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MCAS EL TORO
SSIC # 5090.3

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Final Report
Aerial Photograph Assessment
MCAS El Toro
Contract No. N68711-91-D-4658
Delivery Order 0002
SAIC Project No. 01-0817-02-0817

Submitted to:

Naval Facilities Engineering Command
Southwest Division
1220 Pacific Highway, Room 18
San Diego, CA 92132-5181

Submitted by:

Science Applications International Corporation
Engineering Sciences Division
10260 Campus Point Drive, MS F1
San Diego, CA 92121

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FINAL REPORT
AERIAL PHOTOGRAPH ASSESSMENT
MCAS EL TORO

- References:
- a) Contract No. N68711-91-D-4658, Delivery Order 0002
 - b) Site Analysis, El Toro MCAS, Orange County, California, USEPA, 1991
 - c) Marine Corps Air Station, El Toro, California, Installation Restoration Program , Draft Final Sampling Analysis Plan Amendment, CH2M Hill, 1992
 - d) Preliminary Aerial Photograph Assessment, MCAS El Toro, SAIC, May 28,1993
 - e) Draft Report, Aerial Photograph Assessment, MCAS El Toro, SAIC, August 2, 1993

1.0 INTRODUCTION

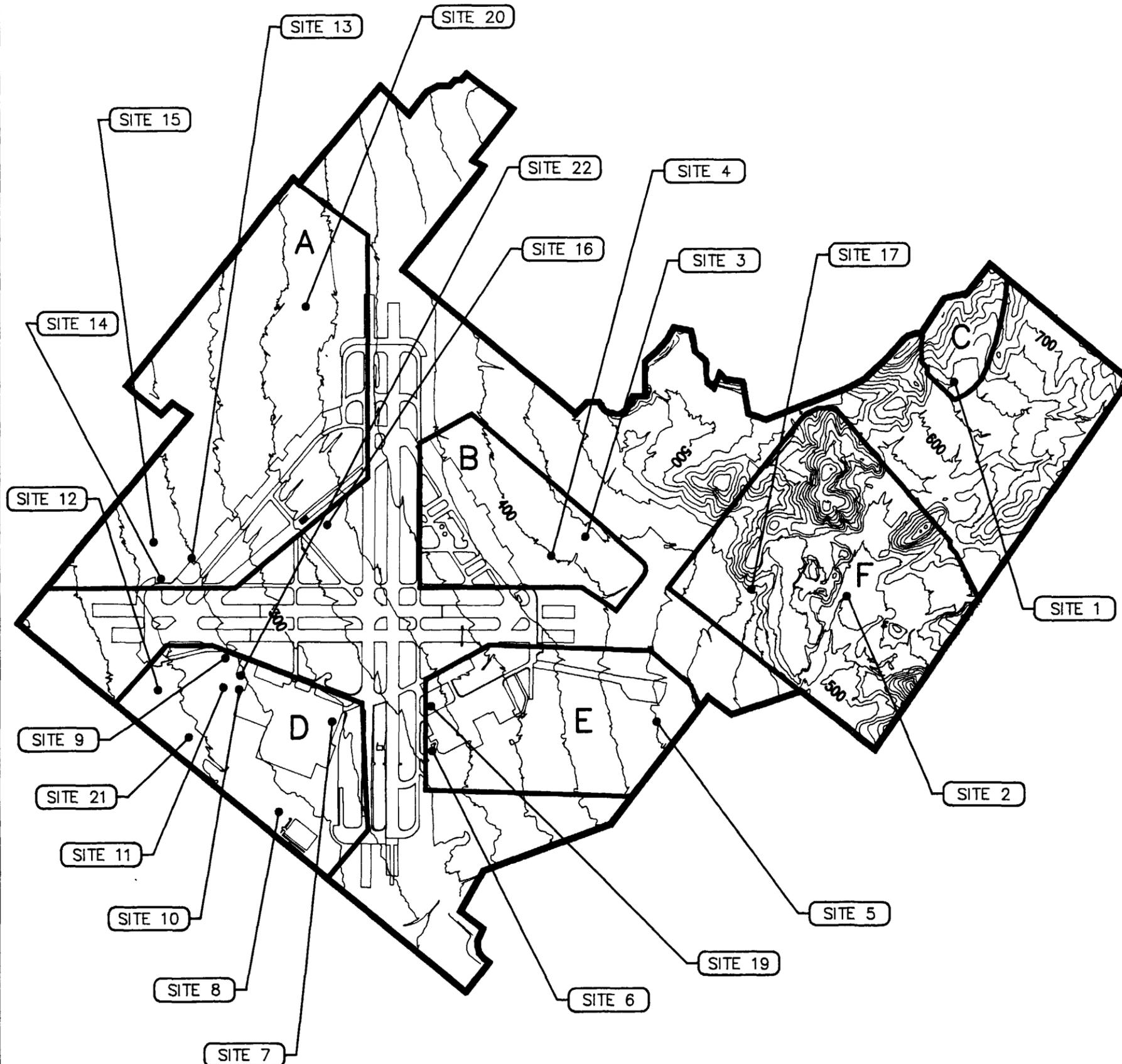
This final report complies with the requirements of Work Element 1.3 (Reference A) and the applicable contract delivery-schedule modifications pertaining to this work element. The work element requires a final report that details the findings of SAIC's investigation to identify areas of environmental concern at the Marine Corps Air Station (MCAS) El Toro through aerial photograph interpretation.

The investigation was conducted in multiple phases. The Phase I investigation was limited to a review of Areas A, B, C, D, and E discussed in Reference B, but excluded photographs for specific years. The Phase I investigation (Work Element 1.2, Reference A) resulted in the report of Reference D. Phase II of the investigation focused on sites and areas of potential concern outside of those addressed in the Reference B report, and also included drainage pattern mapping, historical land use, and the compilation of areas of potential concern obtained from several sources. The Reference E report is a compilation of the work accomplished during Phases I and II. This final report incorporates the information obtained during the Phase I and II investigations, and the comments provided by the Navy. Figure 1 identifies the locations of the USEPA (1992) investigation areas and current SAP Amendment RI/FS sites.

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

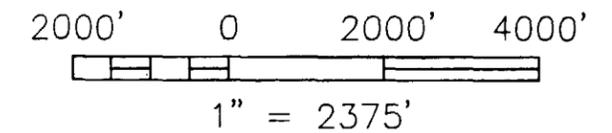
Figure 1
 Sheet 1 of 1

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



LEGEND:

SYMBOL	DESCRIPTION
A-F	USEPA (1992) Investigation Areas
1-22	SAP Amendment RI/FS Sites



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The primary purpose of the investigation was to identify sites and areas of potential environmental concern that had not been previously recognized. Consequently, the aerial photograph analysis focused on the identification and documentation of features that may be indicative of contaminant release or of having the potential for contaminant release. These features include, but are not limited to: stained or wet soil, liquids, drums, open storage areas, vertical tanks, horizontal tanks, disturbed ground, trenches, excavations, impoundments, refuse, and mounded material. To provide quality control, the photographs were interpreted and later reviewed by qualified, experienced personnel.

Aerial photographs taken during the years reported on in Reference B were to have been excluded from analysis. These excluded years are 1952, 1959, 1965, 1970, 1980, 1981, 1986, 1989, and 1991. Although excluded from general consideration, but because they were available, photographs taken during 1952, 1980, and 1981 were used to investigate portions of MCAS El Toro not reviewed in Reference B. These photographs were mistakenly obtained due to errors in the data bases provided by the aerial photograph suppliers.

The results of the aerial photograph analysis discussed here generally reaffirm the previous work, but also identify new sites that may require additional investigation. Some of the sites and general areas noted here were also identified in Reference B, but are included here to indicate persistence over time and to identify significant features not previously reported. In several cases, the combination of old and new data define areas of potential concern that are more extensive than previously recognized. The addition of new sites to those identified previously does not indicate that the previous analyses were faulty or incomplete, but rather that the passage of time, changes in land use, meteorological conditions prior to the time that the photographs were taken, sun angle, photograph format (e.g., color, color infrared, black and white), photograph scale and resolution, season of year during which the photograph was taken, and the interpreter's experience, skill and equipment can all affect the results of the investigation.

Attempts were made to obtain aerial photographic coverage of MCAS El Toro for the years 1943 through 1992, exclusive of the years that were the subject of the Reference B investigation. The search included four Federal and State governmental agencies, 28 private companies and two universities. Not all of the private companies could be contacted, and several that were contacted did not have the requested types of photographs. One Federal agency did not respond to our request for information. Errors were discovered in some of the photographic coverage lists. Typical errors included listing the incorrect year, location, or scale for the photograph. These errors resulted in our obtaining coverage for some of the years discussed in Reference B. Because the photographs were available, they were used to investigate the portions of MCAS El Toro not addressed in Reference B. Their inclusion provided additional information that would not otherwise have been available.

The aerial-photograph search criteria included black and white, color and color infrared aerial photographs at scales of 1:36,000 (1 in = 3000 feet) or larger. Photographic scales smaller than 1:36,000 render recognition and identification of small-scale features

difficult. If multiple scales or formats were available for a given year, color was favored over black and white, and the largest practical scale with the greatest areal coverage was selected. Color infrared photographs and black and white photographs were obtained for some years. However, due to the poor resolution and scales of the color infrared photographs, they are not discussed here. Preference was also given to photographs providing stereographic coverage. All photographs were viewed through a standard mirror stereoscope capable of magnification.

Photographs covering all or portions of MCAS El Toro for each of 21 years, exclusive of those discussed in Reference B, were obtained during the investigation. The years include 1946, 1955, 1958, 1960, 1961, 1964, 1967, 1968, 1971, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1983, 1984, 1987, 1988, and 1992. The total number of photographs from these years totaled 106. Photographs discussed in Reference B, including 1952, 1980 and 1981 (total of 16) were used in investigations of areas of MCAS El Toro not included in the Reference B report. Also reviewed were several aerial photograph indices and four photographs misidentified by the vendors as being of MCAS El Toro.

Information regarding the photograph date, scale format, identification, interpreter, and other information are included in Appendix D, Photograph Documentation. Many of the photographs used during this investigation were of smaller or larger scale than desired, several did not provide stereographic coverage, some were of poor resolution, and many cover only portions of the investigation area. In some situations the original negative was no longer available and it was necessary to copy the original photograph and then prepare a second generation print. This process results in degraded photographic resolution, relative to the original.

The search and photograph acquisition phases of the investigation were hampered by slow responses from some suppliers, and by lengthy order processing times. Had more time been available for the early phases of the investigation, better and more complete photographic coverage could likely have been secured, and enlarged photographs of selected areas obtained. However, the major results of the investigation would probably not have changed significantly. That is, more sites of potential concern would probably have been identified, but most would likely have been located in the general areas discussed herein and in References B, C, D and E.

Although not required by the delivery order, some areas adjacent to the MCAS El Toro boundaries, especially those that appeared to be upgradient of the activity, were also included in the investigation. This allowed the inclusion of sites that may potentially contribute to contamination of the groundwater flowing beneath the site from upgradient sources, or contributing to contamination observed downgradient of MCAS El Toro. The identified offsite areas of potential concern typically include agriculture-related areas, and commercial or industrial sites. Pesticides, fertilizers, fuels, solvents, and other potential contaminants may be used or stored at these sites.

The following discussions of the investigation's findings are presented in chronological order. Except as noted below, each year's discussion is preceded by one, two, or four

annotated photographs. Copyright restrictions prohibited reproduction of the photographs for seven years, 1975, 1976, 1977, 1978, 1983, 1987, and 1992. For these years, the annotated sites are identified on a 1992 base map that uses the MCAS El Toro airfield area as a location reference. All of the original photographs will be transmitted to the Navy at the conclusion of the investigation.

Some sites and areas noted in previous investigations are also noted here due to their persistence, due to the recognition of significant features not previously reported, or because they may delineate a larger area of concern. Site 18 occupies an area of about 5 square miles located south and west of MCAS El Toro that is thought to be underlain by trichloroethylene (TCE) contaminated groundwater (Reference C). The site is not directly addressed herein and is discussed only as it may overlap other designated areas and sites.

Although the photographs are discussed in chronological order, they were interpreted in random order due to the various delivery schedules provided by the several suppliers. As a result, there was unavoidable repetition of identified features from year to year, and it was not practicable to eliminate all redundancies. Because the purpose of the investigation was to identify sites and areas of potential concern, little effort was expended in developing a detailed chronology of the development of MCAS El Toro, or of the temporal persistence of various facilities and features of potential concern. The discussions lack universal year-to-year comparisons of many noted features. Nevertheless, the photograph annotations do indicate notable changes, or the lack thereof, for many identified features or areas. Maps showing all sites of potential concern identified during this and previous investigations (Section 3), indicating land use (Section 4), and drainage patterns (Section 5) are also included in this report. The information contained in this report reflects the time and resources available for the investigation and report preparation.

Recommendations for further investigation of specific sites and areas of potential concern may vary from photograph year to photograph year. This variation results from the annual-random interpretation order of the photographs. The recommendations are generally based on the information available from the specific photograph under discussion. Photographs from periods prior to, or following the photograph in question may reveal information of different scope or detail. Conservative assumptions regarding the potential for contaminants being present in a given area are reflected in the recommendations. Stains and liquids on paved or concrete surfaces are often not noted, under the assumption that infiltration is unlikely. However, additional investigation is typically recommended if liquids, stains, drums, etc., occur in areas of soil, under the assumption that infiltration is possible.

Recommendations for additional investigation do not necessarily imply that field sampling is required. Depending on the particular case, additional investigation may possibly be satisfied by: a review of historical site usage; by a review of potential contaminants that may have been used, stored, or disposed at the site; by a review of spill, emergency response or similar records; by anecdotal evidence; or by other method.

For example, photographic evidence of a liquid discharge from near a building determined to be a residence could possibly be disregarded as being irrigation water, whereas a liquid discharge from a solvent-storage building would require greater consideration.

Information about the possible contamination of a particular site may also be obtained from information not made available to this investigation and from sampling related to the current IR program field investigation. Prior to commencing additional investigation of any site noted in this report, all available information should be considered. This should include, at a minimum, an investigation of the site's historical usage, and investigation of the potential for contaminants having been used, stored, or disposed at the site. It may not be necessary to specifically address each site that is recommended for investigation in this report if other data are available that can adequately serve the investigatory requirements. For example, the site or feature may be acceptably close to current or proposed sampling sites.

The aerial photograph analysis did not reveal new sites for which there is clear evidence of contamination. This is not possible from aerial photographic analysis alone. However, several sites were noted that may be of concern, and may therefore, require additional investigation. These sites possess the characteristics noted during the previous analyses, such as stained or wet soil, open storage areas, tanks, etc., but which had not been identified or reported previously. The work reported herein is of greater detail than was originally requested, but is justified by the number and locations of new sites recognized. As was also done in previous investigations, the certainty with which a feature can be identified ranges from definite, if no modifier is included, to probable and possible as the certainty decreases.

Stains and liquids on the aircraft parking aprons, taxiways, and runways were typically not noted unless significant amounts of flowing liquids were observed or suspected, or unless the liquids appeared to have reached soil covered areas. In many, if not most cases, these liquids and those flowing from buildings are probably wash or rinse water. However, the composition of the liquid cannot be determined from the photographs, and thus, the presence of such liquids satisfying the above criteria is noted. Also, the contents or purposes of the buildings were typically not known to the photograph interpreter, preventing inferences about the composition of the liquids.

Similar to the methodology of Reference B, open storage areas were noted if stains, drums, or other features of concern appeared to be associated with the area. Because open storage areas tended to fluctuate in size over time, decreases in size are typically not noted. The identification of drums in open storage areas was problematical due to the limited magnification of the analysis equipment and the small scale and poor resolution of many of the photographs.

In contrast to the methods used during the Reference B investigation, SAIC's analysis reports nearly all vertical and horizontal tanks that were observed, but not previously noted. SAIC disagrees that these tanks should be discussed only if they are associated

with stains or spills, as was done in Reference B. Photographic analysis cannot determine the contents or integrity of the tanks and their ancillary systems. Further, evidence of leakage or spills may not be apparent at the ground surface, and, depending on the type of liquid, may be an ephemeral event not detectable at the time, scale, or other characteristic of the photograph. After the tanks are investigated, those used for innocuous materials, such as potable water supply, can be deleted from future consideration. Some water-supply tanks were recognized as such and were not noted.

2.0 AERIAL PHOTOGRAPH INTERPRETATION

This section discusses the findings of MCAS El Toro aerial photograph interpretation. The locations of the SAP Amendment RI/FS site locations (Reference C) are indicated in Figure 1, Location Map. The annotated photographs, or the findings derived from them, of MCAS El Toro and the immediate vicinity, and the accompanying discussions, are presented in chronological order for the years 1946, 1952, 1955, 1958, 1960, 1961, 1964, 1967, 1968, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1983, 1984, 1987, 1988, and 1992. Copies of the interpreted photographs, or annotated overlays over a base map, are identified as Figures 2 through 23. Following discussions with the Navy, only the annotated site locations are included for the years 1975, 1976, 1977, 1978, 1983, 1987, and 1992. Copies of the photographs are not being provided due to copyright restrictions. Possession of the original photographs will be transferred to the Navy at the conclusion of the investigation.

Information regarding potential sites or areas of concern that are in the immediate vicinity of MCAS El Toro, but not within its boundaries are also included if these features may impact the activity. These areas typically border the activity and include features such as quarries, commercial and industrial sites, and agricultural support areas. These sorts of features typically use or store potential contaminants, such as fuels, oil, solvents, pesticides, and fertilizers. The identified sites are generally located upgradient of MCAS El Toro, or upgradient of known areas of contamination.

The present investigation was to focus on identifying sites of potential concern that were not previously recognized. Many of the sites identified during the USEPA (Reference B) investigation were largely excluded from additional review, except to identify significant discrepancies between the investigations. Thus, sites identified by the USEPA, and many sites occurring within the SAP Amendment RI/FS boundaries (Reference C), are often not noted on the photographs reproduced in this report, even though many of the sites were verified during the investigation. However, all of the sites identified during this and previous investigations are compiled on Plates 1 and 2. Section 3 of this report briefly discusses the preparation of Plates 1 and 2.

Sites of potential concern that occur within the current SAP Amendment (Reference C) RI/FS boundaries are indicated by either an "a" or "b" preceding the comment number in the photograph annotation discussions and in Appendix B. Sites identified during the USEPA (Reference B) investigation that occur within the SAP Amendment RI/FS boundaries that were verified during the present investigation, irrespective of the photograph year, are indicated by an "a". Sites identified during the present investigation that are within the SAP Amendment boundaries, but not noted by the USEPA, are indicated by a "b". Comments describing sites of potential concern that are located outside of the SAP Amendment boundaries are preceded by a "c". The "c" classification includes most of the sites identified during the present investigation and several sites identified by the USEPA. Comments that address multiple sites or large sites are

preceded by a "c" if any of the indicated sites or areas lie outside of the SAP Amendment RI/FS boundaries.

The annotated photographs, or annotated base maps, are presented in chronological order, beginning with the earliest available photographs, 1946, and sequentially progressing through 1992. The features of potential concern are annotated on each photograph or base map, and identified numerically and by appropriate feature abbreviations. Each figure provides a legend of the abbreviations. Following each photograph or annotated base map are discussions of the features. The discussion identifies the type of feature(s) noted, describes the location of each feature relative to sites identified on "MCAS El Toro, Santa Ana, California, General Development Map," and typically makes recommendations relative to additional investigation.

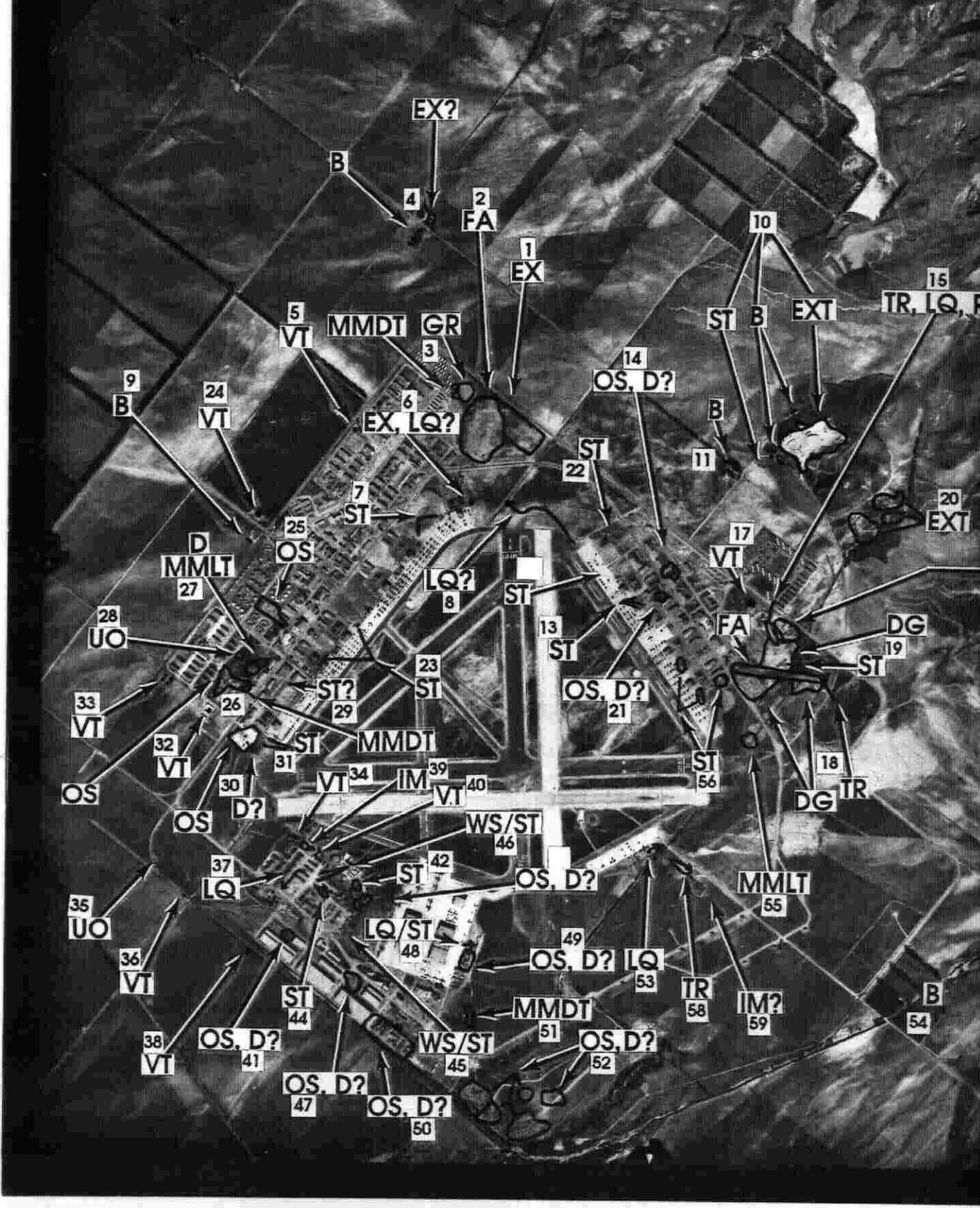
The map of MCAS El Toro (1 inch equals 200 feet) was provided by the Navy at the beginning of the investigation, and is adequately representative of most areas described in this report. The map is undated, but, based on comparisons with the aerial photographs, was prepared after March of 1973, but before February of 1979. Some of the geographic locations and buildings are not depicted on maps for different time periods. Because precise measurements were not required from the aerial photographs, the true scales were typically not determined, but rather, the nominal scale indicated by the photograph's supplier is generally given, and if required, used in the discussions.

Appendix D, Aerial Photograph Documentation, is a compilation of the aerial photograph lists obtained during the project. The information documented in the appendix includes, where available: the date of the photograph; whether or not the photograph was obtained; if it was used in the investigation; the source of the information about the photograph; the supplier's photograph-identification number; the flight or job number; the frame number; the nominal photographic scale; the type of photograph (e.g., black and white, color, etc.); the company or agency that photographed the site; the names of the photograph interpreter and reviewer.

Due to the composite nature of Appendix D, it was necessary to eliminate several redundant entries. Users of this report should note that errors were discovered in some of the lists. Errors typically included the incorrect year, location, or photographic scale. As a result, several inappropriate photographs were obtained. Where noted, the errors were corrected or the entry eliminated. Undetected errors may remain in the appendix. The list does not include the aerial photograph indices from which individual photographs were selected.

12-29-46

8-100





Aerial Photographic Interpretation
 MCAS El Toro
 Santa Ana, California

1946

Figure 2

Sheet 1 of 1

December 29, 1946

Photo Number GS-CP-8-100

Source:

U.S. Geological Survey

Prepared for:

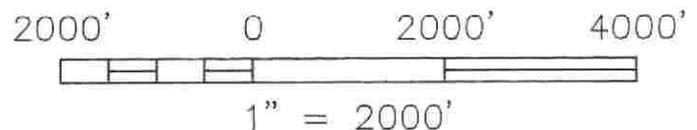
Southwest Division

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	TR	Trench
	Revetment	UO	Unidentified Object
GR	Graded Area	VT	Vertical Tank
GS	Ground Scar	WS	Wet Soil
HT	Horizontal Tank		



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2.1 1946 PHOTOGRAPHS

FIGURE: 2
DATE: 29 DECEMBER 1946
PHOTOGRAPH: GS-CP-8-100

c 1. An excavation (EX) about 400 feet wide by 500 feet long is noted beneath the present threshold area of Runway 16L. The purpose of the excavation is unknown, but may be an early, undocumented disposal area. The site history, or the site itself, should be investigated to determine if potential contaminants were disposed of in the excavation.

c 2. A fill area (FA) is located immediately west of the excavation (EX) discussed in the previous comment. The area appears to contain spoil material from the excavation. No additional investigation of the fill material is recommended at this time.

c 3. A circular graded (GR) area about 300 feet in diameter is located near the present Auto Hobby Shop (Building 625). Along the western border of the area is a dark-toned mound (MMDT) of unknown composition, but may be soil and vegetation debris from the grading. No additional investigation is recommended at this time.

c 4. Farm buildings (B) and a possible excavation (EX) are located on Irvine Boulevard, north of the activity. The buildings may contain fuel, solvents, pesticides, fertilizers, and other potential contaminants; the excavation may have been used to dispose of these materials. No additional investigation is recommended at this time, unless contamination is detected near, or downgradient of the site, in areas of interest to the IR program.

c 5. A vertical tank (VT) is noted at N 6th Street and D Street. This is probably Building 222 (Elevated Water Tank). No additional investigation is recommended at this time.

c 6. There is an excavation (EX) at the present intersection of N 7th Place and K Street. There appears to be wet soil (WS) or liquid (LQ) extending into the excavation from a light-colored building at the edge of the aircraft parking apron. The site should be investigated for past use as a possible disposal area.

c 7. There are stains (ST) adjacent to the aircraft parking apron at N 6th Place and K Street, and at N 4th Place and K Street. Additional investigation of these sites is recommended.

c 8. A drainage channel (EX) with probable liquid (LQ) extends from the aircraft parking apron near the approach end of Runway 21 and into a drainage ditch near the approach end of Runway 16R. The channel probably controls runoff from the apron area, and may convey contaminated water. Additional investigation is recommended.

- c 9. Farm buildings (B) are noted adjacent to Trabuco Road, near Gate No.1. The buildings may contain fuel, solvents, pesticides, fertilizers, and other potential contaminants; the excavation may have been used to dispose of these materials. No additional investigation is recommended at this time, unless contamination is detected near, or downgradient of the site, in areas of interest to the IR program.
- c 10. A large quarry (EXT) with apparent support buildings (B) and stains (ST) are located northwesterly of the present residential area of the activity. The buildings may be the site of fuel, oil and solvent use and storage. No additional investigation is recommended at this time, unless contamination is detected near, or downgradient of the site, in areas of interest to the IR program.
- c 11. Farm buildings (B) are located adjacent to Irvine Boulevard, southwest of the quarry. The buildings may contain fuel, solvents, pesticides, fertilizers, and other potential contaminants; the excavation may have been used to dispose of these materials. No additional investigation is recommended at this time, unless contamination is detected near, or downgradient of the site, in areas of interest to the IR program.
- c 12. There are stains (ST) adjacent to the aircraft parking apron in the vicinity of the present site of Building 605, near N 8th Street and M Street. Additional investigation of the site is recommended.
- c 13. There are soil stains (ST) in the area southwest of Building 292, near N 8th Street, between N Street and M Street. The stains appear to result from flowing liquids. Additional investigation is recommended.
- c 14. An open storage (OS) area on the northerly side of Building 136, between N 9th Street and North Marine Way, and between N Street and O Street, may contain drums (D). Additional investigation of the site is recommended.
- c 15. There is an open trench (TR) about 500 feet southeast of the Pumphouse / Water Reservoir. There appears to be liquid (LQ) in the northerly portion of the trench and possible refuse (R) in the southerly portion. The trench does not appear to have been recognized during earlier investigations, but it occurs within the present field investigation area of the Original Landfill (Site 3). Additional investigation may be advisable.
- b 16. Light-and dark-toned mounded material (MMLT and MMDT) occur on the easterly side of the trench (TR) noted in the previous comment. The materials are unidentified, but may be construction debris. The areas appears to extend beyond the limits of the present IR program field investigation. Expansion of the investigation area is advised.
- a 17. Vertical tank (VT) is Tank 293, Water Reservoir. No additional investigation is recommended.

c 18. There is a trench (TR) and fill area (FA) about 1000 feet south of Tank 293 (Water Reservoir). The trench is oriented nearly east-west, and is about 900 feet long. Spoil material (FA) extends about 500 feet to the west, along the trench alignment. There is a large area of disturbed ground (DG) south of the trench. It should be verified that the trench is wholly contained by the present IR program field investigation for the Original Landfill (Site 3).

b 19. There is a large area of stained (ST) soil in the vicinity of the Original Landfill (DG). The Site 3 investigation appears to encompass the area; no additional investigation is recommended at this time.

c 20. There are three areas of apparent extraction (EXT) at the mouth of Agua Chinon Wash. These areas may have been used for waste disposal. Additional investigation is recommended if contamination is detected near, or downgradient of the site, in areas of interest to the IR program.

c 21. An open storage (OS) area on the northwest side of Building 120, near N 8th Street and O Street, contains possible drums (D). Additional investigation is recommended.

c 22. Probable soil stains (ST) occur in the southwestern portion of Tank Farm No. 4, near N 8th Street and O Street. Additional investigation is recommended.

a 23. There are stains (ST): adjacent to the aircraft parking apron about 200 feet northeast of Building 12; at S 1st Street and K Street; and between Buildings 10 and 11, on S 4th Place.

c 24. Seven (7) possible vertical tanks (VT) are noted on the north side of Trabuco Road, west of Gate No. 1. These may be silos, however, the existence and use of the suspected tanks should be verified, and if necessary, the area investigated.

c 25. There is an open storage (OS) area, perhaps related to construction activities, between F and G Streets and S 1st and S 3rd Streets. If construction-related, the site may have contained a variety of paints, solvents, and other potential contaminants. Additional investigation is advised.

c 26, a 27, and c 28. These sites are located on the northwesterly sides of Buildings 25, 27, 29, and 31 between S 5th and S 8th Streets and G Street and West Marine Avenue. The area contains open storage (OS) areas with possible drums (D), light- and dark-toned mounded material (MMLT and MMDT), unidentified materials, and unidentified objects (UO) that may be mounds or drums. Additional investigation of these areas is recommended.

a 29. There appears to be stained (ST) soil on the southwest side of Building 241, near S 5th Street and West Marine Way. Additional investigation is recommended.

- c 30. An open storage (OS) area with possible drums (D) is located on the southwest side of Building 246, near S 8th Street and West Marine Way. Additional investigation is recommended.
- b 31. There is stained (ST) soil on the southeast side of Building 246, near S 8th Street and West Marine Way. Additional investigation is recommended.
- c 32. A probable vertical tank (VT) is located about 400 feet southwest of Building 31, near S 8th Street and West Marine Way. There also appears to be soil staining (ST) or wet soil (WS) at the base of the tank. Verification of the tank and possible contents is recommended.
- c 33. There is a probable vertical tank (VT) on the southwest side of Building 249, near S 8th Street and D Street. Verification of the tank and its possible contents is recommended.
- c 34. A probable vertical tank (VT), possibly Tank 155, is located near S 11th Street and L Street. Verification of the tank and its contents is recommended.
- c 35. An unidentified object (UO), possibly a vertical tank (VT) or mound (M) is noted on the north side of Perimeter Road, about 800 feet northwest of Bee Canyon Wash. Additional investigation is recommended.
- c 36. There appears to be a vertical tank (VT) near the railroad tracks at the Bee Canyon Wash crossing. Verification of the tank and its contents is recommended.
- a 37. There is liquid (LQ) flowing southwesterly from the southwest side of Building 132, near S 14th Street, between M and N Streets. Additional investigation is recommended.
- c 38. There appears to be a vertical tank (VT) adjacent to the railroad tracks about 250 feet southwest of Building 317. Verification of the tank and its contents is recommended.
- c 39. Two impoundments (IM) can be observed on the southwest side of Building 306, near S 11th Street and L Street. Investigation of the impoundments' uses is recommended.
- a 40. There are two vertical tanks (VT) on the northeast side of Building 306, near S 11th Street and L Street. Investigation of the tanks' contents is recommended.
- b 41. There is an open storage (OS) area, possibly with drums (D), on the westerly side of Building 320, near S 15th Street and O Street. Additional investigation is recommended.

- b 42. There are soil stains (ST) beneath the present aircraft parking apron about 500 feet southeast of Tank 174. Additional investigation may be advisable.
- b 43. Open storage (OS) areas with possible drums (D) are noted about 700 and 1000 feet southeast of Tank 174, beneath the present aircraft parking apron. Additional investigation may be advised.
- c 44. There are soil stains (ST) in an open storage (OS) area now occupied by Buildings 386 and 1389, about 350 feet northeast of Building 368 (Public Works). Additional investigation is advisable.
- b 45. There is wet soil (WS) or stains (ST) in the open storage (OS) area about 500 feet northwest of Building 322 (Mess Hall). Additional investigation is advisable.
- c 46. There is wet soil (WS) or stains (ST) in the area now occupied by the southwest corner of Building 1389, and in the open storage (OS) area about 200 feet northwest of Building 1389. Additional investigation is be advisable.
- c 47. There is an open storage (OS) area with possible drums (D) near the approximate location of Building 359, near South Marine Way and P Street. Additional investigation is recommended.
- b 48. There appear to be stains (ST) caused by liquids (LQ) flowing easterly from the aircraft parking apron about 200 feet east of Building 296 (hangar). Additional investigation is recommended.
- b 49. There may be drums (D) in an open storage (OS) area about 200 feet east of Building 296 (hangar). Additional investigation is recommended.
- c 50. There is an open storage (OS) area at the present location of Building 360, near South Marine Way, between Q and R Streets. Additional investigation may be advisable.
- c 51. Dark-toned mounded material (MMDT) can be seen adjacent to the drainage ditch between Perimeter Road and the southeast corner of the aircraft parking apron. The mounds appear to be soil related to maintenance of the ditch. No additional investigation is recommended at this time.
- c 52. In the area north of the railroad tracks, between Agua Chinon Wash and Borrego Canyon Wash, there are four open storage (OS) areas. All appear to contain refuse (R) or materials in storage. The westerly area appears to have been excavated (EX) and the spoil (FA) placed toward the southeast. The spoil area (FA) and excavated (EX) area appeared to be covered with refuse (R) or other materials. The southerly open storage (OS) area is an aircraft salvage area with several fuselage and wings sections visible. Smaller open storage (OS) areas occur near the four major sites. Additional investigation of the areas is recommended.

c 53. Liquid (LQ) can be seen flowing from a former hangar (?) near the northeast end of the aircraft parking apron on the northerly side of the present ACER site (Site 19). The liquid (LQ) discharges into a drainage ditch from a small building behind the former hangar. The flow appears to be significant and additional investigation is recommended.

c 54. There are farm buildings (B) near Perimeter Road and Borrego Canyon Wash, near Gate No. 3 on Trabuco Road. The buildings may contain fuel, solvents, pesticides, fertilizers, and other potential contaminants. Additional investigation is recommended if contamination is detected near the site, or downgradient of the site, in areas of interest to the IR program.

c 55. There is light-toned mounded material (MMLT) adjacent to the drainage ditch between North Marine Way and the approach end of Runway 25R. The material appears to be soil associated with construction or maintenance of the ditch. The ditch drains the Original Landfill (Site 3) area, and is intersected by one of the trenches. Investigation of the mounded soil and ditch is recommended.

c 56. Soil stains (ST) can be observed: on the southeast side of Building 125, near S Place and N 9th Street; at the edge of the aircraft parking apron about 200 feet northwest of Tank Farm No. 6; and near the present location of Buildings 697 and 642, near N 8th Street and S Street. Additional investigation is recommended.

b 57. No activity was noted at either the Magazine Road Landfill (Site 2), or the Communication Station Landfill (Site 17).

c 58. A trench (TR), possibly for drainage, can be seen northwest of the former building, located about 800 feet west of East Marine Way and El Toro Boulevard. Additional investigation is recommended.

c 59. There is a probable impoundment (IM) or storage tank of some sort southeast of the building indicated in the previous comment. The object appears to be a square-shaped, bermed area with impounded liquid or a square-shaped object on top of the mound. Additional investigation is recommended.

12-12-62





Aerial Photographic Interpretation
 MCAS El Toro
 Santa Ana, California

1952

Figure 3

Sheet 1 of 2

December 12, 1952

Photo Number AXK-3K-36

Source:

U.S. Department of Agriculture

Prepared for:

Southwest Division

Naval Facilities Engineering Command

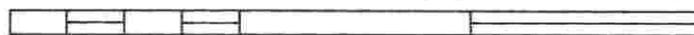
Contract N68711-92-D-4658

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	TR	Trench
	Revetment	UO	Unidentified Object
GR	Graded Area	VT	Vertical Tank
GS	Ground Scar	WS	Wet Soil
HT	Horizontal Tank		



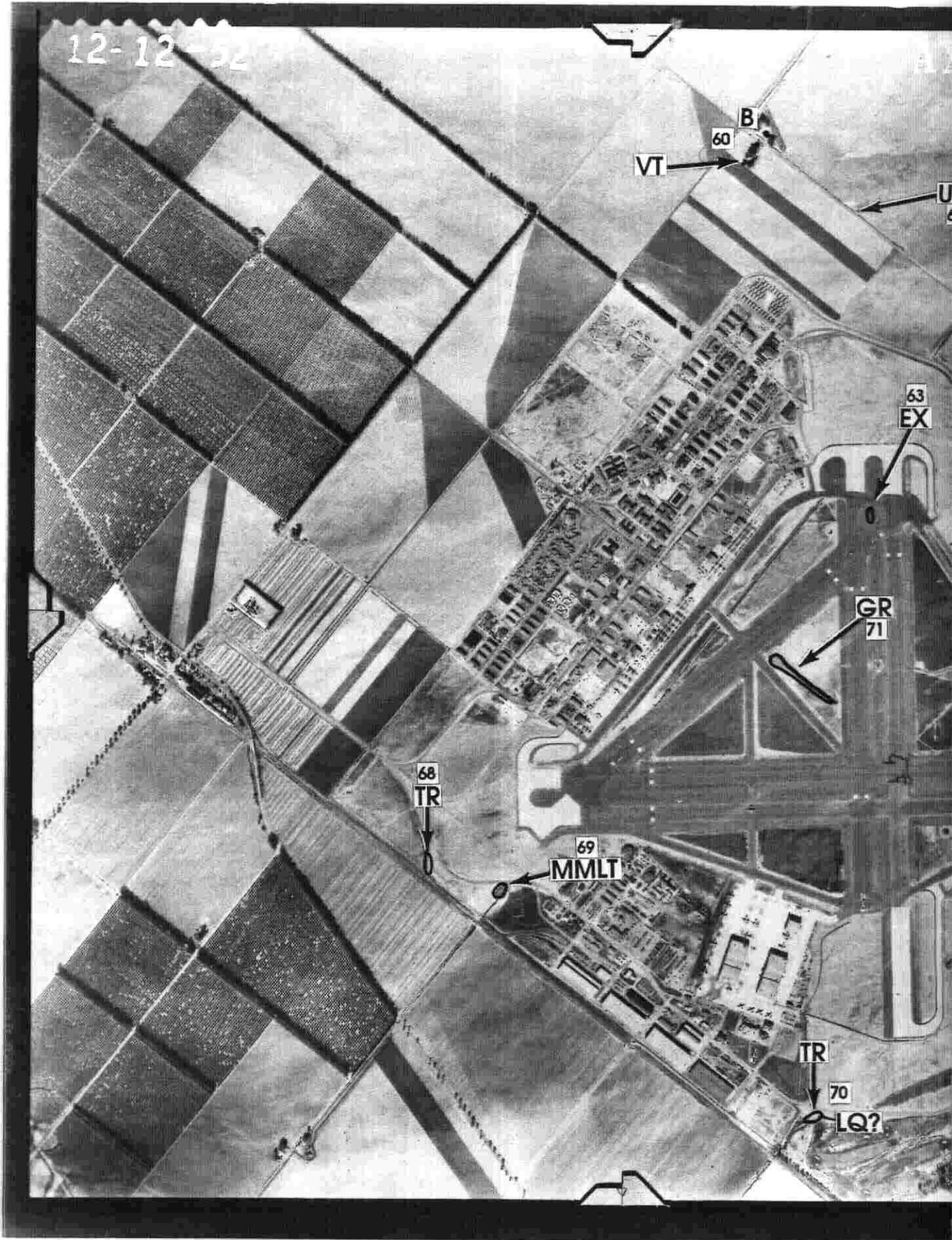
2000' 0 2000' 4000'



1" = 1667'

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12-12-52





Aerial Photographic Interpretation
 MCAS El Toro
 Santa Ana, California

1952

Figure 3

Sheet 2 of 2

December 12, 1952

Photo Number AXK-2K-141

Source:

U.S. Department of Agriculture

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	TR	Trench
	Revetment	UO	Unidentified Object
GR	Graded Area	VT	Vertical Tank
GS	Ground Scar	WS	Wet Soil
HT	Horizontal Tank		



2000' 0 2000' 4000'



1" = 1667'

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2.2 1952 PHOTOGRAPHS

FIGURE: 3
DATE: 12 DECEMBER 1952
PHOTOGRAPH: AXK-3K-36 and AXK-2K-141
NOTE: The following comments address only areas not reported on in Reference B.

c 60. Farm buildings (B) are noted at Irvine Road and Range Road. There are probable vertical tanks (VT) about 500 feet southerly of intersection. Farm buildings and probable vertical tank may contain fuels, solvents fertilizers, pesticides or other chemicals. Investigation is recommended if contaminants are detected near or downgradient of the site, in areas of interest to the IR program.

c 61. There is an unidentified object (UO) on north side of Irvine Road, about 2000 feet southeast of Range Road that may be a mound. Additional investigation is not recommended at this time.

c 62. There is a large quarry (EXT) with numerous support structures on northwest and southwest sides. Heavy equipment is probably used and maintained at the site, and therefore, fuel, oil and solvent use and storage are likely. Additional investigation is recommended if contaminants are detected near the site, or downgradient of the site, in areas of interest to the IR program.

c 63. An excavation (EX) can be seen between Runways 16L and 16R, near the approach end. It is probably related to drainage control. Additional investigation is not recommended at this time.

c 64. At the quarried (EXT) area, two (2) sites appear to be active and the other site recently active. The quarries may have been used for waste disposal. Additional investigation is recommended if contamination is detected at the site, or downgradient of the site.

c 65. The MCAS El Toro residential area is under development with extensive grading (GR) and earthmoving. Additional investigation is not recommended at this time.

c 66. There is a trench (TR) about 250 feet long, located about 1000 feet northeast of N 16th Street and T Street. The purpose of the trench is unknown and additional investigation is recommended if contaminants are detected in the area, or downgradient of the trench site.

c 67. Two (2) probable vertical tanks (VT) are located about 500 feet southeast of N 14th Street and S Street. The tanks should be verified and their contents determined.

c 68. This is a shallow or backfilled trench (TR). Additional investigation is recommended to determine if it was used for waste disposal.

c 69. Light-toned mounded material (MMLT) can be seen on the westerly side of Bee Canyon Wash, south of Perimeter Road. It appears to be stockpiled soil. Additional investigation is not recommended at this time.

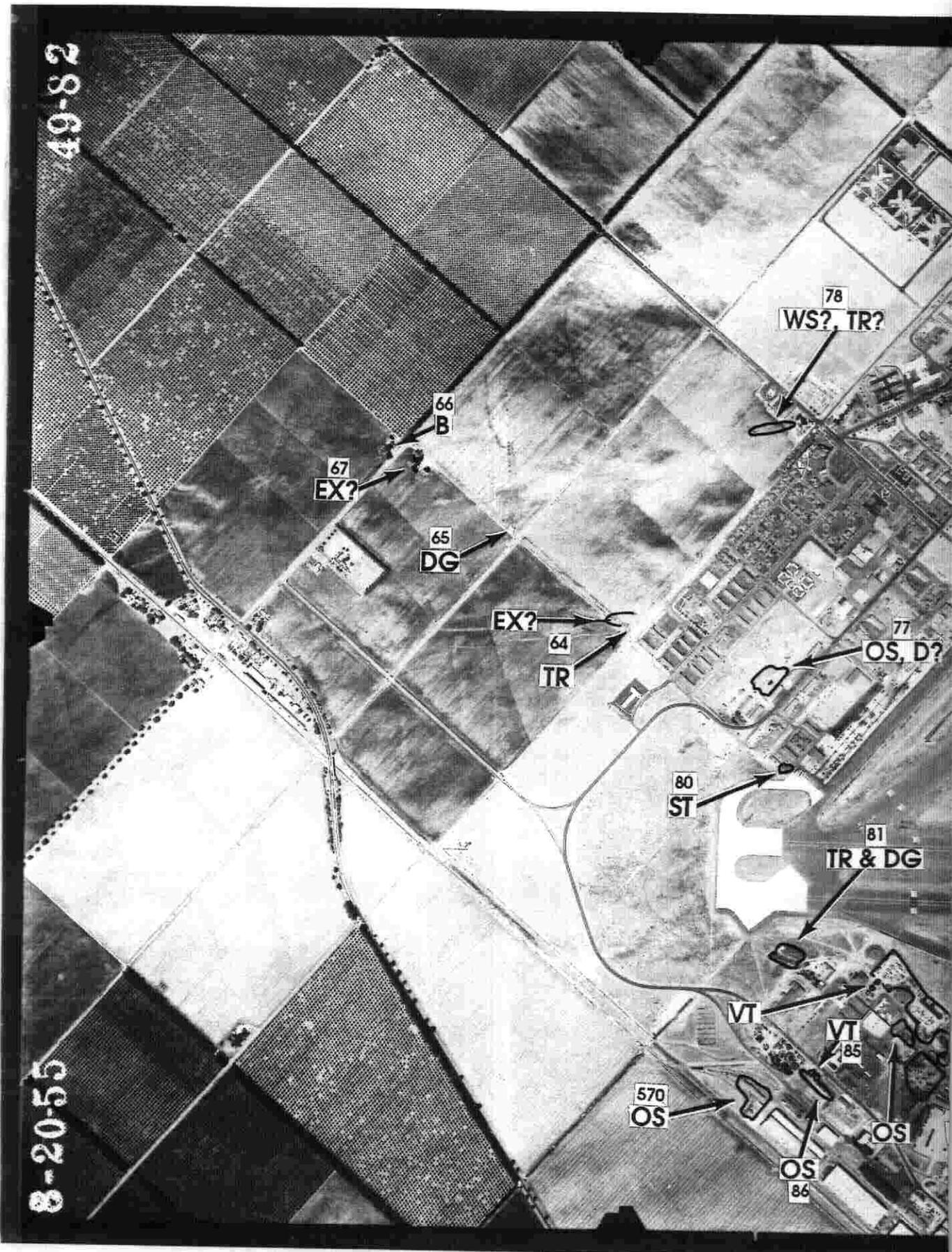
c 70. A trench (TR) with possible liquid (LQ) at its north end is located near South Marine Way and Agua Chinon Canyon Wash. The possible liquid may be darkening caused by a shadow. The purpose of the trench is unknown, but may be related to a storm drainage system. Additional investigation is not recommended at this time unless contamination is detected near the site, or downgradient of the site.

c 71. Probable grading (GR) or trench backfilling operation is apparently in progress west of Runway 34L and north of Runway 25R. The purpose is unknown. Additional investigation is not recommended at this time unless contamination detected in the site area, or downgradient of the site, in areas of interest to the IR program.

c 72. Three (3) possible horizontal tanks (HT) and one (1) possible vertical tank (VT) are noted near the southwest corner of the Quarry (Comment 60). This appears to be a support area for the quarry operation. Additional investigation is recommended if contaminants are detected near the site, or downgradient of the site, in areas of interest to the IR program.

49-82

8-20-55



Aerial Photographic Interpretation
 MCAS El Toro
 Santa Ana, California
 1955

Figure 4

Sheet 1 of 1

August 20, 1955

Photo Number PAI 49V, 49-82

Source: Map and Imagery Library,
 University of California, Santa Barbara

Prepared for:

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

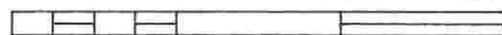


LEGEND:

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



1000' 0 1000' 2000'



1" = 1167'

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2.3 1955 PHOTOGRAPHS

FIGURE: 4
DATE: 20 AUGUST 1955
PHOTOGRAPH: PAI 49V,49-82
NOTE: Partial coverage of area, partial stereographic coverage.

c 73. There is a possible trench (TR) or excavation (EX) at South 8th Street and Perimeter Road that is probably related to cultivation. Additional investigation is not recommended at this time unless contamination is detected in the site area, or downgradient of the site, in areas of interest to the IR program.

c 74. Disturbed ground (DG), possibly a former building site, is located about 1200 feet southeast of Sand Canyon Avenue and S 8th Street. Additional investigation is not recommended at this time unless contamination is detected in the site area, or downgradient of the site, in areas of interest to the IR program.

c 75. Farm buildings (B) are located at Sand Canyon Avenue and S 8th Street. The buildings may contain fuels, solvents fertilizers, pesticides or other chemicals. Investigation is recommended if contaminants potentially related to the site are detected downgradient at the site, or downgradient of the site, in areas of interest to the IR program.

c 76. There is an excavation (EX), possibly a disposal site, near the farm buildings (B) noted in the previous comment. Additional investigation is recommended if contaminants potentially related to the site are detected near the site, or downgradient of the site, in areas of interest to the IR program.

a 77. An open storage (OS) area with possible drums (D) is located on westerly side of Buildings 27 and 29, near S 5th Street and West Marine Way. Additional investigation is recommended.

c 78. A trench (TR) or drainage ditch with possible wet soil (WS) extends from the developed area westerly of Gate No. 1, on Trabuco Road. Additional investigation is recommended if contaminants are detected near site, or downgradient of the site, in areas of interest to the IR program.

c 79. There is an open storage (OS) area on westerly side of Building 286, near N 7th Street and West Marine Way. Additional investigation is recommended.

c 80. Stains (ST) are noted at the easterly end of Building 246, near S 8th Street and J Street. Additional investigation is recommended.

c 81. A trench (TR) and disturbed ground (DG) can be seen about 230 feet northwesterly of Building 307, near S 14th Street and K Street. The purpose is unknown. Additional investigation is recommended.

c 82. There are open storage (OS) areas in much of the north-central portion of Area D (Reference B). The current IR program field investigation is probably adequate relative to the site noted here. Additional investigation not recommended at this time.

c 83. Probable stains (ST) are adjacent to the northwest corner of the aircraft parking apron. The current IR program field investigation probably adequate, relative to the features noted here. Additional investigation not recommended at this time.

c 84. Two (2) vertical tanks (VT) can be seen north of Building 355, near S 11th Street and M Street. Verification of the tanks and their contents is recommended.

b 85. There are two (2) vertical tanks (VT) near South Marine Way and M Street, about 200 feet south of Building 368 (Public Works). Verification of the tanks and their contents is recommended.

c 86. An open storage (OS) area is located parallel to South Marine Way, and extends approximately from the site of previous comment to Building 305. The current IR program field investigation is probably adequate, relative to the features noted here. Additional investigation is not recommended at this time.

570. An open storage (OS) area is located westerly of Building 317, near M Street, between S 15th Street and Perimeter Road. Additional investigation is recommended.

15

VII-ORA-8-13

FL

WORLDWIDE

2-21-58



Aerial Photographic Interpretation
 MCAS El Toro
 Santa Ana, California

1958

Figure 5

Sheet 1 of 1

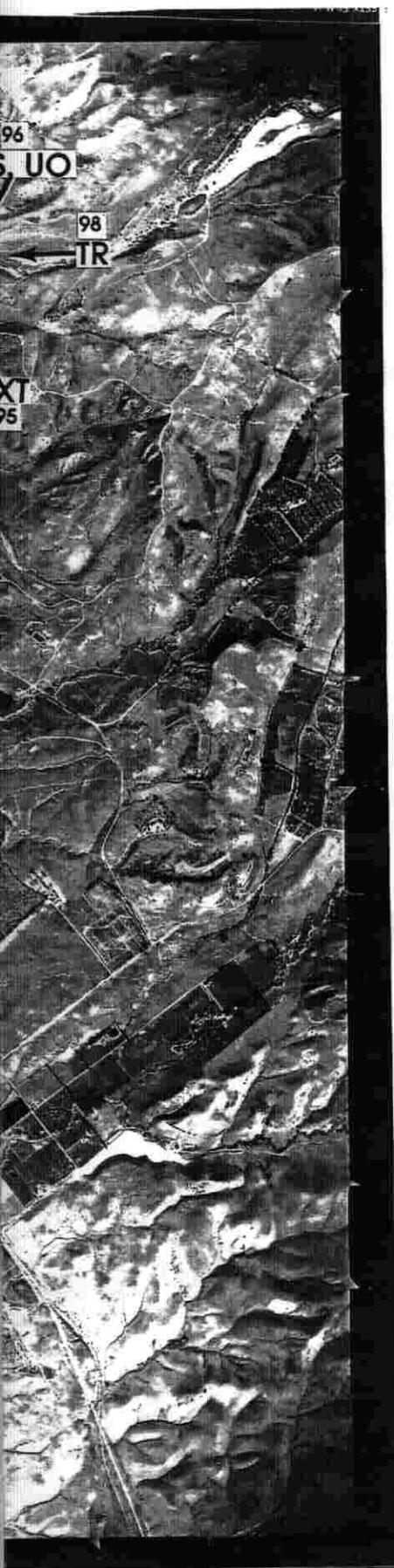
February 21, 1958

Photo Number C-23023, VII-ORA-8-13

Source: Whittier College,
 Whittier, California

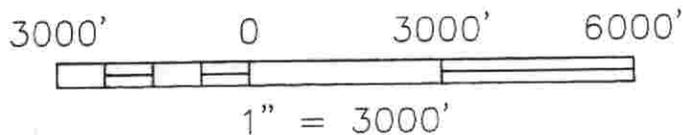
Prepared for:

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



LEGEND:

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
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