



CITY OF OAKLAND



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Public Works Agency
Environmental Services

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November 17, 2004

Mr. Barney Chan
Alameda County Health Care Services
Environmental Health Services
1131 Harbor Bay Parkway, suite 250
Alameda, CA 94502-9335

Subject: Submission of Technical Report Request – Municipal Service Center, 7101 Edgewater Drive, Oakland, CA 94621

Dear Mr. Chan:

Per your letter dated October 15, 2004, in response to the County's request for Technical Reports, please find enclosed for your review one copy each of:

1. The City's Dual-Phase Extraction Work plan
2. The report dated November 16, 2004 of the Conduit Study conducted by Ninyo & Moore.

We are expecting that the second semi-annual 2004 groundwater monitoring report will be completed by the end of November 2004. We hope to have the report submitted to you as soon as it is submitted to the City by the consultant, LFR.

If there are any questions, please contact me at (510) 238-7371 or e-mail me at oojukwu@oaklandnet.com.

Sincerely,

A handwritten signature in black ink, appearing to read "Odili N. Ojukwu".

Odili N. Ojukwu, P.E.
Environmental Program Specialist

Copy:

Mark Gomez, City of Oakland, PWA/ESD (wo/enclosure)

**CONDUIT STUDY
MUNICIPAL SERVICE CENTER
7101 EDGEWATER DRIVE
OAKLAND, CALIFORNIA**

PREPARED FOR:

City of Oakland, Public Works Department
Environmental Sciences Division
250 Frank Ogawa Plaza, Suite 5301
Oakland, California 94612

PREPARED BY:

Ninyo & Moore Geotechnical and Environmental Sciences Consultants
1956 Webster Street, Suite 400
Oakland, California 94610

November 16, 2004
Project No. 400834017

November 16, 2004
Project No. 400834017

Mr. Odili Ojukwu
City of Oakland, Public Works Department
Environmental Sciences Division
250 Frank Ogawa Plaza, Suite 5301
Oakland, California 94612

Subject: Conduit Study
Municipal Service Center
7101 Edgewater Drive
Oakland, California

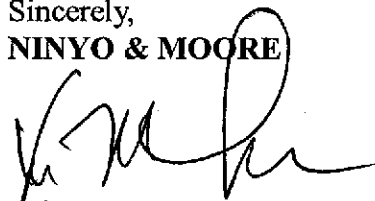
Reference: Ninyo & Moore, 2004, Spring Semi-Annual Groundwater Monitoring Report,
Municipal Service Center, 7101 Edgewater Drive, Oakland, California, dated
July 14.

Dear Mr. Ojukwu:

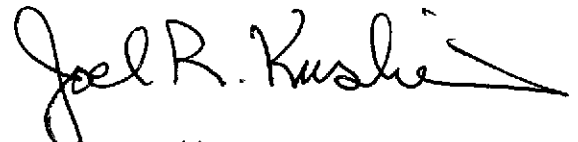
This report summarizes activities and results for a Conduit Study for the Municipal Service Center in the City of Oakland, County of Alameda, California. The objective of the Conduit Study is to evaluate potential lateral and vertical migratory pathways for the free product and dissolved chemical constituents on site. The scope of services for the project is also described in this report.

We appreciate the opportunity to be of service to the City of Oakland on this project. If you have any questions or comments regarding this report, please contact the undersigned at your convenience.

Sincerely,
NINYO & MOORE



Kris M. Larson
Project Environmental Geologist



Joel R. Kushins, R.C.E.
Principal Environmental Engineer

KML/JRK/jms

Distribution: (3 copies bound, 1 copy unbound) Addressee

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1. INTRODUCTION AND SCOPE OF SERVICES

This report summarizes the results of a conduit study, as recommended in the Ninyo & Moore Spring Semi-Annual 2004 Groundwater Monitoring Report for the Municipal Service Center (MSC), located in Oakland, California (Figure 1). The work conducted by Ninyo & Moore was in accordance with Assignment No. GO3-N&M-16. The objective of the conduit study is to evaluate potential lateral pathways for the free product and dissolved chemical constituents on site.

The scope of services for this project included conducting a review of available site aerial photographs and drawings and environmental reports prepared for the site. The City of Oakland (City) Public Works Department (PWD) and various utility companies were contacted to access available utility drawings for the site. A site reconnaissance was also conducted to search for active and inactive utility trenches.

2. HISTORICAL LAND USE

To reveal the historical land use, Ninyo & Moore conducted a historical record search for the site. This included a review of historical aerial photographs, historical fire insurance maps, and environmental reports and utility drawings prepared for the site.

2.1. Aerial Photographs

Historical aerial photographs were available for the site for the years 1947, 1953, 1959, 1968, 1973, 1979, 1985, 1990, 1996, and 2002. A listing of the photographs reviewed is presented in Table 1, followed by notable observations from each photograph. Copies of the aerial photographs are presented in Appendix A.

TABLE 1
AERIAL PHOTOGRAPHS REVIEWED

Date	Photograph Identification	Scale
1947	AV 11-7-11	1"=1,667'
1953	AV 119-13-27	1"=833'
1959	AV 337-6-38	1"=800'
1968	AV 858-2-36	1"=1,000'
1973	AV 1100-6-31	1"=1,000'
1979	AV 1750-6-32	1"=1,000'
1985	AV 2640-6-29	1"=1,000'
1990	AV 2640-6-29	1"=1,000'
1996	AV 5200-112-32	1"=1,000'
2002	AV 8202-11-30	1"=1,000'
Source: Pacific Aerial Surveys, Oakland, California		

1947-1959 - The site area has not yet been filled and is part of the San Leandro Bay.

1968 - The site has been filled and vegetation exists on the property, however it is undeveloped in this aerial photograph. Edgewater Drive is located along the northeastern site boundary and trends north-south. A dike constructed as a barrier for the Bay is located on what is now the western section of the site, and fill material is noted west of the dike. Industrial development appears east of Edgewater Drive.

1973 - The site is developed with the Public Works Building, the Administration and Crafts and Storage Building, the Storage Shed and Building No. 5, which is larger than the current building configuration. Parking lots are noted on the northern, central and southern areas of the site. The Bay has been filled in westward of the dike, which has created the western boundary for the site.

1979-1996 - No changes were observed on site except for the connection of the Administration and Crafts and Storage Buildings. The area east of the site, across Edgewater Drive has shown continuous development.

2002 - A new building (the 911 Center) appears between the Administration and Public Works Building and Building #5 has been partially demolished. Approximately 360,000 square feet of the west side of Building #5 has been removed.

2.2. Fire Insurance Rate Maps

Environmental Data Resources, Inc. (EDR) was retained to procure Sanborn Fire Insurance Rate Maps for the site. According to EDR, no maps were available for the site area.

2.3. Environmental Reports

Four Environmental reports were obtained from the City PWD, Environmental Services Division for review of the site. A summary of the reports contents relating to the project is below.

Cambria Environmental, 1999 Fuel Pipeline Removal Sampling Report, City of Oakland Municipal Service Center (MSC), Oakland, California

This report discusses the soil and groundwater sampling in association with the fuel piping removal that was completed between September and December 1998 on site. The former fuel piping consisted of 2,650 lineal feet of 2-inch diameter steel pipe transporting diesel and gasoline to fuel stations on site. The piping was located in the western section of the site, extending from north of the Public Works Building toward Building No. 5 in the southern section of the site (Figure 2). Sections of fuel line piping were also located between the Public Works Building and the Storage Shed. A total of 338 cubic yards of contaminated soil was over-excavated in the pipe trenches subsequent to pipe removal. Excavation depths ranged from 0.7 feet to 4.2 feet below the former pipe depth. The piping was reportedly located at approximately 2 feet bgs. According to the report, most of the petroleum hydrocarbon impacted bedding sands overlying low permeable bay mud were removed from the former piping excavation. However, in certain areas where soils underlying the bedding sands were more permeable, the full extent of petroleum impacted soil could not be removed.

Contaminated soil was stockpiled, sampled and transported offsite to Altamont Landfill in Livermore, California. Non-contaminated soil from excavation activities was used as back-fill material in the over excavated trenches. One 2-inch and one 4-inch Schedule 40 PVC conduit with pull lines were installed in the former piping trench above a clean imported

sand bed. According to the City, the replacement piping was installed as conduit for a future groundwater treatment system. The trench was backfilled with clean stockpiled soil and covered by 1-foot of road base and 3-inches of asphalt. Two six-inch diameter backfill wells (TBW-5 and TBW-6) were also installed for the purpose of free product monitoring along the former pipeline. The wells were installed to 14.8 feet below ground surface (bgs) and 12.9 feet bgs, respectively.

Soil and groundwater samples were collected within the excavation subsequent to the piping removal. Select Samples were analyzed for total petroleum hydrocarbons as gasoline (TPH-G) and diesel (TPH-D), benzene, toluene, ethylbenzene and total xylenes (BTEX), methyl tert butyl ether (MTBE) and organic lead. The highest concentrations of the constituents of concern included TPH-G at 23,000 milligrams per kilograms (mg/kg), TPH-D at 2,400 mg/kg, benzene at 110 mg/kg, toluene at 100 mg/kg, ethylbenzene at 300 mg/kg, total xylenes at 1,300 mg/kg, and MTBE at 17 mg/kg. Organic lead was not reported above laboratory reporting limits.

The highest constituent concentrations of groundwater grab samples collected on site included TPH-G at 32 $\mu\text{g/L}$, TPH-D at 49,000 $\mu\text{g/L}$, benzene at 8,600 $\mu\text{g/L}$, toluene at 400 $\mu\text{g/L}$, ethylbenzene at 510 $\mu\text{g/L}$ and total xylenes at 2,000 $\mu\text{g/L}$. MTBE was not reported above laboratory reporting limits.

Recommendations in the report included targeted remediation and removal of separate phase hydrocarbons hot-spot areas on site.

Subsurface Consultants, Inc., 2000 Soil and Groundwater Investigation, Stormdrain Rehabilitation Project, Municipal Service Center, Oakland, California.

This report discussed the soil and groundwater investigation along a stormdrain alignment trending west to east near the Storage Shed to Edgewater Drive (Figure 2). Soil samples were collected and analyzed for TPH-G, TPH-D, TPH-MO, BTEX, MTBE and LUFT 5 Metals. The highest concentration of constituents of concern included TPH-D at 330 mg/kg,

TPH-G at 6,500 mg/kg, ethylbenzene at 160 mg/kg and total xylenes at 240 mg/kg. TPH-MO, benzene, toluene and MTBE were not reported above laboratory reporting limits.

The highest constituents of concern reported from groundwater samples collected included TPH-D at 350,000 µg/L, TPH-G at 44,000 µg/L, benzene at 890 µg/L, toluene at 680 µg/L, ethylbenzene at 1,700 µg/L, and total xylenes at 8,500 µg/L. TPH-MO and MTBE were not reported above laboratory reporting limits.

The report conclusions noted that groundwater within the backfill material of the existing stormdrain pipe was impacted with elevated concentrations of TPH-G and TPH-D and that if stormdrain rehabilitation activities involved dewatering and excavation, contaminated groundwater encountered would require pre-treatment if discharged to the sanitary sewer.

Baseline Environmental Consulting, 2001 Site history and Characterization, City of Oakland Municipal Service Center, 7101 Edgewater Drive, Oakland

This report summarizes past subsurface investigations on site, and results of investigations conducted by baseline in July 2000.

Baseline installed 42 direct push soil borings in areas where potential for subsurface soil and groundwater contamination existed. Samples were collected below the soil/groundwater interface to evaluate the vertical extent of contamination. The report indicated that three areas on site contained potential subsurface contamination. The three areas were identified as the Southwest Subarea (located near the south corner of the site), Building No. 5 Subarea (located within the vicinity of Building 5) and the Central Subarea (located south of the Public Works Building and west of the Storage Building). Four petroleum hydrocarbon free product plumes were identified in the Southwest and Central Subareas. No free product plumes were observed in the Building 5 Subarea, however dissolved phase petroleum hydrocarbon contamination was reported in several borings within the vicinity of the Building 5 Subarea.

The report also identified potential migration pathways for soil and groundwater contamination on site. Buried channels (beneath the fill), utility lines and trenches, high permeability

fill features and a buried dike were noted in the report as potential migration pathways for site contamination. Buried channels were dismissed as a potential migration pathway for free product because the groundwater table (reported between 5 and 10 feet bgs) is higher than the buried channels. Because free product floats on water, it is unlikely the free product has saturated the buried channels. The fill has been reported to average approximately 12 feet deep.

The report also indicates that the fill material used on site was composed mostly of relatively fine grained, low permeability materials, such as clays and silts, making it difficult that dissolved phase hydrocarbons would permeate the fill material and flow into the channels.

The buried dike is located entering the site beneath the north parking lot and trends to the south through the former fuel line area, west of the Storage Shed and building 5, where it exits the site through the southern site boundary approximately 300 feet south of Building 5 (Figure 3). During the fuel line excavation, dike material was observed as riprap material. However, it was not determined if the dike has been a conduit or barrier for free product or dissolved phase hydrocarbon plumes on site. There has been no damming effect on groundwater levels on site, and higher constituent concentrations were also not occurring on the eastern or landward side of the dike. If the dike was a conduit, higher constituent concentrations should be observed along the dike axis. According to the report, no detailed soil and groundwater investigation has been conducted along the dike; however, grab groundwater samples collected west and downgradient of the dike and Storage Shed did not report TPH-G and BTEX above laboratory reporting limits. Other groundwater samples were collected within the vicinity of the dike, north of the plume areas and no significant contamination was observed. Contamination, however, was observed in the form of free product in the areas of the dike where the fuel lines were removed. The report concluded that not enough data is available to evaluate if the dike is either a barrier or conduit for contamination migration.

Utility lines and trenches with backfill composed of highly permeable material excavated below groundwater were, according to the report, the most likely pathways for constituent

migration. Trenches excavated above 5 feet bgs are not likely to be pathways for contamination because the lowest point of the trench would be above groundwater. Most utilities, including gas, electric and water would be installed in trenches with depths shallower than 5 feet bgs. Stormdrain and sanitary sewer trenches would most likely be deeper than 5 feet bgs. The report observed that trench backfill was sampled in two of the main storm drain trenches on site (located north of the Storage Shed and west of the Public Works Building), and lithologic characteristics of the backfill indicated that the fill material was composed of potentially highly permeable material between 5 to 10 feet bgs and that groundwater was observed in the trenches. This section of stormdrain trench is adjacent to a free product plume located east (upgradient) of the stormdrain trench. The report concluded that the stormdrain appears to be a conduit and, therefore a potential pathway for contaminant migration, and that a portion of the stormdrain in the western section of the site should be sealed, with check dams installed in strategic locations. A free product plume is also adjacent to a stormdrain pipeline in the southwestern section of the site, located approximately 175 feet southwest of Building #5. The pipeline trends north-south and connects to an east-west trending stormdrain that drains toward Edgewater Drive.

Harding ESE August 2001 Stockpile Soil Sampling, New Stormwater Excavation Trench, Oakland Municipal Service Center, 7101 Edgewater Drive, Oakland, California

Four soil stockpile samples were collected from excavated materials adjacent to a new stormdrain trench and stormdrain line located south of building No. 5. The new stormdrain trench and stormdrain line connect to an existing stormdrain line located approximately 90 feet southwest of Building #5. The soil stockpile samples were composited by the laboratory and analyzed for TPH-G and TPH-D, BTEX, and volatile organic compounds (VOCs). The constituents of concern were not reported above laboratory reporting limits except for TPH-D, which was reported at 12 mg/kg. The stockpiled material was confirmed for reuse by the Alameda County Department of Environmental Health.

2.4. Utility maps

Underground Service Alert (USA) was contacted for a list of potential utility providers to the site. The list of potential utility providers included AT& T Broadband, City of Oakland, Comcast, East Bay Municipal Utility District, East Bay Water, Equilon Pipeline (Former Shell), Kinder Morgan, Level 3 Comm, MCI World Communications, Pac Bell/SBC, PG&E Gas, Quest Communication, and the County of Alameda. Each company was contacted to review utility drawings they may have. Utility drawings were also requested from the City PWD. The City provided Utility drawings for stormdrain, sanitary sewer, fuel, gas and electrical lines on site. The City Utility drawings are discussed in Section 2.5 below and copies of the maps are presented in Appendix B. The following table indicates the responses from the utility companies contacted for information regarding underground utilities on site.

TABLE 2 - UNDERGROUND SERVICE ALERT CONTACTS FOR UNDERGROUND UTILITIES AT THE CITY OF OAKLAND MUNICIPAL SERVICE CENTER

Utility provided by USA	Correspondence
AT& T Broadband	10/27 General Email. 10/28 Email response referring us to Local Telephone Company.
City of Oakland	10/26 Armando Lazano, sewage 510-615-5985 stated that his dept. only has maps of main sewage lines in street, no lateral line maps, suggested I contact Lee White 238-7274. Msg. left 10/26. 10/26 Contacted Michelle Ortega (administration 615-5822) she will look into finding someone to help and will call back tomorrow. 10/4 Copies of As Built for stormwater, sanitary sewer, fuel line, gas and electrical were received from City PWD at the MSC from Mr. Jeff Kroon (510-615-5515).
Comcast	10/26 General Email, no response.
East Bay Municipal Utility District	10/26 Emailed Customer Service, responded with mapping department phone # (1-866-403-2683). 10/26 Telephone Conversation with Customer Service Rep. EBMUD is not responsible for pipelines on private property, only water mains in streets, responsible up to sidewalk.
East Bay Water	See above EBMUD.
Equilon Pipeline (Former Shell)	10/26 Emailed Business Manager and Oil Movement Manager listed on website, no response. 10/28 Sent letter to Shell Utility Coordinator requesting information, no response.
Kinder Morgan	10/26 General Email, no response.
Level 3 Comm.	10/26 Emailed Steven Forry, no response.
MCI World Comm.	10/26 General Email, no response. 10/26 Email response stating "if the specific information you seek is not online, it is not information MCI discloses publicly." Information is not online.
Pac Bell/SBC	10/26 Email correspondence with Arlene, Customer Service Rep. SBC has very little information on conduits on private property and suggested contacting USA to mark.
PG&E Gas	10/26 Tiffany 510-437-2233 directed me to William Lam, Senior Gas Distribution Engineer 510-437-2110. 11/5 Mr.Lam agreed to send Utility drawings for the site.
PG&E Distribution Oakland	See above
Quest Communica-tion	10/26 Emailed Dave Wallworth (undeliverable) 10/26 General Email, no response.
County of Alameda	10/26 General Email

10/27 Email response "Please contact the City of Oakland or PG& E for this information".
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2.5. City of Oakland Public Work Department As Built Maps

The City PWD provided As Built maps for storm drain, sanitary sewer, fire, fuel, water, gas and electrical lines on site. A discussion of each utility line location and trend is discussed below. Figure 2 illustrates the stormdrain, sanitary sewer and fire lines on site, however the other pipelines were not included because they are reportedly located between one to two feet bgs and would not be encountering groundwater. Utility drawings illustrating the location of water, gas and electrical lines (as well as storm drain, sanitary sewer, fuel and fire lines) are presented in Appendix A. According to sources at the PWD, the stormdrain outfall is north of the site in Damon Slough.

Storm Drain Lines

According to the Utility drawings, storm drain lines are located in all site areas including the north, central and south parking areas, west and south of the Public Works Building, west and south of the 911 Center, between the Crafts and Storage and Storage Buildings, between the Crafts and Storage/Administrative Building and Building #5, and west and south of Building #5 (Figure 2). Stormwater catch basins feed stormdrain lines trending both parallel (north-south) and perpendicular (west-east) to Edgewater drive. Stormwater flow appears to drain toward a stormwater main line trending parallel to Edgewater Drive.

Sanitary Sewer Lines

Sanitary sewer lines are located on the north and south sides of the Public Works Building, on the north side of the Administration and Crafts and Storage Building, and on the north and south sides of Building #5 (Figure 2). The sanitary sewer lines on site flow toward and trend perpendicular to Edgewater Drive.

Fuel Lines

Fuel line piping removal was completed between September and December 1998 on site. The former fuel piping consisted of 2,650 lineal feet of 2-inch diameter steel pipe transporting diesel and gasoline to fuel stations on site. According to the City PWD, the only fuel piping left on site is approximately 100 feet of pipeline that trends north to east from the active underground storage tanks (USTs) located north of Building 5. Further discussion of the fuel line piping removal is presented in Section 2.3.

Gas and Electrical Lines

The gas line main for the site is located parallel to Edgewater Street on the northeastern property boundary. According to the Utility drawings, connections from the gas main are located on the north side of the Public Works Building, on the south side of the Administration Building, and on the north side of Building #5.

Electrical and communication lines are located throughout the site. Electrical feeds for the site are located on a combination Pacific Gas and Electric and Pacific Bell telephone pole adjacent the south corner of the site and a transformer located north of Building #5 and adjacent to Edgewater Drive. Electrical lines follow the property fence line bordering the east, west and south boundaries of the site. Electrical and communication lines trend east-west across the site approximately 60 feet north of the Public Works Building, approximately 60 feet south of the Administration and Crafts and Storage Building, north and adjacent to Building #5, and approximately 60 feet south of Building No. 5. Electrical lines also connect between the Crafts and Storage Building and the Storage Shed. Electrical and telephone lines also enter the site from Edgewater Drive east of the Public Works Building and between the Administrative Building and Building #5.

Water and Fire Lines

Water lines enter the site from Edgewater Drive and are connected to each building including the Storage Shed (Appendix B). Fire (water) lines also enter the site from Edgewater Drive and trend east-west on the north side of the Public Works Building, between the Public Works Building and the 911 Center, and between the Administrative Building and

Building No. 5 (Figure 2). According to the City PWD, the fire line trenches are between 2 feet and 6 feet bgs.

3. SUMMARY AND CONCLUSIONS

Stormdrain, sanitary sewer, fuel, gas and electrical lines are located beneath the site. Potential migration pathways for the free product plumes and dissolved phase hydrocarbons on site would most likely be located in sanitary sewer, stormdrain and fire (water) line trenches where groundwater elevations are equal to or higher than the trench invert elevations, including the stormdrain and sanitary sewer trenches. Stormwater and sanitary sewer line flow on site is generally toward the east, away from the Bay. The As Built maps and reports reviewed indicate that the underground utility trenches that may be at or below groundwater level, including the stormdrain lines that may have already been sealed, terminate at least 200 feet east of the Bay. A section of stormdrain pipeline between the Storage Shed and the Public Works Building is adjacent to a free product plume, and, therefore a potential pathway for contaminant migration. A previous report recommended that the stormdrain pipeline should be sealed, with check dams installed in strategic locations to prevent seepage of free product into the stormdrain.

Gas, electric, communication, water and former fuel lines are most likely above the groundwater table on site. Fuel line piping that transported diesel and gasoline to fuel stations on site were removed between September and December 1998. Excavation depths ranged from 0.7 feet to 4.2 feet below the former pipe invert elevations. Most of the petroleum hydrocarbon impacted bedding sands overlying low permeable bay mud were removed from the former piping excavation, however in certain areas where soils underlying the bedding sands were more permeable, the full extent of petroleum impacted soil could not be removed.

Observations made during stormdrain trench sampling between the 911 Center and Storage Shed on site indicate that permeable fill material was saturated with groundwater in the trench samples collected. Alternatively, fill material covering most of the site is reportedly composed of fine, impermeable clays and silts that would be difficult for free product to penetrate. The dike trend-

ing north-south on site is composed of riprap that may be a more permeable material for free product and dissolved phase hydrocarbons to migrate through.

Free product plumes are reportedly located adjacent to stormdrain trenches approximately 200 feet west of the Public Works Building and in the southwestern section of the site. A recommendation was made by Baseline to seal a section of the stormdrain pipe near the Public Works Building to prevent free product migration (Baseline 2001). Free product plumes also intersect the dike west of the Public Works Building and north of the Storage Shed on site. Laboratory analytical data from groundwater samples collected along several places downgradient of the dike reported either very low concentrations or concentration not reported above laboratory reporting limits for constituent of concern on site.

4. RECOMMENDATIONS

The conduit study has evaluated and identified utility trenches on site that may act as preferential pathways for the migration of soil and groundwater contamination from on-site petroleum hydrocarbon sources. A study is recommended to evaluate closure of several existing groundwater monitoring wells that are not in the vicinity of the potential conduits or free product plumes on site.

5. LIMITATIONS

The environmental services described in this report have been conducted in general accordance with current regulatory guidelines and the standard-of-care exercised by environmental consultants performing similar work in the project area. No warranty, expressed or implied, is made regarding the professional opinions presented in this report. Please note that this study did not include an evaluation of geotechnical conditions or potential geologic hazards.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore

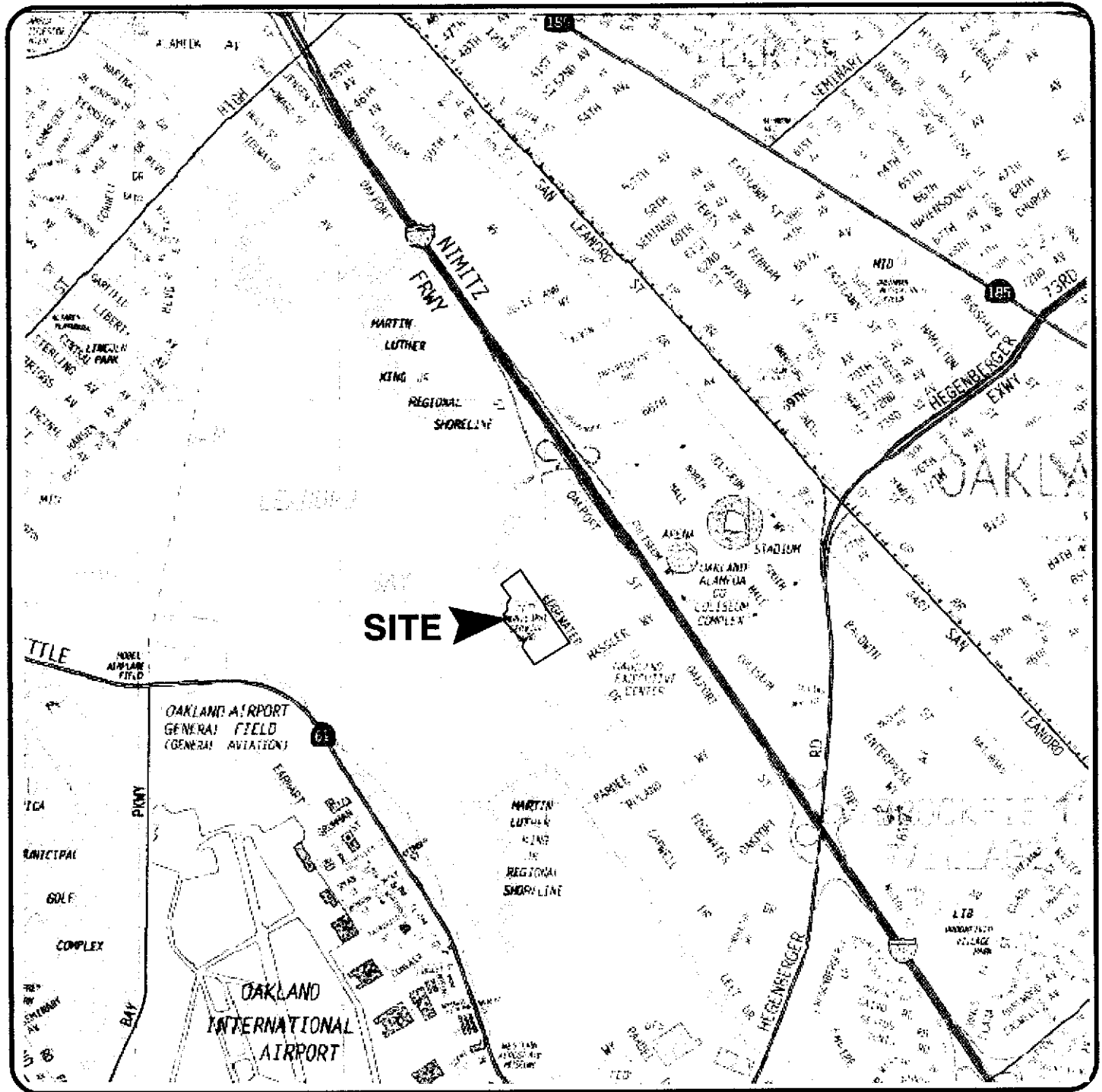
should be contacted if the reader requires any additional information or has questions regarding the content, interpretations presented, or completeness of this document.

Our conclusions, recommendations and opinions are based on an analysis of the observed site conditions and the referenced literature. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

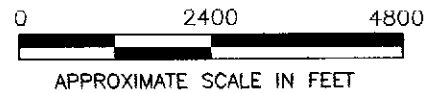
This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

6. SELECTED REFERENCES

- Baseline Environmental Consulting, 2001, Site history and Characterization, City of Oakland Municipal Service Center, 7101 Edgewater Drive, Oakland, dated January.
- Cambria Environmental, 1999, Fuel Pipeline Removal Sampling Report, City of Oakland Municipal Service Center (MSC), Oakland, California, dated July 23.
- Harding ESE, 2001, Stockpile Soil Sampling, New Stormwater Excavation Trench, Oakland Municipal Service Center, 7101 Edgewater Drive, Oakland, California, August 3.
- Kaiser Engineers, 1970, Consolidated Service Center, City of Oakland Site Plans and Details;
- Ninyo & Moore 2004 Spring Semi-Annual Groundwater Monitoring Report, Municipal Service Center, 7101 Edgewater Drive, Oakland, California, dated July 14.
- Subsurface Consultants, Inc., 2000, Soil and Groundwater Investigation, Stormdrain Rehabilitation Project, Municipal Service Center, Oakland, California, August 24.



REFERENCE: 2002 THOMAS GUIDE FOR ALAMEDA AND CONTRA COSTA COUNTIES, STREET GUIDE AND DIRECTORY.



400834-A1.DWG

Ninyo & Moore

SITE LOCATION MAP

MUNICIPAL SERVICE CENTER
7101 EDGEWATER DRIVE
OAKLAND, CALIFORNIA

PROJECT NO.

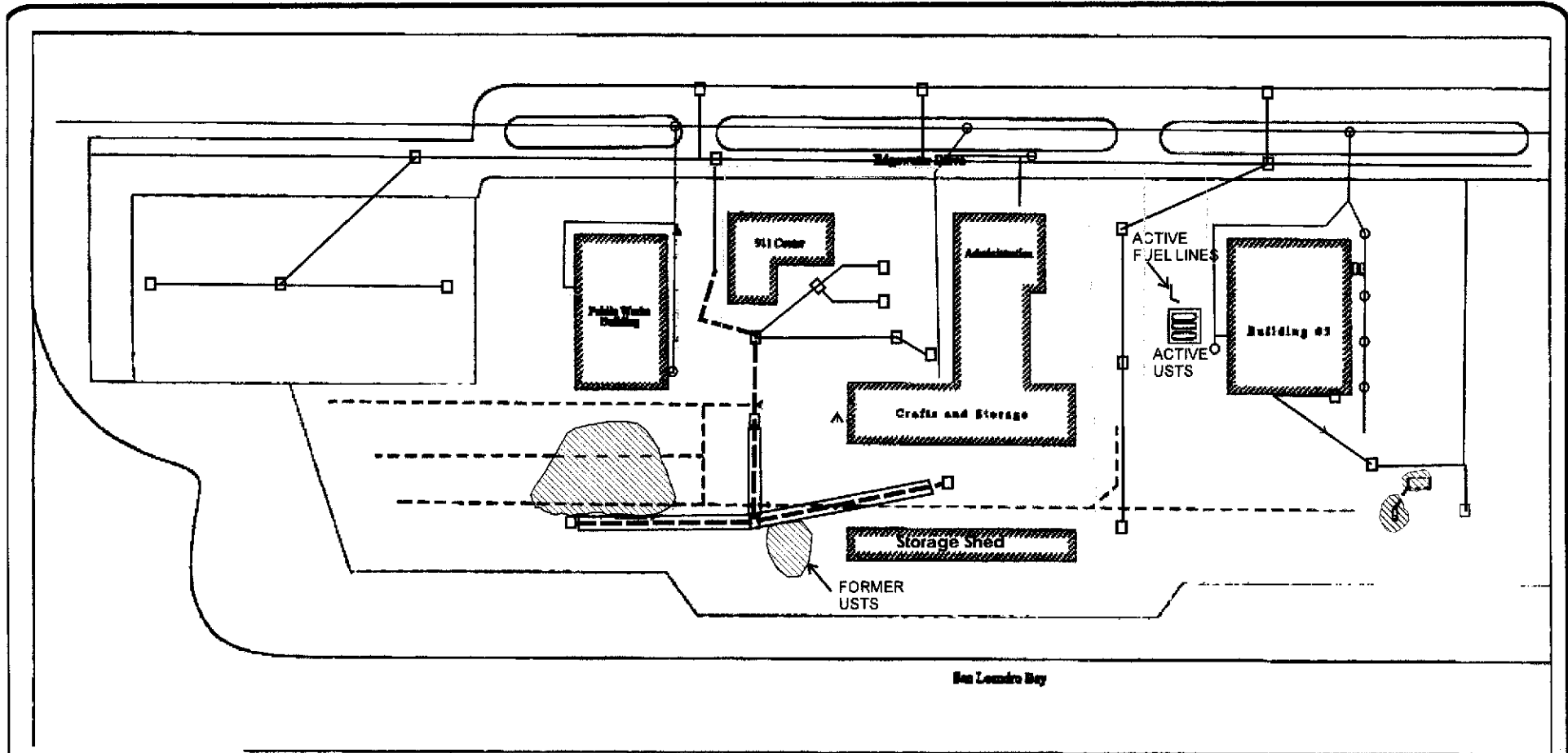
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DATE

11/2004

FIGURE

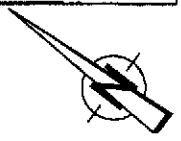
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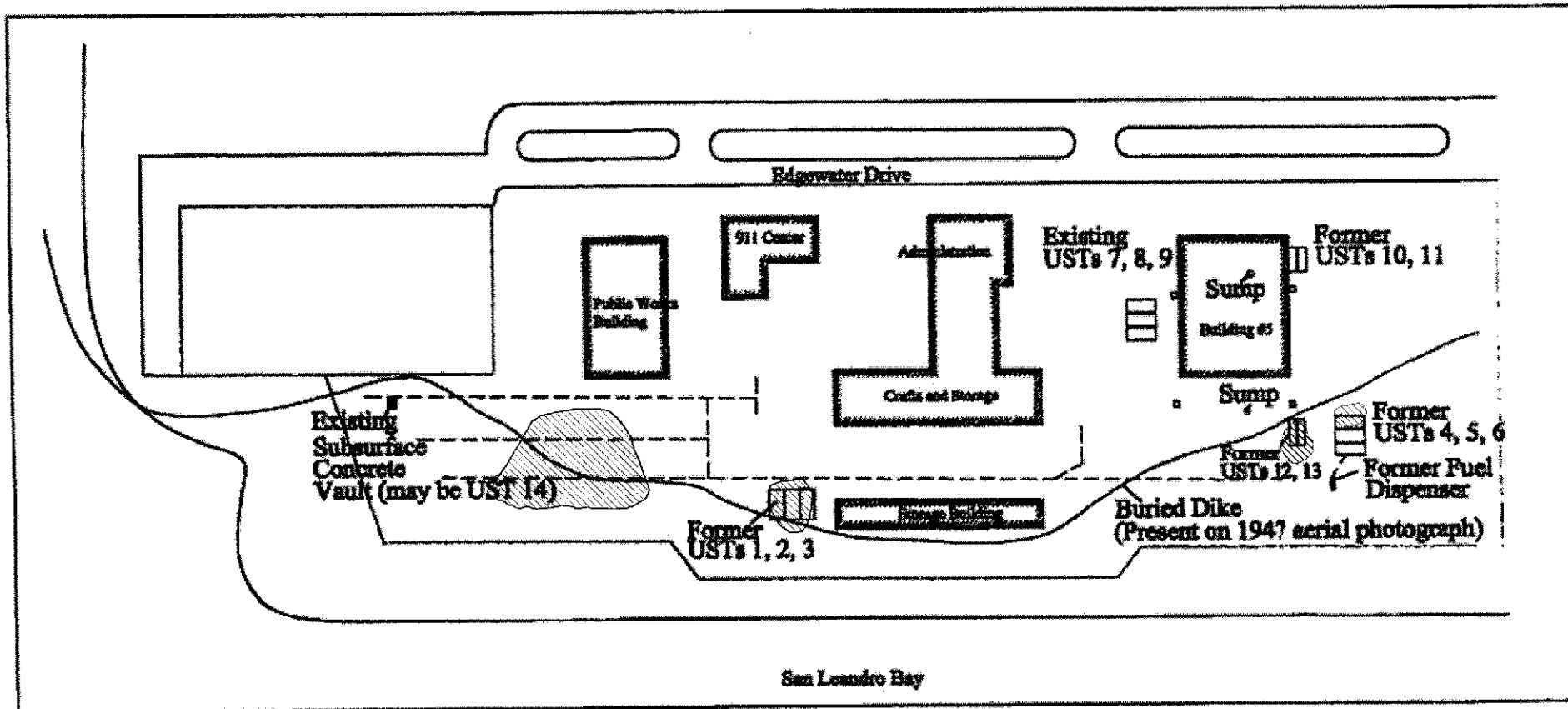
Legend

- STORMDRAIN CATCHBASIN
- SANITARY SEWER LINE
- - - FORMER FUEL HYDRANT LINE
- - - - PORTION OF STORM SEWER INVESTIGATION BY SUBSURFACE CONSULTANT (2000)
- ▬ RECOMMENDED SEGMENT OF STORM LINE TO BE SEALED
- ▨ AREAS OF FREE PRODUCT ON GROUNDWATER
- ▣ UNDERGROUND STORAGE TANKS
- CLEANOUT
- STORMDRAIN LINE
- ⋯ FIRE LINE




200 0 200
 Approximate Scale in Feet



STORMDRAIN AND SANITARY SEWER SYSTEM MAP		
MUNICIPAL SERVICE CENTER 7101 EDGEWATER DRIVE OAKLAND, CALIFORNIA		
PROJECT NO. 400834017	DATE 11/04	FIGURE 2



Legend

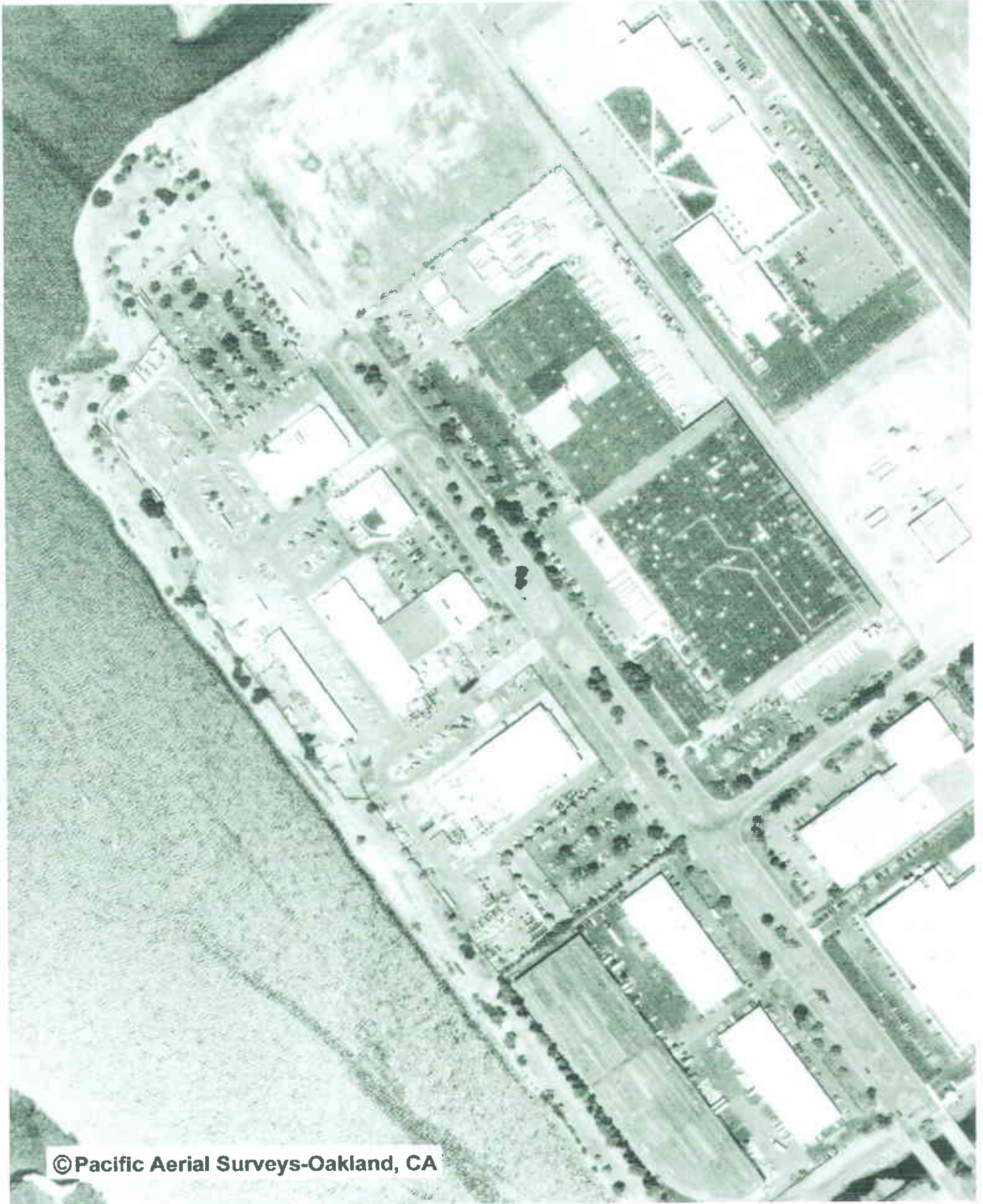
-  FORMER FUEL HYDRANT LINE
-  AREAS OF FREE PRODUCT ON GROUNDWATER
-  BURIED DIKE



BURIED DIKE LOCATION MAP		
MUNICIPAL SERVICE CENTER 7101 EDGEWATER DRIVE OAKLAND, CALIFORNIA		
PROJECT NO. 400834017	DATE 11/04	FIGURE 3

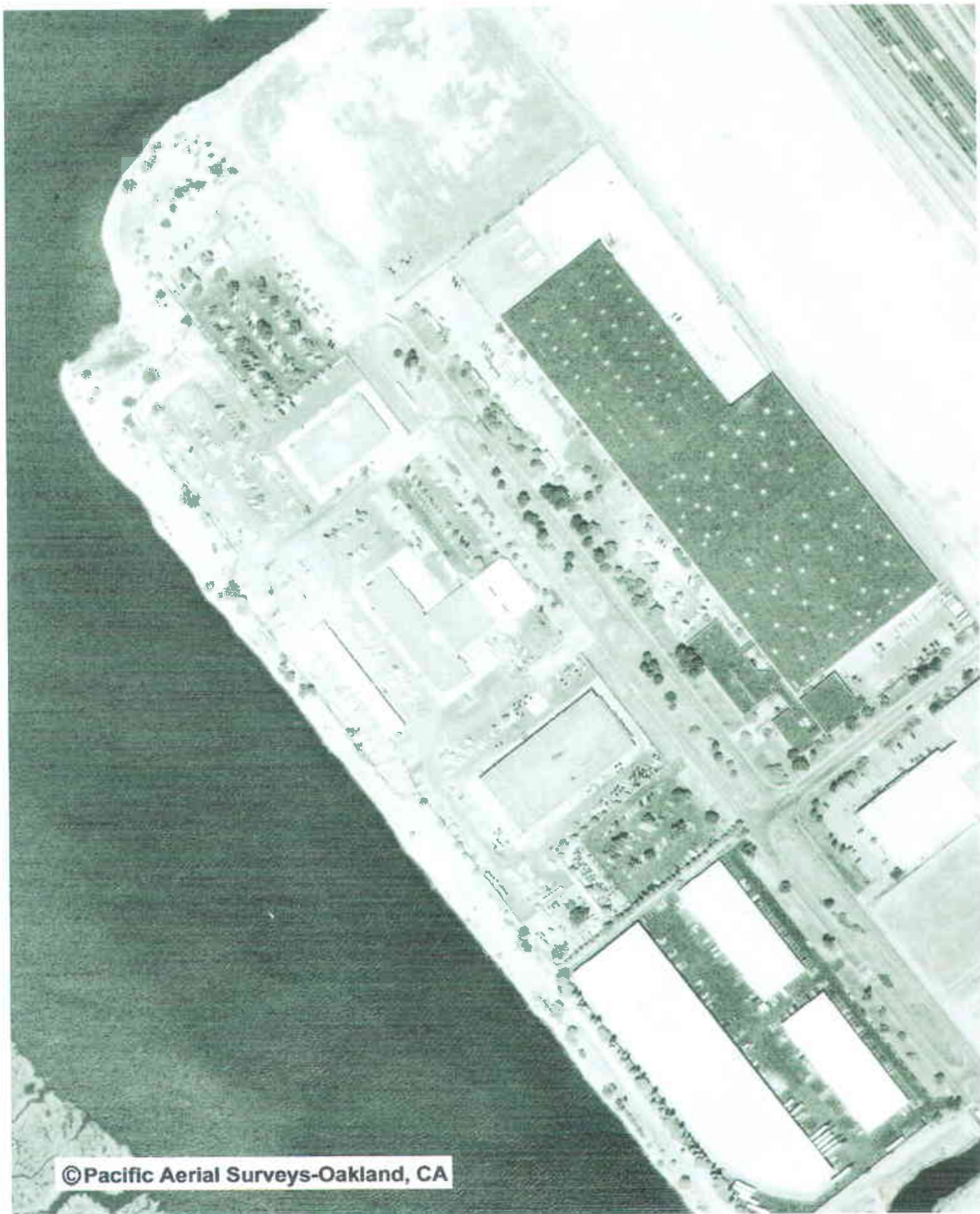
REFERENCE: BASELINE HISTORY CHARACTERIZATION, JANUARY 2001

APPENDIX A
SITE AERIAL PHOTOGRAPHS



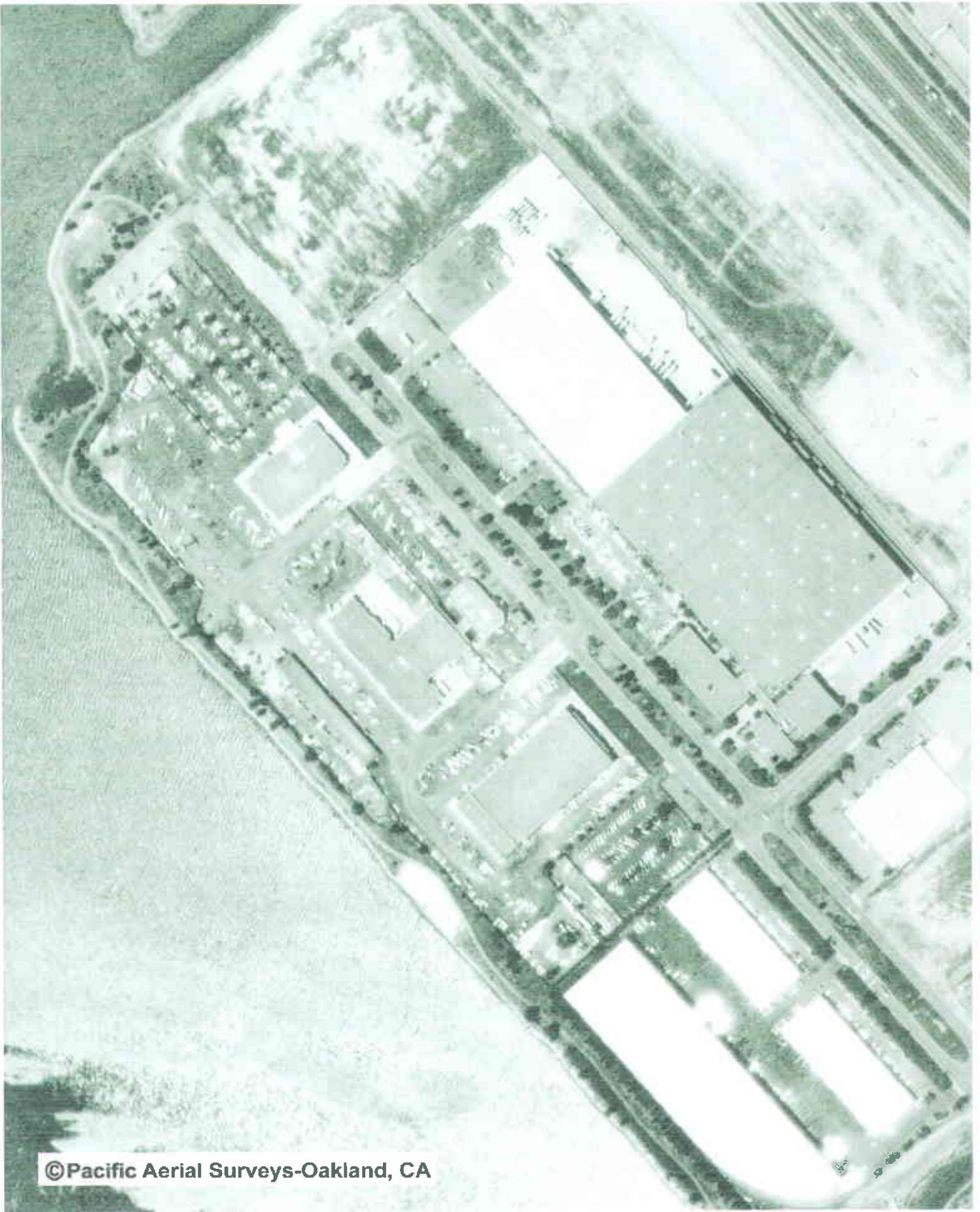
© Pacific Aerial Surveys-Oakland, CA

2002



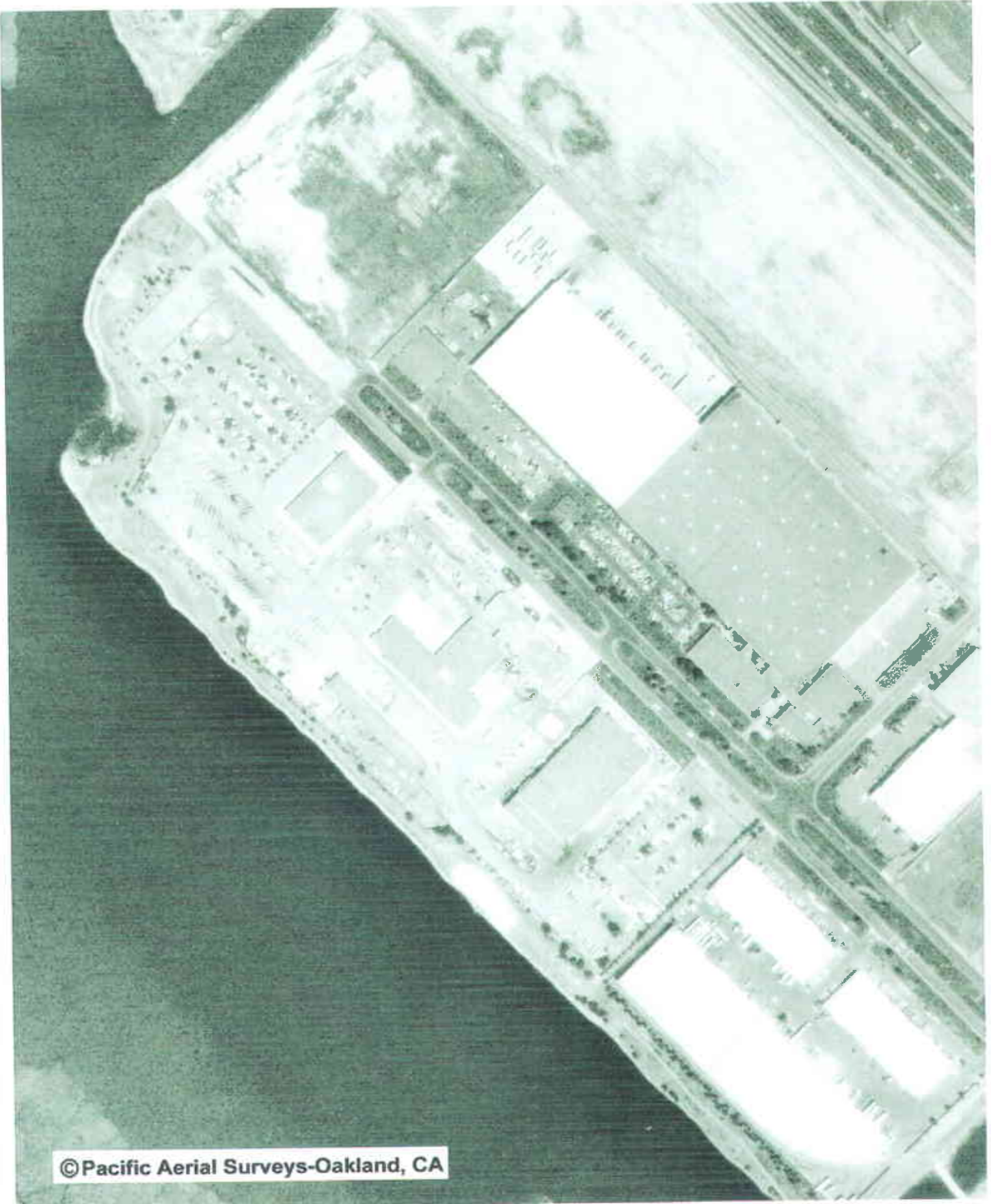
© Pacific Aerial Surveys-Oakland, CA

1996



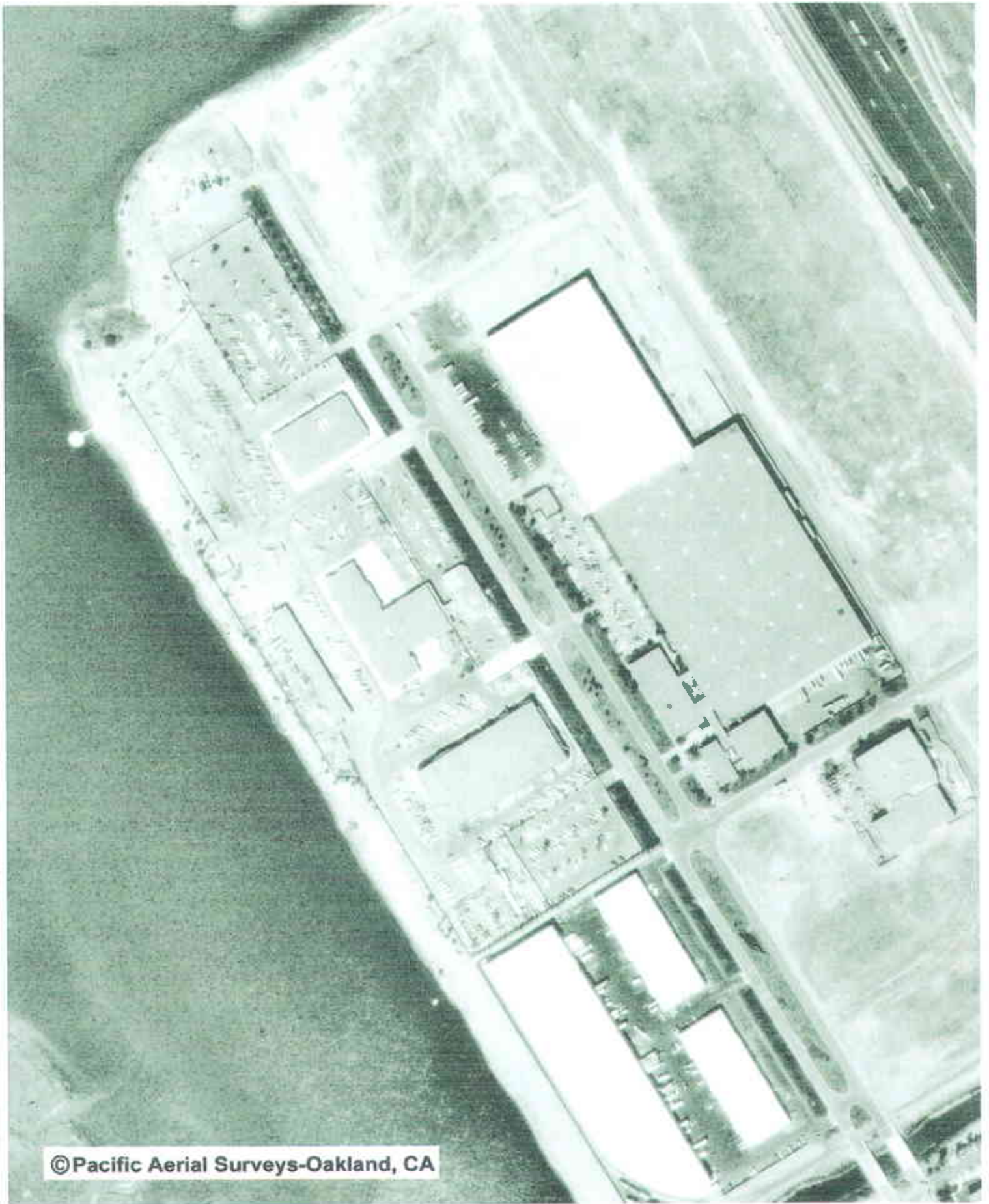
©Pacific Aerial Surveys-Oakland, CA

1990



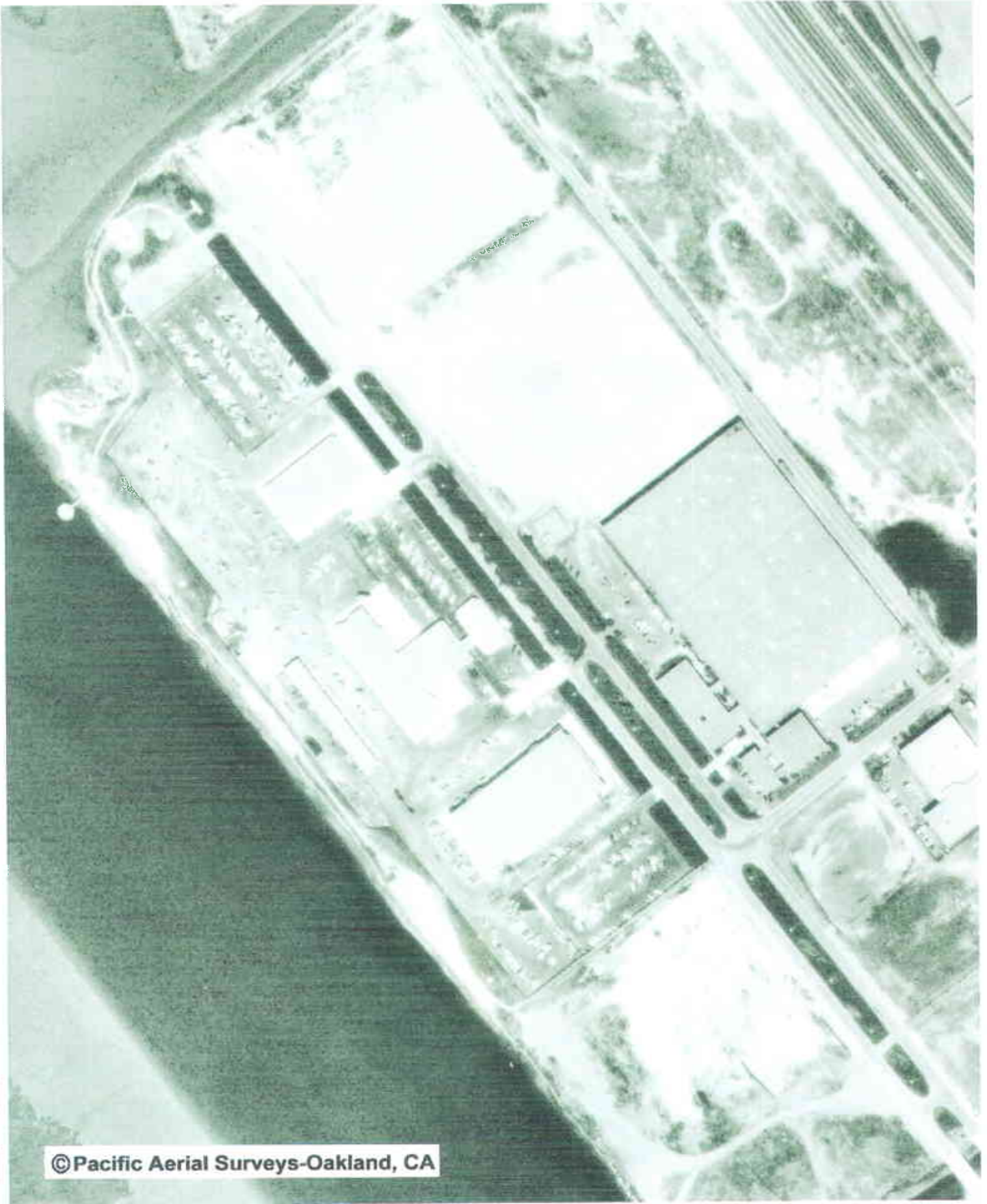
© Pacific Aerial Surveys-Oakland, CA

1985



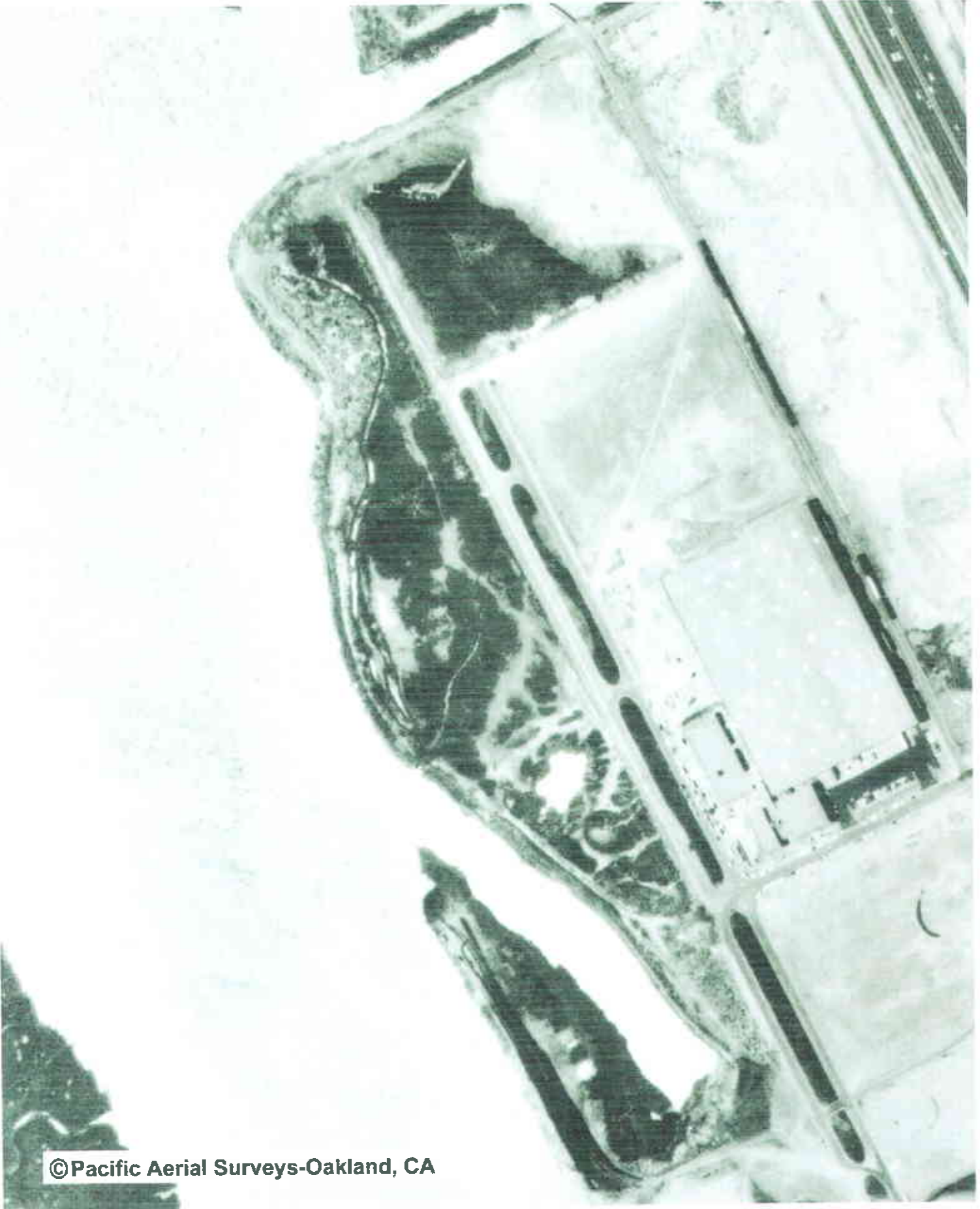
© Pacific Aerial Surveys-Oakland, CA

1979



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1973



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1968



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1959



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1953



©Pacific Aerial Surveys-Oakland, CA

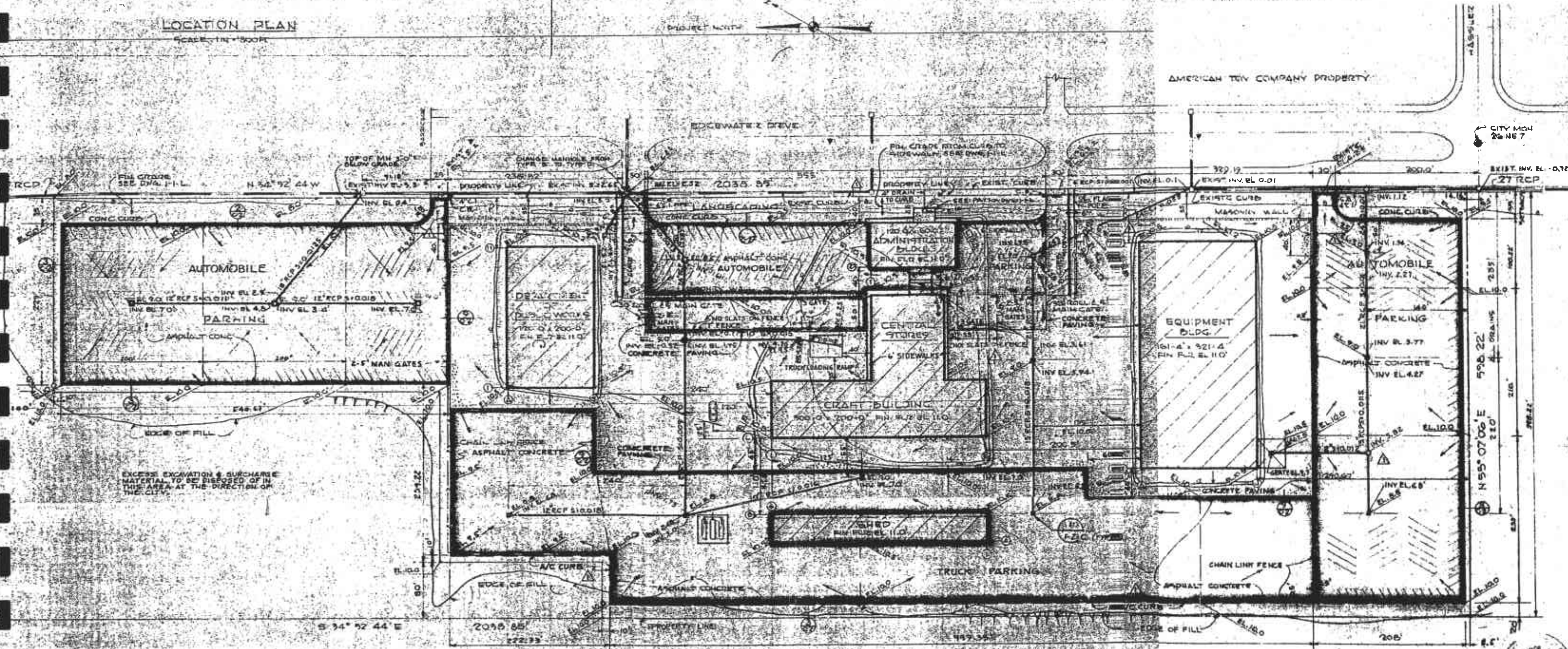
1947

APPENDIX B
AS BUILT MAPS FOR THE CITY OF OAKLAND MUNICIPAL SERVICE CENTER



- CONCRETE PAVEMENT
- ASPHALTIC CONCRETE PAVEMENT
- PROPERTY LINE
- EXISTING CONTOUR LINES
- FIRE HYDRANT
- MANHOLE CITY OF OAKLAND TYPE I
- CONCRETE CURB
- ASPHALT CONCRETE CURB
- 12"x12" CATCH BASIN - PRE-CAST WITH 4" C.I. DRAIN PIPE @ 1/4" FT. SLOPE

LOCATION PLAN
SCALE: 1/4" = 100'



6. STORM DRAINS TO BE REINFORCED CONC. PIPE (RCP)
7. ALL ELEVATIONS AT CITY DATUM
8. VERIFY EXISTING DATA IN FIELD

REVISIONS	BY	DATE	DESCRIPTION

1. CITY MONUMENT AT BLAHERST CHANNEL AND EDGEWATER DRIVE
 2. REMOVE EXIST. CURBS AT DRIVEWAYS AND INSTALL STANDARD CITY OF OAKLAND CONCRETE DRIVEWAYS
 3. CONCRETE DRIVEWAYS, DRIVEWAYS, CURB AND A/C CONCRETE WITH WEAR SURFACING ON 4" CONCRETE BASE COURSE ON ROLLED SUBGRADE
 4. RAMP UP ALL DRIVEWAYS ON 1/4" TO 1/2" TO FLOOD ELEV. 110.0 AT ALL DOOR AND GARAGE ENTRANCES
 5. ENTRANCE ROADS TO BE 1/2" MAX. GRADE

DESCRIPTION: _____
 CORE ACCOUNT: _____
 WORK COVERED BY THIS DRAWING: _____
 CHANGED TO COST ACCOUNT ABOVE: _____

APPROVAL: _____

COI	

