changes
c	440.	1981	No significant changes
c	441.	1981	ST
c	442.	1981	OS
c	443.	1981	EXT
a	444.	1981	IM, LQ
c	445.	1981	No significant changes
c	446.	1981	No significant changes
a	447.	1981	MMLT
c	448.	1981	LQ, IM
c	449.	1981	WS, LQ
c	450.	1981	TR
c	451.	1981	OS, D
c	452.	1981	ST
c	453.	1981	No significant changes

c	454.	1981	ST
c	455.	1981	TR, GR
c	456.	1983	LQ
c	457.	1983	LQ
c	458.	1983	ST
c	459.	1983	ST, DG
a	460.	1983	ST
b	461.	1983	ST
a	462.	1983	LQ
c	463.	1983	LQ
c	464.	1983	LQ
c	465.	1983	EX, DG
c	466.	1983	IM, LQ
c	467.	1983	LQ
c	468.	1983	No significant changes
c	469.	1983	ST
c	470.	1983	VT
c	471.	1983	MM
c	472.	1983	LQ, IM
c	473.	1983	FA
c	474.	1983	GR, FA
c	475.	1983	EX, FA
c	476.	1983	B, GR
c	477.	1983	No significant changes
c	478.	1983	LQ
c	479.	1983	No significant changes
c	480.	1984	WS
c	481.	1984	ST
c	482.	1984	ST
c	483.	1984	ST, LQ
c	484.	1984	ST
c	485.	1984	MMLT, MMDT, DG
a	486.	1984	ST
b	487.	1984	LQ
c	488.	1984	ST, WS
b	489.	1984	ST, WS
c	490.	1984	IM, LQ
c	491.	1984	VT
c	492.	1984	DG
c	493.	1984	No significant changes
a	494.	1984	ST, IM
c	495.	1984	B, GR
c	496.	1984	GR, EXT, FA
c	497.	1984	B, DG

c	498.	1984	EXT, ST, WS
c	499.	1984	Appears abandoned
c	500.	1984	No significant changes
c	501.	1984	No significant changes
c	502.	1987	ST
a	503.	1987	No significant changes
c	504.	1987	DG
c	505.	1987	EX, DG
c	506.	1987	VT
b	507.	1987	LQ
c	508.	1987	LQ
a	509.	1987	No significant changes
c	510.	1987	GR
c	511.	1987	GR
a	512.	1987	Landfill appears inactive
a	513.	1987	No significant changes
c	514.	1987	EXT, ST, LQ
c	515.	1987	VT
c	516.	1987	B, MMDT
c	517.	1987	No significant changes
c	518.	1987	ST, WS
c	519.	1987	GR
c	520.	1987	GR, B, IM, LQ, B
c	521.	1987	B
c	522.	1988	DG
c	523.	1988	LQ, WS
c	524.	1988	VT
c	525.	1988	WS
c	526.	1988	OS, D
c	527.	1988	VT
c	528.	1988	LQ
c	529.	1988	LQ
c	530.	1988	VT
b	531.	1988	TR, LQ
c	532.	1988	WS, LQ
c	533.	1988	LQ
b	534.	1988	VT
a	535.	1988	FA, GR, EXT
c	536.	1988	EXT
c	537.	1988	EXT, ST
c	538.	1988	ST, MMDT
c	539.	1988	DG, B, MMLT, TR
c	540.	1988	MMDT, LQ
c	541.	1988	No significant changes

c	542.	1988	GR
c	543.	1988	B, GR
a	544.	1988	GR
c	545.	1988	IM
c	546.	1988	No significant changes
c	547.	1988	B, GR
c	548.	1992	OS, D
c	549.	1992	ST
a	550.	1992	ST
a	551.	1992	LQ
c	552.	1992	LQ
c	553.	1992	MMLT, DG
c	554.	1992	TR
c	555.	1992	LQ
a	556.	1992	TR
c	557.	1992	B, UO, VT
c	558.	1992	DG
c	559.	1992	OS
c	560.	1992	MMLT, MMDT
c	561.	1992	MMLT, MMDT, IM, LQ
c	562.	1992	ST, MMDT
c	563.	1992	WS, LQ, MMLT, MMDT
c	564.	1992	GR
c	565.	1992	B, GR
a	566.	1992	No significant changes
c	567.	1992	OS
c	568.	1992	DGDT
c	569.	1992	LQ

APPENDIX C

HISTORIC LAND USE DATA SOURCES

The maps and reports referenced in this appendix were obtained from the Navy and used in the preparation of the land use maps presented in Section 4 of this report. Several of the older maps are poor copies of the original and are partially illegible. Some of the maps are incomplete or undated.

Plot Plan, Sheet 1 of 170, NOY5421, dated 14 October 1942.

Master Shore Station, Part III, Section 2, Area Allocation Plan, PS 1097, dated 1952.

Master Shore Station Development Plan, General Development Plan, Existing and Planned Peacetime, Sheet 4 of 12, dated 8 June 1956.

Public Works Engineering Department, (title illegible), appears to be an activity improvement map, undated, but post-1965 and pre-1970, based on an aerial photograph comparison.

Department of the Navy, U.S. Marine Corps Air Station, El Toro, Santa Ana, California, Station Map, Sheet 1 of 1, Drawing No. S-2010, dated 27 February 1973.

MCAS El Toro, Santa Ana, California, General Development Map, Key Map, dated September 1976.

MCAS El Toro, Santa Ana, California, General Development Map, Key Map, Existing and Planned Pre-M Day, dated 1 July 1962, updated 1 July 1971, 9 sheets.

MCAS El Toro, Santa Ana, California, General Development Map, undated, compiled September 1976, 12 sheets.

Master Plan MCAS El Toro, El Toro, California, dated March 1982.

MCAS El Toro Master Plan, 1991

APPENDIX D

AERIAL PHOTOGRAPH DOCUMENTATION

AERIAL PHOTOGRAPH DATA BASE, MCAS EL TORO AND VICINITY

NOTES:

1. INCLUDES PHOTOGRAPHS COMPILED FROM ALL AVAILABLE LISTS. SOME DATA ARE INACCURATE OR INCOMPLETE.
2. INCLUDES ONLY PHOTOGRAPHS WITH SCALES OF 1:36000 OR LARGER
3. PHOTOGRAPHS COVER SITE AND ADJACENT AREAS
4. SOURCES OCCASIONALLY PROVIDE REDUNDANT DATA
5. NOT ALL LISTED PHOTOGRAPHS ARE AVAILABLE
6. ERRORS, e.g., INCORRECT YEAR, WERE INCLUDED IN SOME LISTS - ALL ERRORS MAY NOT HAVE BEEN FOUND AND CORRECTED

DATE	USED	SCENE ID	FLT, ETC	FRAME	SCALE	TYPE	COMPANY / AGENCY	INTERPRETER	DATE	REVIEWED BY
1943	NO	NONE FOUND								
1944	NO	NONE FOUND								
1945	NO	NONE FOUND								
12/29/46	YES	AB1CP0000000008	GS-CP	8:99	1:24000	B&W	USGS	J.T. ZELLMER	4/16/93	S. Heinz
12/29/46	YES	AB1CP0000000008	GS-CP	8:100	1:24000	B&W	USGS	J.T. ZELLMER	4/16/93	S. Heinz
12/29/46	YES	AB1CP0000000008	GS-CP	8:101	1:24000	B&W	USGS	J.T. ZELLMER	4/16/93	S. Heinz
9/1/47	NO		C-11730	7:23	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	7:24	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	7:25	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	7:26	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	7:27	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	7:50	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	7:51	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	7:52	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	7:53	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	15:62	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	15:63	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	15:64	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	15:65	1:7200	B&W	FAIRCHILD			

9/1/47	NO		C-11730	15:66	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	15:119	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	15:120	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	15:121	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	15:122	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	15:123	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	15:124	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	15:125	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	15:126	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	15:158	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	15:159	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	15:160	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	15:161	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	15:162	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	15:163	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	15:164	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	16:104	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	16:106	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	21:66	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	21:67	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	21:68	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	21:69	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	21:95	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	21:96	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	21:97	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	21:98	1:7200	B&W	FAIRCHILD			
9/1/47	NO		C-11730	21:99	1:7200	B&W	FAIRCHILD			
1947	NO		C-11730	55	1:14400	B&W	FAIRCHILD			
1947	NO		C-11730	56	1:14400	B&W	FAIRCHILD			
1947	NO		C-11730	65	1:14400	B&W	FAIRCHILD			
1947	NO		C-11730	66	1:14400	B&W	FAIRCHILD			
1/16/47	NO	DD1CP0000910732		0	1:26600	B&W	USGS/EROS			
1/16/47	NO	DD1CP0000910728		0	1:26600	B&W	USGS/EROS			
1948	NO	NONE FOUND								
7/18/49	NO		C-13990	25:4-6, 59-61	1:18000	B&W	FAIRCHILD			
7/18/49	NO		C-13990	25:5	1:18000	B&W	FAIRCHILD			
7/18/49	NO		C-13990	25:6	1:18000	B&W	FAIRCHILD			
7/18/49	NO		C-13990	29:59	1:18000	B&W	FAIRCHILD			

7/18/49	NO		C-13990	29:60	1:18000	B&W	FAIRCHILD			
7/18/49	NO		C-13990	29:61	1:18000	B&W	FAIRCHILD			
5/5/49	NO	NOT AVAILABLE	AXK	5	1:20000	B&W	USDA / ASCS			
5/5/49	NO	NOT AVAILABLE	AXK	6	1:20000	B&W	USDA / ASCS			
1950	NO	NONE FOUND								
1951	NO	NONE FOUND								
12/12/52	NO	WRONG AREA	AXK	3K-97	1:20000	B&W	USDA / ASCS			
12/12/52	NO	WRONG AREA	AXK	3K-98	1:20000	B&W	USDA / ASCS			
12/12/52	YES		AXK	2K-138	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/2 & 4/6/93	S. Heinz / E. Tambini
12/12/52	YES		AXK	2K-139	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/2 & 4/6/93	S. Heinz / E. Tambini
12/12/52	YES		AXK	2K-140	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/2 & 4/6/93	S. Heinz / E. Tambini
12/12/52	YES		AXK	2K-141	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/2 & 4/6/93	S. Heinz / E. Tambini
12/12/52	YES		AXK	2K-142	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/2 & 4/6/93	S. Heinz / E. Tambini
12/12/52	YES		AXK	3K-35	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/2 & 4/6/93	S. Heinz / E. Tambini
12/12/52	YES		AXK	3K-36	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/2 & 4/6/93	S. Heinz / E. Tambini
12/12/52	YES		AXK	3K-37	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/2 & 4/6/93	S. Heinz / E. Tambini
12/12/52	YES		AXK	3K-38	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/2 & 4/6/93	S. Heinz / E. Tambini
12/12/52	YES		AXK	3K-39	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/2 & 4/6/93	S. Heinz / E. Tambini
2/1/53	NO		C-18785	2:140	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	2:141	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	2:142	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	2:143	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	2:144	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	2:145	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	2:146	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	3:03	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	3:04	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	3:05	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	3:06	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	3:07	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	3:08	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	3:09	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	3:10	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	3:24	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	3:25	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	3:26	1:14400	B&W	FAIRCHILD			

2/1/53	NO		C-18785	3:27	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	3:28	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	3:29	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	3:30	1:14400	B&W	FAIRCHILD			
2/1/53	NO		C-18785	3:31	1:14400	B&W	FAIRCHILD			
1953	NO		C-18785	2145		B&W	FAIRCHILD			
1953	NO		C-18785	2146		B&W	FAIRCHILD			
1953	NO		C-18785	327		B&W	FAIRCHILD			
1953	NO		C-18785	328		B&W	FAIRCHILD			
1953	NO		C-18785	329		B&W	FAIRCHILD			
1953	NO		C-18785	330		B&W	FAIRCHILD			
1953	NO		C-18785	331		B&W	FAIRCHILD			
1953	NO		C-18785	33		B&W	FAIRCHILD			
1953	NO		C-18785	34		B&W	FAIRCHILD			
1953	NO		C-18785	35		B&W	FAIRCHILD			
1953	NO		C-18785	36		B&W	FAIRCHILD			
1953	NO		C-18785	37		B&W	FAIRCHILD			
2/26/53	NO	WRONG AREA	AXK	5K-140	1:20000	B&W	USDA / ASCS			
2/26/53	NO	WRONG AREA	AXK	5K-141	1:20000	B&W	USDA / ASCS			
10/26/53	NO	668	530-1	663	1:24000	B&W	NOS			
10/26/53	NO	668	530-1	664	1:24000	B&W	NOS			
10/26/53	NO	668	530-1	665	1:24000	B&W	NOS			
10/26/53	NO	668	530-2	660	1:24000	B&W	NOS			
10/26/53	NO	668	530-2	661	1:24000	B&W	NOS			
10/26/53	NO	668	530-2	662	1:24000	B&W	NOS			
10/26/53	NO	668	530-2	663	1:24000	B&W	NOS			
10/26/53	NO	668	530-2	664	1:24000	B&W	NOS			
10/26/53	NO	668	530-2	665	1:24000	B&W	NOS			
10/26/53	NO	668	530-2	666	1:24000	B&W	NOS			
1954	NO	NONE FOUND								
8/20/55	YES		PAI 49V	49-31	1:14000	B&W	PACIFIC AIR INDUSTRIES	J.T. ZELLMER	3/2&3, 4/1&16	S. Heinz / E. Tambini
8/20/55	YES		PAI 49V	49-81	1:14000	B&W	PACIFIC AIR INDUSTRIES	J.T. ZELLMER	3/2&3, 4/1&16	S. Heinz / E. Tambini
8/20/55	YES		PAI 49V	49-82	1:14000	B&W	PACIFIC AIR INDUSTRIES	J.T. ZELLMER	3/2&3, 4/1&16	S. Heinz / E. Tambini

3/7/55	NO		C-21677		1:18000	B&W	FAIRCHILD?			
1956	NO	NONE FOUND								
1957	NO	NONE FOUND								
1/17/58	YES		C-23023	ORA:5:108	1:36000	B&W	FAIRCHILD	J.T.ZELLMER	3/2,3,4 &4/2&6	S. Heinz / E. Tambini
1/17/58	YES		C-23023	ORA:110	1:36000	B&W	FAIRCHILD	J.T.ZELLMER	3/2,3,4 &4/2&6	S. Heinz / E. Tambini
2/21/58	YES		C-23023	ORA:8:11	1:36000	B&W	FAIRCHILD	J.T.ZELLMER	3/2,3,4 &4/2&6	S. Heinz / E. Tambini
2/21/58	YES		C-23023	ORA:8:13	1:36000	B&W	FAIRCHILD	J.T.ZELLMER	3/2,3,4 &4/2&6	S. Heinz / E. Tambini
2/21/58	YES		C-23023	ORA:8:14	1:36000	B&W	FAIRCHILD	J.T.ZELLMER	3/2,3,4 &4/2&6	S. Heinz / E. Tambini
2/21/58	YES		C-23023	ORA:8:15	1:36000	B&W	FAIRCHILD	J.T.ZELLMER	3/2,3,4 &4/2&6	S. Heinz / E. Tambini
1959	NO	NONE FOUND								
1960	NO		C-23870	309	1:14400	B&W	FAIRCHILD			
1960	NO		C-23870	310	1:14400	B&W	FAIRCHILD			
1960	NO		C-23870	311	1:14400	B&W	FAIRCHILD			
1960	NO		C-23870	312	1:14400	B&W	FAIRCHILD			
1960	NO		C-23870	313	1:14400	B&W	FAIRCHILD			
1960	NO		C-23870	345	1:14400	B&W	FAIRCHILD			
1960	NO		C-23870	346	1:14400	B&W	FAIRCHILD			
1960	NO		C-23870	347	1:14400	B&W	FAIRCHILD			
1960	NO		C-23870	348	1:14400	B&W	FAIRCHILD			
1960	NO		C-23870	349	1:14400	B&W	FAIRCHILD			
1960	NO		C-23870	350	1:14400	B&W	FAIRCHILD			
1960	NO		C-23870	351	1:14400	B&W	FAIRCHILD			
1960	NO		C-23870	351	1:14400	B&W	FAIRCHILD			
1960	NO		C-23870	353	1:14400	B&W	FAIRCHILD			
1960	NO		C-23870	354	1:14400	B&W	FAIRCHILD			
1960	NO		C-23870	355	1:14400	B&W	FAIRCHILD			
1960	NO		C-23870	356	1:14400	B&W	FAIRCHILD			
1960	NO		C-23870	357	1:14400	B&W	FAIRCHILD			
1960	NO		C-23870	358	1:14400	B&W	FAIRCHILD			
1960	YES		C-23870	2009	1:14400	B&W	FAIRCHILD	J.T.ZELLMER	3/2,3,4&4/2&6	S. Heinz / E. Tambini
1960	YES		C-23870	2010	1:14400	B&W	FAIRCHILD	J.T.ZELLMER	3/2,3,4&4/2&6	S. Heinz / E. Tambini

1960	YES		C-23870	2011	1:14400	B&W	FAIRCHILD	J.T.ZELLMER	3/2,3,4&4/2&6	S. Heinz / E. Tambini
1960	YES		C-23870	2012	1:14400	B&W	FAIRCHILD	J.T.ZELLMER	3/2,3,4&4/2&6	S. Heinz / E. Tambini
1960	NO		PAI 127V	127V-25	1:24000		PACIFIC AIR INDUSTRIES			
1960	NO		PAI 127V	127V-26	1:24000		PACIFIC AIR INDUSTRIES			
1960	NO		PAI 127V	126V-35	1:24000		PACIFIC AIR INDUSTRIES			
1960	NO		PAI 127V	126V-36	1:24000		PACIFIC AIR INDUSTRIES			
1960	NO		PAI 127V	126V-37	1:24000		PACIFIC AIR INDUSTRIES			
8/1/61	YES		C-24153	213	1:12000	B&W	FAIRCHILD	J.T.ZELLMER	3/22 &4/5&8	S. Heinz / E. Tambini
8/1/61	YES		C-24153	214	1:12000	B&W	FAIRCHILD	J.T.ZELLMER	3/22 &4/5&8	S. Heinz / E. Tambini
8/1/61	YES		C-24153	215	1:12000	B&W	FAIRCHILD	J.T.ZELLMER	3/22 &4/5&8	S. Heinz / E, Tambini
8/1/61	YES		C-24153	216	1:12000	B&W	FAIRCHILD	J.T.ZELLMER	3/22 &4/5&8	S. Heinz / E. Tambini
8/1/61	YES		C-24153	217	1:12000	B&W	FAIRCHILD	J.T.ZELLMER	3/22 &4/5&8	S. Heinz / E. Tambini
8/1/61	YES		C-24153	218	1:12000	B&W	FAIRCHILD	J.T.ZELLMER	3/22 &4/5&8	S. Heinz / E. Tambini
10/30/61	NO	62 82	615-2	7396	1:36000	B&W	NOS			
10/30/61	NO	62 82	615-2	7397	1:36000	B&W	NOS			
10/30/61	NO	62 82	615-2	7398	1:36000	B&W	NOS			
10/30/61	NO	62 82	615-2	7399	1:36000	B&W	NOS			
10/30/61	NO	62 82	615-2	7400	1:36000	B&W	NOS			
10/30/61	NO	62 82	615-2	7401	1:36000	B&W	NOS			
10/30/61	NO	62 82	615-2	7402	1:36000	B&W	NOS			
10/30/61	NO	62 82	615-2	7403	1:36000	B&W	NOS			
10/30/61	NO	62 82	615-2	7404	1:36000	B&W	NOS			
10/30/61	NO	62 82	615-2	7405	1:36000	B&W	NOS			
10/30/61	NO	62 82	615-2	7405	1:36000	B&W	NOS			
10/30/61	NO	62 82	615-2	7406	1:36000	B&W	NOS			
10/30/61	NO	62 82	615-2	7407	1:36000	B&W	NOS			
10/30/61	NO	62 82	615-2	7408	1:36000	B&W	NOS			
10/30/61	NO	62 82	615		1:36000	B&W	NOS			
1962	NO	NONE FOUND								
1963	NO	NONE FOUND								
1964	YES		C-24848	225	1:14400	B&W	FAIRCHILD	J.T. ZELLMER	3/2,3,4&4/6&8	S. Heinz / E. Tambini

1964	YES		C-24848	226	1:14400	B&W	FAIRCHILD	J.T. ZELLMER	3/2,3,4&4/6&8	S. Heinz / E. Tambini
1964	YES		C-24848	227	1:14400	B&W	FAIRCHILD	J.T. ZELLMER	3/2,3,4&4/6&8	S. Heinz / E. Tambini
1964	YES		C-24848	228	1:14400	B&W	FAIRCHILD	J.T. ZELLMER	3/2,3,4&4/6&8	S. Heinz / E. Tambini
1964	YES		C-24848	229	1:14400	B&W	FAIRCHILD	J.T. ZELLMER	3/2,3,4&4/6&8	S. Heinz / E. Tambini
7/1/64	NO	ORANGE CO	OR-64		1:1200	B&W	FOSALH			
1965	NO	NONE FOUND								
1966	NO	NONE FOUND								
5/7/67	YES	AB1VBTA00000001	GS-VBTA	1:34	1:33400	B&W	USGS	J.T.ZELLMER	4/17/93	S. Heinz
5/7/67	YES	AB1VBTA00000001	GS-VBTA	1:35	1:33400	B&W	USGS	J.T.ZELLMER	4/17/93	S. Heinz
5/7/67	YES	AB1VBTA00000001	GS-VBTA	1:36	1:33400	B&W	USGS	J.T.ZELLMER	4/17/93	S. Heinz
6/27/67	NO		VBTA	1:34	1:32000	B&W	USGS			
6/27/67	NO		VBTA	1:35	1:32000	B&W	USGS			
6/27/67	NO		VBTA	1:36	1:32000	B&W	USGS			
3/1/67	NO				1:24000	B&W	CONTINENTAL AERIAL PH.			
1968	YES		TG-2400	2400-4	1:24000	B&W	TELEDYNE	J.T.ZELLMER	3/2,3,4 & 4/6,8	S. Heinz / E. Tambini
1968	YES		TG-2400	2400-5	1:24000	B&W	TELEDYNE	J.T.ZELLMER	3/2,3,4 & 4/6,8	S. Heinz / E. Tambini
1968	YES		TG-2400	2400-27	1:24000	B&W	TELEDYNE	J.T.ZELLMER	3/2,3,4 & 4/6,8	S. Heinz / E. Tambini
1968	YES		TG-2400	2400-28	1:24000	B&W	TELEDYNE	J.T.ZELLMER	3/2,3,4 & 4/6,8	S. Heinz / E. Tambini
1968	YES		TG-2400	2400-29	1:24000	B&W	TELEDYNE	J.T.ZELLMER	3/2,3,4 & 4/6,8	S. Heinz / E. Tambini
9/1/68	NO		2400		1:28000	B&W	FAIRCHILD?			
1969	NO	NONE FOUND								
1970	NO	NONE FOUND								
6/1/71	NO				1:36000		CONTINENTAL AERIAL PH.			

5/19/71	NO	ORANGE	AXK	6	1:20000	B&W	USDA / ASCS			
5/19/71	NO	ORANGE	AXK	7	1:20000	B&W	USDA / ASCS			
5/19/71	YES		AXK	1MM-60	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/8 & 4/9/93	S. Heinz / E. Tambini
5/19/71	YES		AXK	1MM-61	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/8 & 4/9/93	S. Heinz / E. Tambini
5/19/71	YES		AXK	1MM-62	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/8 & 4/9/93	S. Heinz / E. Tambini
5/19/71	YES		AXK	1MM-63	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/8 & 4/9/93	S. Heinz / E. Tambini
5/19/71	YES		AXK	1MM-64	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/8 & 4/9/93	S. Heinz / E. Tambini
5/19/71	YES		AXK	1MM-70	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/8 & 4/9/93	S. Heinz / E. Tambini
5/19/71	YES		AXK	1MM-71	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/8 & 4/9/93	S. Heinz / E. Tambini
5/19/71	YES		AXK	1MM-72	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/8 & 4/9/93	S. Heinz / E. Tambini
5/19/71	YES		AXK	1MM-73	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/8 & 4/9/93	S. Heinz / E. Tambini
5/19/71	YES		AXK	1MM-74	1:20000	B&W	USDA / ASCS	J.T. ZELLMER	4/8 & 4/9/93	S. Heinz / E. Tambini
12/1/72	NO		ORANGE		1:24000	B&W	BREWSTER PACIFIC MAPS			
3/14/73	YES	AB573000999ROLL		193	1:32000	COL	USGS/EROS	J.T. ZELLMER	3/8 & 4/9/93	S. Heinz / E. Tambini
3/14/73	YES	AB573000999ROLL		194	1:32000	COL	USGS/EROS	J.T. ZELLMER	3/8 & 4/9/93	S. Heinz / E. Tambini
3/14/73	YES	AB573000999ROLL		195	1:32000	COL	USGS/EROS	J.T. ZELLMER	3/8 & 4/9/93	S. Heinz / E. Tambini
3/14/73	YES	AB573000999ROLL		196	1:32000	COL	USGS/EROS	J.T. ZELLMER	3/8 & 4/9/93	S. Heinz / E. Tambini
3/14/73	NO	AB573000998ROLL		193	1:32000	B&W	USGS/EROS			
3/14/73	NO	AB573000998ROLL		194	1:32000	B&W	USGS/EROS			
3/14/73	NO	AB573000998ROLL		195	1:32000	B&W	USGS/EROS			
3/14/73	NO	AB573000998ROLL		196	1:32000	B&W	USGS/EROS			
3/14/73	NO	AB573000997ROLL		193	1:32000	CIR	USGS/EROS			
3/14/73	NO	AB573000997ROLL		194	1:32000	CIR	USGS/EROS			
3/14/73	NO	AB573000997ROLL		195	1:32000	CIR	USGS/EROS			
3/14/73	NO	AB573000997ROLL		196	1:32000	CIR	USGS/EROS			
11/15/73	NO	AB625800130ROLL		3	1:23266	CIR	USGS/EROS			
11/15/73	NO	AB625800120ROLL		3	1:23266	COL	USGS/EROS			
1973	NO		TG-7300	9:09	1:24000	B&W	TELEDYNE			
1973	NO		TG-7300	9:10	1:24000	B&W	TELEDYNE			
1973	NO		TG-7300	9:11	1:24000	B&W	TELEDYNE			

1973	NO		TG-7300	9:12	1:24000	B&W	TELEDYNE			
1973	NO		TG-7300	10:09	1:24000	B&W	TELEDYNE			
1973	NO		TG-7300	10:10	1:24000	B&W	TELEDYNE			
1973	NO		TG-7300	10:11	1:24000	B&W	TELEDYNE			
1973	NO		TG-7300	10:12	1:24000	B&W	TELEDYNE			
10/1/73	NO				1:24000	B&W	CONTINENTAL AERIAL PH.			
3/1/73	NO				1:24000	B&W	UNICAL			
7/1/74	NO	ORANGE CO.				B&W	FOSAPH			
8/28/74	NO	AB574001905ROLL		9904	1:33000	CIR	USGS/EROS			
8/28/74	NO	AB574001905ROLL		9905	1:33000	CIR	USGS/EROS			
8/28/74	NO	AB574001905ROLL		9906	1:33000	CIR	USGS/EROS			
8/28/74	NO	AB574001905ROLL		9907	1:33000	CIR	USGS/EROS			
11/26/74	YES	AB574001974ROLL		186	1:33000	CIR	USGS/EROS	J.T. ZELLMER	3/8,28 & 4/9/93	S. Heinz
11/26/74	YES	AB574001974ROLL		187	1:33000	CIR	USGS/EROS	J.T. ZELLMER	3/8,28 & 4/9/93	S. Heinz
11/26/74	YES	AB574001974ROLL		188	1:33000	CIR	USGS/EROS	J.T. ZELLMER	3/8,28 & 4/9/93	S. Heinz
12/1/74	NO		7400		1:24000	B&W	WHITTIER?			
12/1/74	NO		ORANGE		1:24000	B&W	BREWSTER PACIFIC CORP.			
1974	YES		TG-7400	10:14	1:27300	B&W	TELEDYNE	J.T. ZELLMER	3/8,23 & 4/9/93	S. Heinz
1974	YES		TG-7400	10:15	1:27300	B&W	TELEDYNE	J.T. ZELLMER	3/8,23 & 4/9/93	S. Heinz
1974	YES		TG-7400	10:16	1:27300	B&W	TELEDYNE	J.T. ZELLMER	3/8,23 & 4/9/93	S. Heinz
1974	YES		TG-7400	9:20	1:27300	B&W	TELEDYNE	J.T. ZELLMER	3/8,23 & 4/9/93	S. Heinz
1974	YES		TG-7400	9:21	1:27300	B&W	TELEDYNE	J.T. ZELLMER	3/8,23 & 4/9/93	S. Heinz
8/5/75	YES	AB575002171ROLL		187	1:33000	CIR	USGS/EROS	J.T. ZELLMER	3/23,24 &4/10	
8/5/75	YES	AB575002171ROLL		264	1:33000	CIR	USGS/EROS	J.T. ZELLMER	3/23,24 &4/10	

1/13/75	YES		157-10	15	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/23,24 &4/10	S. Heinz
1/13/75	YES		157-10	16	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/23,24 &4/10	S. Heinz
1/13/75	YES		157-10	17	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/23,24 &4/10	S. Heinz
1/13/75	YES		157-10	18	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/23,24 &4/10	S. Heinz
1/13/75	YES		157-11	15	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/23,24 &4/10	S. Heinz
1/13/75	YES		157-11	16	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/23,24 &4/10	S. Heinz
1/13/75	YES		157-11	17	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/23,24 &4/10	S. Heinz
2/21/76	NO				1:36000	B&W	AERIAL MAP INDUSTRIES			
9/7/76	YES		177 KSS-1	A	1:12200	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/24 & 4/12/93	S. Heinz
9/7/76	YES		177 KSS-1	B	1:12200	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/24 & 4/12/93	S. Heinz
9/7/76	YES		177 KSS-1	C	1:12200	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/24 & 4/12/93	S. Heinz
9/7/76	YES		177 KSS-1	D	1:12200	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/24 & 4/12/93	S. Heinz
12/1/76	NO		ORANGE		1:24000	B&W	BREWSTER PACIFIC CORP.			
1/24/77	YES		181-10	16	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/24 & 4/12/93	S. Heinz
1/24/77	YES		181-10	17	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/24 & 4/12/93	S. Heinz
1/24/77	YES		181-10	18	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/24 & 4/12/93	S. Heinz
1/24/77	YES		181-10	19	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/24 & 4/12/93	S. Heinz
1/24/77	YES		181-11	17	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/24 & 4/12/93	S. Heinz
1/24/77	YES		181-11	18	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/24 & 4/12/93	S. Heinz
1/24/77	YES		181-11	19	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/24 & 4/12/93	S. Heinz
3/1/77	NO		7700		1:24000	B&W	UNICAL			
5/1/77	NO	E. LA BASIN	7700		1:24000	B&W	UNICAL			
5/30/77	NO		TG-7700	O.C.-51	1:24000	B&W	TELEDYNE			
5/30/77	NO		TG-7700	O.C.-29	1:24000	B&W	TELEDYNE			
5/30/77	NO		TG-7700	O.C.-29A	1:24000	B&W	TELEDYNE			

12/14/78	YES		203-10	20	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/24 & 4/12/93	S. Heinz
12/14/78	YES		203-10	21	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/24 & 4/12/93	S. Heinz
12/14/78	YES		203-10	22	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/24 & 4/12/93	S. Heinz
12/14/78	YES		203-10	23	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/24 & 4/12/93	S. Heinz
12/14/78	YES		203-11	22	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/24 & 4/12/93	S. Heinz
12/14/78	YES		203-11	23	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/24 & 4/12/93	S. Heinz
12/14/78	YES		203-11	24	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/24 & 4/12/93	S. Heinz
12/14/78	YES		203-11	25	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/24 & 4/12/93	S. Heinz
12/1/78	NO		ORG005		1:24000	B&W	CONTINENTAL AERIAL PH.			
12/1/78	NO		ORANGE		1:24000	B&W	BREWSTER PACIFIC CORP.			
2/4/79	YES		OC	86	1:24000	B&W	BREWSTER PACIFIC CORP.	J.T. ZELLMER	3/2,3,4 & 4/12	S. Heinz
2/4/79	YES		OC	95	1:24000	B&W	BREWSTER PACIFIC CORP.	J.T. ZELLMER	3/2,3,4 & 4/12	S. Heinz
4/1/79	NO	ORANGE CO	3747		1:24000	B&W	UNICAL			
11/1/80	YES	AB1VEZT00000001	GS-VEZT	1:152	1:24000	B&W	USGS/EROS	J.T. ZELLMER	4/17/93	S. Heinz
11/1/80	YES	AB1VEZT00000001	GS-VEZT	1:153	1:24000	B&W	USGS/EROS	J.T. ZELLMER	4/17/93	S. Heinz
11/1/80	YES	AB1VEZT00000001	GS-VEZT	1:154	1:24000	B&W	USGS/EROS	J.T. ZELLMER	4/17/93	S. Heinz
10/30/81	YES	AB1VEZT00000009	GS-VEZT	9:11	1:24000	B&W	USGS/EROS	J.T. ZELLMER	4/17/93	S. Heinz
10/30/81	YES	AB1VEZT00000009	GS-VEZT	9:12	1:24000	B&W	USGS/EROS	J.T. ZELLMER	4/17/93	S. Heinz
10/30/81	YES	AB1VEZT00000009	GS-VEZT	9:13	1:24000	B&W	USGS/EROS	J.T. ZELLMER	4/17/93	S. Heinz
1/7/82	NO	ORANGE CO	OC82		1:36000	B&W	AERIAL MAP INDUSTRIES			
1/9/82	NO	DC1VEZT00670964	VEZT		1:24000	B&W	USGS/EROS			
1/9/82	NO		VEZT	9:11	1:24000	B&W	USGS/EROS			
1/9/82	NO		VEZT	9:12	1:24000	B&W	USGS/EROS			
1/9/82	NO		VEZT	9:13	1:24000	B&W	USGS/EROS			

1/9/82	NO		VEZT	1-152	1:24000	B&W	USGS/EROS			
1/9/82	NO		VEZT	1-153	1:24000	B&W	USGS/EROS			
1/9/82	NO		VEZT	1-154	1:24000	B&W	USGS/EROS			
1982	NO				1:24000	COL	ROBERT J. LUNG AND AS.			
1982	NO		EL TORO 1974 PR (7400)		1:24000	?	FIRESCOPE III			
8/1/82	NO	ORANGE CO	OR82		1:3600	B&W	COMARC			
8/1/82	NO	ORANGE CO	OR82		1:24000	B&W	COMARC			
2/1/83	NO	ORANGE CO	PA-83		1:36000	B&W	PACAER			
3/1/83	NO	ORANGE CO	OR83		1:36000	B&W	AERIAL MAP INDUSTRIES			
4/1/83	YES		218-10	19	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/25 & 4/14,15	S. Heinz
4/1/83	YES		218-10	20	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/25 & 4/14,15	S. Heinz
4/1/83	YES		218-10	21	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/25 & 4/14,15	S. Heinz
4/1/83	YES		218-10	22	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/25 & 4/14,15	S. Heinz
4/2&5/18/83	YES		218-11	18	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/25 & 4/14,15	S. Heinz
4/2&5/18/83	YES		218-11	20	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/25 & 4/14,15	S. Heinz
4/2&5/18/83	YES		218-11	21	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/25 & 4/14,15	S. Heinz
4/2&5/18/83	YES		218-11	22	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/25 & 4/14,15	S. Heinz
10/1/83	NO	ORANGE CO	218		1:24000	B&W	CONTINENTAL AERIAL PH.			
11/1/83	NO	LA BASIN	A COUNTY		1:24000	B&W	BREWSTER PACIFIC CORP.			
12/1/83	NO	ORANGE CO			1:36000	B&W	I.K. CURTIS SERVICES			
2/1/84	NO	ORANGE CO	PA-84		1:36000	B&W	PACAER			

3/1/84	NO	ORANGE CO	OR-84		1:36000	B&W	AERIAL MAP INDUSTRIES			
5/1/84	NO	HWY 5-405	8440-4		1:1200	B&W	CADH			
11/1/84	YES	NOV 84 OC51/29			1:20880	B&W	AIREYE	J.T. ZELLMER	3/22 & 4/15/93	S. Heinz
10/16/84	NO		84-912-04		UNKNOWN	COL	AIRBORNE SYSTEMS, INC.			
10/9/84	NO		84-912-02		1:3000	B&W	AIRBORNE SYSTEMS, INC.			
1/1/85	NO	ORANGE CO	ORA -85		1:3600	B&W	COMARC			
1/1/85	NO	ORANGE CO	ORA -85		1:24000	B&W	COMARC			
2/1/85	NO	ORANGE CO	PA85		1:36000	B&W	PACAER			
1985	NO	G 1528 07 R86 1986		K24	1:14400	?	RUPP AERIAL			
1986	NO	NONE FOUND								
1987	NO				1:6000	B&W	ROBERT J. LUNG AND AS.			
1987	NO				1:9600	B&W	ROBERT J. LUNG AND AS.			
3/16/87	NO		87-863		1:2400	B&W	AIRBORNE SYSTEMS, INC.			
1/1/87	NO	ORANGE CO	OR-87		1:36000	B&W	CONTINENTAL AERIAL PH.			
1/9/87	YES			F-253	1:36000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/26 & 4/15/93	S. Heinz

1/9/87	YES			F-254	1:36000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/26 & 4/15/93	S. Heinz
1/9/87	YES			F-255	1:36000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/26 & 4/15/93	S. Heinz
1/9/87	YES			F-256	1:36000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/26 & 4/15/93	S. Heinz
2/1/87	NO	ORANGE CO	IKC-87		1:36000	B&W	I.K. CURTIS SERVICES			
1/1/88	NO	SAN DIEGO AREA	SAN-88		1:36000	B&W	FOTO			
1/1/88	NO	SAN DIEGO AREA	SAN-88		1:36000	B&W	FOTO			
1/21/88	YES	588003697	3697	160	1:33000	COL	NASAAM	J.T. ZELLMER	3/8 & 4/15/93	S. Heinz
1/21/88	YES	588003697	3697	161	1:33000	COL	NASAAM	J.T. ZELLMER	3/8 & 4/15/93	S. Heinz
2/1/88	NO	ORANGE CO	EGL-88		1:36000	B&W	EAGLE			
7/1/88	NO				1:36000	B&W	CONTINENTAL AERIAL PH.			
1/21/88	NO		88-820		1:30000	B&W	AIRBORNE SYSTEMS, INC.			
1/23/88	NO		88-820		1:30000	COL	AIRBORNE SYSTEMS, INC.			
2/1/88	NO	NONE FOUND								
1989	NO	NONE FOUND								
11/5 &8/90	NO		91-808-01		1:3000	B&W	AIRBORNE SYSTEMS, INC.			
1991	NO									
1/20/92	YES		C85-10	8	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/26 & 4/15/93	S. Heinz
1/20/92	YES		C85-10	9	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/26 & 4/15/93	S. Heinz
1/20/92	YES		C85-10	10	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/26 & 4/15/93	S. Heinz

1/20/92	YES		C85-11	9	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/26 & 4/15/93	S. Heinz
1/20/92	YES		C85-11	10	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/26 & 4/15/93	S. Heinz
1/20/92	YES		C85-11	11	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/26 & 4/15/93	S. Heinz
1/20/92	YES		C85-11	12	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/26 & 4/15/93	S. Heinz
1/20/92	YES		C85-11	13	1:24000	B&W	CONTINENTAL AERIAL PH.	J.T. ZELLMER	3/26 & 4/15/93	S. Heinz
6/3 & 25/92	NO		92-834		1:36000	COLOR	AIRBORNE SYSTEMS, INC.			

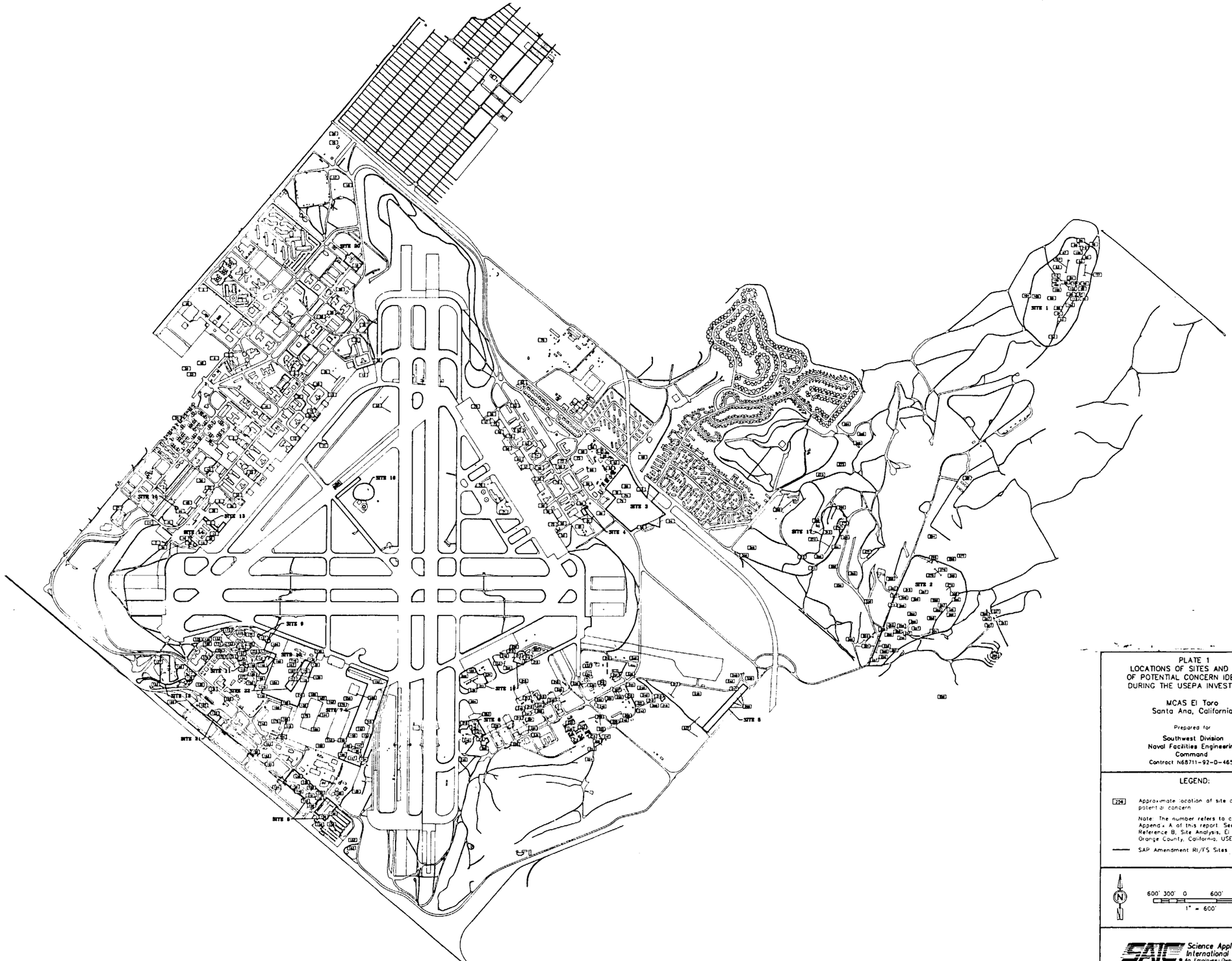


PLATE 1
LOCATIONS OF SITES AND AREAS OF POTENTIAL CONCERN IDENTIFIED DURING THE USEPA INVESTIGATION

MCAS El Toro
Santa Ana, California

Prepared for

Southwest Division
Naval Facilities Engineering Command
Contract N68711-92-D-4658

LEGEND:

[224] Approximate location of site or area of potential concern

Note: The number refers to comments in Appendix A of this report. See also Reference B, Site Analysis, El Toro MCAS, Orange County, California, USEPA, 1991

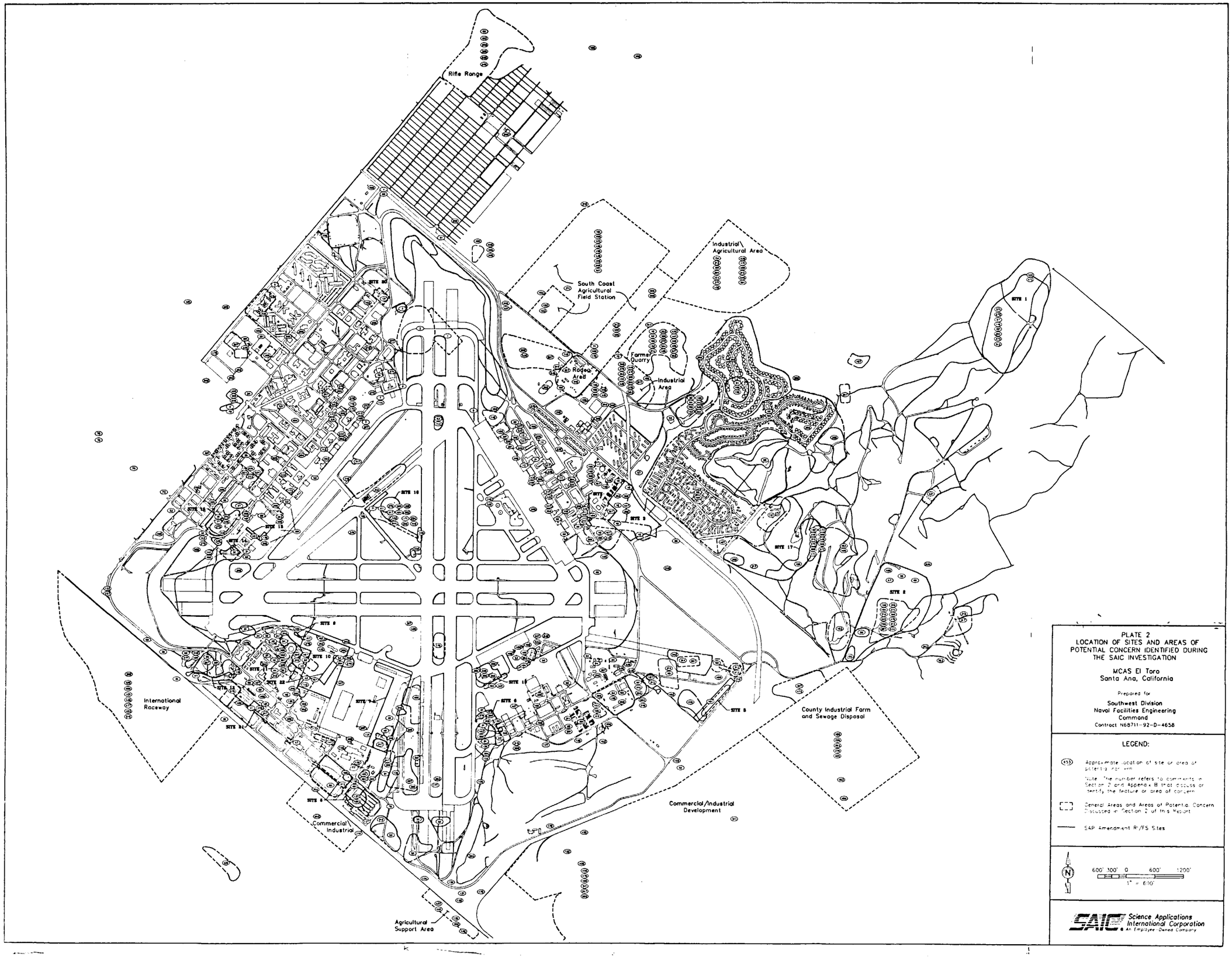
SAP Amendment RI/FS Sites

N

600' 300' 0 600' 1200'

1" = 600'

Science Applications International Corporation
An Employee-Owned Company


Rifle Range
Industrial/
Agricultural Area
South Coast
Agricultural
Field Station
Rodeo
Area
Farms
Quarry
Industrial
Area
SITE 1
SITE 2
SITE 3
SITE 4
SITE 5
SITE 6
SITE 7
SITE 8
SITE 9
SITE 10
SITE 11
SITE 12
SITE 13
SITE 14
SITE 15
SITE 16
SITE 17
SITE 18
SITE 19
SITE 20
SITE 21
SITE 22
International
Raceway
County Industrial Farm
and Sewage Disposal
Commercial/Industrial
Development
Commercial/
Industrial
Agricultural
Support Area
PLATE 2
LOCATION OF SITES AND AREAS OF
POTENTIAL CONCERN IDENTIFIED DURING
THE SAIC INVESTIGATION
MCAS El Toro
Santa Ana, California
Prepared for
Southwest Division
Naval Facilities Engineering
Command
Contract N68711-92-D-4658
LEGEND:
Approximate location of site or area of potential concern
Note: The number refers to comments in Section 2 and Appendix B that discuss or identify the feature or area of concern
General Areas and Areas of Potential Concern Discussed in Section 2 of this Report
SAP Amendment RI/FS Sites
N
600' 300' 0 600' 1200'
1" = 600'
SAIC Science Applications International Corporation
An Employee-Owned Company