CITY of OAKLEY

A PLACE *for* FAMILIES *in the* HEART *of the* DELTA

OAKLEY 2020 GENERAL PLAN

FINAL ENVIRONMENTAL IMPACT REPORT

SCH #2002042134

NOVEMBER, 2002

PREPARED FOR:
CITY OF OAKLEY
3639 Main Street
Oakley, CA 94561

PREPARED BY:
Quad Knopf, Inc.

Quad Knopf

IN CONJUNCTION WITH:

Pacific Municipal Consultants: Gen. Plan
Fehr & Peers: Circulation
Santina & Thompson: Engineering
RHAA: Parks and Recreation
SDC: Recreation Planning
Foothill Associates: Biology and GIS
May Associates, Inc.: Biology
Bollard & Brennan: Noise
Don Ballanti: Air Quality
Don Napoli: Cultural and Historic
Bottomley Associates: Urban Design

TABLE OF CONTENTS

1.0 INTRODUCTION

CHAPTER ONE
INTRODUCTION

1.1 PURPOSE

The *Draft Environmental Impact Report, Oakley 2020 General Plan,* dated September, 2002, was prepared to disclose, analyze, and provide mitigation measures for all potentially significant environmental effects associated with adoption and implementation of the proposed General Plan. Preparation of an Environmental Impact Report (EIR) is a requirement of the California Environmental Quality Act (CEQA) for all discretionary projects in California that have a potential to result in significant environmental impacts. As required under CEQA, the Draft Environmental Impact Report (EIR) was published and circulated for review and comment by responsible and trustee agencies and interested members of the public. The public review period established ran from September 16, 2002 through October 30, 2002. Written comments received during the review period are addressed in this Final EIR.

CEQA requires that a Final Environmental Impact Report (Final EIR) be prepared, certified, and considered by public decision-makers prior to taking action on a project. The Final EIR provides the Lead Agency (i.e., City of Oakley) an opportunity to respond to comments received on the Draft EIR during the public review period and to incorporate any additions or revisions to the Draft EIR necessary to clarify or supplement information contained in the Draft document.

1.2 SCOPE AND FORMAT

This document includes this chapter, Introduction, outlining the purpose, scope and format of the Final EIR. Chapter Two explains the public review process and lists all agencies and individuals who commented on the Draft EIR. Chapter Three consists of the actual letters of comment, reproduced in their entirety. Chapter Four consists of responses to each written comment received on the Draft EIR. These responses are intended to supplement or clarify information contained in the Draft EIR, as appropriate, based on the comments and additional research or updated information. Each response follows the associated comment, which is summarized. Each letter has been numbered (e.g., Letter 1, Letter 2). Within each letter, individual comments are assigned an alpha-numeric identification. For example, the first comment on Letter 1 is Comment 1-A, and the second is Comment 1-B.

During their review of the Draft General Plan, the City Council has directed certain numbering changes in General Plan Policies and Programs. The numbering of Policies and Programs that are specifically referenced in this Final EIR has been changed to correspond to the numbering in the current Draft General Plan dated November 12, 2002. Numbering in the Draft EIR has not been changed. For complete information on current numbering, the current Draft General Plan and the previous General Plan are available for review at the offices of the City of Oakley Community Development Department, 3639 Main Street, Oakley, California 94561.

2.0 OVERVIEW OF COMMENTS RECEIVED

CHAPTER TWO
OVERVIEW OF COMMENTS RECEIVED

2.1 PUBLIC REVIEW AND COMMENT PROCEDURES

CEQA requires public disclosure in an EIR of all project environmental effects and encourages public participation throughout the EIR process. As stated in §15299 of the CEQA Guidelines, the purposes of public review of environmental documents are:

1) sharing expertise
2) disclosing agency analyses
3) checking for accuracy
4) detecting omissions
5) discovering public concerns
6) soliciting counter proposals

Section 15201 of the CEQA Guidelines states that "Public participation is an essential part of the CEQA process." A public review period of no less than 30 days nor longer than 60 days is required for a Draft EIR under §15087(c) of the CEQA Guidelines. If a State agency is a lead or responsible agency for the project, the public review period shall be at least 45 days. In this case, a review period extending from September 16, 2002 to October 30, 2002 was established. Any responsible agencies identified for this project (i.e., those agencies have discretionary approval authority over portions of the project) will utilize the Final EIR during project consideration. A public hearing was held before the Oakley Planning Commission on October 29, 2002 to provide the public an opportunity to comment on the Draft EIR. One person, David A. Gold, commented on the Draft EIR during the public hearing. As noted below, Mr. Gold also submitted a letter of comment that incorporated his verbal comments. The response to Mr. Gold's written comments are included in Chapter Four.

2.2 AGENCIES AND INDIVIDUALS WHO COMMENTED ON THE DRAFT EIR

Letter 1: Governor's Office of Planning and Research, State Clearinghouse

Letter 2: Roger L. Wilson, Director of Facilities and Planning, Liberty Union High School District

Letter 3: Barbara J. Cook, Chief, Northern California Cleanup Operations Branch, Department of Toxic Substances Control, State of California

Letter 4: Brian Wiese, Interagency Planning, East Bay Regional Park District

Letter 5: James W. Cutler, Lesher Trust Representative, Planning, Mediation, and Environmental Services

Letter 6: Margit Aramburu, Executive Director, Delta Protection Commission

Letter 7: William C. Norton, CEO/Executive Secretary, Bay Area Air Quality Management District

Letter 8: Anne Olson, P.E., Water Resources Control Engineer, California Regional Water Quality Control Board

Letter 9: Steve Shaffer, Director, Ag & Environmental Policy, State of California, Department of Food and Agriculture.

Letter 10: Jerry Brown, Director of Planning, Contra Costa Water District

Letter 11: Mike Yeraka, P.E., General Manager, Diablo Water District

Letter 12: Patrick Roche, Principal Planner, Advance Planning Division, Contra Costa County Community Development Department

Letter 13: Timothy C. Sable, District Branch Chief, Department of Transportation

Letter 14: Robert D. Gromm, Secretary/Chairman, Reclamation District #799

Letter 15: David A. Gold, Morrison & Foerster, LLP

Letter 16: Paul Detjens, Associate Civil Engineer, Flood Control Engineering, Contra Costa County Flood Control and Water Conservation District

Letter 17: Tom Williams, Acting District Manager, Ironhouse Sanitary District

Letter 18: Timothy Sable, District Branch Chief, IGR/CEQA, State of California Department of Transportation

3.0 LETTERS OF COMMENT

Letter 1

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse

ACKNOWLEDGEMENT OF RECEIPT

Gray Davis
GOVERNOR

Tal Finney
INTERIM DIRECTOR

DATE: October 16, 2002

TO: Barry Hand
City of Oakley Community Development
3633 Main Street
Oakley, CA 94561

RECEIVED
OCT 18 2002
CITY OF OAKLEY

RE: Oakley 2020 General Plan
SCH#: 2002042134

This is to acknowledge that the State Clearinghouse has received your environmental document for state review. The review period assigned by the State Clearinghouse is:

Review Start Date: September 16, 2002
Review End Date: October 30, 2002

We have distributed your document to the following agencies and departments:

California Highway Patrol
Caltrans, District 4
Department of Conservation
Department of Fish and Game, Region 3
Department of Forestry and Fire Protection
Department of Health Services
Department of Parks and Recreation
Department of Toxic Substances Control
Native American Heritage Commission
Office of Historic Preservation
Public Utilities Commission
Regional Water Quality Control Board, Region 2
Resources Agency
State Lands Commission
State Water Resources Control Board, Division of Water Rights

The State Clearinghouse will provide a closing letter with any state agency comments to your attention on the date following the close of the review period.

Thank you for your participation in the State Clearinghouse review process.

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
916-445-0613 FAX 916-323-3018 www.opr.ca.gov

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse

Gray Davis
Governor

Tal Finney
Interim Director

October 31, 2002

RECEIVED
NOV 04 2002
CITY OF OAKLEY

Barry Hand
City of Oakley Community Development
3633 Main Street
Oakley, CA 94561

Subject: Oakley 2020 General Plan
SCH#: 2002042134

Dear Barry Hand:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. On the enclosed Document Details Report please note that the Clearinghouse has listed the state agencies that reviewed your document. The review period closed on October 30, 2002, and the comments from the responding agency (ies) is (are) enclosed. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly. A

Please note that Section 21104(c) of the California Public Resources Code states that:

> "A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

These comments are forwarded for use in preparing your final environmental document. Should you need more information or clarification of the enclosed comments, we recommend that you contact the commenting agency directly.

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process.

Sincerely,

Terry Roberts

Terry Roberts
Director, State Clearinghouse

Enclosures
cc: Resources Agency

Document Details Report
State Clearinghouse Data Base

SCH# 2002042134
Project Title Oakley 2020 General Plan
Lead Agency Oakley, City of

Type EIR Draft EIR

Description The current Contra Costa County General Plan was adopted by the City of Oakley in 1999 to serve as the Oakley General Plan until completion and adoption of the Oakley 2020 General Plan. The Contra Costa County General Plan assumed a planning horizon of 1995 -2010 and addressed growth, development, housing, and recreational use within the Oakley community, as well as the remainder of the unincorporated area of Contra Costa County. The primary function of the General Plan is to prescribe growth within the region in an orderly fashion and to allocate specific areas for development that will cause the least impact to the environment.

Lead Agency Contact

Name Barry Hand
Agency City of Oakley Community Development
Phone 925-625-7000 ***Fax***
email
Address 3633 Main Street
City Oakley ***State*** CA ***Zip*** 94561

Project Location

County Contra Costa
City Oakley
Region
Cross Streets
Parcel No. various
Township ***Range*** ***Section*** ***Base***

Proximity to:

Highways Hwys 4 and 160
Airports
Railways BNSF
Waterways Marsh Creek/Contra Costa Canal
Schools Various
Land Use Rural unincorporated area
Marsh Creek - Two sloughs

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Drainage/Absorption; Economics/Jobs; Fiscal Impacts; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Minerals; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Schools/Universities; Septic System; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Wildlife; Growth Inducing; Landuse; Cumulative Effects; Other Issues

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Reviewing Agencies Resources Agency; Department of Conservation; Department of Fish and Game, Region 3; Department of Forestry and Fire Protection; Office of Historic Preservation; Department of Parks and Recreation; California Highway Patrol; Caltrans, District 4; Department of Health Services; State Water Resources Control Board, Division of Water Rights; Regional Water Quality Control Board, Region 2; Department of Toxic Substances Control; Native American Heritage Commission; Public Utilities Commission; State Lands Commission; Delta Protection Commission

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Date Received 09/16/2002 ***Start of Review*** 09/16/2002 ***End of Review*** 10/30/2002

Note: Blanks in data fields result from insufficient information provided by lead agency.

Liberty Union High School District
20 Oak Street
Brentwood, CA 94513
Phone: (925) 634-2166 Fax (925) 634-1687

RECEIVED
OCT 04 2002
CITY OF OAKLEY

October 1, 2002

Barry Hand
City of Oakley
Assistant City Manager
P.O. Box 6
Oakley, CA 94561

RE: Draft Environmental Impact Report, Oakley 2020 General Plan.

Dear Barry:

Thank you for the opportunity to address your report. We would like to request that in section 4.3-6 Public Service, the first paragraph, the Liberty Union High School District be referenced similar to the Oakley Union School District. Also reference should be made that at all levels of density, the high school will be directly impacted. A
Furthermore, on Table 4.4-1, Analysis of Alternatives, we would like to request that under High Density/Schools that the aforementioned impact would show up as a plus sign rather than a zero. B

Should you have any questions on our concerns, please feel free to contact this office.

Yours truly,

Roger L. Wilson, CSI, C.A.S.H.
Director of Facilities and Planning

cc: Dan Smith - LUHSD

Letter 3

Department of Toxic Substances Control

Edwin F. Lowry, Director
700 Heinz Avenue, Suite 200
Berkeley, California 94710-2721

Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Gray Davis
Governor

October 16, 2002

RECEIVED
OCT 17 2002
CITY OF OAKLEY

Mr. Barry Hand
City of Oakley Community Development
3633 Main Street
Oakley, California 94561

Dear Mr. Hand:

The Department of Toxic Substances Control (DTSC) has reviewed the *Oakley 2020 General Plan, Draft Environmental Impact Report*, dated September 2002, SCH # 2002042134.

Much of the land in this area has historically been used for agricultural purposes and may contain harmful levels of pesticides. Also, as we noted in our comment letter of May 15, 2002, at least one parcel zoned for residential use (at 139 Hill Avenue) contains high levels of lead (up to 300,000 parts per million) in the soil under an asphalt cap, as a result of battery recycling operations. As a result, DTSC suggests the following be added to the *Goals, Policies, and Implementation Programs* portion of the General Plan: A

- That an environmental assessment be required prior to any new construction, in order to verify the environmental suitability of the land for its intended use.
- That land with contamination at levels unsafe for currently zoned land uses, be re-zoned to allow only those land uses considered safe.

DTSC has professional staff who work on site characterization and cleanup activities. DTSC provides guidance for Preliminary Endangerment Assessment (PEA) preparation and cleanup oversight through its Voluntary Cleanup Program (VCP). The VCP enables interested parties to assess and remediate contaminated properties in a cost effective, cooperative manner which allows a property to be returned to productive economic use. Enclosed is a fact sheet describing this program.

If you have any questions regarding this letter, please contact Bill Brown at (510) 540-3841.

Sincerely,

Barbara J Cook

Barbara J. Cook, P.E., Chief
Northern California – Coastal Cleanup Operations Branch

Enclosure

cc: Planning & Environmental Analysis Section
CEQA Tracking Center
P.O. Box 806
Sacramento, California 95812-0806

Governor's Office of Planning and Research
State Clearinghouse
P.O. Box 3044
Sacramento, California 95812-3044

The Voluntary Cleanup Program

The California Environmental Protection Agency's Department of Toxic Substances Control (DTSC) has introduced a streamlined program to protect human health, cleanup the environment and get property back to productive use. Corporations, real estate developers, and local and state agencies entering into Voluntary Cleanup Program agreements will be able to restore properties quickly and efficiently, rather than having their projects compete for DTSC's limited resources with other low-priority hazardous waste sites. This fact sheet describes how the Voluntary Cleanup Program works.

Prior to initiation of the Voluntary Cleanup Program, project proponents had few options for DTSC involvement in cleaning up low-risk sites. DTSC's statutory mandate is to identify, prioritize, manage and cleanup sites where releases of hazardous substances have occurred. For years, the mandate meant that, if the site presented grave threat to public health or the environment, then it was listed on the State Superfund list and the parties responsible conducted the cleanup under an enforcement order, or DTSC used state funds to do so. Because of staff resource limitations, DTSC was unable to provide oversight at sites which posed lesser risk or had lower priority.

DTSC long ago recognized that no one's interests are served by leaving sites contaminated and unusable. The Voluntary Cleanup Program allows motivated parties who are able to fund the cleanup -- and DTSC's oversight -- to move ahead at their own speed to investigate and remediate their sites. DTSC has found that working cooperatively with willing and able project proponents is a more efficient and cost-effective approach to site investigation and cleanup. There are four steps to this process:

- Eligibility and Application
- Negotiating the Agreement
- Site Activities
- Certification and Property Restoration

The rest of this fact sheet describes those steps and gives DTSC contacts.

The Voluntary Cleanup Program

Step 1: Eligibility and Application

Most sites are eligible. The main exclusions are if the site is listed as a Federal or State Superfund site, is a military facility, or if it falls outside of DTSC's jurisdiction, as in the case where a site contains only leaking underground fuel tanks. Another possible limitation is if another agency currently has oversight, e.g., a county (for underground storage tanks). The current oversight agency must consent to transfer the cleanup responsibilities to DTSC before the proponent can enter into a Voluntary Cleanup Program agreement. Additionally, DTSC can enter into an agreement to work on a specified element of a cleanup (risk assessment or public participation, for example), if the primary oversight agency gives its consent. The standard application is attached to this fact sheet.

If neither of these exclusions apply, the proponent submits an application to DTSC, providing details about site conditions, proposed land use and potential community concerns. No fee is required to apply for the Voluntary Cleanup Program.

Step 2: Negotiating the Agreement

Once DTSC accepts the application, the proponent meets with experienced DTSC professionals to negotiate the agreement. The agreement can range from services for an initial site assessment, to oversight and certification of a full site cleanup, based on the proponent's financial and scheduling objectives.

The Voluntary Cleanup Program agreement specifies the estimated DTSC costs, scheduling for the project, and DTSC services to be provided. Because every project must meet the same legal and technical cleanup requirements as do State Superfund sites, and because DTSC staff provide oversight, the proponent is assured that the project will be completed in an environmentally sound manner.

In the agreement, DTSC retains its authority to take enforcement action if, during the investigation or cleanup, it determines that the site presents a serious health threat, and proper and timely action is not otherwise being taken. The agreement also allows the project proponent to terminate the Voluntary Cleanup Program agreement with 30 days written notice if they are not satisfied that it is meeting their needs.

Step 3: Site Activities

Prior to beginning any work, the proponent must have: signed the Voluntary Cleanup Program agreement; made the advance payment; and committed to paying all project costs, including those associated with DTSC's oversight. The project manager will track the project to make sure that DTSC is on schedule and within budget. DTSC will bill its costs quarterly so that large, unexpected balances will not occur.

Once the proponent and DTSC have entered into a Voluntary Cleanup Program agreement, initial site assessment, site investigation or cleanup activities may begin. The proponent will find that DTSC's staff includes experts in every vital area. The assigned project manager is either a highly-qualified Hazardous Substances Scientist or Hazardous Substances Engineer. That project manager has the support of well-trained DTSC toxicologists, geologists, industrial hygienists and specialists in public involvement.

The project manager may call on any of these specialists to join the team, providing guidance, review, comment and, as necessary, approval of individual documents and other work products. That team will also coordinate with other agencies, as appropriate, and will offer assistance in complying with other laws, such as the Resource Conservation and Recovery Act.

Step 4: Certification and Property Restoration

When remediation is complete, DTSC will issue either a site certification of completion or a "No Further Action" letter, depending on the project circumstances. Either means that what was, "The Site," is now property that is ready for productive economic use.

To learn more about the Voluntary Cleanup Program, contact the DTSC representative in the Regional office nearest you:

Southern California
Tina P. Diaz
1011 North Grandview Avenue
Glendale, California 91201
(818) 551-2862

Central California
Megan Cambridge
8800 Cal Center Drive
Sacramento, CA 95826-3200
(916) 255-3727

North Coast California
Lynn Nakashima   Janet Naito
700 Heinz Avenue, Suite 200
Berkeley, California 94710-2737
(510) 540-3839   (510) 540-3833

Central California - Fresno Satellite
Tom Kovac
1515 Tollhouse Road
Clovis, California 93612
(209) 297-3939

(Revised 3/2002)

Letter 4

EAST BAY REGIONAL PARK DISTRICT

PARKS FOR THE FUTURE

October 22, 2002

Mr. Barry Hand
Community Development Director
3639 Main Street, PO Box 6
Oakley CA 94561

RE: Oakley General Plan, Draft EIR

Dear Mr. Hand:

Thank you for providing the East Bay Regional Park District with a copy of the Draft EIR for the Oakley 2929 General Plan. The District owns and manages regional open space and trails within the City, including the Antioch-Oakley Pier and sections of the Marsh Creek, Delta DeAnza and Big Break Shoreline Regional Trails, as well as the Big Break Regional Shoreline. The District is interested in working with the City to help plan and provide a connected system of regional open space and shoreline access for residents of Oakley and the East County. In that context, we offer the following comments: A

Open Space Resources not Identified

The document identifies existing regional trails within the city (p. 3-66). It would be useful if the text more specifically identified the Big Break Regional Shoreline as an area for Delta shoreline access and recreational opportunities, contiguous with the City's planned habitat restoration and recreational development at Dutch Slough, immediately to the east. We suggest adding to the sentence *The East Bay Regional Park District (EBRPD) also manages regional parks and recreation facilities within the City of Oakley and the far eastern Contra Costa County region* (p. 3-68), the following phrase: ...*including the Big Break Regional Shoreline, located along Oakley's northern city boundary on the San Joaquin River Delta, and to the west of the Cypress Corridor / Dutch Slough area.* B

Land Use and Resouce Maps Should be Included

It would be helpful if the Land Use and Open Space and Conservation sections of the EIR reproduced relevant figures contained in the general plan in order to illustrate the city policies which are discussed as mitigations. The Land Use Diagram (General Plan figure 2-2) should be included as the Preferred Alternative along with the High Density, Low Density and Existing Contra Costa General Plan (EIR, 4.2--1-3) to show the land uses proposed in the Plan. Likewise maps of Vegetation Types (General Plan, figure 6-1) and Biological Sensitivity (figure 6-2) should be included in the Biological Resources section to illustrate the location of resources and compare with the Land Use Diagram.

The General Plan and EIR should address potential land-use incompatibilities between the proposed commercial development adjacent to the Big Break Marina, and the surrounding Delta Recreational Lands, including the Big Break Shoreline. Buffers or other ways to mitigate land use conflicts should be considered. C

Open Space System Should be Based on Resource Analysis

A number of the General Plan policies offered as mitigations appear to be only partially reflected in the

Land Use Diagram, for example: OSCE Policy 6.3.1, *Preserve important ecological and biological resources as open space,* and OSCE Policy 6.6.4, *Where feasible and desirable, major open space components shall be combined and linked to form a visual and physical system in the city.* Major resource areas along Dutch Slough area and irrigated farmlands in the Future Expansion Area are preserved outright or partially through low-density zoning; however, outside of these areas, biological and agricultural resources (vineyards and orchards) shown in GP figures 6-1 and 6-2 are not called out for preservation in the General Plan, as reflected in the Land Use Diagram. Thus it appears that much of the proposed land use pattern is not linked to any geographic resource analysis. If resource-conservation policies are to be used as mitigation measures, they should be linked to a geographic analysis which would include natural features such as Marsh Creek, sloughs off of Dutch Slough and view preservation. D

Without a comprehensive resource analysis, reflected in the Land Use Diagram, open space dedications associated with new development risk being ad-hoc and not linked into a meaningful open space system. We would suggest that implementation policies in the General Plan incorporate provisions for open space fees in lieu of dedication, under the Quimby Act, along with transfer of development rights or density credits.

Future Expansion Area

OSCE Program 6.1.B states: *Encourage consolidated development, with appropriate land use buffers of parks, open space and trails, for proposed major subdivisions of prime agricultural lands.* Much of the Future Expansion Area (Sphere of Influence) is in irrigated fields and / or seasonal wetland. Both wetlands and prime agricultural lands and other resources should be mapped as part of the EIR so that these policies can be implemented. The Plan proposes an Agricultural Limited land use designation for some of this land, which includes a wide density range (0.1-1 du / ac.) and single-family low and medium density on the remainder. Do these densities include or exclude wetlands? E

The general plan shows no proposed public parks in this area. In implementing the above policy, it would be useful to consider how to "encourage consolidated development." One way to mitigate development impacts would be by providing for clustering or development rights transfer in order to consolidate development and preserve contiguous habitat, resource and agricultural areas. Such a transfer could facilitate an eastward extension of the Dutch Slough preserve, for example, or a buffer between it and proposed residential development. F

The Park District appreciates the opportunity to make these comments, and will look forward to receiving a copy of the final EIR and General Plan.

Sincerely,

Brian Wiese

Brian Wiese
Interagency Planning

Letter 5

JIM CUTLER

PLANNING, MEDIATION AND ENVIRONMENTAL SERVICES
P.O. BOX 967
WEST POINT, CA 95255

Phone 209 293-4024
Fax 209 293-4024

October 24, 2002

City of Oakley
Community Development Department
Mr. Barry Hand
3633 Main Street
Oakley, CA 94561

Dear Barry:

I have reviewed the Oakley 2020 General Plan Draft Environmental Impact Report and have a few comments on the document.

On Page 1-2 of the document it states in the second paragraph that an additional purpose of this EIR "is intended to assist the Contra Costa County Local Agency Formation Commission (LAFCO) in making decisions about changes to the Oakley City limits and Sphere of Influence (SOI) in the future." A

Beyond this one sentence of intent in this document and two paragraphs on Page 2-11 there is no discussion of the LAFCO policies on modifying the City SOI to include areas within the Oakley Planning Area. The report does not, in any way, reference or discuss LAFCO "factors of consideration" in making SOI changes that would allow for annexation of adjacent outlying areas. This seems to be a substantial oversight.

On Page 2-11 the DEIR references the Delta Protection Agency. This section should be augmented to point out that the Cypress Corridor Expansion Area is also located within the secondary zone of the Delta and is not subject to the requirements of the Delta Protection Commission's plan. The boundaries established for the Commission's jurisdictional areas, within Contra Costa County, were largely based upon County adopted Urban Limits Line. B

Page 3-128 does not include within the list of major growth areas in Oakley the Cypress Corridor Expansion Area. This area should be added to the list. C

On Page 4-22 the proposed project is identified as the environmentally superior alternative. We concur in that assessment. D

Since the DEIR relies heavily on the policies found within Draft Oakley 2020 General Plan, any concerns I have on those policies would probably be best considered during the General Plan discussions.

Sincerely yours,

James W. Cutler

James W. Cutler
Lesher Trust Representative

STATE OF CALIFORNIA—THE RESOURCES AGENCY

Letter 6

GRAY DAVIS, *Governor*

DELTA PROTECTION COMMISSION
14215 RIVER ROAD
P.O. BOX 530
WALNUT GROVE, CA 95690
Phone (916) 776-2290
FAX (916) 776-2293
E-Mail: dpc@citlink.net Home Page: www.delta.ca.gov

RECEIVED
OCT 25 2002
CITY OF OAKLEY

October 24, 2002

Barry Hand, Planning Director
City of Oakley
3633 Main Street
Oakley, CA 94561

Subject: Draft Environmental Impact Report (DEIR) for the Oakley 2020 General Plan; SCH # 2002042134

Dear Mr. Hand:

I am writing regarding the DEIR for the City's General Plan. The Commission itself has not had the opportunity to review the DEIR so these are staff comments only. They are however based on the Commission's law and adopted Land Use and Resource Management Plan for the Primary Zone of the Delta.

Portions of water-covered areas in the City limits are in the Primary Zone of the Delta. The City limits lie 200 feet waterward of the mean high tide line. The DEIR does not acknowledge this, or the fact that local government actions in the Primary Zone of the Delta can be appealed to the Delta Protection Commission. I suggest that the DEIR show the actual shoreline, the City Limits, and the boundary of the Primary Zone of the Delta. In addition, the DEIR should describe the Commission's law and plan and how they pertain to the City's planning process. The City's General Plan must be consistent with the Commission's adopted Plan and will have to be submitted to the Commission for a formal finding of consistency. **A**

The Commission's Plan supports development of public access and recreation along the shoreline, a concept that is reflected in the proposed General Plan.

In summary, the DEIR should delineate the boundary of the Primary Zone of the Delta and describe the relationship between the City and the Delta Protection Commission. The DEIR should also acknowledge that the City will have to submit its adopted General Plan to the Commission to ensure it is consistent with the Commission's Plan.

The Commission's law and plan are posted on the Commission's website--www.delta.ca.gov.

Please let me know if you need hard copies of the Commission's Plan or if you have any questions.

Sincerely,

Margit Aramburu
Executive Director

Cc: Chairman Patrick N. McCarty
Commissioner Marci Coglianese, ABAG Representative
Commissioner Federal Glover
Pacific Municipal Consultants
OPR, State Clearinghouse

Letter 7

October 29, 2002

Barry Hand
Community Development Director
City of Oakley
P.O. Box 6
Oakley, CA 94561

Subject: City of Oakley 2020 General Plan

Dear Mr. Hand:

The Bay Area Air Quality Management District (District) has received your agency's Draft Environmental Impact Report (DEIR) for the City of Oakley 2020 General Plan. The General Plan addresses the full development or "build-out" of the City of Oakley and is intended to provide guidance for land use and development decisions until 2020.

District staff believe that implementation of the General Plan could have potentially significant impacts upon air quality in the region, and we are not convinced that implementation of the programs and policies listed in *Air Quality Section 3.4* will be sufficient to reduce the impacts to a less than significant level. The Bay Area is currently a non-attainment area for federal and state ambient air quality standards for ground level ozone, and state standards for particulate matter. The air quality standards are set at levels to protect public health and welfare. The major source of air pollution in the Bay Area is motor vehicles. A

The District supports the intent of the air quality policies discussed in the General Plan DEIR, but we believe the City needs to increase the residential densities and redesign the mixture of land uses in order to promote realistic alternatives to driving alone. Decisions made by the City of Oakley can directly influence motor vehicle usage both in your jurisdiction and in the greater Bay Area. It is important that your city view its General Plan as an opportunity to move transportation and land use policy in a direction that minimizes vehicle trips and reduces the rate of growth in vehicle miles traveled, thereby improving local and regional air quality. B

The District is concerned about the General Plan's land use composition, especially regarding the proposed densities of residential uses and their ability to support alternative modes of transportation. While the densities of residential land use designations ranges between 1.0 and 16.7 dwelling units per acre (du/ac), the majority of the residential acreage is devoted to single-family homes at densities of 5.5 du/ac or less, figures that are too low to support transit service. With such low densities, residents will be more likely to travel via single-occupancy vehicles. The City should rework the residential densities, especially near transit nodes, downtown, and other activity centers to increase the residential densities to at least 10 du/ac, a density commonly regarded as able to support transit service as well as improve the bike/walkability of neighborhoods. In addition, the District urges the City to consider planning for higher density commercial development near current and future transit facilities than is currently being proposed in the General Plan. C

Both the air quality and transportation sections of the DEIR mention City policies and programs designed to achieve the goals of reducing automobile travel demand and promoting alternatives to the single-occupancy vehicle. While we are pleased that some of the District's recommended Transportation Control Measures for City General Plans (*TCMs 9, 15, & 19*) are addressed in the DEIR, we believe the City needs to do more. Specifically, we recommend that the City revise the land use designations to match the General Plan policies that promote use of alternative modes of transportation. General Plan policies mentioned in the DEIR state that the City will "ensure that the density and mixture of future land uses encourage transit usage, walking, and bicycling (*CE Policy #3.7.2*)" and "encourage site planning that promotes all modes of transportation, and that minimizes vehicular trips between different land uses (*CE Policy #3.7.6*)." However, the Land Use Diagram (*Figure 2-2*) in the General Plan does not clearly reflect these goals. Instead, the City of Oakley in 2020 appears to have predominantly single-family residential uses with commercial uses primarily lining major arterial roadways. Low-density residential land uses and the lack of mixed-use designations will result in a build-out of Oakley which is not supportive of alternative modes of transportation. D

Instead, we recommend the City of Oakley reconsider the land use mixture and densities to better promote transportation alternatives including bicycle and pedestrian accessibility, public safety and access to services. In the DEIR's determination of consistency with the 2000 Clean Air Plan (CAP), the City identifies General Plan policies which implement some of the transportation control measures identified in the CAP. While the District supports the identified policies, we also recommend stronger language that clearly defines Oakley's commitment to improving regional air quality with unambiguous mitigation measures, including those aimed at current and future residential and commercial development in Oakley. Without appropriate mitigation measures in place, future development could lead to a long-term cumulative increase in motor vehicle traffic that will impair attainment of air quality standards and prolong residents' exposure to unhealthy air. We strongly urge you consider not only implementing transportation demand management measures but also focusing on a smart growth model of development. E

We are aware of the City of Oakley's participation in the current Contra Costa County "Shaping Our Future" smart growth planning process. Decisions from this process will help to guide a number of growth-related issues throughout the county including more efficient use of land, the reduction of traffic congestion and better transit service. The District was disappointed to see no mention of this process in the DEIR, and we strongly recommend that your city's General Plan reflect the goals and intent of "Shaping Our Future" as well as provide policies and programs that will implement the smart growth strategies that come out of that county-wide planning process. F

The City of Oakley General Plan DEIR did not include an adequate analysis of the General Plan's consistency with the most recently adopted regional air quality plans, the 2000 Bay Area Clean Air Plan (CAP) and the 2001 Ozone Attainment Plan. In order to evaluate the General Plan's consistency with the air quality plans, the City should not only consider the extent to which the General Plan implements transportation control measures from the air quality plans but also the General Plan's consistency with the air quality plans' population and vehicle use projections, as well as whether the General Plan provides buffer zones around sources of odors, dust and toxics. For more details, we recommend that the City refer to the BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans (1999) for guidance on best practices for assessing and mitigating air quality impacts related to plan consistency, as well as for construction emissions, land use/design measures, project operations, motor vehicles, nuisance impacts and more. If you do not already have a copy of our guidelines, we highly recommend you obtain a copy by calling our Public Information Division at (415) 749-4900. G

The DEIR also lacks any reference to specific transit-oriented development opportunities that might exist near the proposed Oakley eBART station or other current or future transit nodes in the City. The eBART project is a current proposal to run a single track diesel motorized train along existing railroad tracks to connect the Pittsburg BART station with the East Contra Costa County communities of Antioch, Byron, Oakley and Brentwood. The District is generally supportive of infill development that is of a moderate to high density, has a variety of compatible land uses and encourages alternative modes of transportation. Such development patterns have been strongly supported by Contra Costa County residents at "Shaping Our Future" workshops. These projects are generally much less automobile-dependent, especially if there is a compatible mixture of uses including needed services. Such projects generate less air pollution than conventional sprawl development by promoting transit usage as well as walking and cycling. H

Finally, we urge the City to develop a more comprehensive air quality section or element in the General Plan. The current Draft Air Quality Section of the Open Space and Conservation Element makes mention of the relationship between reducing automobile travel and the benefits to air quality but lacks adequate detail about location-specific City programs or policies to encourage less single-occupancy automobile usage. By including a more thorough air quality section or element, the City can link specific land use and transportation policies to Oakley's commitment towards clean air. I

If you have any questions regarding these comments, please contact Suzanne Bourguignon, Environmental Planner, at (415) 749-5093.

Sincerely,

William C. Norton
CEO/Executive Secretary

WN:SB

Cc: BAAQMD Director Mark DeSaulnier
BAAQMD Director Mark Ross
BAAQMD Director Gayle Uilkema

California Regional Water Quality Control Board

Central Valley Region

Robert Schneider, Chair

Winston H. Hickox
Secretary for Environmental Protection

Sacramento Main Office
Internet Address: http://www.swrcb.ca.gov/rwqcb5
3443 Routier Road, Suite A, Sacramento, California 95827-3003
Phone (916) 255-3000 • FAX (916) 255-3015

Gray Davis
Governor

28 October 2002

RECEIVED
OCT 29 2002
CITY OF OAKLEY

Ms. Gregoria Garcia
State Clearinghouse
P.O. Box 3044
Sacramento, CA 95812-0613

COMMENTS ON OAKLEY 2020 GENERAL PLAN DRAFT ENVIRONMENTAL IMPACT REPORT, SCH# 2002042134, CONTRA COSTA COUNTY

Regional Board staff has reviewed the subject document, which we received on 27 September 2002, and offers the following comments:

1. With the exception of the alternatives analysis section, there are no maps or graphics to illustrate existing and proposed land uses, streets, or infrastructure improvements. It is therefore not possible to conceptualize the proposed development plan. A

2. Table 2-1 Identifies the California Regional Water Quality Control Board as a key agency "...responsible for evaluating appropriate uses of water and responsible for issuing waste discharge permits to protect water quality. This agency will act as Responsible Agency to evaluate project consistency with the City's existing National Pollutant Discharge Elimination System (NPDES) permit." B

   First, the Regional Board does not evaluate appropriate uses of water. Through the Basin Planning process, the Regional Board determines the existing and future beneficial uses of surface waters and groundwater. The beneficial uses are then used to determine applicable Water Quality Objectives.

   Second, the Regional Board's mission is to protect the quality of surface water and groundwater quality through regulation of waste discharges to land and surface water. The primary mechanism by which these discharges are regulated is adoption of Waste Discharge Requirements (WDRs) for individual dischargers. The Regional Board is also the implementing agency for the federal NPDES program and issues NPDES permits for point source discharges to surface water and storm water discharges. C

   Third, Regional Board staff is unaware of any NPDES permit issued for the City of Oakley other than the MS4 storm water permit. The reference should be more specific. D

   We hope this will be clarified in the final EIR.

3. Section 3.8.1, Surface Water Resources, should be revised to reflect that the Central Valley Regional Water Quality Control Board is responsible for protecting water quality in the Sacramento-San Joaquin Delta, which is the receiving water for discharges originating in the Oakley area. The Water Quality Control Plan (Basin Plan) for the Sacramento River Basin and the San Joaquin River Basin sets forth the existing and potential beneficial uses, water quality objectives, an implementation plan, and a surveillance/monitoring plan for the basin. E

4. Section 3.8.1, Wastewater Services, should be revised to address the following comments:

   a. The current WDRs for the Ironhouse Sanitary District (ISD) Wastewater Treatment Facility state that the current treatment capacity is 3.0 mgd (note that this in not the same as disposal capacity). The current permitted effluent disposal capacity is 2.0 mgd until ISD completes additional effluent disposal areas on Jersey Island. This limit determines the allowable influent flow rate. F

   b. It should be noted that the long-term viability of ISD's current effluent disposal program is not certain. The Regional Board and Contra Costa Water District are concerned about the potential for impacts to groundwater and surface water quality. The current WDRs (copy enclosed) set forth a plan and schedule for evaluation of groundwater quality and implementation of source control measures as needed, and we understand that ISD is currently updating its Master Plan. G

5. Based on the discussion presented in the draft EIR, Impact 3.8-A, it appears that this impact analysis is intended to address four different potential sources of water quality impacts: storm water impacts associated with construction (short-term); storm water impacts associated with changed land uses (long-term); potential groundwater impacts and/or increased seepage of pollutants into the Contra Costa Canal; and groundwater level fluctuations. However, the discussion seems to be limited to storm water discharges during and after construction. We suggest that these be identified and analyzed as separate potential impacts. Additionally, the analysis should be revised to address the following comments. H

   a. The discussion of storm water impacts associated with construction should be moved to Impact 3.8-B. I

   b. The conclusion states that the City of Oakley has adopted policies and programs to "…protect the citizens of Oakley from the dangers of flooding." This is not consistent with the impact topics. J

   c. Many of the policies and programs listed are not relevant to avoiding or mitigating water quality impacts associated with any of the identified sources. They should be deleted. K

   d. Many of the policies and programs cited as mitigation focus on encouraging, discouraging, coordinating, and consulting, but appear to lack specific means to ensure appropriate implementation of those policies and programs. L

6. Impact 3.8-B is confusing: the impact statement states that the subject is construction-related erosion and sedimentation, but the mitigation measures includes several policies and programs related to flood control and drainage improvements. The mitigation measures should be directly tied to the impact, and drainage and flooding issues should be identified and analyzed as separate impacts. M

7. The following (or similar language) should be included in Impact 3.8-B as a mitigation measure for construction-related water quality impacts: "For development projects encompassing disturbance of 5 N

acres or more, issue grading permits only upon receipt of documents verifying that the applicant has applied for coverage under the Sate Water Resources Control Board's General Permit for Discharge of Storm Water Associated with Construction Activities."

8. Impact 3.8-C should be separated into two separate impacts: impacts to the treatment and disposal capacity of the ISD wastewater treatment facility (which belongs in Section 3.6, Public Services) and potential water quality impacts associated with increased discharge of treated effluent at the facility. The analysis of impacts under Public Facilities should include sewer hydraulic capacity, and the ISD facility hydraulic, treatment, and disposal capacities. Even at the Program EIR level, it should be possible to identify portions of the existing wastewater conveyance system whose capacity will be impacted by the proposed development plan. Unless some future CEQA document(s) will address these impacts, they must be disclosed and analyzed in the final EIR. O

Thank you for the opportunity to comment on this document. If you have any questions or need clarification, please call me at (916) 255-3140.

Anne Olson

ANNE L. OLSON, P.E.
Water Resources Control Engineer

Enclosure: Order No. 5-01-237

cc w/ enc.: Barry Hand, Oakley Community Development Department, Oakley

cc: w/o enc.: Ken Stuart, Contra Costa Environmental Health Department, Concord
Donald Freitas, Contra Costa Clean Water Program, Martinez
David Bauer, Ironhouse Sanitary District, Oakley
Richard Denton, Contra Costa Water District, Concord

State of California

Letter 9

Memorandum

To: Ms. Terry Roberts, Senior Planner
State Clearinghouse
Governor's Office of Planning and Research

Mr. Barry Hand, Director
Community Development Department
City of Oakley
3633 Main Street
Oakley, CA 94561

Date: October 29, 2002

Place: Sacramento

Phone: (916) 657-4956

RECEIVED
NOV 01 2002
CITY OF OAKLEY

From: Department of Food and Agriculture - Steve Shaffer, Director
Ag & Environmental Policy

S Shaffer

Subject Draft Environmental Impact Report (DEIR) for the City of Oakley 2020 General Plan – **SCH #2002042134**

California Department of Food and Agriculture (CDFA) has reviewed the DEIR for the City of Oakley's 2020 General Plan. The Department's mission is to protect and promote agriculture in California and the natural resources upon which agriculture depends. We offer the following comments on the DEIR.

The General Plan will guide the growth and development of the City of Oakley over the next approximately 20 years. The DEIR considers four project alternatives, including "no project" alternative, which each appear to affect the amount and configuration of agricultural land to be converted for urban uses.

We recommend that the final DEIR be amended to include the following additional information concerning project impacts on agricultural land. First, we request that the final EIR clearly set forth in narrative, maps and tables the existing categories and acreage of agricultural land in the planning area. Also, the categories and acreage of agricultural land that would be converted under each alternative should be set forth. Information on farmland categories and acreage can be obtained from the California Department of Conservation's Important Farmland Series maps and reports. A

Second, the DEIR notes that the Dutch Slough area will either host the development of approximately 4,000 residential dwelling units, or be set aside in a CALFED Ecosystem Restoration acquisition. We recommend that the final EIR reflect the current status of the Dutch Slough area and, if the Slough is to be preserved for the purposes of CALFED, how the 4,000 dwelling units will be accommodated in the planning area. Particularly, the DEIR should address the growth-inducing impacts on agricultural land if the ecosystem restoration alternative use of Dutch Slough redirects the urban growth slated under the referenced development agreement onto other lands. B

The DEIR lists a number of policies to mitigate the loss of agricultural land from the projected City growth through 2020. We recommend that the mitigation measures that compensate for the loss of agricultural land through transfer of development rights and C agricultural land conservation easements be quantified and related to the projected agricultural land conversion for each project alternative. In other words, we recommend a quantifiable mitigation target be set forth in the DEIR so that effectiveness of farmland conversion mitigation can be monitored.

Finally, the DEIR contains two technical references that are in error and should be corrected in the final EIR. First, on page 2-13 of the project description, the California Department of Food and Agriculture is listed as the agency responsible for agricultural preserves set up by local jurisdictions under the Williamson Act. Since the 1970's, the California Department of Conservation has been responsible for the statewide administration of the Williamson Act and its companion Open Space Subvention Entitlement Act. D

Second, the first bullet at the top of page 3-77 of the DEIR has an outdated reference to the U.S. Soil Conservation Service. The former Soil Conservation Service remains an agency of the U.S. Department of Agriculture, but has been renamed as the Natural Resources Conservation Service. E

Thank you for the opportunity to review and comment on the DEIR for the City's first General Plan. If I can be of assistance in responding to our comments, please feel free to call me at (916) 657-4956.

cc: Ed Meyer, Agricultural Commissioner
Contra Costa County

CONTRA COSTA
WATER DISTRICT

1331 Concord Avenue
P.O. Box H20
Concord, CA 94524
(925) 688-8000 FAX (925) 688-8122

October 30, 2002

Via Fax 925/625-9194

Barry Hand, Director
Community Development Department
City of Oakley
3639 Main Street, P.O. Box 6
Oakley, California 94561

RECEIVED
NOV 01 2002
CITY OF OAKLEY

Subject: Comments on Draft EIR for the Oakley 2020 General Plan

Dear Mr. Hand: Barry

Thank you for the opportunity to review and comment on the Draft EIR prepared for the Oakley 2020 General Plan. Most of the General Plan area is within the existing Contra Costa Water District (CCWD) service area boundaries.

The Planning Area for the General Plan is the incorporated City of Oakley boundaries (12.6 square miles), plus two areas east of the City referred to as proposed expansion areas (4.2 square miles). The Oakley 2020 General Plan is intended to replace the current Contra Costa County General Plan, which was adopted by the City of Oakley in 1999 shortly after incorporation as an interim land use and development policy. The Draft EIR evaluates the environmental impacts of the Preferred Plan (Figure 2-2 Land Use Diagram as shown in General Plan Public Review Draft document) as well as three alternatives.

CCWD has prepared detailed comments on the Draft EIR, which are contained in Attachment 1. Key comments are summarized below:

- General Plan policies or EIR Mitigation Measures need to be identified and implemented to protect the Contra Costa Canal and the municipal water supply. We appreciate the City's cooperation in working with CCWD to ensure that concerns related to land use changes adjacent to the Contra Costa Canal are properly addressed in the EIR and General Plan.

- Water supply analysis should be done in the context of CCWD's water supply planning.

- The institutional processes required to secure the CVP supply and LVP benefits for areas proposed for future development in the Draft General Plan need to be clearly described.

If you have any questions on the comments, or require further information on the CCWD facilities, please call Dennis Pisila at 925/688-8119.

Sincerely,

Jerry Brown
Director of Planning

Attachment 1: Specific Comments

cc: Cay Goude, Assistant Field Supervisor, U.S. Fish and Wildlife Service, Sacramento
Robert Edwards, Chief, Engineering, Maintenance and Operations, USBR, Tracy

SPECIFIC COMMENTS ON THE DRAFT EIR FOR THE OAKLEY 2020 GENERAL PLAN

The following specific comments are made in the sequence of the document. Recommended additional specific or replacement wording is shown in **bold**.

Table 2-1 Key Public Agencies, pages 2-12 through -14. The second sentence under the United States Fish and Wildlife Service (USFWS) Responsibility may be subject to misinterpretation. Revised language could be: This agency will act as a Responsible Agency pursuant to **the Federal Endangered Species Act (Section 7 or Section 10 permits)** and Migratory Birds Act. A

In the Responsibility for Diablo Water District (DWD), please delete the first sentence. DWD obtains all of its surface water supplies from the Contra Costa Water District (CCWD). B

In the Responsibility for Contra Costa Water District (CCWD), change "City of Oakley" to **Diablo Water District**. C

Chapter 3.0 Environmental Setting, Impacts & Mitigation Measures, Roadway System, Bicycle and Pedestrian System, page 3-29. The last sentence includes the Delta de Anza Regional Trail along the Contra Costa Canal as a multi-use, paved trail "for hikers, horses, and bicycles." Please delete "horses" with reference to this facility, as CCWD does not permit horses in close proximity to its public water supply. D

3.5.1 Environmental Setting Summary, Trails, page 3-66. The Marsh Creek Regional Trail (according to the East Bay Regional Park District Master Plan) shows trail connections to the Los Vaqueros Watershed area and its 55-mile trail system. It may be appropriate to add **and the Los Vaqueros Reservoir and Watershed** at the end of the second sentence under Marsh Creek Regional Trail. E

Open Space Resources, San Joaquin Delta, page 3-68. In the last paragraph, please add a third sentence for information on additional open space resources in the East County area: **CCWD manages approximately 18,000 acres, including trails, fishing access and marina facilities, resource protection areas and an interpretive center at the Los Vaqueros watershed south of Brentwood.** F

3.8 Hydrology and Water Quality, Environmental Setting Summary, Surface Water Resources, page 3-118. The first sentence should be corrected to state that Marsh Creek originates off **Mt. Diablo**, rather than "Marsh Creek Reservoir". G

Under Surface Water Hydrology and Quality, in the second paragraph, 4th sentence, it would be more accurate to use **flows** or **traverses** instead of "drains". H

Water Quality – Diablo Water District, page 3-119. It is not understood why "Diablo Water District" is included in this title since none of the discussion relates to DWD facilities or activities. I

<u>3.8.3 Analysis of Impacts, Discussion and Conclusion, pages 3-123 through –125.</u> In the second full paragraph (page 3-123), first sentence, add **levee** after "Contra Costa Canal". In the third paragraph, first sentence, change "cause damage" to **affect.** J

In the fourth paragraph, first sentence it is stated that the identified policies and programs were designed to "protect the citizens of Oakley from the dangers of flooding." The ensuing list of policies, however, do not appear to be related to flooding, or the actual mitigation of Impact 3.8-A, which is development associated discharges into surface waters, or other alteration of surface water quality. An examination of the bulleted policies indicates they are directly related to water supply or water service issues. In fact, the same listed policies appear once again on pages 3-156 and –157 under <u>3.11.3 Analysis of Impacts</u> for water supplies (where they should be). It would appear that another set of policies was intended to apply to drainage impacts. K

Due to the absence of any existing policy or program relative to identified Impact 3.8-A, either a new set of policies needs to be identified, or mitigation needs to be identified and applied. CCWD is concerned that future development adjacent to and/or in proximity to the Contra Costa Canal could result in additional discharges into the canal that would affect the quality of a municipal water supply. As a result of this concern, CCWD recommended (comment letter dated October 4, 2002 to the City of Oakley on the Draft General Plan) that an additional policy be added to the General Plan. The recommended policy is *4.10.10 Prevent drainage from entering the Contra Costa Canal and protect the canal levee system.* CCWD also recommended two new programs in order to implement the new policy. If CCWD's recommended additional policy 4.10.10 is <u>not</u> added to the General Plan, CCWD hereby requests that the two programs recommended to implement that policy be incorporated as mitigation for EIR Impact 3.8-A. The resulting two implementation measures recommended to mitigate this impact on canal water quality are: L

Mitigation Measure 3.8-A 1. Permanent structures and fill material placed within 1,000 feet of the Contra Costa Canal property shall be adequately designed to prevent seepage to the Canal, and to prevent any effects to the developed property caused by groundwater fluctuations due to water in the Canal. CCWD must be consulted prior to construction activities within 1,000 feet of the Canal property line.

Mitigation Measure 3.8-A 2. Stormwater and sewer drainage cannot be routed to the Contra Costa Canal. Stormwater and sewer pipelines within 1,000 feet of the Canal property line must be designed consistent with CCWD design criteria; detention ponds within 1,000 feet of the Canal property line shall be lined to prevent seepage.

<u>3.9 Biological Resources, Environmental Setting Summary, page 3-131.</u> Under Special Status Plants with a "High Potential" (last paragraph) to occur in the Planning Area, please consider adding **Antioch Dunes Evening Primrose.** This plant species is shown to have an occurrence in the City of Oakley on the "Interim Service Area Listed Species Occurrences and Potential Habitat" map (June 2000) prepared by CCWD and the U.S. Bureau of Reclamation as a requirement contained in a Los Vaqueros Project biological opinion. The occurrence data used M

in the Interim Service Area Map is from the California Department of Fish and Game Natural Diversity Data Base (NDDB).

<u>3.11 Utilities and Service Systems, Water Services, pages 3-152 and –153.</u> In the first paragraph under <u>Water Supply,</u> move the third through fifth sentences into the second paragraph following the third sentence. This information applies strictly to the CCWD/DWD Randall-Bold Treatment Plant agreement. In the last sentence of the first paragraph add the following qualification: **subject to drought or other restriction by the U.S. Bureau of Reclamation.** N

Please change "1997" to **1999** in the first sentence of the first full paragraph on <u>page 3-153.</u> Technically, the quality (and possibly the reliability) of DWD's water supply was improved in 1997 due to diversion of Old River water; however, the Los Vaqueros Reservoir was not placed into service until after it was filled on January 28, 1999. O

The third paragraph discussion on <u>page 3-153</u> needs to be significantly augmented with additional information on the institutional processes and findings necessary in order to extend CVP and Los Vaqueros Project (LVP) water supplies into new areas. CCWD's May 29, 2002 NOP Response requested that this process be explained in the Draft EIR. While the NOP Response (with appropriate attachments) is included in the Appendix, there is no summation or reference in the Draft EIR text to the Appendix in order to facilitate the information CCWD provided. The third paragraph could serve as a convenient introductory into the institutional processes because the areas "in the eastern portion of DWD's sphere of influence" discussed are largely outside CCWD's CVP contractual service area (about seven square miles) and the LVP planning area. In fact, about half of the present city boundaries are outside the CVP service area, including projects that are currently under City review (e.g., Cypress Grove). In addition, some areas (approximately 1,200 acres in three portions of the eastern part of the Planning Area) are also outside the CCWD and DWD service area boundaries. It is noted that all areas currently not serviced in the Planning Area are "anticipated" to "become part of DWD's system with supply from Randall-Bold WTP". It is therefore recommended that additional sentences, or perhaps separate paragraphs, be added following this paragraph, in order to sequentially identify: (1) the local annexation process, and (2) the CVP inclusion process, as follows: P

For water services from the Randall-Bold Treatment Plant to be extended into the entire Planning Area, some areas will need to be annexed into both DWD and CCWD. A common procedure would be a reorganization application submitted by the City to the Contra Costa Local Agency Formation Commission (LAFCO) around the time of development approval. The reorganization would include annexations for the respective service agencies including DWD and CCWD.

In order for CCWD to authorize DWD to extend CVP water supplies into most of these areas (i.e., east of the AT&SF Railroad), the U.S. Bureau of Reclamation must first approve an inclusion application submitted by CCWD. CCWD's annexation regulations require a project proponent to submit environmental and other information along with

required processing fees to CCWD for submission to Reclamation (see Appendix A, CCWD NOP Response). The environmental information must include evidence of compliance with federal laws and regulations, including the Endangered Species Act (ESA). In order to issue a Confirmation Letter to DWD to serve an inclusion applicant, CCWD must also find that the developed project, when combined with buildout in the current service area, will not compromise the water quality and reliability objectives of the Los Vaqueros Project.

3.11.3 Analysis of Impacts, pages 3-154-157. The Discussion and Conclusion does not provide a quantification of project water demands for analytical purposes. Impact 3.11-A recognizes that new development may exceed available supply or distribution capacity to the extent that it is identified as a *Potentially Significant Impact*, but does not provide the empirical evidence to support this statement. The EIR should include a quantified analysis of this project water demand in the context of CCWD's water supply planning, as requested in the NOP Response. Q

GME Program #4.8.A, as stated on page 3-157, provides an excellent opportunity for the City to require new development to demonstrate that it has secured an "adequate water supply". The City's project analysis of an adequate supply should not be confined to DWD's ability to extend treated water services, but should be broad enough to provide assurances that CVP inclusion and LVP services are secured before final subdivision maps or final development plans are approved. *GME Program #4.8.A* should be expanded to incorporate the following language: **The City will send written requests to the water supplier for Water Supply Assessments or Water Supply Verifications, as required under recent Senate Bills 221 and 610.** R

Note that the third and fourth bulleted GME Programs on page 3-157 are identical. One should be deleted. S

Letter 11

DIABLO
WATER
DISTRICT

2107 Main St.
P.O. Box 127
Oakley, CA 94561-0127
925 • 625 • 3798
Fax 925 • 625 • 0814

October 30, 2002

Mr. Barry Hand
City of Oakley
P.O. Box 6
Oakley, CA 94561

Subject: Draft EIR Comments - Oakley 2020 General Plan

Dear Barry:

We have reviewed the Draft EIR for the subject project and have the following comments:

1. Page ES-16, Impact 3.11-A, indicates that the increase in demand from new development may exceed supply (during drought years) or distribution capacity. While it is accurate that demand may exceed supply in drought years, the District's distribution system has been designed to accommodate the demands of new growth for all the project's alternatives. **A**

2. Page 2-14, Local Agency Contra Costa Water District, indicates that CCWD has water treatment agreements with the City of Oakley. CCWD's water treatment contract is with the Diablo Water District. **B**

3. Page 3-153 Interim Intertie with the City of Brentwood. There is only one intertie with the City of Brentwood and it will be in operation until 2007 unless the contract is extended by the District. **C**

4. Page 3-156, third bullet from the bottom. This bullet suggests that water wells shall be abandoned after connection to the District's water supply. I would encourage the City not to adopt such a policy in the General Plan. Even though a residence would be connected to the District's water supply, they could still use their well for outside watering which would reduce the demand on the District's supply and be of benefit to the District's conservation efforts. **D**

5. Page 4-17, Utilities and Services. This section compares average water need with ultimate storage capacity. The section goes on to say that the High Density Alternative would result in the highest water need of all the alternatives but still fall below 50 percent of the ultimate capacity of the provider.

   The reader of the Draft EIR may believe that the District has twice as much water as is needed for the High Density Alternative, which is not the case. I would suggest using language from page 8 of the City's Public Facilities Background Report. There is a discussion in that report with regards to how the District has the ability to serve at build-out given each alternative.

Please let me know if you have any questions regarding our comments.

Sincerely,

Mike Yeraka, P.E.
General Manager

cc: DWD Directors

Letter 12

Community Development Department

County Administration Building
651 Pine Street
4th Floor, North Wing
Martinez, California 94553-0095

Phone:

Contra Costa County

Dennis M. Barry, AICP
Community Development Director

October 30, 2002

Mr. Barry Hand
Community Development Director
City of Oakley
3639 Main Street
Oakley, CA 94561

RECEIVED
NOV 04 2002
CITY OF OAKLEY

Subject: Comments on Draft Environmental Impact Report
Oakley 2020 General Plan

Dear Mr. Hand:

Thank you for sending us the Draft Environmental Impact Report (DEIR) prepared for the proposed Oakley 2020 General Plan.

Staff from the Community Development Department and the Public Works Department have reviewed the document. We offer the following comments regarding the DEIR:

Overall Comments:

1. EIR Documentation Is Lacking and Insufficient A

   It is stated on page ES-2 (ES.2 Summary of Project Impacts and Mitigation) that the proposed Oakley General Plan is "self-mitigating" because the General Plan policies are designed to avoid or minimize environmental impacts. We note that the mitigation measures for all the impacts identified in the document are essentially a listing of various policies and programs proposed in the General Plan. Although CEQA Guidelines (Section 15166) provides for combining the General Plan document with the EIR, it does not relieve the Lead Agency from presenting a meaningful analysis of impacts and mitigation measures in an environmental document. As presently drafted, the document is lacking in this regard because there is little or insufficient documentation about the degree of impact based on the threshold of significance or how the proposed General Plan policies and programs would actually mitigate the impacts.

This lack and/or insufficiency of documentation is perhaps best illustrated in the DEIR's review of traffic impacts. Beginning on page 3-36 and ending on page 3-37, Impact 3.3-A identifies the increase in traffic associated with the General Plan as exceeding Level of Service standards for roadway segments and signalized intersections as potentially significant. The analysis of impacts for Impact 3.3-A includes a summary discussion and conclusion about the traffic impact, a listing of the relevant General Plan policies and programs aimed at mitigating the impact, and a concluding statement that taken together the General Plan policies and programs would reduce this impact to a less than significant level and there is no need for further mitigation measures. B

It has been the custom in this County that at a minimum the EIR traffic analysis for a General Plan, even though it is a program level EIR document, would include the following:

- map of the existing transportation (roadway) network,
- list or map of study intersections (signalized and unsignalized)
- discussion of the traffic analysis methodology,
- tables presenting the peak hour Level of Service for study intersections under existing conditions, conditions for the horizon year, and conditions under the proposed mitigation measures

We were surprised that the DEIR released by the City of Oakley does not include the basic level of documentation needed for a reviewer to understand the degree of traffic impacts today and in the horizon year under the proposed General Plan, and how the proposed mitigation measures based on General Plan policies and programs would reduce the impact to a level of insignificance. The Circulation Element in the proposed General Plan does present some baseline traffic data, which is apparently incorporated by reference to the DEIR. However, CEQA Guidelines Section 15147 advise that "the information contained in an EIR shall include summarized technical data, maps, plot plans, diagrams, and similar relevant information sufficient to permit full assessment of significant environmental impact by reviewing agencies and members of the public". The County is concerned that, as presently drafted, a full assessment of significant environment impacts identified in the EIR is not possible because the documentation is lacking and insufficient. This is particularly the case with the traffic analysis. As it is not possible for the County to discern how the General Plan's traffic impacts would affect roadways that share service to the unincorporated communities of Bethel Island and Knightsen, or how traffic associated with the General Plan would affect key portions of the regional transportation network, State Highway 4 (freeway portion), the State Route 4 Bypass, etc.

The traffic impacts and their mitigation measures are just one example, but the concern with documentation occurs throughout the DEIR. The County urges the City of Oakley to prepare an EIR that documents the degree of impact on the environment based on the thresholds of significance and then establish a more direct analytical link with how the mitigation measure (General Plan policies and programs) would reduce the impact to a less than significant level. C

2. Adequacy of Mitigation Measures

CEQA Guidelines advise that to be considered adequate, mitigation measures should be specific, feasible actions that actually improve adverse environmental conditions. Mitigation measures should be measurable to allow monitoring their implementation. Effective mitigation measures involve clearly explaining its objectives – how it will be implemented, where it will be implemented, when will it be implemented, and who will be responsible to implement. While it is acknowledged that the activity being evaluated in this EIR is a General Plan, and the mitigation measures consist of policies and programs from the General Plan, many of these mitigation measures are not very specific as to how, when, where, and who will implement the measure. In several instances, the mitigation measures are deferred to some unspecified point in the future. D

3. Water Supply Assessment –S.B. 610 and S.B. 221

It is unclear from reviewing the DEIR whether or not the required water supply assessment under the recently adopted Senate Bill 610 has been conducted. As you may be aware, S.B. 610 requires a local jurisdiction to provide substantial evidence that there is a water supply and water delivery system sufficient to approve subsequent residential subdivision maps. The EIR should provide the reviewer with a discussion of how the water supply assessment will provide the basis for making future findings relative to another new law related to water, Senate Bill 221. E

Specific Comments:

4. Cypress Corridor Expansion Area: Impact 3.7-A – Stormwater Drainage Plan

The DEIR under Impact 3.7-A acknowledges that the General Plan, may result in absorption changes, drainage patterns, and the rate of and amount of surface runoff within the Planning Area, including the Cypress Corridor Expansion Area. The Contra Costa Flood Control and Water Conservation District has prepared drainage plans for the current incorporated Oakley city limits, however these plans do not cover the Cypress Corridor Expansion Area (generally east of Jersey Island Road). F

A stormwater drainage plan needs to be developed for the Cypress Corridor prior to considering urban development in this area that would increase the amount of impervious surface. The City of Oakley should consider an additional mitigation measure (and General Plan policy) that the development of an areawide stormwater drainage plan, which identifies a collect and convey and discharge program for specific parcels within the Cypress Corridor Expansion Area, would occur prior to urban development.

5. Page 3-29, 3. Circulation/Transportation, Bicycle and Pedestrian System

   The report states that the City has limited bicycle facilities and calls out three areas with bike lanes. The EIR should include the bike lanes on Cypress Avenue from Rose Avenue to Empire Avenue, the bike lanes on Empire Avenue from Laurel Drive to Oakley Road, and the following bike paths: 1. Marsh Creek Regional Trail that goes from the levee at Big Break to Brentwood, 2. The trail along the Contra Costa Canal from Neroly Road to Cypress Road, and 3. The Big Break Trail complex. The EIR should reference the East Contra Costa Bikeways Plan developed by TRANSPLAN. G

6. Page 3-30, 3. Circulation/Transportation, Rail

   The DEIR states, "there are no grade-separated rail crossings in Oakley." Vintage Road is grade-separated from the railroad. H

7. Page 3-31, 3. Circulation/Transportation, Bicycles and Pedestrian Circulation

   The DEIR states, "...and a capital improvement program to ensure adequate maintenance of bicycle and pedestrian facilities." Capital Improvement Programs typically are for new construction, not for maintenance of existing facilities. I

8. Page 3-32, 3. Circulation/Transportation, Bicycles and Pedestrian Circulation

   The DEIR states, "A map of proposed bicycle lanes and bicycle/pedestrian trails is included in Figure 7-3 in the Parks and Recreational Element." We suggest that the map should also be included in the Circulation Element of the General Plan to show that the City is serious about the use of bicycles as a mode of transportation. If the map is in the Parks and Recreation Element it appears that the City considers bicycling as a recreation and not a mode of transportation. J

9. Page 3-41, under Impact 3.3-C, Sixth bullet

   The mitigation measure/General Plan policy states that the City will work coordinate with the school districts to create a well designed, Routes to Schools map. We suggest that the City of Oakley should be working with the school districts to create Safe Routes to School Plans to facilitate their applications for funding from the Safe Routes to School Grant Program. K

Contra Costa County appreciates the opportunity to review and comment on the Draft EIR for the Oakley 2020 General Plan. We fully appreciate the difficult task of putting together the City's first General Plan. We know how difficult it is to maintain a schedule while balancing the needs and desires of the many stakeholders in the process. So, we hope that you will view these comments as we intend them, constructive and supportive.

Should you have any questions regarding the concerns and comments raised in this letter, please contact me telephone at (925) 335-1242 or by e-mail at proch@cd.co.contra-costa.ca.us.

Sincerely yours,

Patrick Roche

Patrick Roche
Principal Planner
Advance Planning Division

CC: Members, Board of Supervisors
D. Barry, CDD-Director
Chron file

Letter13

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY GRAY DAVIS, Governor

DEPARTMENT OF TRANSPORTATION
P. O. BOX 23660
OAKLAND, CA 94623-0660
(510) 286-4444
(510) 286-4454 TDD

Flex your power!
Be energy efficient!

October 30, 2002

CC-General
CC-000201
SCH2002042134

Mr. Barry Hand
City of Oakley
Community Development Department
3633 Main Street
Oakley, CA 94561

RECEIVED
NOV 13 2002
CITY OF OAKLEY

Dear Mr. Hand:

OAKLEY 2020 GENERAL PLAN - DRAFT ENVIRONMETAL IMPACT REPORT

Thank you for including the California Department of Transportation (Department) in the environmental review process for the Oakley 2020 General Plan Update. The following comments are based on our review of the Draft Environmental Impact Report (DEIR), which is dated September 2002.

California Environmental Quality Act Compliance

Specific project-related traffic impacts are not discussed in the DEIR as required by California Environmental Quality Act (CEQA) Section 15147 which states that project-related traffic impacts and mitigation must be discussed in sufficient detail "…to permit full assessment of significant environmental impacts by reviewing agencies and members of the public." Moreover, CEQA mandates full public disclosure of project impacts, preventing significant impacts through mitigation (CEQA Section 15002 (1) (2) (3) (4)), and that the review period allow adequate time for public review and comment on DEIRs (Section 15203). A

By transmittal dated May 29, 2002 (enclosed), the Department requested a detailed traffic study including project-related level of service (LOS) impacts to state roadway facilities. The Preliminary Draft Report for the Long-Range Circulation Plan which is dated June 19, 2000 was faxed to our office on October 23, 2002, more than a month after the September 16, 2002 commencement of the review period. The Preliminary Draft Circulation Plan is currently being reviewed by Departmental staff; however, since this information was received late, our ability to assess project impacts to state roadways has been severely limited. Therefore, we request a time extension of one month from the date we received the information, which would be November 23, to allow for the lawful period of project review required by CEQA Section 15105 (a) which states, "The public review period for a draft EIR should not be less than 30 days…". B

Traffic

1. The study area should include intersections and mainline roadway segments along State Route 160 as well as State Route 4. Please see the Department's *"Guide for the Preparation of Traffic Impact Studies"* at the following website for more information: http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/reports/tisguide.pdf C

2. The Association of Bay Area Government's (ABAG) Projection 2002 data set should be used for the long range (2025) land use, population and employment projections rather than the data extrapolated from ABAG's 1998 data set of year 2020 projections. ABAG's Projection 2002 data set contains year 2025 projection data that is more appropriate for the East County Model. D

3. Future improvement projects along the State Route 4 corridor, including those listed below, should be included in the analysis. E
   - Loveridge Interchange reconstruction, and
   - Widening the eastbound onramp and new auxiliary lane at Hillcrest Avenue.

4. Specific mitigation measures for project impacts must be identified, as well as financing, scheduling, implementation responsibilities and lead agency monitoring. The project's fair share contribution towards project impact mitigation should also be identified. Additional comments will be forthcoming pending final staff review of the Preliminary Draft Circulation Plan. F

Local Agency Authority

The State Route 4 Bypass Authority should be listed as a key public agency in Table 2-1 on Page 2-13. G

Please send two copies of the Traffic Study, including Technical Appendices, to the address below.

Patricia Maurice, Associate Transportation Planner
Transportation Planning B, Mail Station 6F
California DOT, District 4
111 Grand Avenue
Oakland, CA 94612-3717

If you have any questions regarding this letter, please feel free to call or email Patricia Maurice of my staff at (510) 622-1644 or patricia_maurice@dot.ca.gov at any time.

Sincerely,

Timothy C. Sable

TIMOTHY C. SABLE
District Branch Chief
IGR/CEQA

c: Gregoria Garcia (State Clearinghouse)

DEPARTMENT OF TRANSPORTATION
P. O. BOX 23660
OAKLAND, CA 94623-0660
(510) 286-4444
(510) 286-4454 TDD

Flex your power!
Be energy efficient!

May 29, 2002

CC-General
CC000201
SCH# 2002042134

Mr. Barry Hand
City of Oakley
Community Development
3633 Main Street
Oakley, CA 94561

Dear Mr. Hand:

Oakley 2020 General Plan – Notice of Preparation for a Draft Environmental Impact Report

Thank you for including the California Department of Transportation in the environmental review process for the above-referenced project. We have reviewed the Notice of Preparation (NOP) for a Draft Environmental Impact Report (DEIR), and offer the following comments:

We recommend that a Traffic Impact Study be prepared. Please include the following information in the study:

a. Information on the project's traffic impacts in terms of trip generation, distribution, and assignment. The assumptions and methodologies used in compiling this information should be addressed.

b. Average Daily Traffic and AM and PM peak hour volumes on all significantly affected streets and highways, including crossroads and controlling intersections.

c. Schematic illustration of the traffic conditions for: 1) existing, 2) existing plus project, and 3) cumulative for the intersections in the project area.

d. Calculation of cumulative traffic volumes should consider all traffic-generating developments, both existing and future, that would affect the facilities being evaluated.

e. Mitigation measures that consider highway and non-highway improvements and services. Special attention should be given to the development of alternative solutions to circulation problems which do not rely on increased highway construction.

f. All mitigation measures proposed should be fully discussed, including financing, scheduling, implementation responsibilities, and lead agency monitoring.

We have reviewed the NOP, and look forward to reviewing the DEIR for this project. We do expect to receive a copy from the State Clearinghouse, but in order to expedite our review, you may send two copies in advance to:

Rick Kuo
Office of Transportation Planning B
Department of Transportation, District 4
P.O. Box 23660
Oakland, CA 94623-0660

Should you require further information or have any questions regarding this letter, please call Rick Kuo, of my staff at (510) 286-5988.

Sincerely,

Jean CR Finney

JEAN C. R. FINNEY
District Branch Chief
IGR/CEQA

c: Katie Shulte Joung (State Clearinghouse)

RECLAMATION DISTRICT #799
Hotchkiss Tract

Board of Trustees: Robert D. Gromm, David A. Dal Porto, Kenneth Carver, Joseph S. Spotts, Lloyd F. Pereria
Office: 2070 Dutch Slough Road, Oakley, CA 94561
Mail: P. O. Box 547, Bethel Island, CA 94511
Telephone: 925-684-2117 FAX: 925-684-9610

October 30, 2002

City of Oakley

Via Fax to 625-9194

RE: Comments to DEIR re Expansion of the City's Boundary

Reclamation District #799 was not notified of the DEIR and requests a copy and additional time to comment. A

Reclamation District #799 is a special district that is responsible for the maintenance of the levee and drainage system on Hotchkiss Tract. It is our understanding that the DEIR discusses the inclusion of some or all of Hotchkiss Tract into the city's boundary. B

It is also our understanding that the DEIR does not discuss the jurisdiction or responsibilities of RD #799. Because most of the tract is below sea level, the District's roll in providing flood protection and drainage is a critical function. C

Please contact Robert Gromm, Chairman, at 684-2117 for further information.

Yours truly,

Robert D. Gromm, Secty/Chrmn

Letter 15

MORRISON & FOERSTER LLP

SAN FRANCISCO
LOS ANGELES
DENVER
PALO ALTO
WALNUT CREEK
SACRAMENTO
CENTURY CITY
ORANGE COUNTY
SAN DIEGO

ATTORNEYS AT LAW

PLEASE RESPOND TO:
P.O. BOX 8130
WALNUT CREEK, CALIFORNIA 94596-8130

101 YGNACIO VALLEY ROAD, SUITE 450
WALNUT CREEK, CALIFORNIA 94596-4095
TELEPHONE (925) 295-3300
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SINGAPORE
TOKYO

October 30, 2002

Writer's Direct Contact
(925) 295-3310
dgold@mofo.com

RECEIVED
OCT 30 2002
CITY OF OAKLEY

By Messenger

Barry Hand
Community Development Director
City of Oakley
3633 Main Street
Oakley, CA 94561-5779

Re: Oakley Draft 2020 General Plan and DEIR

Dear Barry:

This comment letter is written on behalf of our clients, the Burroughs and Emerson families, with respect to their portions of the approximately 1,500 acre properties referred to in this letter as "Cypress Corridor." Although the other Cypress Corridor landowner, the Mark E. Gilbert Administrative Trust, is not our client, this letter has been reviewed by Brent Gilbert and his consultants and the Trust joins the comments provided.

We appreciate the great efforts the City has undertaken to prepare its initial General Plan and the CEQA document supporting this effort. We congratulate the City on nearing the finish line of this major post-Oakley incorporation planning effort. We are eager to cooperate with the City to ensure that the new General Plan accurately identifies the setting, impacts and studies available concerning Cypress Corridor and tracks with the September 23, 2002 Memorandum of Understanding entered into between the City and the Cypress Corridor landowners (the "MOU"). We appreciate that the analysis and planning of Cypress Corridor is somewhat complicated by the existing Development Agreements vesting the master planned Mixed Use M-8 General Plan designations involving the entire Cypress Corridor and by the pending nature of the CALFED transactions involving the sale of substantially all of the property north of the Contra Costa Canal for the Dutch Slough Restoration Project.

wc-74900

Although the CALFED transaction has recently received key approvals, the transaction has not been finalized and we want to ensure that the DEIR and General Plan accurately reflects the existing physical constraints on the property, based upon the extensive biological, geotechnical, infrastructure and other studies generated on the entire Cypress Corridor property. It is critical that the DEIR accurately describes the existing constraints based upon the available information which has been made available to the City and does not confuse this baseline information with the vision presented by the pending Dutch Slough Restoration Project.

We have organized our comments according to issue topic. References to the Oakley General Plan Draft Environmental Impact Report are labeled "DEIR" and references to the General Plan Update are labeled "GPU," both followed by the relevant page number. Our comments are as follows:

Global Issues

Cypress Corridor Studies: The property owners of Cypress Corridor have prepared the attached biological, geotechnical, and infrastructure studies and the attached wetland delineations related to Cypress Corridor. We request that these documents be included in the DEIR and specifically referenced as documents considered by the Final EIR. Section 2.B of the MOU provides that the City will include these studies in the EIR "to minimize, to the extent possible, the environmental analysis necessary for the development of the Southern Property [South Canal Land, as defined below]." **A**

Definition of Dutch Slough: We are concerned with the General Plan language that alternately defines Dutch Slough as (1) the actual slough waterways, and (2) the entire Cypress Corridor. We request that the GPU and DEIR be clarified such that term "Dutch Slough" refers only to the actual slough waterways and not to any surrounding land. We suggest that the 1,257 acre portion of Cypress Corridor north of the Contra Costa Canal be referred to as the "Northern Canal Land," the 307 acre portion of Cypress Corridor south of the Contra Costa Canal and north of Cypress Road be referred to as the "South Canal Land," and the remaining portion of the "Cypress Corridor Planning Area" south of Cypress Road be referred to as the "South Cypress Land." We respectfully request that the DEIR and GPU assumption (see e.g., DEIR Page 3-68, GPU Page 2-21) that Cypress Corridor is currently an open space resource of the City be corrected to reflect the existing urban Development Agreement M-8 General Plan designation. **B**

Cypress Corridor Acreage: We are concerned that the DEIR and the GPU do not reflect the correct acreage of Cypress Corridor (see DEIR Pages 3-4 though 3-5, GPU

Page 2-21). We request that that these documents be corrected to show that Cypress Corridor *north* of the Contra Costa Canal contains 1,257 acres +/- and Cypress Corridor *south* of the Contra Costa Canal contains 307 acres +/-, as reflected in the most current surveys prepared by Carlson, Barbee, and Gibson. Please revise the third paragraph in the Cypress Corridor Planning Area - Description (see GPU Page 2-21) as follows: **C**

> The Cypress Corridor Planning Area includes the North Canal Land, the South Canal Land and the South Cypress Land (the North Canal Land and the South Canal Land are subject to existing Development Agreements with Contra Costa County dated January 13, 1997 for urban mixed-use (M8) master-planned development covering both the North Canal Land and the South Canal Land). At the time of adoption of this General Plan, the City of Oakley had entered into a Memorandum of Understanding dated September 23, 2002, with the three landowners of the North Canal Land and the South Canal Land which contemplates possible CALFED funding for the acquisition of the North Canal Land for the creation of an eco-system restoration project referred to as the "Dutch Slough Restoration Project."

MOU: The City should also be concerned that the DEIR accurately identifies the development constraints related to the Cypress Corridor. The MOU contemplates numerous future City related amenities and improvements north of the Contra Costa Canal and the dedication of 27 acres south of the canal to the City. (We refer the EIR consultant to Sections 1-6 of the MOU in particular.) Also, please confirm that the first and second bullets in Section 3 of the MOU, (i.e., 1,200 units on 271 acres at a density of 4.2-4.4 per gross acre and commercial development on 10-15 acres of the Cypress Corridor property, excluding the acres to be dedicated to the City), are consistent with the densities and units contemplated by the draft General Plan. We call to the attention of City Staff and the City's consultants that the City Council approved MOU (Section 2A) conditions cash payments to City on whether the new General Plan meets these use and density terms for the South Canal Land. **D**

We request that the DEIR and the GPU reference the recently approved MOU concerning the proposed CALFED restoration project. We also request the DEIR and GPU clearly indicate that if the restoration project is not finalized, Cypress Corridor may be planned consistent with its existing Development Agreement or re-evaluated for future development potential as analyzed under the DEIR High-Density and No Project Alternatives. **E**

Biological Issues

In general, we are concerned that both the DEIR and the GPU inadvertently portray Cypress Corridor as currently valuable wildlife habitat. Cypress Corridor property owners have commissioned the *Biological Assessment of the Emerson & Burroughs Properties*, dated January 4, 1999 (the "Biological Assessment"), prepared by Sycamore Associates ("Sycamore"), which has been previously provided to the City and is attached as Exhibit A. The Biological Assessment indicates that Cypress Corridor consists predominately of disturbed lands from which the naturally-occurring vegetation has been entirely removed by grading, filling, draining, irrigating and grazing. The Biological Assessment also indicates that no state or federally-listed Endangered, Threatened, Candidate species or species proposed for listing are considered to have a moderate or high potential to occur on Cypress Corridor. We request that the following references, to the extent they affect Cypress Corridor, be clarified to reflect the findings of the Biological Assessment: F

DEIR Page 3-69/GPU Pages 2-17, 6-9 describe the "Delta Recreation (DR)" land use designation and state that the most appropriate uses for such land include wildlife preservation. Should the Dutch Slough Restoration Project not be finalized, the DR designation may not be appropriate since there is limited existing wildlife on the North Canal land.

DEIR Pages 3-130 indicates that "Irrigated Pasture Land" is home to "weedy species tolerant of year round wet conditions" and support "foraging habitat for numerous avian and small mammal species."

DEIR Page 3-131 indicates that Cypress Corridor waterways are associated with riparian habitat that supports various wildlife species.

DEIR Pages 3-137 through 3-138 expand on the discussion of Irrigated Pasture lands and sloughs as suitable habitat for protected species.

DEIR Page 4-15 indicates that, under the No Project Alternative, Cypress Corridor would be developed north of the canal and, therefore, threaten potential "sensitive habitat."

DEIR Page 5-12 indicates that Cypress Corridor is "likely protected" by the California Fish and Game Code and "is considered sensitive habitat by CDFG."

GPU Pages 6-17 through 6-19 indicate that Cypress Corridor contains a waterway of Oakley and that riparian vegetation is associated with this land. These pages also state that "numerous resident and migratory wildlife species utilize open water canal habitats for foraging and shelter opportunities" and list several species that may occur in this area.

GPU Figure 6-2 indicates that Cypress Corridor is in an area of "medium biological sensitivity."

GPU Page 6-27 contains a significant description of Cypress Corridor and the proposed restoration project. We are concerned, however, with several references to the assumed wildlife habitat value of Cypress Corridor in its existing condition.

Wetland Delineations

The DEIR, at pages 3-133 and 3-137, suggests that no formal wetland delineations have been prepared for Cypress Corridor. In fact, Sycamore prepared the *Preliminary Wetlands Delineation of Jurisdictional Determination of the Emerson and Burroughs Properties*, dated December 7, 1998, and the U.S. Army Corps of Engineers has produced the *Wetlands Verification Letter of 43.2 Acres for Emerson & Burroughs Properties*, dated December 30, 1998. Both of these documents have previously been transmitted to the City and are attached as Exhibits B and C. We request that the DEIR and GPU be clarified to reflect these documents and their conclusions. G

Agricultural Issues

We are concerned that the DEIR and GPU both inadvertently depict Cypress Corridor as viable agricultural land, the development of which will deplete the City's supply of this resource. We request that the DEIR and GPU both reflect that Cypress Corridor has been fully entitled for development of a mixed use, master planned community for at least a decade, that the County in its 1990-91 General Plan FEIR determined that Cypress Corridor is not prime agricultural land, and that Cypress Corridor is not suitable for high-production agricultural purposes, as reflected in the Biological Assessment. Furthermore, we note that in 1991, as part of its General Plan Update, the County analyzed the impacts that development of Cypress Corridor would have on state agricultural lands and determined that such impacts were less than significant. Only a small portion of Cypress Corridor has been used for dairy purposes, and it is anticipated that the dairy operations will cease operations in the near future. We request that the following passages, to the extent they affect Cypress Corridor, be clarified to indicate that Cypress Corridor is not a viable agricultural resource: H

DEIR Pages 3-68 though 3-69 and GPU Page 6-9 indicate that agricultural uses are appropriate within the Delta Recreation designation, including Cypress Corridor.

DEIR Pages 3-130 through 3-131 and GPU Pages 6-1, 6-9 indicate that agricultural uses are appropriate within lands considered irrigated pasture, including Cypress Corridor.

DEIR Page 3-145 and GPU Page 6-26 mistakenly describe the Emerson and former Burroughs dairies as "farmsteads", thus suggesting they are situated on prime agricultural land.

Geotechnical Issues

We are concerned that the DEIR and GPU inaccurately depicts Cypress Corridor as overly flood prone and susceptible to significant earthquake damage. We are similarly concerned with statements in the DEIR and GPU suggesting that the levees surrounding Cypress Corridor cannot adequately protect the public from natural disasters as they exist or as they may be fortified in the future. Specifically, we are concerned with the following passages:

DEIR Page 3-69 describes the GPUs "Delta Recreation" land use designation and states that part of Cypress Corridor lies within the 100-year flood plain.

DEIR Pages 3-99, 3-105, and 5-8 indicate that most of the Cypress Corridor planning area, including Cypress Corridor, lies within the 100-year flood plain.

DEIR Page 4-13 indicates that buildout of the Project Alternative "preserves much of the land in flood-prone areas" including Cypress Corridor.

DEIR Pages 4-18 and 4-19 indicate that Cypress Corridor is "susceptible to high [earthquake] damage."

GPU Policy 4.10.3 refers to the "unique flooding constraints" of Cypress Corridor.

GPU Figure 8-1 indicates that the entire Cypress Corridor is susceptible to "high [earthquake] damage."

GPU Figure 8-2 indicates that a majority of Cypress Corridor is located in an area of "generally high" liquefaction potential.

GPU Figure 8-3 indicates that the entire Cypress Corridor north of the Contra Costa Canal is within the 100-year flood plain.

We request that these passages be clarified to reflect the determinations of the *Preliminary Geotechnical Reconnaissance*, dated January 4, 1999, and the *Preliminary Geotechnical Investigation*, dated April 26, 1999, prepared by Engeo Incorporated. These studies were previously made available to the City and are attached as Exhibits D and E. We also request that the DEIR and GPU indicate that these Engeo studies have determined that flood and earthquake hazards at Cypress Corridor are minimal and that existing levees can be reconstructed (or new levees constructed) in a manner that will adequately protect future development from flooding.

Natural Gas Wells

DEIR Page 3-101 and GPU Figure 8-4 indicate that several "active" oil and/or gas wells currently exist at Cypress Corridor. It is our understanding that of the eleven natural gas wells on or near Cypress Corridor, only one gas well remains active. Furthermore, there are no "oil" wells at Cypress Corridor. The current status of these wells should be clarified in the DEIR. J

General Land Use Issues

DEIR Page 3-10 indicates that the General Plan Update anticipates a residential buildout potential that accommodates 6,500 persons less than the buildout potential of the same planning area under the Contra Costa County General Plan. We request clarification of whether this numerical difference is due to the City's assumption that M8 will not be developed on the North Canal Land. K

DEIR Page 3-123 indicates that "[a]ll development planned near the unlined portions of the [Contra Costa] Canal will be residential, either single-family or multi-family" in order to mitigate potential impacts of development to local water supplies. We request verification that this mitigation measure does not apply to Cypress Corridor South Canal land and that commercial development will also be permitted near unlined portions of the Canal with adequate mitigation. L

DEIR Pages 4-2 through 4-4 describe the various project alternatives analyzed by the DEIR. The existing County entitlements for Cypress Corridor appear to be analyzed under both the No Project and High-Density Alternatives considered by the DEIR. We request that the DEIR clearly indicate in these Alternatives that Cypress Corridor is the subject of existing Development Agreements with Contra Costa County. M

GPU Figure 2-2; GPU Pages 2-21,22 designates specific land uses within the 307 acre South Canal Land. We agree with the statement at GPU Page 2-12 that the location of land use designations on the Land Use Diagram are approximate and that the generalized depiction of the planning area will require some flexibility when interpreting the plan. We request limited flexibility assure that future general plan amendments will not necessarily be required within the 307 acre South Canal land, provided the development intensity contemplated by the MOU is not exceeded (specifically, a density of 1,200 units on the westernmost 271 acres of the South Canal Land at an overall residential density of 4.2-4.4 dwelling units per acre and 10-15 acres of commercial development). In the first paragraph of the GPUs "Development Vision" Section pertaining to the "Cypress Corridor Planning Area" (see GPU Page 2-21), we request the following insert: N

> Given that there are six (6) distinct land use designations within the 307 acre South Canal Land, it should be noted that the locations identified on Figure 2-2 are illustrative of one potential land use plan consistent with this General Plan. Future development proposals covering the South Canal Land may significantly vary from the illustrative land use pattern identified on Figure 2-2 without the need to amend this Land Use Element, provided (i) the land use density and intensity of use does not exceed the aggregate levels contemplated by Figure 2-2 and (ii) the intersection of East Cypress Road and Sellers Avenue substantially complies with this higher intensity development vision.

GPU Page 2-21: In the third paragraph of the Cypress Corridor Planning Area - Constraints Section, we request that the following be inserted: O

> The reader of this General Plan should be directed to inquire about the status of existing Development Agreement dated January 13, 1997 entered into between Contra Costa County covering the mixed-use (M8) master planned development of the North Canal Land and the South Canal Land, as well as the status of the Dutch Slough Restoration Project which was pending at the time of adoption of this General Plan.

GPU Policy 2.3.13 states that City will "[r]equire that all commercial developments construct, and dedicate land to the City, *and* pay impact fees and other fees that represent their respective fair shares of necessary public services and facilities." Consistent with State law, we request that that this policy be redrafted to require "...all commercial developments construct and dedicate land to the City, *or* pay impact fees....." P

GPU Page 2-21 describes various "constraints" on development in the Cypress Corridor Planning Area including inadequate circulation access, undersized water delivery and wastewater collection lines, the need for pump stations, and uncertified existing levees. We have submitted to the City the *Preliminary Traffic Analysis for* Q

Potential Development in the Oakley Cypress Road Corridor, dated March 1999, prepared by George Nickelson Associates, and attached as Exhibit F. We request that this study be included in the DEIR. Furthermore, we request that the DEIR clearly indicate that Cypress Road is planned as a four lane arterial and that Sellers Avenue provides access to the south. We also request that the DEIR indicate that plans are in place for the construction of a 24" force main under Cypress Road, a portion of which is already in place. The DEIR should also indicate that the Diablo Water Master Plan identifies necessary water main improvements that will be constructed concurrent with development of Cypress Corridor. Finally, we note that uncertified levees do not affect Cypress Corridor if such structures behind the levees are brought above elevation seven.

GPU Program 5.1.L indicates that the Cypress Corridor Planning Area is not targeted for "economic development". Please indicate whether this is a reference to redevelopment. R

GPU Figure 7-1 and Figure 7-2 indicate that a 100 acre community park is proposed *south* of the Contra Costa Canal at Cypress Corridor. We request that these figures be amended to reflect the terms of the MOU and show that an approximately fifty (50) acre community park is planned *north* of the Contra Costa Canal. S

GPU Figure 7-3 indicates various existing and proposed trails at Cypress Corridor and a trial staging area north of the Contra Costa Canal. We recommend revising this figure to reflect the terms of the MOU. T

GPU Page 7-35 notes Dutch Slough water opportunities and a proposed 100 acre park at Cypress Corridor. We request that this description also include a reference to the MOU. U

GPU Page 4-23 states that "[d]evelopment in the Cypress Corridor will require the installation of a new and larger [wastewater] main from Bethel Island Road west to the treatment plant." Although we agree with this statement, we request that the DEIR note that the size and alignment of this main have been determined by the Iron Horse Sanitary District and that construction will commence concurrent with development of Cypress Corridor. V

GPU Page 4-24 states that "[t]he Cypress Corridor Area and the Cypress Corridor Expansion Area currently have limited drainage infrastructure and little planning has been undertaken to consider the drainage requirements for future development." We request that this discussion be amplified with respect to Cypress Corridor so that it notes that necessary planning will take place concurrent with development applications and that projects will be required to adequately protect new residences from flooding and collect and convey normal drainage within the project. W

Miscellaneous Issues

DEIR Page 3-72 discusses how growth may impact availability of open space in the City's planning area and describes the CALFED project, M8, and the existing development agreement for Cypress Corridor. We request that the DEIR indicate that City's removal of existing urban land use designations was done subject to the existing Cypress Corridor Development Agreements and in contemplation of the pending CALFED funded acquisition for the Dutch Slough Restoration Plan. X

Conclusion

We appreciate the opportunity to comment on both the DEIR and the draft Oakley General Plan. Last night I provided a summary of these requests to the Planning Commission. Although many of these requests are technical in nature, given the concerns raised, we would appreciate the opportunity to meet with City Staff and the GPU and EIR consultants in advance of the upcoming City Council hearings. Please let me know if there is a day next week when we could set a teleconference or meet to address these issues.

Very truly yours,

David

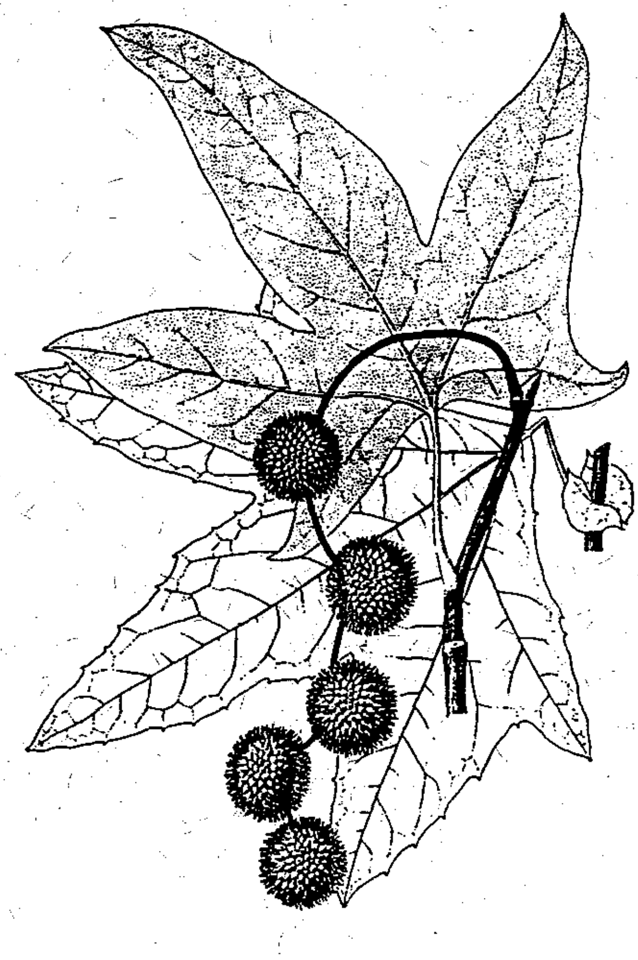
David A. Gold

Attachments

cc: Libby Silver, City Attorney (w/o Att.)
Mike Oliver, City Manager (w/o Att.)
Nancy Ortenblad, City Clerk (w/o Att.)
Robert Burroughs (w/o Att.)
Stan Emerson (w/o Att.)
Brent Gilbert (w/o Att.)
Rick Gilmore (w/o Att.)
Mark Burrell (w/o Att.)
Soapy Tompkins (w/o Att.)

EXHIBIT A

BIOLOGICAL ASSESSMENT OF THE EMERSON AND BURROUGHS PROPERTIES, OAKLEY, CONTRA COSTA COUNTY, CALIFORNIA



January 4, 1999

Prepared for:

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SUMMARY

This report presents a summary of existing and potentially-occurring biological resources on two parcels just east of the City of Oakley, in northeastern Contra Costa County, California. Sycamore Associates LLC was contracted to conduct a reconnaissance-level site survey and to evaluate the potential for occurrence of special-status plant and animal species and natural communities on the property. Focused special-status plant or animal surveys were not conducted as part of this effort. This report presents the findings of our literature review and field work, an analysis of potential biological and permitting constraints, recommendations for additional studies of the site and a discussion of opportunities for future land use.

The two parcels considered as part of this study are the Emerson and Burroughs properties, occupying 613 acres and 490 acres respectively. The study area consists of low-lying, relatively level land situated just east of the City of Oakley in northeastern Contra Costa County. Current land uses include a commercial dairy, pasture for dairy cows and beef cattle, cultivation for livestock fodder, and rural residential. Both properties are dissected by a complex series of drainage and irrigation ditches and canals, and the Contra Costa Canal crosses the southern portion of the study area. The site is surrounded by extensive open lands with farms and scattered residences. Adjacent land uses consist primarily of agricultural activities, including farming and livestock grazing. The nearby waters of Big Break and Dutch Slough are popular recreational areas used for fishing, boating, water skiing and other activities.

The study area consists predominantly of disturbed lands at or below sea level from which the naturally-occurring vegetation has been entirely removed by grading, filling, cultivation, draining, irrigating and livestock grazing. Both parcels were diked and drained and have been continuously farmed since the mid-1800s. Cultivated fields and ruderal vegetation represent the dominant habitats. In low-lying areas or on fallow sites, patches of such native plant communities as valley freshwater marsh, alkali meadow, Great Valley willow scrub, Great Valley mixed riparian forest and inland dunes are present, representing either remnants of the original vegetation or sites on which native species have become reestablished. Although regularly maintained, many of the drainage ditches and irrigation canals support freshwater marsh vegetation.

Based on a review of special-status plant species in Contra Costa County, a total of 44 special-status plant species are known to occur in similar habitats in the project region. Ten special-status plant species are considered to have a moderate potential for occurrence within the study area based on the presence of marginally suitable habitat. The remaining 35 target species are considered to have a low or no potential for occurrence on site due to the fact that no suitable habitat is present.

A total of 63 special-status animal species are known to occur in the project region. Eight of these target species are considered to have a high potential to breed or forage within the study area. Another 12 species are considered to have a moderate potential for occurrence on site and 43 special-status species have a low potential for occurrence of site. The remaining six target species are not considered to have any potential for occurrence on site due to lack of suitable habitat. Ten special-status fish species also have some potential to occur in the sloughs and creeks surrounding the study area.

Based on recent agency comments on development projects in the vicinity, the following biological resources are those most likely to be raised as issues of concern during the environmental review process:

1. Based on this reconnaissance-level assessment, the study area supports at least five special-status natural communities and/or jurisdictional habitats. These include valley freshwater marsh, Great Valley willow scrub, Great Valley mixed riparian forest, alkali meadow and open water. Impacts to wetlands and all open water bodies would fall under the jurisdiction of the Army Corps of Engineers (ACOE). Permits by the ACOE, Regional Water Quality Control Board (RWQCB) and California Department of Fish and Game (CDFG) might be required. A formal wetland delineation and jurisdictional determination was verified by the ACOE in 1998. The verified delineation is valid for a period of five years. Once a project plan has been developed, impacts to wetlands can be calculated and permitting needs and mitigation requirements can then be evaluated.

2. Ten special-status plant species are considered to have a moderate potential for occurrence within the study area. A series of focused botanical surveys pursuant to California Environmental Quality Act (CEQA) will be required prior to beginning any major development. Recommended survey seasons are April, mid-May and mid-August.

3. Four special-status reptiles may occur within the study area, including the federally-listed Endangered giant garter snake, and the California Species of Special Concern silvery legless lizard, California horned lizard, and western pond turtle. Based on existing habitats and the distribution of these species in the region, a habitat assessment should be performed by a qualified herpetologist. Consultation with USFWS may be required to assess impacts and/or identify the need for further studies. Preconstruction surveys for western pond turtles are recommended prior to any impacts to drainage channels or perennial marsh habitats.

4. Three special-status amphibians are considered to have a low potential to occur within the study area. The potential for occurrence of federally-listed Threatened California red-legged frog, and the California Species of Special Concern California tiger salamander and western spadefoot is considered to be low due to a lack of suitable habitat and/or distance from known populations. However, consultation with the CDFG and United States Fish and Wildlife Service (USFWS) would be prudent to ascertain their level of concern regarding these species at this location.

5. Eighteen special-status bird species have a moderate to high potential for occurrence within the project area. Eight of these were detected within the project area, three of which (the California fully protected species white tailed kite, and the California Species of Special Concern loggerhead shrike and northern harrier) are considered to have a moderate to high potential to nest within the study area. Five other special-status birds, (the California Species of Special Concern double crested cormorant and long-billed curlew, and migratory birds great egret, red-tailed hawk and reed-shouldered hawk) were detected foraging within the study area or immediately adjacent. Although no breeding habitat is present within the study area for the state-listed Threatened California black rail, it could occur in tidal salt marsh in the vicinity. A preconstruction survey for California black rail might be warranted. Preconstruction nesting surveys for these and other special-status birds will be important prior to the initiation of any land use changes.

6. Due to the presence of suitable nesting habitat and the presence of the species in the vicinity, preconstruction surveys for the California Species of Special Concern burrowing owl should be conducted no more than 30 days prior to the initiation of any land clearing activities.

7. Six special-status bat species have the potential to occur within the study area. A survey of potential roosting sites is warranted to identify areas to be avoided or mitigated for if altered or disturbed.

8. A total of 15 special-status invertebrate species have been recorded from the region and marginally suitable habitat is present within the study area. Because the habitat requirements of many of these species are not well documented, a separate evaluation by a qualified entomologist is recommended.

9. An assessment of fisheries resources would be required for any proposed activities that would alter slough configuration or depth or affect water quality of any tidally influenced habitats.

10. The rich biotic resources of the region and the project site present numerous opportunities to preserve, protect and enhance the wetland and wildlife habitat.

1.0 INTRODUCTION

1.1 Background and Objectives

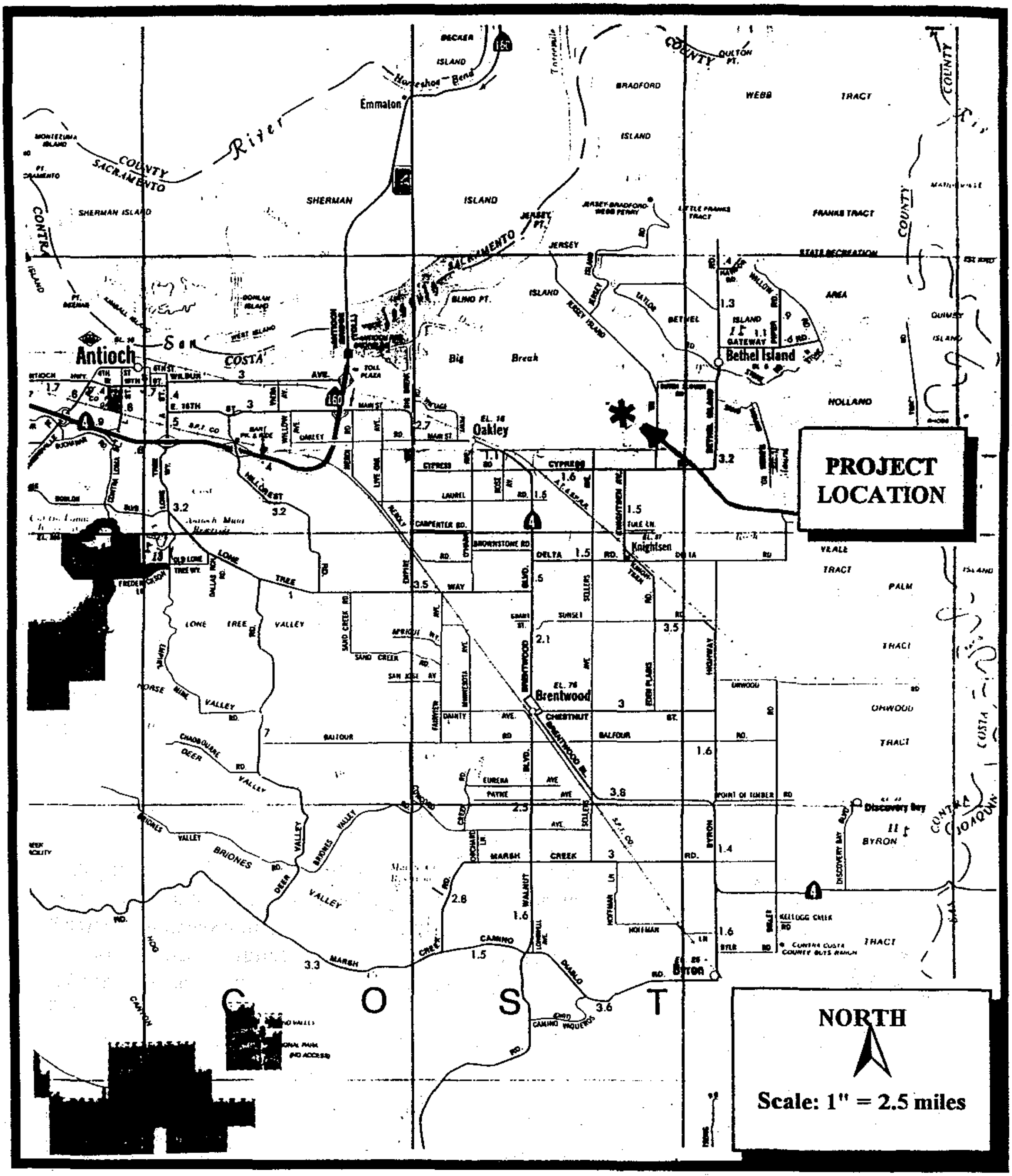
This report presents a summary of existing and potentially-occurring biological resources on two parcels just east of the City of Oakley, in northeastern Contra Costa County, California. The two parcels considered as part of this study occupy 613 acres (Emerson) and 490 acres (Burroughs). This report is intended to provide background and site-specific information pertaining to biological resources, serving as a checklist of potential constraints and opportunities for future land use. It includes a discussion of the existing plant communities, potentially-occurring special-status biological resources, biological and permitting constraints, anticipated surveys needed to fulfill environmental review requirements for any development of the site, and opportunities available to maximize the scenic, biological, and recreational values of the property.

1.2 Methods and Limitations

Analysis of the 1,103-acre study area was based on a review of the literature and data bases, review of existing environmental documentation prepared for nearby lands, review of recent and historical aerial photographs, reconnaissance-level surveys by botanists and wildlife biologists, a formal wetlands delineation, and review of relevant city, county, state and federal environmental legislation and policies.

Surveys were conducted by Sycamore biologists during October and November, 1998. The reconnaissance-level site visits were intended only to provide an initial evaluation of habitat types within the study area. Surveys were conducted on foot and by car during daylight hours only; the entire perimeter of the study area and all fields and habitats were surveyed. Dominant plant species for each plant community were recorded, as were drainages, creeks and potential wetlands. All wildlife species observed were also recorded. Focused special-status plant or animal surveys were not conducted as part of this effort. A formal wetlands delineation and jurisdictional determination was performed and submitted to the U.S. Army Corps of Engineers (ACOE) for verification. Wetlands are described in a separate report (Sycamore Associates 1998d). A complete inventory of plant and animal species is not included as part of this effort. The description of existing biological conditions included in this report is preliminary only and is not based on sufficient site analysis of meet California Environmental Quality Act (CEQA) or California Department of Fish and Game's guidelines for assessing potential impacts to special-status biological resources (CDFG 1984).

A literature review was conducted to gather information on vegetation and wildlife use in the project vicinity..Previous studies reviewed include biological reports prepared for a parcel one mile to the east of the study area (Sycamore Associates 1998a, b, c).



SYCAMORE ASSOCIATES L.L.C.

Regional Location of Study Area

FIGURE 1

Other documents reviewed include the *Contra Costa County General Plan* (Contra Costa County 1991). Information on special-status plant and animal species was compiled through a review of the California Native Plant Society's (CNPS) *Electronic Inventory* (Skinner and Pavlik 1997), the CDFG's *Special Plants List* (CDFG 1998c) and *Special Animals List* (CDFG 1998a), *State and Federally Listed Endangered, Threatened, and Rare Plants of California* (CDFG 1998d), *State and Federally Listed Endangered and Threatened Animals of California* (CDFG 1998b), the U.S. Fish and Wildlife Service's *Endangered and Threatened Wildlife and Plants* (USFWS 1995), *Endangered and Threatened Plant and Animal Taxa; Proposed Rule* (USFWS 1996), *Status of Rare, Threatened and Endangered Vascular Plants in Alameda and Contra Costa Counties (and Some Adjacent Areas)* (Olson 1994), and *Unusual and Significant Plants of Alameda and Contra Costa Counties* (Lake 1995).

Nomenclature used in this report conforms to Hickman (1993) for plants and Holland (1986) for plant communities; plant community names according to Sawyer and Keeler-Wolf (1996) and Cowardin, *et al.* (1979) are also given.

2.0 EXISTING CONDITIONS

2.1 Setting

The study area covers approximately 1,103 acres on two discontinuous parcels located just east of the City of Oakley in northeastern Contra Costa County (Figure 1). The westernmost parcel (Emerson Ranch) consists of approximately 613 acres. It is bordered by Marsh Creek to the west, Cypress Road to the south, Dutch Slough to the north and Emerson Slough and Sellers Avenue to the east. The eastern parcel (Burroughs Ranch) consists of approximately 490 acres. It is bordered by Dutch Slough to the north, an unnamed inlet to the west, Cypress Road to the south and Jersey Island Road to the east. Topography of both properties is mostly level. Levees have been constructed along the northern portions of both properties adjacent to the waters of Marsh Creek, Dutch Slough and Emerson Slough, where elevation is near or below sea level.

The Emerson Ranch currently supports a commercial dairy. A majority of the property is under cultivation for livestock fodder or is used as pasture. Fields are regularly disked and planted with forage plants. Numerous outbuildings and structures such as barns, sheds, feed lots and corrals are present on the property. In addition, some areas of the ranch are used for feed storage and for the stockpiling of manure. A wastewater holding pond is located near the center of the parcel and is connected to a series of pumps and a pipe system. Livestock effluent mixed with delta water is regularly disposed of by flooding fields on the property. Portions of the property are also plowed and currently under cultivation for dairy feed and silage. A small vineyard is also present.

The Burroughs Ranch formerly supported a dairy operation, which has been abandoned. All of the property is currently used for grazing of beef cattle. Pastures are regularly flooded with delta water pumped into actively maintained irrigation ditches. Numerous associated buildings including barns and sheds remain from this operation. A single occupied residence is present within the study area, and another is present in a small out-holding. Both properties are dissected by a complex series of drainage and irrigation ditches and canals. Irrigation water is pumped from Dutch Slough. Although the Contra Costa Canal crosses the southern portion of the study area, it is not used as a source of irrigation water.

The study area is surrounded by extensive open lands with farms and scattered residences. Adjacent land uses consist primarily of agricultural activities, including farming and livestock grazing. The nearby waters of Big Break and Dutch Slough are popular recreational areas used for fishing, boating, water skiing and other activities. Big Break Regional Shoreline, a public open space, is located just west of the study area, on the west side of Marsh Creek. The Iron House Sanitation District operates a waste water treatment facility just west of Marsh Creek. Effluent is pumped via pipes across Dutch Slough to Jersey Island for disposal.

2.2 Plant Communities

The study area consists predominantly of disturbed lands on which the naturally-occurring vegetation has been entirely removed by grading, filling, cultivation, draining, irrigating and livestock grazing. Both parcels have been continuously farmed since the mid-1800s. Cultivated fields and ruderal vegetation represent the dominant habitats. In low-lying areas or on fallow sites, patches of such native plant communities as valley freshwater marsh, alkali meadow, Great Valley willow scrub and interior dunes are present, representing either remnants of the original vegetation or sites on which native species have become reestablished. Although regularly maintained, many of the drainage ditches and irrigation canals support freshwater marsh vegetation, and some are occupied by narrow bands of Great Valley mixed riparian forest. Vegetation communities are described in more detail below.

Disturbed and Cultivated Lands

Disturbed lands are those on which the native vegetation has been completely removed by grading, cultivation, and development. Disturbed areas include paved and unpaved roadways, quarries, vacant lots, developments, parking areas, and storage yards. Such areas are not expected to support any naturally occurring vegetation, although invasive native species may become reestablished. Portions of the study area occupied by a commercial dairy operation support no vegetation whatsoever.

Cultivated lands within the study area are plowed and actively farmed for dairy forage and silage. Species under cultivation during the time of the present surveys include alfalfa (*Medicago sativa*), Sudan grass (*Sorghum bicolor*) and clover (*Trifolium* sp.). In addition, numerous irrigated fields are used as pasture for livestock and support an assemblage of mostly herbaceous, non-native, annual and perennial grasses and forbs. Common species observed in irrigated pastures in the study area include tall fescue (*Festuca arundinacea*), Dallis grass (*Paspalum dilatatum*), Bermuda grass (*Cynodon dactylon*), Italian ryegrass (*Lolium multiflorum*), rabbitfoot grass (*Polypogon monspeliensis*), millet (*Setaria* sp.), clover (*Trifolium* spp.), common nutsedge (*Cyperus eragrostis*), curly dock (*Rumex crispus*), common plantain (*Plantago major*), bristly ox-tongue (*Picris echioides*) and many others. In places, some native species, including salt grass (*Distichlis spicata*) and meadow barley (*Hordeum brachyantherum*) are also present.

Landscaped lands associated with home sites and buildings are similarly disturbed, but the native vegetation has been replaced with horticultural species.

Ruderal Vegetation

Ruderal habitat is that from which the native vegetation has been completely removed by grading, cultivation, or other surface disturbances. Such areas, if left undeveloped, may become recolonized by invasive exotic species as well as native species. The native vegetation may ultimately become at least partially restored if the soils are left intact and there is no further disturbance.

A majority of the property has been subject to a long period of cultivation and grazing. Ruderal habitat is present in many upland areas of the study area, including levees, roadsides, building sites, pastures and the margins of cultivated fields. The native vegetation on these lands has been completely removed and in some instances replaced by ruderal (weedy) non-native and native plant species where left fallow. Weedy non-native species detected within the study area include bristly ox-tongue, Italian ryegrass, horse weed (*Conyza canadensis*), giant reedgrass (*Arundo donax*), wild oats (*Avena* spp.), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), pepper-grass (*Lepidium latifolium*), yellow star thistle (*Centaurea solstitialis*), milk thistle (*Silybum marianum*) and wild radish (*Raphanus sativus*), among others. Native species which have become established on ruderal sites include dogbane (*Apocynum cannabinum*) and common reed (*Phragmites australis*). Ruderal sites along the sides of levees support dense thickets of Himalayan blackberry (*Rubus discolor*) and scattered mature individuals of black walnut (*Juglans californica*), presumably planted by bird-carried seed from nearby orchards.

Ruderal habitat is not specifically described by Sawyer and Keeler-Wolf (1995) and would be classified as upland following Cowardin, *et al.* (1979).

Valley Freshwater Marsh

Valley freshwater marsh typically occurs in low-lying sites that are permanently flooded with fresh water and lacking significant current. It is found on nutrient-rich mineral soils that are saturated for all or most of the year. This vegetation community is most extensive where surface flow is slow or stagnant or where the water table is so close to the surface as to saturate the soil from below. Valley freshwater marsh is distributed along the coast and in coastal valleys near river mouths and around the margins of lakes, springs, and streams

(Holland 1986). This vegetation community characteristically forms a dense vegetative cover dominated by perennial, emergent monocots 1-15 feet high that reproduce by underground rhizomes.

Within the study area, Valley freshwater marsh is commonly found in drainage ditches and irrigation canals, in low-lying areas that do not drain, and on the river side of levees. Characteristic species present within the study area include common tule (*Scirpus acutus* var. *occidentalis*), three-square (*Scirpus americanus*), California bulrush (*Scirpus* californicus), cattail (*Typha spp.*), western goldenrod (*Euthamia occidentalis*) and water knotweed (*Polygonum amphibium* var. *emersum*), among others. It forms an extensive stand at the northern end of the Burroughs property and scattered patches in the northern portion of the Emerson Ranch.

Valley freshwater marsh habitat within the study area most closely corresponds to the Bulrush-Cattail Series following Sawyer and Keeler-Wolf (1995). Following Cowardin, *et al.* (1979) this plant community is classified as palustrine semi-permanently flooded emergent wetland.

Alkali Meadow

Alkali meadow is typically a sparse to densely vegetated plant community consisting of relatively few low-growing plant species. It occurs on fine-textured, more or less permanently moist, alkaline soils. Alkali meadow is distributed in valley bottoms and on the lower edges of alluvial slopes east of the Cascades and the Sierra Nevada as well as throughout the Sacramento and San Joaquin valleys and into Livermore Valley.

Within the study area, alkali meadow is fairly well-developed on fallow, low-lying areas on sandy to loamy soils. Characteristic plant species detected include Mediterranean barley, saltgrass, pickleweed (*Salicornia virginica*), alkali heath (*Frankenia salina*), common nutsedge, Bermuda grass, creeping wildrye (*Leymus triticoides*), yerba mansa (*Anemopsis californica*) and three-square (*Scirpus maritimus*), among others.

Within the study area, alkali meadow most closely corresponds to the Saltgrass Series, as described in Sawyer and Keeler-Wolf (1995). Portions of this plant community would be classified as a palustrine seasonally flooded wetland as described by Cowardin, *et al.* (1979).

Great Valley Willow Scrub

Great Valley willow scrub typically consists of a dense, shrubby, streamside thicket dominated by any of several species of willows. An herbaceous understory may be present or not. This native plant community occurs close to river channels on fine-grained sand and gravel bars with a high water table. It is distributed along all the major rivers and most smaller streams throughout the Great Central Valley watershed below 1,000 feet in elevation (Holland 1986).

Within the study area, Great Valley willow scrub consists of scattered individual willows to small, dense stands of trees in the northern portions of the site. Patches of willows also occur along the levees on both parcels, and have established dense, linear stands along some of the drainage ditches, particularly in the southeastern portion of the Burroughs property. Dominant species occurring within the study area include red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), shining or Pacific willow (*Salix lucida* ssp. *lasiandra*), sandbar willow (*Salix exigua*) and Goodding's willow (*Salix gooddingii*).

Great Valley willow scrub conforms to the Narrowleaf Willow Series, Black Willow Series, Arroyo Willow, Pacific Willow, Red Willow Series as described in Sawyer and Keeler-Wolf (1995) and would be classified as a Palustrine shrub-scrub wetland following Cowardin, *et al.* (1979).

Great Valley Mixed Riparian Forest

Great Valley mixed riparian forest is a tall, dense winter-deciduous forest, typically with a fairly well closed canopy. It consists of any of a number of tall riparian trees with an understory of shade-tolerant shrubs and lianas. It occurs on low gradient floodplains with fine-textured alluvium, usually away from active river channels but subject to periodic flooding. It is distributed on depositional streams throughout the Great Central Valley below 500 feet in elevation. It was once extensive in the Sacramento and San Joaquin valleys, where it has since been cleared for agriculture, flood control and urban expansion.

Within the study area, Great Valley Mixed Riparian Forest occurs in narrow but well developed bands along the artificial drainage ditches. It is most well developed in the southeastern portion of the Burroughs property adjacent to Jersey Island Road. Dominant overstory species occurring within the study area include red willow, arroyo willow, black willow, black walnut, Fremont's cottonwood (*Populus fremontii*) and valley oak (*Quercus lobata*). Understory vegetation includes California rose (*Rosa californica*), Himalayan blackberry, bulrush, three-square and cattail, among others.

Great Valley mixed riparian forest within the study area most closely conforms to the Mixed Willow Series as described in Sawyer and Keeler-Wolf (1995) and would be classified as a Palustrine forested or shrub-scrub wetland following Cowardin, *et al.* (1979).

Interior Dunes

Interior dunes support an open, primarily perennial, winter- and spring-growing herbaceous community with scattered low shrubs or live oaks. Shrubs are generally less than waist high and widely scattered. Annual forbs and grasses form a discontinuous ground canopy interspersed with an open ground layer. This community occurs at low elevations in the vicinity of the Sacramento-San Joaquin Delta. It occupies deposits of sand or pockets of sandy soils formed from windblown stream deposits, on mounds and ridges that have become more prominent as the surrounding organic soils subsided.

Within the study area, a highly disturbed interior dunes community occurs on the western side of the Emerson property adjacent to a vineyard. This site is located on a small, highly disturbed dune from three to ten feet above the surrounding lands. The dominant species occurring within this community within the study area is silver bush lupine (*Lupinus albifrons*). Herbaceous vegetation includes telegraph weed (*Heterotheca grandiflora*), yellow star thistle, and Russian thistle (*Salsola tragus*), among others. While other sand mounds are present within the study area, none have been found to support notable populations of native plant species.

Interior dunes are not specifically described by Sawyer and Keeler-Wolf (1995) and would be classified as upland following Cowardin, *et al.* (1979).

2.3 Wildlife Habitats

Wildlife species expected to utilize the site are those associated with cultivated and pasture lands, ruderal vegetation, valley freshwater marsh, alkali meadow, Great Valley willow scrub, Great Valley mixed riparian forest and interior dunes. In addition, marsh areas along the edges of the site along Dutch and Emerson sloughs can provide suitable habitat for wildlife, especially waterfowl. This area is located 6.8 miles southeast of Sherman Island Waterfowl Management Area and 4.2 miles southwest of Franks tract recreational area. A list of all vertebrate species that were observed within or adjacent to the project site is presented in Appendix A.

Cultivated Lands

Generally, areas that are systematically disked and then used as pasture or fodder can provide habitat for rodents, which in turn can be used by raptors. However, the heavy flooding used in the cultivation may lower the likelihood of substantial populations of rodents. However, some raptors such as the red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), Cooper's hawk (*Accipiter cooperii*), northern harrier (*Circus cyaneus*), American kestrel (*Falco sparverius*), merlin (*Falco columbarius*), white-tailed kite (*Elanus leucurus*), Swainson's hawk (*Buteo swainsoni)*, golden eagle (*Aquila chrysaetos*) and bald eagle (*Haliaeetus leucocephalus*) have the potential to forage in these areas. Other birds associated with cultivated lands include Brewer's blackbird (*Euphagus cyanocephalus*), red-winged blackbird (*Agelaius phoeniceus*), tricolored blackbird (*Agelaius tricolor*), western meadowlarks (*Sturnella neglecta*), horned lark (*Eremophila alpestris*) and various sparrows.

Ruderal Habitat

Ruderal habitat is that from which the native vegetation has been completely removed by grading, cultivation, or other surface disturbances. Species generally associated with ruderal disturbed areas include red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), opossum (*Didelphus virginianus*), starlings (*Sturnus vulgaris*), and mourning doves (*Zenaida macroura*).

Many wildlife species that feed on seeds or other parts of the vegetation, including finches, goldfinches, sparrows, and a variety of rodents. Insects present provide food for species such as western meadowlark, blackbirds, loggerhead shrike (*Lanius ludovicianus*) and western fence lizard (*Sceloporus occidentalis*). This community can support a wide array of predators, including snakes, various raptors, and red fox (*Vulpes vulpes*). Raptors likely to forage over ruderal habitat include red-tailed hawk and barn owl (*Tyto alba*). Killdeer (*Charadrius vociferus*) could also be associated with open ruderal substrates.

Valley Freshwater Marsh

Within the study area, marsh vegetation is commonly found in drainage ditches and irrigation canals, in low lying areas that do not drain, and on the river side of levees. Drainage ditches occur throughout the site.

Valley freshwater marsh typically occurs in low-lying sites that are permanently flooded with fresh water and lacking significant current. Vertebrate species that may occur within the study area are Pacific chorus frog (*Pseudacris regilla*), western terrestrial garter snake (*Thamnophis elegans*), mallard (*Anas platyrhynchos*), cinnamon teal (*Anas cyanoptera*), great blue heron (*Ardea herodias*), common snipe (*Gallinago gallinago*), snowy egret (*Egretta thula*), and black phoebe (*Sayornis nigricans*). Western pond turtle (*Clemmys marmorata*), California toad (*Bufo boreas halophilus*), and introduced bullfrog (*Rana catesbiana*) are all possibly present. Aerial foraging species which hunt over marshy areas with open water include various bats and swallows.

Great Valley Willow Scrub

Great valley willow scrub is found in patches throughout the site. This habitat provides cover and nesting habitat for a variety of birds. A variety of passerine species can be expected to occur and nest in this habitat such as black phoebe (*Sayornis nigricans*), white-crowned sparrow (*Zonotrichia leucophrys*), song sparrow (*Melospiza melodia*), yellow-rumped warbler (*Dendroica coronata*), spotted towhee (*Pipilo maculatus*), house finch (*Carpodacus mexicanus*), and other non-raptor species associated with great valley mixed riparian forest (see below).

Great Valley Mixed Riparian Forest

Riparian habitat is found distributed throughout the site in linear patches. The variety of trees and the associated scrub provide nesting habitat for a variety of birds. Raptors considered to have some potential to nest in these trees include red-tailed hawk, red-shouldered hawk, Cooper's hawk, and American kestrel. Raptors considered to have some potential to nest in these trees include red-tailed hawk, red-shouldered hawk, Cooper's hawk and American kestrel. Other raptors including the above that may use trees for roosting include merlin, white-tailed kite, Swainson's hawk, golden eagle and bald eagle. Healthy riparian areas are important for wildlife because they provide a rich variety of sources of cover, foraging areas and nesting sites. Surface water is an important source of drinking water for many species.

The high relative humidity among aquatic vegetation and presence of deciduous trees can support abundant insects and other invertebrates, providing an important source of food for many vertebrate species. Some of the species that could potentially occur within the project area in this habitat are southern alligator lizard (*Gerrhonotus multicarinatus*), California quail (*Callipepla californica*), downy woodpecker (*Picoides pubescens*), Bewick's wren (*Thryomanes bewickii*), American robin (*Turdus migratorius*), and yellow-rumped warbler (*Dendroica coronata*).

Interior Dunes

Within the study area, remnants of interior dune habitat has been highly modified by grading and colonization by non-native species. Due to this level of disturbance and the isolated nature of these upland, sandy habitats, little of the endemic fauna is expected to have persisted. Wildlife species expected to utilize this habitat is primarily the same as that described for cultivated lands and ruderal habitat, above. However, the sandy substrate is expected to harbor a distinct invertebrate fauna.

3.0 SPECIAL-STATUS BIOLOGICAL RESOURCES

3.1 Special-status Plant Species

Special-status plant species include those listed as Endangered, Threatened, Rare, or as Candidates for listing by the U.S. Fish and Wildlife Service (USFWS 1995, 1996), the CDFG (1998c, d), the CNPS (Skinner and Pavlik 1997). The CNPS listing is sanctioned by the CDFG and serves essentially as their list of "candidate" plant species.

Based on a review of special-status plant species in Contra Costa County listed in the California Natural Diversity Data Base (CDFG 1998e, Skinner and Pavlik 1997), a total of 44 special-status plant species are known to occur in similar habitats in the project region. None of the target special-status plant species is considered to have a high potential for occurrence within the study area. Ten special-status plant species are considered to have a moderate potential for occurrence within the study area based on the presence of marginally suitable habitat. The remaining 34 target species are considered to have a low or no potential for occurrence within the project area due to the fact that no suitable habitat is present. A summary of the status, habitat affinities, reported localities in the project area, blooming period, and potential for occurrence within the project area for each of the target plant species is presented in Table 1. An explanation of all sensitivity status codes is provided in Appendix B.

Although not regarded as significant pursuant to CEQA, additional taxa of botanical interest could occur within the study area. Numerous taxa considered as unusual and significant in Contra Costa and Alameda counties by Lake (1995) have been recorded in the vicinity and could be present within the project area based on the presence of marginally suitable habitats.

3.2 Special-status Animal Species

Special-status animal species include those listed as Endangered, Threatened, Rare, or as Candidates for listing by the USFWS (1995, 1996) and/or CDFG (1998b). Other species regarded as having special-status include special animals, as listed by the CDFG (1998a). Additional animal species receive protection under the Bald Eagle Protection Act and the Migratory Bird Treaty Act. The Fish & Game Code of California provides protection for "fully protected birds" (§ 3511), "fully protected mammals"(§ 4700), "fully protected reptiles and amphibians" (§ 5050) and "fully protected fish" (§ 5515). The California Code of Federal Regulations (Title 14) prohibits the take of Protected amphibians (Chapter 5 §41), Protected reptiles (Chapter 5 §42) and Protected fur bearers (Chapter 5 §460). Additional definitions are given in the California Environmental Quality Act Section 15380(d).

Based on a review of special-status animal species in Contra Costa County listed in the California Natural Diversity Data Base (CDFG 1998e, Skinner and Pavlik 1997), a total of 63 special-status animal species are known to occur in the project region. A total of eight target species are considered to have a high potential to breed or forage within the study area due to the presence of suitable habitat and/or the fact that they were observed during field surveys. These include great egret, red-tailed hawk, red-shouldered hawk, double crested cormorant, northern harrier, white-tailed kite, loggerhead shrike, and long-billed curlew. Another 12 target species (western pond turtle, Cooper's hawk, tricolored blackbird, golden eagle, burrowing owl, ferruginous hawk, Swainson's hawk, yellow warbler, merlin, American peregrine falcon, bald eagle, and western least bittern) are considered to have a moderate potential for occurrence within the project area. The remaining 43 target species are considered to have a low potential for occurrence within the study area due to a lack of suitable habitat and/or the fact that they have never been recorded in the vicinity. A summary of the formal status, habitat affinities, reported localities in the project area, and potential for occurrence within the project area for each of the target animal species is presented in Table 2. A list of fish species of concern in the Delta region is presented in Table 3. An explanation of all sensitivity status codes is provided in Appendix B.

Several special-status wildlife species that are strictly associated with the northern coastal salt marsh habitat present in the Bay-Delta were not included as part of this assessment, since no salt marsh habitat is present on the study site. These species include California clapper rail (*Rallus longirostris obsoletus*), saltmarsh yellowthroat (*Geothlypis trichas sinuosa*), Suisun song sparrow (*Melospiza melodia maxillaris*), San Pablo song sparrow (*Melospiza melodia samuelis*), Suisun shrew (*Sorex ornatus sinuosus*), saltmarsh vagrant shrew (*Sorex vagrans halicoetes*), ornate saltmarsh shrew (*Sorex ornatus salicornicus*) and salt marsh harvest mouse (*Reithrodontomys raviventris*). Similarly, the presence of San Joaquin kit fox (*Vulpes macrotis mutica*) was ruled out because the site is outside the species' range.

This following discussion provides background information on the habitat requirements and reproductive biology of special-status wildlife species known to occur in the vicinity of the study area. Background information is only provided for those special-status vertebrate species detected, those with a moderate to high potential to inhabit the site, or species that are deemed to be of high interest to the USFWS and CDFG in the region.

3.2.1 Threatened and Endangered Wildlife Species

No state or federally -listed Endangered, Threatened, Candidate species or species proposed for listing are considered to have a moderate or high potential to occur on site. However, marginally suitable habitat for several species known to occur in the region is present within the study area. These species are briefly described below.

Giant Garter Snake

The giant garter snake (*Thamnophis gigas*) is listed as Threatened by both state and federal governments. It occupies a restricted range on the Central Valley floor from Colusa County south to Los Banos Creek (Stebbins 1985). Currently the highest densities of giant garter snake are found in the Sacramento Valley within the American Basin, where the species persists primarily in seasonally flooded rice fields and irrigation ditches (Thelander and Crabtree 1994). Recent surveys in the San Joaquin Valley did not locate any individuals (CDFG 1992). The species has been extirpated from approximately 50 percent of its historic range (Thelander and Crabtree 1994). Habitat conversion continues to be the primary threat. A confirmed sighting of the species was made in August 1998 at Sherman Island, Sacramento County (K. Hornaday, USFWS). The giant garter snake is highly aquatic and is typically found in association with marshes and stream channels or in altered habitats such as irrigation ditches and rice fields (CDFG 1992).

Giant garter snake is listed as Threatened by both the state and federal governments. Because the species has been recently recorded at Sherman Island, approximately four miles to the north of the study area and because marginally suitable habitat for the species is present within the immediate vicinity of the study area, it is considered to have a low potential for occurrence on site.

California Red-legged Frog

California red-legged frog (*Rana aurora draytoni* - RLF) is listed by the federal government as Threatened and is considered a Species of Special Concern by the CDFG. It is the largest native frog in California, growing to five inches in length (snout-urostyle length). Dorsal coloration ranges from brownish to reddish, with dark spots or flecks. The undersides of the legs are red. A prominent dorsolateral fold extends from behind each eye down the back.

The RLF utilizes different habitats during each life stage and over the course of the year. The species breeds in a variety of still or slow-moving aquatic habitats, including coastal lagoons, marshes, natural and artificial ponds, and backwater portions of streams. Large egg masses are attached to emergent vegetation, generally between January and March, depending on annual environmental conditions and locality.

During the non-breeding season, RLF may inhabit a variety of upland and aquatic habitats, and individuals may travel considerable distances between breeding habitats and those occupied during the remainder of the year (Miller, *et al.* 1996). Movements of individuals have been noted with the first rains of the weather-year and in response to receding water (Rathbun, *et al.* 1992). Adult frogs are known to occupy ephemeral bodies of water including small streams and springs during certain times of the year. They may take refuge in small mammal burrows, leaf litter or other moist areas during periods of inactivity or to avoid desiccation (Rathbun, *et al.* 1993; Jennings and Hayes 1994).

The RLF historically occupied coastal drainage basins between Point Reyes and northern Baja California, in the Central Valley, and in the foothills of the Sierra Nevada. The species no longer occurs in approximately 75% of its former range. It has been essentially extirpated from the Central Valley and persists in Southern California and the Sierra Nevada only in isolated populations (Jennings and Hayes 1994). Habitat loss, over-harvesting and introduction of exotic predators and competitors have been identified as primary factors in the decline of the species (Miller, *et al.* 1996). Occurrence of this frog has been negatively correlated with presence of introduced bullfrogs (Moyle 1973; Hayes & Jennings 1988), although both species may be able to persist at certain locations, particularly in the Coastal Zone (Jennings, pers. comm.).

3.2.2 Other Special-status Wildlife Species

Western Pond Turtle

The western pond turtle (*Clemmys marmorata*) has been separated into two subspecies (*C. m. marmorata* is the northwestern subspecies and *C. m. pallida* is the southwestern subspecies), both of which are listed as Species of Special Concern by the CDFG and USFWS. Current research suggests, however, that the taxon may be represented by three distinct populations throughout its range in California and may therefore require a taxonomic revision (Jennings and Hayes 1994).

The western pond turtle originally inhabited many of the pacific drainage basins in California (Holland 1992). It ranges from western Washington to northern Baja California, mostly west of the Sierra Nevada-Cascade crest (Stebbins 1985). It ranges in size to just over 8 inches (21 cm) with a low carapace that is generally olive, brownish or blackish (Stebbins 1985, Jennings and Hayes 1994). It primarily inhabits permanent water sources including ponds, streams and rivers. It is often seen basking on logs, mud banks or mats of vegetation, although wild populations are wary and individuals will often plunge for cover after detecting movement from a considerable distance. Sometimes the species is difficult to detect, particularly if no obvious basking sites are present or if the environmental conditions are not favorable. Western pond turtles may live for 40 years or more (Jennings and Hayes 1994). It is assumed that adults are able to persist for several years in poor aquatic habitat, although reproduction might be suppressed. Lack of successful recruitment in degraded habitats is generally due to a lack of safe nesting sites and/or predation of eggs.

Western pond turtle is an aquatic species, which sometimes moves across land in response to fluctuating water level. In California's coastal drainage basins, this is an apparent adaptation to the variable rainfall and unpredictable flows (Rathbun, *et al.* 1992). Western pond turtle can over-winter on land or in water or remain active in the winter, depending on environmental conditions (Rathbun, *et al.* 1993; Jennings and Hayes 1994). Females travel from aquatic sites into open, grassy areas to lay eggs in shallow nests (Holland 1992; Rathbun, *et al.* 1992). Nests have been reported from 2 to 400 meters or more away from water bodies (Jennings and Hayes 1994). Most hatchlings over winter in the nest (Holland 1992; Jennings and Hayes 1994). Placing nests away from watercourses make young less susceptible to death by flood events that commonly occur during the rainy season (Rathbun, *et al.* 1992). Turtles may also place nests away from watercourses to avoid predators such as raccoon (*Procyon lotor*), as well as to influence the sex of offspring based on population dynamics (Rathbun, *et al.* 1992).

White-tailed Kite

The white-tailed kite (*Elanus leucurus*) is a medium-sized raptor that is distributed across much of the western part of California. In California, nesting white-tailed kites are listed as "Fully Protected" in the California Fish and Game Code. The species underwent a dramatic reduction in numbers due to habitat loss and hunting. Between the 1940s and early 1980s, the population recovered and its range expanded. More recently, population declines have again been noted, possibly as a result of the conversion of agricultural lands to urban uses (Dunk 1995). The white-tailed kite occupies low-elevation grassland, agricultural, wetland, oak woodland and savanna habitats. It nests in a wide variety of trees and shrubs, either isolated or in larger stands. Nearby open areas are required for foraging, including certain types of agricultural fields. Food habit studies have demonstrated that voles make up a large proportion of its diet, although other small mammals, birds and insects are also prayed upon (Dunk 1995). The species hunts during the day primarily by hovering and searching for prey. White-tailed kites in California are generally resident, although they may occupy different areas during the non-breeding and breeding seasons. Typically, four eggs are laid in February and March and chicks hatch after 30-32 days. Juveniles are dependent on parents for two to three months before they fledge. During the non-breeding season, the species roosts communally.

Cooper's Hawk

The Cooper's hawk (*Accipiter cooperi*) is listed as a Species of Special Concern by CDFG; it has no formal federal status other than that of a migratory bird. It is a small raptor that breeds in oak woodlands and deciduous riparian areas. Nests are often constructed near water and are vigorously defended. The species can often be located during the breeding season by broadcasting great horned owl (*Bubo virginanus*) territorial calls (Mosher and Fuller 1996). It forages in a variety of woodland and edge habitats. It is an agile flier and will pursue small birds and mammals through thickets and woodlands. During the winter, Cooper's hawks utilize a wider variety of habitats for foraging.

Ferruginous Hawk

When wintering, ferruginous hawk (*Buteo regalis*) is listed as a Species of Special Concern by CDFG; it has no formal federal status other than that of a migratory bird. It is a large raptor that inhabits open habitats in the Great Basin and northern Great Plains during the breeding season; it winters throughout arid and semi-arid areas of California. It prefers open grasslands for foraging and has also been observed utilizing agricultural areas. The primary prey of the ferruginous hawk includes rabbits, ground squirrels and prairie dogs, although birds and reptiles are also eaten (Bechard and Schmutz 1995). Individuals often "perch" on the ground, using sit-and-wait tactics to capture prey. Ferruginous hawks arrive in California between September and October, and depart between February and April. It typically congregates in grasslands and deserts where mammalian prey is abundant.

Short-eared Owl

The short-eared owl (*Asio flammeus*) is listed as a Species of Special Concern by the CDFG; it has no formal federal status other than that of a migratory bird. It is a large owl that inhabits coastal areas of California. It is a winter resident of the Central Valley of California. The species occupies open habitats including annual and perennial grasslands, meadows, irrigated lands, and saline and fresh emergent marshes. Short-eared owls feed primarily on voles and other small mammals, as well as small birds, amphibians and arthropods. Nests are built on the ground in a shallow depression among dense vegetation. Eggs are laid in April and May. The male feeds the female while she incubates eggs. The young fledge at 31-36 days. The greatest numbers of short-eared owls are present in the Bay Area during the non-breeding winter months. The species has been reported to nest at scattered locations in the Bay Area.

Tricolored Blackbird

Tricolored blackbird (*Agelaius tricolor*) is listed as a Species of Special Concern by the CDFG; it has no formal federal status other than that of a migratory bird. It presently inhabits coastal areas of central and southern California and the Central Valley. The species is highly colonial. Historically, tricolored blackbirds congregated in large colonies during the breeding season. Although scattered large colonies still exist, small colonies of fewer than 500 pairs are more common (Beedy, *et al.* 1991). The species typically requires freshwater marshes with emergent vegetation surrounded by water for nesting, although thorny brambles, nettles, dense willows or grain fields near water are also used. Populations have declined over the past approximately 60 years, particularly in the Central Valley due to habitat conversion of natural wetlands (DeHaven, *et al.* 1975b; Beedy, *et al.* 1991; Beedy 1998). The microhabitats selected for nesting must provide protection from numerous avian, mammalian and reptilian predators.

Breeding is highly synchronous. The species is nomadic and smaller colonies will often nest in different areas from year to year. Juveniles are not likely to return to the sites where they were born (DeHaven, *et al.* 1975a). Tricolored blackbirds are regularly observed foraging and roosting in mixed flocks with other blackbird species, especially during the non-breeding season. Tricolored blackbirds forage on seeds and insects in grassland and cropland, the latter primarily during the breeding season (Skorupa, *et al.* 1980). Nesting colonies are highly susceptible to human disturbance and entire colonies have been known to abandon nests after only a single visit by humans (Beedy, *et al.* 1991).

California Horned Lark

The California horned lark (*Eremophila alpestris actia*) is listed as a Species of Special Concern by CDFG; it has no formal federal status other than that of a migratory bird. It breeds in open grasslands throughout the Central Valley and adjacent foothills and along the central and southern California coast region. It is a ground nesting species that prefers shorter, less dense grasses and areas with some bare ground. It feeds on insects and seeds. It forms flocks in the summer and winter months that are often observed foraging and roosting in cultivated fields and along dirt roads.

Loggerhead Shrike

The loggerhead shrike (*Lanius ludovicianus*) is listed as a Species of Special Concern by the CDFG and USFWS. It is a wide-ranging species that occupies open habitats including grassland, scrub and open woodland communities. The species typically nests in densely vegetated, isolated trees and shrubs and occasionally man-made structures. Loggerhead shrikes feed on a variety of small prey including arthropods, mammals, amphibians, reptiles and birds (Yosef 1996). Since it lacks talons, it often impales prey on thorns or barbed wire. In California, the species does not migrate and is resident year-round. Pairs maintain territories during the breeding season and individuals maintain territories during the winter (Yosef 1996). Declines in numbers have been noted across a broad geographical range in the United States.

Mountain Plover

The mountain plover (*Charadrius montanus*) is a federal Candidate species and is a migratory bird. About the size of a small killdeer, mountain plovers breed in open plains at moderate elevations. During non-breeding seasons, they inhabit short-grass plains and fields, plowed fields and sandy deserts. They breed throughout the midwest and into southern central Canada. Wintering occurs in central and rarely northern California, Arizona, Texas, Baja California and northern Mexico.

Yellow Warbler

The yellow warbler (*Dendroica petechia*) is listed as a Species of Special Concern by the CDFG; it has no formal federal status other than that of a migratory bird. It is widely distributed across North America during the spring. The subspecies *D. p. brewsteri* nests in California, Oregon and Washington. Yellow warblers historically nested throughout California with the exception of the high Sierra and desert regions. Steady and significant declines in California have been recorded, particularly in coastal southern California, the San

Joaquin Valley and the Sacramento Valley (Remsen 1978). The alteration of native riparian habitats through channelization, grazing and invasion of exotic species has been implicated in this decline (Dunn and Garrett 1997). Parasitism by the brown-headed cowbird (*Molothrus ater*) has also been suggested as a factor in the decline of yellow warblers (Remsen 1978). Yellow warblers occupy dense riparian woodlands, typically dominated by willows, but also inhabits cottonwoods, maples and sycamores (Dunn and Garrett 1997).

3.3 Special-status Natural Communities

Special-status natural communities are those which are considered rare in the region, support special-status plant or wildlife species, or receive regulatory protection (*i.e.*, §404 of the Clean Water Act and/or the CDFG §§1600, *et seq.* of the California Fish and Game Code). In addition, the CNDDB has designated a number of communities as rare; these communities are given the highest inventory priority (Holland 1986, CDFG 1997).

The study area supports five special-status natural communities that are regulated by state, federal or county legislation or policies. These include the plant communities valley freshwater marsh, Great Valley willow scrub, Great Valley mixed riparian forest, alkali meadow wetland, and open water. No other special-status natural communities are present within the project area.

Riparian habitats are considered to be sensitive and declining resources by several regulatory agencies including the CDFG and the USFWS. Impacts to wetlands are specifically addressed by the CDFG Code §§1600, *et seq.* and fall under the jurisdiction of the § 404 permit process. Permit provisions of the Clean Water Act regulating dredge and fill operation are enforced by the U.S. Army Corps of Engineers (ACOE) and U.S. Environmental Protection Agency (EPA), with technical input from the USFWS, the Natural Resources Conservation Service (NRCS-formerly the Soil Conservation Service), and the National Marine Fisheries Service (NMFS). The ACOE exerts jurisdiction over "waters of the U.S." which include territorial seas, tidal waters, and non-tidal waters in addition to wetlands and drainages that support wetland vegetation, exhibit ponding or scouring, show obvious signs of channeling, or have discernible banks and high water marks. The ACOE considers wetlands to be important to the public interest by performing vital functions (Corps of Engineers Regulatory Program Regulations, §33 CFR 320.4). Wetlands serve significant biological functions by providing nesting, breeding, foraging, and spawning habitat for a wide variety of resident and migratory wildlife species. Wetlands also provide for the movement of water and sediments, ground-water recharge, water purification, storage of storm runoff, and recreation and transport. Wetlands occurring within the project area are discussed in Sycamore (1998a).

4.0 CONSTRAINTS ON DEVELOPMENT

This section summarizes potential biological constraints to development within the study area. This analysis is based on a cursory survey of the property and a review of environmental documentation prepared for developments in the project vicinity; the study area is expected to have many of the same constraints. We have considered two types of constraints, direct and indirect. In addition, policies outlined in the Contra Costa County General Plan (1991) call for the preservation of "significant" trees and natural vegetation, including creeks, wetlands and woodlands.

Direct Constraints

Formally protected or regulated biological resources that are present on site (or are presumed to be present) pose potential direct constraints to development. If a such a resource is likely to be directly and adversely affected by a change in land use, restrictions on the proposed land use could be imposed by the regulating agencies. This assessment of direct constraints is based on our reconnaissance of the study area and knowledge of the region and is not based on any focused surveys of the study area.

Perhaps the greatest direct constraint is posed by the presence of 43.2 acres of jurisdictional wetlands. Project design that would result in unavoidable impacts to wetlands can require mitigation such as avoidance, impact minimization or compensation. Compensation for wetlands impacts requires the development and implementation of a wetlands mitigation and monitoring plan. Unavoidable impacts to wetlands will require application for state and federal permits. By avoiding wetlands impacts or incorporating sensitive design features that minimize such impacts, the permitting process can be avoided or streamlined and mitigation costs can be minimized.

Other potential direct constraints on development could be posed by special-status species. In the event a state- or federally-listed species is found to reside or breed within the study area, or immediate vicinity, it too may pose a direct constraint. The presence, or presumed presence, of such species can necessitate formal or informal negotiations with state and/or federal agencies requiring time and money to conduct studies, process permits and to design and implement mitigation measures. While no such species are believed to currently reside within the study area, the presence of some cannot be ruled out on the basis of these reconnaissance-level surveys. At this time, the special-status species considered most likely to be raised as issues of concern during environmental review include giant garter snake, burrowing owl, and nesting raptors. These resources have the greatest likelihood of posing direct constraints on future development. Based on further studies, some of these may be determined not to represent real constraints, while other species may become issues in the future, either because new species are added to state and/or federal lists or as a result of new information on distribution or habitat requirements.

Indirect Constraints

Indirect constraints are posed by protected or regulated biological resources that could be indirectly affected by changes in land use. Indirect effects include the loss of foraging habitat, reductions in water quality, increased human activity/disturbance, introduction of non-native species of plants or animals, *etc.* Indirect constraints need to be addressed during planning and the implementation of specific project goals. Specifically, clustering of residences, location of active use parks, open space set-asides, landscaping, golf course lay-out, trail design and other recreational uses of the land and open water should take into consideration the level of sensitivity of the habitats in which these design features are to be placed. Indirect constraints are also imposed by limitations for habitat restoration or enhancement, habitat protection, and open space management. During the environmental review process, potential indirect impacts to special-status biological resources will need to be addressed.

4.1 Permitting Implications

It is anticipated that any proposed development within the study area will be required to conform to local environmental policies and state and federal legislation. These agencies and their policies and laws are described below.

4.1.1 Contra Costa County General Plan Policies

Relevant aspects of the Contra Costa County General Plan (1991) are listed below, numbered as they appear in the Conservation Element.

Vegetation and Wildlife Goals

8-D. To protect ecologically significant lands, wetlands, plant and wildlife habitats.

Vegetation and Wildlife Policies

8-6. Significant trees, natural vegetation, and wildlife populations generally shall be preserved.
8-7. Important wildlife habitats which would be disturbed by major development shall be preserved, and corridors for wildlife migration between undeveloped areas shall be retained.
8-9. Areas determined to contain significant ecological resources, particularly those containing endangered species, shall be maintained in their natural state and carefully regulated to the maximum legal extent. Acquisition of the most ecologically sensitive properties within the County by appropriate public agencies shall be encouraged.
8-10. Any development located or proposed within significant ecological resource areas shall ensure that the resource is protected.
8-12. Natural woodlands shall be preserved to the maximum extent possible in the course of land development.

8-13. The critical ecological and scenic characteristics of range lands, woodlands, and wild lands shall be recognized and protected.

8-14. Development on hillsides shall be limited to maintain valuable natural vegetation, especially forests and open grasslands, and to control erosion. Development on open hillsides and significant ridge lines throughout the County shall be restricted, and hillsides with a grade of 26 percent or greater shall be protected through implementing zoning measures and other appropriate actions.

8-15. Existing vegetation, both native and nonnative, and wildlife habitat areas shall be retained in the major open space areas sufficient for the maintenance of a healthy balance of wildlife populations.

8-17. The ecological value of wetland areas, especially the salt marshes and tidelands of the bay and delta, shall be recognized. Existing wetlands in the County shall be identified and regulated. Restoration of degraded wetland areas shall be encouraged and supported whenever possible.

8-21. The planting of native trees and shrubs shall be encouraged in order to preserve the visual integrity of the landscape, provide habitat conditions suitable for native wildlife, and ensure that a maximum number and variety of well-adapted plants are sustained in urban areas.

8-22. Applications of toxic pesticides and herbicides shall be kept at a minimum and applied in accordance with the strictest standards designed to conserve all the living resources of the County. The use of biological and other non-toxic controls shall be encouraged.

8-23. Runoff of pollutants and siltation into marsh and wetland areas from outfalls serving nearby urban development shall be discouraged. Where permitted, development plans shall be designed in such a manner that no such pollutants and siltation will significantly adversely affect the value or function of wetlands. In addition, berms, gutters, or other structures should be required at the outer boundary of the buffer zones to divert runoff to sewer systems for transport out of the area.

8-24. The County shall strive to identify and conserve remaining upland habitat areas which are adjacent to wetland areas that area critical to the survival and nesting of wetland species.

8-27. Seasonal wetlands in grassland areas of the County shall be identified and protected.

8-28. All efforts shall be made to identify and protect the County's mature native oak, bay, and buckeye trees.

<u>General Water Resource Policies</u>

8-78. Where feasible, existing natural waterways shall be protected and preserved in their natural state, and channels which already are modified shall be restored. A natural waterway is defined as a waterway which can support its own environment of vegetation, fowl, fish and reptiles, and which appears natural.

8-79. Creeks and streams determined to be important and irreplaceable natural resources shall be retained in their natural state whenever possible to maintain water quality, wildlife diversity, aesthetic values and recreation opportunities.

8-80. Wherever possible, remaining natural watercourses and their riparian zones shall be restored to improve their function as habitats.

8-86. Existing native riparian habitat shall be preserved and enhanced by new development unless public safety concerns require removal of habitat for flood control or other public purposes.

8-88. New development which modifies or destroys riparian habitat because of needed flood control, shall be responsible for restoring and enhancing an equivalent amount of habitat within or near the project area.

8-89. Setback areas of at least 100 feet shall be provided along natural creeks and streams in areas planned for urbanization. The setback areas shall be of a width adequate to allow maintenance and to prevent damage to adjacent structures, the natural channel and associated riparian vegetation.

8-90. Deeded development rights for lands within established setback areas along creeks or streams shall be sought to assure creek preservation and to protect adjacent structures and the loss of private property.

8-91. Grading, filling and construction activity near watercourses shall be conducted in such a manner as to minimize impacts from increased runoff, erosion, sedimentation, biochemical degradation, or thermal pollution.

8-92. Revegetation of a watercourse shall employ native vegetation, providing the type of vegetation is compatible with the watercourse's maintenance program and does not adversely alter channel capacity.

8-cs. Develop a program for the restoration of riparian vegetation in rural creeks where grazing activities are reducing the extent of the vegetation and are eroding the channel banks.

8-ct. Develop guidelines for creek maintenance practices which assure that native vegetation is not removed unnecessarily. These guidelines should also assure that maintenance is scheduled to minimize disruption of wildlife breeding practices.

4.1.2 State Legislation and Policies

California Environmental Quality Act

One of the basic purposes of CEQA is to prevent significant, avoidable damage to the environment by requiring modifications to projects through the use of alternatives or mitigation measures (§ 15002). Under §15065, a mandatory finding of significance is required if the project has the potential to a) substantially degrade the quality of the environment, substantially reduce the habitat of fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods or California history or prehistory; b) achieve short-term environmental goals to the disadvantage of long-term environmental goals; c) cause possible environmental effects which are individually limited but cumulatively considerable, or d) cause substantial adverse effects on human beings, either directly or indirectly. CEQA provides protection not only for state-listed species, but for any species which can be shown to meet the criteria for state listing (§15380).

California Endangered Species Act

In 1984, the state legislature enacted the California Endangered Species Act (CESA) in recognition of the tremendous threats facing California's native plant and animal populations and their habitats. This legislation declares that deserving plants and animals will be given protection by the state because they are of ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of the state. CESA established that it is state policy to conserve, protect, restore, and enhance endangered species and their habitats. State-listed threatened and endangered species and designated candidates are protected from "taking" except for scientific or management purposes and only by permit. In order to adequately determine the presence or absence of special-status plant or animal species on a particular site, the CDFG has established guidelines for conducting systematic field surveys (CDFG 1984). To be considered adequate, surveys for special-status plant and animal species should include the preparation of a complete species inventory of the site for review by CDFG biologists.

California Department of Fish and Game Streambed Alteration Agreement.

The CDFG has jurisdictional authority over wetland resources associated with rivers, streams, and lakes under California Fish and Game Code §§1600 to 1607. The CDFG has the authority to regulate work that will substantially divert, obstruct, or change the natural flow of a river, stream, or lake; substantially change the bed, channel, or bank of a river, stream, or lake; or use material from a streambed. The CDFG encourages completion of a Streambed Alteration Agreement, which is not a permit, but rather a mutual agreement between the CDFG and the project proponent. The CDFG generally evaluates the information gathered during preparation of the environmental assessment document and attempts to satisfy their resource concerns during the permitting process. In accordance with their policy of "no net loss" of wetland habitat, the Streambed Alteration Agreement can impose conditions on the proposed activity to ensure no net loss of wetlands values or acreage. Typically, a Streambed Alteration Agreement will also include a mitigation program for impacts to all wetlands, regardless of acreage.

Because the CDFG includes under its jurisdiction streamside habitats that under the federal definition may not qualify as wetlands on a particular site, CDFG jurisdiction may be broader than that of the ACOE. Frequently, habitats are regarded as wetlands by the CDFG do not exhibit indicators of all three wetland parameters require for federal jurisdiction. Typical activities regulated by CDFG under §§1600-1607 authority include rechannelling and diverting streams, stabilizing banks, implementing flood control projects, river and stream crossings, diverting water, damming streams, gravel mining, and logging operations.

As part of a Streambed Alteration Agreement with the CDFG, for projects resulting in unavoidable impacts to wetlands, mitigation measures in the form of replacement of lost wetlands values and functions may be required to minimize adverse environmental effects. One of three acceptable types of mitigation are typically required. These include, in order of decreasing preference, on site in-kind replacement, off site in-kind replacement, and mitigation banking. With the incorporation of sensitive project design and construction practices, all impacts to "waters" or wetlands could be completely avoided, thereby avoiding the need for a CDFG permit, pending CDFG review.

State Water Quality Certification

Pursuant to § 401 of the Clean Water Act and EPA 404(b)(1) Guidelines, any applicant for a federal permit to conduct any activity which may result in any discharge into navigable waters must provide a certification from the California Regional Water Quality Control Board (CRWQCB) that such discharge will comply with the state water quality standards, where the activity requires a federal license or permit (Title 23, California Administrative Code, Section 3830, *et. seq.*). The CRWQCB has a policy of "no-net-loss" of wetlands in effect and typically requires mitigation for all impacts to wetlands, regardless of acreage, before it will issue a water quality certification or waiver.

Projects that would result in discharges into waters of the U.S. but qualify for certain Nationwide Permits may also require state water quality certification or waiver thereof. Upon receipt of notification from the permittee, the ACOE issues a public notice for review by the CRWQCB. If the CRWQCB fails or refuses to act on certification requirements within a reasonable time (*e.g.*, 60 days after receipt of the ACOE notice), the certification requirement is waived (CRWQCB 1988). If a CRWQCB issues a water quality certification which includes special conditions, the district engineer will add these conditions as conditions of the Nationwide Permit.

With the incorporation of sensitive project design and construction practices, all impacts to "waters" or wetlands could be completely avoided, thereby avoiding the need for a CRWQCB water quality certification, pending CRWQCB review.

State Lands Commission

The California State Lands Commission was formed in 1938. The Commission has authority over the state's "sovereign lands", which are held in public trust. These lands include over four million acres of land underlying the state's navigable and tidal waterways. Certain lands that were historically navigable or tidal at the time of statehood in 1850 remain in the public trust. These sovereign lands can only be used for public purposes consistent with provisions of the Public Trust such as fishing, water dependent commerce and navigation, ecological preservation and scientific study. Public Trust lands include the beds of over 120 rivers, streams and sloughs, nearly 40 non-tidal lakes, tidal navigable bays and lagoons, and the tidal and submerged lands adjacent to the entire coast and offshore islands of the State from the mean high tide line to three nautical miles offshore.

The State Lands Commission has been contacted and asked to make a determination as to whether or not any portions of the Emerson and Burroughs ranches fall under their jurisdiction. The Commission has not provided us with a determination and we are continuing our inquiry.

4.1.3 Federal Legislation

Endangered Species Act

The Endangered Species Act (ESA), enacted by Congress in 1973 and ammended in 1982, was intended to "provide a means whereby the ecosystems upon which endangered and threatened species depend may be conserved and to provide a program for the conservation of such endangered and threatened species..." (§2). ESA was designed to slow or stop anthropogenic extinctions of various species of fish, wildlife, and plants in the United States; the USFWS is the federal agency primarily responsible for its enforcement. Section 9 of the ESA specifically prohibits "take" of listed fish and wildlife species on private or public lands. Protection for listed plants on private lands is only provided to the extent such species are protected under state law. Under federal law, "take" is defined as meaning "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct." Section 7 of the ESA requires that federal agencies "insure that any action authorized, funded, or carried out by [them] is not likely to jeopardize the continued existence of any endangered species or threatened species, or result in the destruction or adverse modification of [critical] habitat of such species." Section 10 of the ESA authorizes the USFWS to issue permits that allow the incidental "take" of listed species by landowners and others who prepare an acceptable habitat conservation plan (HCP) for those species. Incidental take is defined as "taking which is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity."

Clean Water Act (§ 404) Permit

Section 404 of the Clean Water Act (CWA) of 1972 regulates activities that result in the discharge of dredged or fill material into waters of the U.S., including wetlands. The primary intent of the CWA is to authorize the EPA to regulate water quality through the restriction of pollution discharges. The ACOE is the principal authority to regulate discharges of dredged or fill material into waters of the U.S., although the EPA has a specific oversight role over the ACOE authority.

Specifically, Section 404 of the CWA 1) authorizes the ACOE to issue permits, after notice and an opportunity for comment, for the discharge of dredged or fill material into waters of the U.S., 2) requires that the ACOE issue permits in accordance with EPA's 404(b)(1) Guidelines only in the absence of practicable alternatives, and 3) authorizes the EPA to veto a ACOE decision to issue a permit.

Projects that include potential dredge or fill impacts to waters of the U.S. including wetlands must, under most circumstances, be reviewed by the ACOE pursuant to Section 404 of the CWA. Aggregate wetland impacts (defined as direct fill or indirect effects of fill) over three acres require a standard Individual Permit. Projects impacting one to three acres of wetlands are subject to a Preconstruction Notification (PCN), which includes coordination with federal and state agencies. Projects impacting between 1/3 and one acre will require notification and review by the ACOE. All permittees who utilize the Nationwide Permit 26 for impacts to less than 1/3 of an acre are required to report the location and acreage of impacts to the ACOE. A PCN and Individual Permit are also required for any project that would result in cumulative impacts to more than 500 linear feet of a stream, including cumulative impacts to streams. Additional regional requirements for maintaining upland buffer areas between authorized projects and open waters or streams may be conditions for granting any ACOE permit. Activities authorized under either a Nationwide or Individual Permit require compliance with ACOE Section 404 regulations, EPA Section 404(b)(1) Guidelines, NEPA, the Endangered Species Act, Section 106 of the National Historic Preservation Act, Section 401 of the Clean Water Act and the Coastal Zone Management Act.

5.0 ADDITIONAL ENVIRONMENTAL STUDIES AND DOCUMENTATION

Any future development of the study area will most likely be subject to review under CEQA. Whether a proposed project qualifies for a Negative Declaration or requires the completion of an Environmental Impact Report, the level of direct, indirect and cumulative impacts to biological resources will need to be evaluated for significance as well as state and/or federal permit requirements. In order to make these determinations, additional site-specific information will need to be collected.

Based on recent agency comments on development projects in the vicinity, the following biological resources are those most likely to be raised as issues of concern during the environmental review process.

1. Based on this reconnaissance-level assessment, the study area supports at least five special-status natural communities and/or jurisdictional habitats. These include valley freshwater marsh, Great Valley willow scrub, Great Valley mixed riparian forest, alkali meadow and open water. Impacts to wetlands and all open water bodies would fall under the jurisdiction of the Army Corps of Engineers (ACOE). Permits by the ACOE, Regional Water Quality Control Board (RWQCB) and California Department of Fish and Game (CDFG) might be required. A formal wetland delineation and jurisdictional determination was verified by the ACOE in 1998. The verified delineation is valid for a period of five years. Once a project plan has been developed, impacts to wetlands can be calculated and permitting needs and mitigation requirements can then be evaluated.

2. Ten special-status plant species are considered to have a moderate potential for occurrence within the study area. A series of focused botanical surveys pursuant to California Environmental Quality Act (CEQA) will be required prior to beginning any major development. Recommended survey seasons are April, mid-May and mid-August.

3. Four special-status reptiles may occur within the study area, including the federally-listed Endangered giant garter snake, and the California Species of Special Concern silvery legless lizard, California horned lizard, and western pond turtle. Based on existing habitats and the distribution of these species in the region, a habitat assessment should be performed by a qualified herpetologist. Consultation with USFWS may be required to assess impacts and/or

identify the need for further studies. Preconstruction surveys for western pond turtles are recommended prior to any impacts to drainage channels or perennial marsh habitats.

4. Three special-status amphibians are considered to have a low potential to occur within the study area. The potential for occurrence of federally-listed Threatened California red-legged frog, and the California Species of Special Concern California tiger salamander and western spadefoot is considered to be low due to a lack of suitable habitat and/or distance from known populations. However, consultation with the CDFG and United States Fish and Wildlife Service (USFWS) would be prudent to ascertain their level of concern regarding these species at this location.

5. Eighteen special-status bird species have a moderate to high potential for occurrence within the project area. Eight of these were detected within the project area, three of which (the California fully protected species white tailed kite, and the California Species of Special Concern loggerhead shrike and northern harrier) are considered to have a moderate to high potential to nest within the study area. Five other special-status birds, (the California Species of Special Concern double crested cormorant and long-billed curlew, and migratory birds great egret, red-tailed hawk and reed-shouldered hawk) were detected foraging within the study area or immediately adjacent. Although no breeding habitat is present within the study area for the state-listed Threatened California black rail, it could occur in tidal salt marsh in the vicinity. A preconstruction survey for California black rail might be warranted. Preconstruction nesting surveys for these and other special-status birds will be important prior to the initiation of any land use changes.

6. Due to the presence of suitable nesting habitat and the presence of the species in the vicinity, preconstruction surveys for the California Species of Special Concern burrowing owl should be conducted no more than 30 days prior to the initiation of any land clearing activities.

7. Six special-status bat species have the potential to occur within the study area. A survey for roosting sites is warranted to identify areas to be avoided or mitigated for if altered or disturbed.

8. A total of 15 special-status invertebrate species have been recorded from the region and marginally suitable habitat is present within the study area. Because the habitat requirements of many of these species are not well documented, a separate evaluation by a qualified entomologist is recommended.

9. An assessment of fisheries resources would be required for any proposed activities that would alter slough configuration or affect water quality.

10. The rich biotic resources of the region and the project site present numerous opportunities to preserve, protect and enhance the wetland and wildlife habitat.

6.0 OPPORTUNITIES

Many opportunities are available within the study area for restoring degraded natural habitats, increasing passive recreational use, and enhancing the quality of (human) life for residents and visitors. Given the context of the site, there are excellent opportunities to restore a variety of wetland habitats and interior dune scrub. To a lesser degree, there are also opportunities to create oak woodland habitat. Due to the proximity of the study area to open waters of the San Joaquin River delta and tidally-influenced coastal salt marsh and riparian habitats, restoration of a mosaic of wetland habitats in the northern portion of the study area is highly desirable from a biological perspective. Establishment of a combination of tall canopy riparian trees, dense willow thickets, dense stands of tules and cattails, herbaceous marsh, seasonal wetland and open water would provide abundant nesting, roosting, foraging and breeding opportunities for a wide variety of wildlife species. The presence of such habitats adjacent to Dutch Slough, Little Dutch Slough, Emerson Slough and Marsh Creek would be regarded as having very high habitat values for wildlife.

The study area supports numerous sand mounds, a unique geological feature in the region. The native vegetation on the sand mounds appears to have been almost completely removed historically through agricultural operations. The natural vegetation that once covered sand mounds near the Delta consisted of interior dune scrub. This habitat has been mostly eliminated through historic land uses. The last remaining stands of interior dune scrub are restricted to the Antioch Dunes National Wildlife Refuge and are known to support numerous special-status plant and animal species, including the federally-listed Endangered Antioch Dunes evening-primrose (*Oenothera deltoides* ssp. *howellii*). Restoration of interior dune scrub adjacent to wetland areas or other open space areas would be more desirable than the creation of isolated habitat "islands", surrounded by residences or recreational areas.

Valley oak woodland may have at one time been a more prominent feature of the landscape than it is today. Throughout the Sacramento River Valley, valley oak woodlands form dense to open stands on lands periodically subject to flooding and sediment deposition. Because valley oaks are slow growing, requiring 20 years to develop much of a canopy, restoration of valley oak woodland is a long term proposition. Nonetheless, planting valley oaks on elevated lands along the sloughs or uplands would ultimately enhance wildlife values on site. Oak trees provide nesting and perching opportunities for a wide range of birds and are an important food source for many species of wildlife.

Some of the biological opportunities that exist at the Emerson and Burroughs ranches include the following:

- The properties are ideally situated adjacent to the open waters of the Sacramento/San Joaquin River Delta, providing high scenic and recreational values, including wildlife viewing.
- Migratory and resident water fowl, birds of prey and song birds are already present in the vicinity in large numbers. By expanding and enhancing wetland habitats on site, it is expected that wildlife would be readily attracted.

- Some fortification of levees and erosion control measures may be needed at certain locations. The use of native species at the base of levee slopes could be incorporated into the project design.
- Riparian trees would attract herons and egrets, which like to roost in colonies in tall trees adjacent to open bodies of water.
- Freshwater marsh would provide suitable nesting habitat for a wide range of song birds as well as providing abundant foraging opportunities.
- Shallow water bodies and seasonal wetlands would provide attractive foraging habitat for a wide variety of wading birds. Such habitats have been greatly reduced in the Delta region since the early American settlement period.
- Deeper ponds would attract and support numerous reptiles and amphibians, as well as provide foraging and resting habitat for water fowl.
- Seasonal wetlands would provide foraging opportunities for such birds of prey as northern harrier and American kestrel, as well as foraging and resting habitat for water fowl.
- Oak trees would attract birds of prey such as hawks and owls as well as song birds and wood peckers.
- Restored interior dune scrub would provide loose sandy soils that are needed by a wide variety of ground nesting invertebrates such as solitary bees. Such invertebrates are important pollinators and food sources.
- Interior dune scrub would provide suitable habitat for western fence lizard and other small reptiles, which are preyed upon by such bird species as loggerhead shrike.
- The restoration and enhancement of natural habitats would also enhance the scenic values of the properties, providing an outstanding venue for walking trails, nature education, and wildlife viewing.

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TABLE 1

POTENTIALLY-OCCURRING SPECIAL-STATUS PLANT SPECIES AT THE EMERSON AND BURROUGHS PROPERTIES

Family Scientific Name Common Name	Status[1]		Habitat Affinities and Reported Localities in the Project Area	Blooming Period/ Life Form	Potential for Occurrence On site
Alismataceae					
Sagittaria sanfordii Sanford's arrowhead	Federal State CNPS	SC CEQA 1B:2-2-3	Assorted shallow freshwater marshes and swamps. Known from Shasta to Fresno counties and Marin County.	May-Aug Perennial herb (rhizomatous)	Low: suitable habitat present.
Apiaceae					
Lilaeopsis masonii Mason's lilaeopsis	Federal State CNPS	SC CR 1B:2-2-3	Intertidal brackish and freshwater marshes along streambanks. Recorded in the San Joaquin and Sacramento River Delta and lower Napa River channel.	April-Oct Perennial herb	Moderate: suitable habitat present outside levees.
Perideridia gairdneri ssp. *gairdneri* Gairdner's yampah	Federal State CNPS	SC CEQA? 4:1-2-3	Mesic sites in broadleafed upland forest, chaparral, coastal prairie, Valley/foothill grassland, vernal pools. Found from the Bay Area and San Joaquin Valley to the Oregon border. Endangered in the southern portion of its range.	June-Oct Perennial herb	None: no suitable habitat present.
Asteraceae					
Aster lentus Suisun Marsh aster	Federal State CNPS	SC CEQA 1B:2-2-3	Freshwater and brackish marshes. Known from the Napa River and San Joaquin/Sacramento River Delta.	May-Nov Perennial herb	Moderate: suitable habitat present.
Cirsium crassicaule slough thistle	Federal State CNPS	SC CEQA 1B:3-2-3	Chenopod scrub, marshes and swamps, sloughs and riparian scrub. Recorded from Kings, Kern and Sacramento counties.	May-Aug Annual/ perennial herb	Low: suitable habitat present.
Cirsium hydrophilum var. *hydrophilum* Suisun thistle	Federal State CNPS	C CEQA 1B:3-3-3	Salt marshes. Known from only one location on Grizzly Island in Suisun Marsh, Solano County.	July-Sept Perennial herb	Low: suitable habitat present. Highly restricted.
Grindelia stricta var. *angustifolia* marsh gumplant	Federal State CNPS	none CEQA? 4:1-1-3	Coastal saltmarsh. Found from Monterey County to the San Francisco Bay.	Aug-Oct Perennial herb	Moderate: suitable habitat present outside levees.

TABLE 1 (continued)

Lasthenia conjugens Contra Costa goldfields	Federal FE State CEQA CNPS 1B:3-3-3	Mesic sites in Valley/foothill grassland, vernal pools. Extant in Napa and Solano counties, recently rediscovered in Contra Costa County; presumed extirpated in Alameda, Mendocino, Santa Barbara and Santa Clara counties.	Mar-June Annual herb	Low: marginally suitable habitat present.
Psilocarphus brevissimus var. *multiflorus* Delta woolly-marbles	Federal none State CEQA? CNPS 4:1-2-3	Vernal pools. Recorded from Alameda, Napa, Santa Clara, San Joaquin, Solano, Stanislaus and Yolo counties.	May-June Annual herb	Low: marginally suitable habitat present.
Psilocarphus tenellus var.*globiferus* round woolly-marbles	Federal none State CEQA? CNPS 4:1-2-1	Coastal dunes and vernal pools. Known from the San Joaquin Valley, Central Coast, Sierra foothills and the San Francisco Bay area.	April-May Annual herb	Low: marginally suitable habitat present.
Trichocoronis wrightii var. *wrightii* Wright's trichocoronis	Federal none State CEQA CNPS 2:3-3-1	Meadows, marshes and swamps, riparian forest, and alkaline vernal pools. Recorded from Colusa, Merced, Sutter, Riverside and San Joaquin counties, and into Texas and northern Mexico. Believed to be extirpated in the Central Valley.	May-Sept Annual herb	Low: marginally suitable habitat present.
Boraginaceae				
Plagiobothrys glaber hairless popcorn-flower	Federal none State CEQA CNPS 1A	Alkaline meadows and vernal coastal salt marshes. Presumed extinct. Once occurred in Alameda, Merced, Marin, San Benito, and Santa Clara counties.	April-May Annual herb	Low: marginally suitable habitat present.
Plagiobothrys hystriculus bearded popcorn-flower	Federal none State CEQA CNPS 1A	Vernal pools and mesic Valley/foothill grassland. Presumed extinct. Endemic to Solano County.	April-May Annual herb	Low: marginally suitable habitat present.
Brassicaceae				
Erysimum capitatum ssp. *angustatum* Contra Costa wallflower	Federal FE State CE CNPS 1B:3-3-3	Stabilized interior dunes. Known from only two occurrences on the dunes east of Antioch, along the San Joquin River.	Mar-July Perennial herb	Low: marginally suitable habitat present.
Campanulaceae				
Downingia pusilla dwarf downingia	Federal none State CEQA CNPS 2:1-2-1	Mesic sites in Valley/foothill grassland and vernal pools. Occurs from Sonoma and Napa counties through the Sacramento Valley and Sierra foothills.	Mar-May Annual herb	Low: marginally suitable habitat present.
Legenere limosa legenere	Federal SC State CEQA CNPS 1B:2-3-3	Vernal pools. Recorded from Lake and Napa counties throughout the Sacramento Valley. Believed extirpated in Sonoma and Stanislaus counties.	May-June Annual herb	None: no suitable habitat present.

TABLE 1 (continued)

Chenopodiaceae				
Atriplex cordulata heartscale	Federal SC State CEQA CNPS 1B:2-2-3	Chenopod scrub, Valley/foothill grassland, on somewhat alkaline or saline hard packed soils. Recorded from Alameda County throughout the Central Valley from Glenn to Kern counties. Presumed extirpated in Contra Costa and San Joaquin counties.	May-Oct Annual herb	Detected?: suitable habitat present. Tentatively identified on the Emerson Ranch.
Atriplex coronata var. *coronata* crownscale	Federal none State CEQA? CNPS 4:1-2-3	Chenopod scrub, Valley/foothill grassland on alkaline soils. Known from the northern San Joaquin Valley, Central Coast, and eastern San Francisco Bay.	April-Oct Annual herb	Moderate: suitable habitat present.
Atriplex depressa brittlescale	Federal none State CEQA CNPS 1B:2-2-3	Chenopod scrub, playas and Valley/foothill grassland on alkaline and clay soils. Occurs from Solano County throughout the Sacramento and San Joaquin Valleys. Presumed extirpated in Stanislaus County.	May-Oct Annual herb	Moderate: suitable habitat present.
Atriplex joaquiniana San Joaquin spearscale	Federal SC State CEQA CNPS 1B:2-2-3	Chenopod scrub, Valley/foothill grassland and alkali meadows. Occurs from Solano County throughout the Sacramento and San Joaquin valleys. Presumed extirpated in Santa Clara, San Joaquin and Tulare counties.	April-Sept Annual herb	Moderate: suitable habitat present.
Cyperaceae				
Carex comosa bristly sedge	Federal none State CEQA CNPS 2:3-3-1	Marshes and swamps, lake margins. Believed extirpated in San Francisco, San Bernardino and Santa Cruz counties. Extant in Contra Costa, Lake, Shasta, San Joaquin and Sonoma counties.	May-Sept. Perennial herb (rhizomatous)	Low: marginally suitable habitat present.
Eleocharis parvula small spikerush	Federal none State CEQA? CNPS 4:1-1-1	Wet, generally saline flats, coastal salt marsh. Recorded from Orange to Humboldt counties.	June-Sept Perennial herb	Moderate: suitable habitat present.
Fabaceae				
Astragalus tener var. *tener* alkali milk-vetch	Federal none State CEQA CNPS 1B:3-2-3	Playas, Valley/foothill grasslands, on adobe clay and alkaline vernal pools. Extant in Merced, Solano and Yolo counties. Extirpated throughout the Bay Area and San Joaquin Valley.	March-June Annual herb	Low: marginally suitable habitat present.
Lathyrus jepsonii var. *jepsonii* Delta tule pea	Federal SC State CEQA CNPS 1B:2-2-3	Freshwater and brackish marshes. Occurs throughout the Sacramento-San Joaquin River delta, San Francisco Bay and Central Valley.	May-Sept. Perennial herb	Moderate: suitable habitat present outside levees.
Juglandaceae				
Juglans californica var. *hindsii* Northern California black walnut	Federal SC State CEQA CNPS 1B:3-3-3	Riparian forests and riparian woodlands. Known from only two extant populations in Napa and Contra Costa counties. Presumed extirpated in Sacramento, Solano and Yolo counties. Widely naturalized in cismontane Calif., used as a root stock for *J. regia*.	April-May Deciduous tree	Detected: Non-native waifs present. No native stands present.

TABLE 1 (continued)

Lamiaceae					
Pogogyne douglasii ssp. *parviflora* Douglas's pogogyne	Federal State CNPS	none CEQA? 3:1-2-3	Chaparral, cismontane woodland, lower coniferous forest, meadows, marshes/swamps, mesic Valley/foothill grasslands and vernal pools. Recorded from Lake, Napa, Sonoma and Mendocino counties. Possibly in Butte and Sacramento counties.	May-July Annual herb	Low: suitable habitat present.
Scutelaria lateriflora mad-dog scullcap	Federal State CNPS	none CEQA 2:3-2-1	Mesic meadows, marshes and swamps. Reported from Inyo and San Joaquin counties, to New Mexico and Oregon. Known from only two occurrences in California.	July-Sept perennial herb (rhizomatous)	None: suitable habitat present.
Malvaceae					
Hibiscus lasiocarpus rose-mallow	Federal State CNPS	none CEQA 2:2-2-1	Freshwater marshes. Restricted to the Sacramento-San Joaquin River Delta.	June-Sept Perennial herb (rhizomatous)	Moderate: suitable habitat present outside levees.
Onagraceae					
Oenothera deltoides ssp *howellii* Antioch Dunes evening-primrose	Federal State CNPS	FE CE 1B:3-3-3	Remnant river bluffs and interior sand dunes. Known from seven occurrences among the dunes east of Antioch.	Mar-Sept Perennial herb	Low: marginally suitable habitat present.
Poaceae					
Neostapfia colusana Colusa grass	Federal State CNPS	FPT CE 1B:1-3-3	Restricted to large, northern claypan vernal pools with alkaline soils that remain flooded until early summer. Known from Merced, Solano, Stanislaus and Yolo counties; presumed extirpated in Colusa County.	May-July Annual herb	None: marginally suitable habitat present.
Orcuttia tenuis slender Orcutt grass	Federal State CNPS	FPT CE 1B:2-3-3	Restricted to vernal pools. Known from Lake, Plumas, Sacramento, Shasta, Siskiyou and Tehama counties.	May-July Annual herb	None: no suitable habitat present on site.
Orcuttia viscida slender Orcutt grass	Federal State CNPS	FPE CE 1B:3-3-3	Restricted to vernal pools. Known from only seven occurrences in Sacramento County.	May-June Annual herb	None: no suitable habitat present on site.
Tuctoria greenei Crampton's tuctoria	Federal State CNPS	FPE CR 1B:2-3-3	Restricted to vernal pools. Known from Butte, Fresno, Madera, Merced, Shasta, San Joaquin, Stanislaus, Tehama and Tulare counties.	May-July Annual herb	None: no suitable habitat present on site.
Tuctoria mucronata Crampton's tuctoria	Federal State CNPS	FE CE 1B:3-3-3	Restricted to vernal pools. Known from only three occurrences near Jepson Prairie and Davis. Reported in Solano and Yolo counties.	April-July Annual herb	None: no suitable habitat present on site.

TABLE 1 (continued)

Polemoniaceae				
Navarretia leucocephala ssp. *bakeri* Baker's navarretia	Federal none State CEQA CNPS 1B:2-2-3	Cismontane woodland, lower montane coniferous forest, mesic meadows, Valley/foothill grassland, vernal pools. Known from Tehama, Colusa, Lake, Mendocino, Solano, Sonoma, Santa Clara, Marin, and Napa counties.	May-July Annual herb	None: marginally suitable habitat present.
Navarretia myersii pincushion navarretia	Federal none State CEQA CNPS 1B:3-3-3	Restricted to vernal pools. Reported from Amador, Lake, Merced and Sacramento counties.	May Annual herb	None: no suitable habitat present on site.
Polygonaceae				
Polygonum marinense Marin knotweed	Federal SC State CEQA? CNPS 3:3-3-3	Coastal salt marsh. Known from fewer than ten occurrences in Marin, Napa and Sonoma counties. Taxonomic questions regarding identification and origin.	June-Aug Annual herb	Low: marginally suitable habitat present.
Potamogetonaceae				
Potamogeton zosteriformis eel-grass pondweed	Federal none State CEQA CNPS 2:2-2-1	Assorted freshwater marshes and swamps. Known from Contra Costa, Lake, Modoc, Lassen, and Shasta counties and Washington and Oregon.	June-July Annual herb (aquatic)	Low: suitable habitat present.
Ranunculaceae				
Delphinium recurvatum recurved larkspur	Federal SC State CEQA CNPS 1B:1-2-3	Chenopod scrub, cismontane woodland and Valley/ foothill grassland, in alkaline places. Restricted to the Central Valley from Colusa to Kern counties, San Luis Obispo.	Mar-May Perennial herb	Low: marginally suitable habitat present.
Myosorus minimus ssp. *apus* little mousetail	Federal SC State CEQA? CNPS 3:2-3-2	Alkaline vernal pools. Recorded throughout the Central Valley.	March-June Annual herb	None: no suitable habitat present.
Ranunculus lobbii Lobb's aquatic buttercup	Federal none State CEQA? CNPS 4:1-2-3	Mesic sites in cismontane woodland, Valley/foothill grassland, North Coast coniferous forest and vernal pools. Known from the San Francisco Bay Area to Mendocino and Napa counties.	March-May Annual herb (aquatic)	Low: suitable habitat present.
Scrophulariaceae				
Cordylanthus mollis ssp. *mollis* soft bird's-beak	Federal FPE State CR CNPS 1B:3-2-3	Coastal saltmarsh. Known from fewer than 10 locations in Contra Costa, Napa, and Solano counties. Extirpated in Marin and Sonoma counties.	July-Sept Annual herb (hemiparasitic)	Low: marginally suitable habitat present outside levees.
Gratiola heterosepala Boggs Lake hedge-hyssop	Federal none State CE CNPS 1B:1-2-2	Marshes along lake margins, vernal pools on clay. Occurs from the Sacramento Valley to the Modoc Plateau, central Sierra foothills and interior of the North Coast Ranges.	April-Aug Annual herb	None: no suitable habitat present.

TABLE 1 (continued)

Limosella subulata Delta mudwort	Federal State CNPS	none CEQA 2:2-3-1	Marshes and swamps, muddy or sandy intertidal flats in the Sacramento and San Joaquin river deltas.	May-Aug Perennial herb (stoloniferous)	Low: marginally suitable habitat present.

[1]Explanation of sensitivity status codes provided in Appendix B.

TABLE 2

POTENTIALLY-OCCURRING SPECIAL-STATUS WILDLIFE SPECIES AT THE EMERSON AND BURROUGHS PROPERTIES

Scientific Name Common Name	Status[1]		Habitat Affinities and Reported Localities in the Project Area	Potential for Occurrence On site
Invertebrates				
Aegialia concinna Ciervo aegilian scarab beetle	Federal State	none none	Inhabits sandy substrates. Specific habitat requirements and life history not known. Known only from a single location near Mendota, Fresno County.	Low: suitable habitat present Not known from project area.
Anthiscus antiochensis Antioch Dunes anthicid beetle	Federal State	SC none	Extinct. Formerly inhabited sandy substrate at the Antioch Dunes. Last seen in the early 1950s, before industialization of the area.	Low: marginally suitable habitat present.
Apodemia mormo langei Langes metalmark butterfly	Federal State	FE	Inhabits stabilized dunes along the San Joaquin River. Endemic to Antioch Dunes, Contra Costa County. Primary host plant is *Eriogonum nudum* var. *auriculatum*; feeds on nectar of other wildflowers as well.	Low: marginally suitable habitat present.
Coelus globosus globose dune beetle	Federal State	SC none	Inhabits foredunes and sand hummocks, burrowing beneath the sand surface, frequent among vegetation. Known to occur from Bodega Head, Mendocino Co. to Ensenada, Mexico.	Low: suitable habitat present. Not known from project vicinity.
Cophura hurdi Antioch Cophuran robberfly	Federal State	SC none	Habitat not well understood. Recorded only from Antioch in 1939.	Low: suitable habitat could be present. Not recorded from project vicinity.
Desmocerus californicus demorphus Valley elderberry longhorn beetle	Federal State	FT none	Riparian and oak savanna habitats. Requires elderberry (*Sambucus* spp.) as host plants. Inhabits streamsides in the Central Valley below 3,000 feet.	Low: potentially suitable habitat present.
Efferia aniochi Antioch efferian robberfly	Federal State	SC none	Habitat not well understood. Recorded only from Antioch Dunes in Contra Costa County in 1959.	Low: suitable habitat could be present. Not recorded from project vicinity.
Eucerceris ruficeps redheaded sphecid wasp	Federal State	SC none	Inhabits Central California interior dunes. Nests in hard-packed sand utilizing abandoned halictine bee burrows. Recorded only from near Coalinga and Stanislaus.	Low: marginally suitable habitat present.

TABLE 2 (continued)

Euphydryas editha bayensis bay checkerspot butterfly	Federal State	FT none	Restricted to native grasslands on serpentine. Primary larval host plant is *Plantago erecta. Orthocarpus densiflorus* and *O. purpurascens* are secondary host plants. Restricted to San Francisco, Alameda, Contra Costa, San Mateo, and Santa Clara counties. Not known from project vicinity.	None: no suitable habitat present on site or in project vicinity.
Helminthoglypta nickliniana bridgesi Bridges' Coast Range shoulderband snail	Federal State	SC none	Inhabits open hillsides of Alameda and Contra Costa counties. Tends to colonize under tall grasses and weeds. Prefers rock piles. Recorded from Kensington and in the vicinity of Thousand Oaks in the Berkeley Hills and in San Pablo Creek.	None: no suitable habitat present.
Hydrochara rickseckeri Rickseckers water scavenger beetle	Federal State	SC none	This aquatic species has been recorded in lakes, lagoons and vernal pools. Members of this family (Hydrophilidae) are scavengers whose larvae are predaceous. Nothing is known about the habits specific to this taxon. Restricted to the San Francisco Bay Area. Recorded from Solano, Marin and San Mateo counties. Known from Jepson Prairie.	Low: marginally suitable habitat present.
Hygrotus curvipes curved-footed hygrotus diving beetle	Federal State	SC none	Restricted to freshwater aquatic habitats. Known from a single, shallow muddy pool at Oakley, Contra Costa Co.	Low: marginally suitable habitat present.
Idiostatus middlekaufi Middlekaufs shieldback katydid	Federal State	SC none	Inhabits sandy dunes. Recorded only from Antioch Dunes in 1965. Not recorded from project vicinity.	Low: marginally suitable habitat present.
Myrmosula pacifica Antioch multilid wasp	Federal State	SC none	Inhabits sandy dunes. Recorded only from Antioch Dunes, Contra Costa County, in 1952. Not recorded from project vicinity.	Low: marginally suitable habitat present.
Perdita hirticeps luteocincta yellow banded andrenid bee	Federal State	SC none	Inhabits sandy dunes. Recorded only from Antioch Dunes, Contra Costa County, in 1936. Observed visiting flowers of *Gutierrezia californica*. Not recorded from project vicinity.	Low: marginally suitable habitat present.
Perdita scituta antiochensis Antioch andrenid bee	Federal State	SC none	Inhabits sandy dunes. Recorded only from Antioch Dunes, Contra Costa County, in 1977. Observed visiting flowers of *Eriogonum, Gutierrezia californica, Heterotheca grandiflora,* and *Lessingia glandulifera.*	Low: marginally suitable habitat present.
Philanthus nasilis Antioch specid wasp	Federal State	SC none	Inhabits sandy dunes. Recorded only from Antioch Dunes, Contra Costa County, in 1959. Not recorded from vicinity.	Low: marginally suitable habitat present.

TABLE 2 (continued)

Amphibians			
Ambystoma tigrinum californiense California tiger salamander	Federal SC State SSC	Breeds in temporary or semi-permanent pools. Seeks cover in rodent burrows in grasslands and oak woodlands. Inhabits the Coast Ranges from Santa Barbara to Sonoma counties along the coast and inland to Colusa, Yolo and Tulare counties.	Low: marginally suitable habitat present. Not recorded from vicinity.
Rana aurora draytonii California red-legged frog	Federal FT State SSC	Prefers semi-permanent and permanent stream pools, ponds and creeks with emergent and/or riparian vegetation. Occupies upland areas especially during the wet winter months. Most extant populations inhabit coastal areas and coastal mountains from Marin to Santa Barbara counties.	Low: suitable habitat present.
Scaphiopus hammondii western spadefoot toad	Federal SC State SSC	Breeds in temporary pools following winter and spring rains; larvae transform within 3 - 11 weeks; aestivates in burrows in loose soil.	Low: patches of suitable habitat present.
Reptiles			
Anniella pulchra pulchra silvery legless lizard	Federal SC State SSC	Inhabits sparsely vegetated areas on beaches and in chaparral, oak woodlands and riparian habitats. Needs loose soils for burrowing (sand, loam or humus), moisture, warmth and plant cover. Burrows in washes, dune sand and loose soils at the base of slopes or in intermittent streams. Forages in leaf litter during the day, but may emerge on the surface at dusk or night.	Low: marginally suitable habitat present.
Clemmys marmorata western pond turtle	Federal SC State SSC, CP	Prefers permanent, slow-moving creeks, streams, ponds, rivers, marshes and irrigation ditches with basking sites and a vegetated shoreline. Needs upland sites for egg-laying. Occurs from the Oregon border to the San Francisco Bay, inland throughout the Sacramento Valley and south along the coastal zone to San Diego County.	Moderate: suitable habitat present.
Masticophis flagellum ruddockii San Joaquin whipsnake	Federal SC State SSC, CP	Inhabits dry, open grassland or saltbush scrub. Utilized mammal burrows for refuge.	None: no suitable habitat present.
Phrynosoma coronatum frontale California horned lizard	Federal SC State SSC	Occurs in scrub and grassland on sandy soils. Active above ground between April and October. Prey primarily on native ant species.	Low: patches of marginally suitable habitat present.
Thamnophis gigas giant garter snake	Federal FT State CT	Inhabits sloughs, canals and small water courses with grassy banks and emergent vegetation. Requires high ground for basking and escape during winter flooding. Known from the Central Valley from Fresno north to the Sutter Buttes. Recently recorded from Sherman Island.	Low: suitable habitat present.

TABLE 2 (continued)

Species	Status		Habitat	Potential for occurrence
Birds				
Accipiter cooperi Cooper's hawk	Federal State Audubon	MB SSC Blue List	Nests primarily in deciduous riparian forests. May also occupy dense canopied forest from gray pine-oak woodland to ponderosa pine. Forages in open woodlands.	Moderate: species is a regular winter visitor to the region.
Agelaius tricolor tricolored blackbird	Federal State Audubon	SC , MB SSC none	Nests primarily in dense freshwater marshes with cattail or tules. Forages in grass lands. Largely endemic to California. Permanent resident in the Central Valley and along the coast from Marin to San Diego counties. Also known from Lake, Sonoma and Solano Co.	Moderate: suitable foraging habitat present.
Aquila chrysaetos golden eagle	Federal State Audubon	MB SSC none	Forages in a variety of habitats including grasslands, chaparral and oak woodland supporting abundant mammals. Nests on cliffs and escarpments and tall trees.	Moderate: marginally suitable foraging habitat present. No suitable nesting habitat present.
Ardea alba great egret (rookery site only)	Federal State Audubon	MB none none	Nests in large trees, reeds and cattails. Will nest colonially with great blue herons.	High: marginally suitable nesting habitat present.
Asio flammeus short-eared owl (nesting only)	Federal State Audubon	MB SSC Blue List	Found in salt and freshwater swamps, lowland meadows, irrigated alfalfa fields. Nests in tules and tall grasslands. Needs daytime seclusion. Nests on dry ground in depressions concealed by vegetation.	Low: some suitable nesting and foraging habitat present.
Athene cunicularia burrowing owl	Federal State Audubon	SC, MB SSC SC	Open, dry grasslands, deserts, prairies, farmland and scrublands with abundant active and abandoned mammal burrows. Occurs in lowlands throughout California.	Moderate: patches of suitable nesting and foraging habitat present.
Branta canadensis leucopareia Aleutian Canada goose	Federal State Audubon	FT, MB none none	One of eleven recognized subspecies. Winters in wetlands, grasslands and cultivated fields.	Low: suitable wintering habitat present only.
Buteo jamaicensis red-tailed hawk	Federal State	MB none	Nests in woodlands, feeds in open country.Often perches on poles or treetops.	High: nesting and foraging habitat present.
Buteo lineatus red-shouldered hawk	Federal State	MB none	Breeds in moist woodlands, often close to cultivated fields. Common in the Southeast Hunts for prey from a perch.	High: nesting and foraging habitat present.

TABLE 2 (continued)

Buteo regalis ferruginous hawk	Federal SC, MB State SSC Audubon SC	Forages over open terrain in plains and foothills where there are abundant ground squirrels or other small mammals. Does not nest in California. Common east of San Francisco Bay during the winter months.	Moderate: suitable wintering and foraging habitat present.
Buteo swainsoni Swainson's hawk	Federal MB State CT Audubon SC	Nests in oaks or cottonwoods in or near riparian habitat. Forages in grasslands and agricultural fields. Highest nesting densities are in Yolo County. Common throughout the lower Sacramento and San Joaquin valleys.	Moderate: suitable wintering habitat present. Low potential to nest on site; not within known range.
Charadrius alexandrinus nivosus western snowy plover	Federal FT, MB State SSC Audubon SC	Nests on sandy beaches on marine and estuarine shores, salt pond levees and shores of large alkali lakes. Requires sandy, gravelly or friable substrate to build nests.	Low: marginally suitable foraging habitat present.
Charadrius montanus mountain plover	Federal C State SSC Audubon none	Nests on arid plains and short-grass prairies in Western Great Plains and Great Basin; Winters in open, arid habitats, as well as fallow fields.	Low: marginally suitable wintering habitat present
Chlidonias niger black tern (nesting)	Federal SC, MB State SSC	Nests along lakes and in marshes in loose colonies built on floating vegetation just above water level.	Low: patches of suitable nesting habitat present.
Circus cyaneus northern harrier (nesting/wintering)	Federal MB State SSC	Nests and forages in grasslands ranging from salt grass in desert sinks to mountain cienagas. Nests on ground in shrubby vegetation or marsh.	Detected: suitable nesting and foraging habitat present
Dendroica petechia brewsteri yellow warbler	Federal MB State SSC Audubon SC	Nests in riparian areas dominated by willows, cottonwoods, sycamores or alders and in mature chaparral. May also inhabit oak and coniferous woodlands and urban areas near stream courses.	Moderate: suitable nesting habitat present.
Elanus leucurus white-tailed kite (nesting sites)	Federal MB State CFP Audubon none	Inhabits low rolling foothills and valley margins with scattered oaks and river bottom lands or marshes adjacent to deciduous woodlands. Prefers open grasslands, meadows and marshes for foraging close to isolated, dense-topped trees for nesting and perching.	Detected: suitable nesting and foraging habitat present.
Eremophila alpestris actia California horned lark	Federal MB State SSC Audubon none	Nests on ground in open grassland. Known from vicinity of San Francisco Bay.	Low: suitable foraging habitat present.

TABLE 2 (continued)

Falco columbarius merlin (wintering)	Federal MB State SSC Audubon SC	Winters in open country often along coast near concentrations of shorebirds. Known from vicinity of San Francisco Bay.	Moderate: suitable wintering habitat present.
Falco mexicanus prairie falcon	Federal MB State SSC Audubon none	Nests in cliffs and forages in open, arid and semi-arid habitats and marshes. Occurs as a permanent resident throughout California.	Low: may occassionally forage on site.
Falco peregrinus anatum American peregrine falcon	Federal FE, MB State CE, CFP Audubon none	Nests and roosts on protected ledges of high cliffs, bridges or buildings, usually adjacent to lakes, rivers or marshes. Permanent resident in the North and South Coast Ranges. Winters in the Central Valley southward through the Transverse and Peninsular Ranges.	Moderate: may occassionally forage on site. Nest recorded at the Antioch bridge.
Grus canadensis tabida greater sandhill crane (wintering)	Federal MB State CT, CFP Audubon none	Summers in open terrain near shallow freshwater lakes or marshes. Winters in plains and valleys near bodies of fresh water. Breeds from Sierra County northward to east side of the Cascade Range. Winters in the Central Valley and southern Imperial County.	Low: suitable habitat present. Not known from project vicinity.
Haliaeetus leucocephalus bald eagle	Federal FT, MB State CE Audubon none	Nests in tall trees, often near water in Pacific Northwest and Canada. Winters in a variety of habitats, primarily in the Central Valley.	Moderate: suitable foraging habitat present. No nesting habitat present.
Icteria virens yellow-breasted chat	Federal MB State SSC Audubon none	Nests in dense riparian habitats dominated by willows, alders, ash, blackberry and grape vines. Uncommon migrant in California. Known to nest in Sonoma, Mendocino El Dorado, Shasta and Yolo counties.	Low: suitable habitat present. Not known from project vicinity.
Ixobrychus exilis hesperis western least bittern	Federal SC, MB State SSC Audubon none	Inhabits fresh and brackish water marshes. Nests on the ground or on mounds of cattails, bulrush or tall grasses.	Moderate: suitable habitat present.
Lanius ludovicianus loggerhead shrike	Federal SC, MB State SSC Audubon Blue List	Open grasslands at margins of woodland and scrub habitats. Often uses lookout perches such as fence posts. Resident and winter visitor in lowlands and foothills throughout California.	Detected: suitable nesting and foraging habitat present

TABLE 2 (continued)

Laterallus jamaicensis coturniculus California black rail	Federal State	SC CT, CFP	Inhabits upper edges of tidal marshes. Prefers dense, low-growing vegetation for nesting.	Low: no suitable nesting habitat present on site. Moderately suitable foraging habitat available outboard of levees.
Melospiza melodia maxillaris Suisun song sparrow	Federal State	SC SSC	Resident of brackish-water marshes surrounding Suisun Bay. Inhabits cattails, tules and other sedges, and *salicornia*. Also known to occupy tangles bordering sloughs.	Low: dense scrub for nesting and some high vantage points for singing.
Numenius americanus long-billed curlew	Federal State Audubon	MB SSC SC	Salt marshes, mud flats, beaches; nests on upland prairies outside of California	Detected: suitable foraging habitat present.
Phalacrocorax auritus double crested cormorant (rookery site)	Federal State Audubon	MB SSC none	Nests in colonies on coastal cliffs and offshore islands and on lake margins in the interior of the state.	High: observed foraging in adjacent sloughs. No suitable nesting habitat present.
Rallus longirostris obsoletus California clapper rail	Federal State Audubon	FE, MB CE, CFP SC	Restricted to salt water marshes traversed by tidal sloughs in the vicinity of San San Francisco Bay. Associated with stands of pickleweed and high tidal marsh but forages on molluscs in tidal mud flats.	Low: no suitable nesting habitat present on site.
Mammals				
Antrozous pallidus pallid bat	Federal State	none SSC	Found in grasslands, shrublands, woodlands and forest from sea level through mixed conifer forests. Prefers rocky outcrops, cliffs and crevices with access to open habitats for foraging. Roosts must be protected from heat. Known from vicinity of San Francisco Bay. Nearest recorded location at Tracy.	Low: suitable roosting habitat present. Could forage on site and in vicinity.
Corynorhinus (Plecotus) townsendii townsendii Townsend's western big-eared bat	Federal State	SC SSC	Inhabits humid coastal regions of northern and central California. Roosts in limestone caves, lava tubes, mines, buildings, etc. Will only roost in open areas, hanging from walls and ceilings. Suitable roosting sites extremely limited and species. Highly sensitive to disturbance. Known from San Francisco Bay. Nearest recorded location at Tracy.	Low: suitable roosting habitat present. Could forage on site and in vicinity.
Eumops perotis californicus western mastiff bat	Federal State	none SSC	Inhabits many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands and chaparral. Roosts in crevices in cliff faces,high buildings, trees and tunnels. Known from vicinity of San Francisco Bay.	Low: marginally suitable roosting habitat present. Could forage on site.

TABLE 2 (continued)

Myotis ciliolabrum small-footed myotis bat	Federal SC State none	Roosts in caves, mine tunnels, crevices in rocks and buildings, generally near forested areas. Feeds low among trees or over shrubs. Distributed from interior California through the Great Plains states to the east coast.	Low: marginally suitable foraging habitat present.
Myotis volans long-legged myotis	Federal SC State none	Roosts colonially in buildings and crevices in rock ledges. Distributed throughout the western U.S., Mexico and Canada.	Low: suitable roosting habitat present. Could forage on site.
Myotis yumanensis Yuma myotis bat	Federal SC State SSC	Roosts colonially in caves, tunnels and buildings. Inhabits arid regions. Distributed throughout the western U.S., Mexico and Canada.	Low: suitable roosting habitat present. Could forage on site.
Sorex ornatus sinuosus Suisun shrew	Federal SC State SSC	Inhabits tidal marshes of the northern shores of Suisun and San Pablo bays. Requires dense low-lying cover and driftwood and other litter above the mean high tide line for nesting and foraging. Restricted range.	None: no suitable habitat present.

[1]Explanation of sensitivity status codes provided in Appendix B.

TABLE 3

FISHERIES RESOURCES OF POTENTIAL CONCERN

Scientific Name Common Name	Status[1]		Habitat Affinities and Reported Localities in the Project Area
Fishes			
Acipenser medirostris green sturgeon	Federal State	SC SSC	Anadromous. Inhabits estuaries of large rivers. Migrates far inland to spawn. Spawns during spring in rivers in deep, cold, fast-moving water. Only known to spawn in the Sacramento and Klamath rivers. Estuaries serve as nurseries. Adults are mostly marine,spending limited time in estuaries and rivers. Occurs from Alaska to Baja California.
Archoplites interruptus Sacramento perch	Federal State	SC SSC	This warm water, lacustrine species formerly inhabited sloughs, slow-moving rivers and lakes of the Central Valley. It is now mostly restricted to reservoirs and farm ponds. It is associated with submerged or emergent vegetation, which is essential for young. Adults can tolerate a wide range of physical and chemical water conditions. The species is native to the Sacramento, San Joaquin, Salinas and Pajaro rivers.
Eucyclogobius newberryi tidewater goby	Federal State	FE SSC	Restricted to brackish water lagoons or estuaries in coastal California. Reported from the Santa Clara River mouth (1984).
Hypomesus transpacificus Delta smelt	Federal State	FT CT	Inhabits open brackish and fresh water of large channels. Spawns during spring in sloughs and channels in the upper Delta. Spawning has also been recorded in Montezuma Slough and Suisun Bay. Occurs from Isleton on the Sacramento River and Mossman on the San Joaquin River to Suisun Bay.
Lampetra ayresi river lamprey	Federal State	SC SSC	Anadromous. Spawns during spring in clear gravel riffle pools in coastal streams. Young metamorphose upriver from salt water and enter the ocean in the following late spring. Restricted to coastal streams from Alaska to the San Francisco Bay. In Calif., the species is only recorded the Sacramento-San Joaquin rivers and the Russian River.
Lampreta tridentata Pacific lamprey	Federal State	SC none	Anadromou. Spawns during spring in clear, gravel riffle pools in clear, coastal streams. Adults feed in the ocean. Distributed from Alaska to the Santa Ana River.

TABLE 3 (continued)

Oncorhyncus mykiss irideus steelhead trout (Central Valley)	Federal State	FPE none	Anadromous. Inhabits cold headwaters, creeks, and small to large rivers and lakes with swift, shallow water and clean, loose gravel for spawning. Requires large pools during summer months. Spawns in spring. Populations inhabiting coast streams from the Russian River northward to Oregon and the Central Valley from Stanislaus County northward.
Oncorhyncus tshawtscha winter-run chinook salmon	Federal State	FE CE	Anadromous. Inhabits open ocean and coastal streams. Adults move upstream Jan.-June and begin spawning in April. Downstream migrant smolts move past Red Bluff Aug.-Oct. Limited entirely to the Sacramento River system.
Pogonichthys macrolepidotus Sacramento splittail	Federal State	FPT SSC	Inhabits both fresh and brackish water. Adults spawn on flooded vegetation after storms from Jan.-May. Larvae remain in inshore vegetation until late summer. Recorded in Sacramento, Sutter, Yolo and Stanislaus counties.
Spirinchus thaleichthys longfin smelt	Federal State	SC SSC	This native species inhabits estuaries and bays near to shore. It occurs along the Pacific coast from Alaska to the Monterey Bay. In the San Francisco Bay, its main populations are in San Pablo Bay. It ascends coastal streams from Oct. to Dec. to spawn. It is an important forage species.

[1]Explanation of sensitivity status codes provided in Appendix B.

APPENDIX A

Vertebrate Wildlife Species Observed at the Emerson/Burroughs Project Site

Key to Annotations:

CLASS: AMPHIBIA
ORDER: SALIENTIA (Frogs and Toads)
Family: Hylidae (Treefrogs and Relatives)
California tree frog
Family: Ranidae (True Frogs)
Bullfrog (*Rana catesbeiana*)

CLASS: REPTILIA
SUBORDER: SERPENTES (Snakes)
Family: Colubridae (Colubrids)
Gopher Snake (*Pituophis melanoleucus*)

CLASS: AVES
ORDER: CICONIIFORMES (Herons, Storks, Ibises, and Relatives)
Family: Ardeidae (Herons and Bitterns)
Great Blue Heron (*Ardea herodias*)
Snowy egret (*Egretta thula*)
Great egret (*Ardea alba*)
ORDER: ANSERIFORMES (Screamers, Ducks, and Relatives)
Family: Anatidae (Swans, Geese, and Ducks)
Canada Goose (*Branta canadensis*)
ORDER: FALCONIFORMES (Vultures, Hawks, and Falcons)
Family: Cathartidae (American Vultures)
Turkey Vulture (*Cathartes aura*)
Family: Accipitridae (Hawks, Old World Vultures, and Harriers)
White-tailed Kite (*Elanus leucurus*)
Red-shouldered Hawk (*Buteo lineatus*)
Red-tailed Hawk (*Buteo jamaicensis*)
Northern Harrier (*Circus cyaneus*)
Family: Falconidae (Caracaras and Falcons)
American Kestrel (*Falco sparverius*)
ORDER: GALLIFORMES (Megapodes, Currassows, Pheasants, and Relatives)
Family: Phasianidae (Quails, Pheasants, and Relatives)
Ring-necked pheasant (*Phasianus colchicus*)

APPENDIX B
EXPLANATION OF SENSITIVITY STATUS CODES

AGENCIES

USFWS = U.S. Fish and Wildlife Service
CDFG = California Department of Fish and Game
CNPS = California Native Plant Society
BLM = Bureau of Land Management
USFS = U.S. Forest Service

CALIFORNIA NATIVE PLANT SOCIETY DESIGNATIONS

List 1: Plants of highest priority
List 1A: Plants presumed extinct in California
List 1B: Plants rare and endangered in California and elsewhere
List 2: Plants rare and endangered in California but more common elsewhere
List 3: Plants about which additional data are needed
List 4: Plants of limited distribution

CNPS R-E-D Codes

R (Rarity)
1 = Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction or extirpation is low at this time.
2 = Occurrence confined to several populations or to one extended population.
3 = Occurrence limited to one or a few highly restricted populations, or present in such low numbers that it is seldom reported.
? = More data are needed

E (Endangerment)
1 = Not endangered
2 = Endangered in a portion of its range
3 = Endangered throughout its range
? = More data are needed

D (Distribution)
1 = More or less widespread outside California
2 = Rare outside California
3 = Endemic to California
? = More data are needed

FEDERAL DESIGNATIONS

FE = listed as Endangered by the Federal Government
FT = listed as Threatened by the Federal Government
FPE = proposed as Endangered by the Federal Government
FTE = proposed as Threatened by the Federal Government
FSS = federal sensitive species, as listed by BLM and USFS
C[1] = Candidate; taxa for which USFWS has sufficient biological information to support a proposal to list as Endangered orThreatened).
SC[1] = Species of Concern
MB = migratory non-game birds of management concern to the USFWS; protected under the Migratory Bird Treaty Act.

[1] As of Feb. 28, 1996, all Category 1 candidate taxa are now regarded merely as Candidates. The USFWS ceased to maintains lists of Category 2 and Category 3 candidate taxa; Category 2 taxa are now regarded as Species of Concern.

CALIFORNIA DEPT. OF FISH AND GAME DESIGNATIONS

CE = Listed as Endangered by the State of California
CR = Listed as Rare by the State of California
CT = Listed as Threatened by the State of California
CPE = Proposed for listing as Endangered
SSC = California Species of Special Concern
* = taxa that are restricted in distribution, declining throughout their range, or associated with habitats that are declining in California.
CEQA = taxa which are considered to meet the criteria for listing as Endangered, Threatened or Rare by the CDFG; impacts to such taxa must be addressed in CEQA documents.
CEQA? = Taxa that might be locally significant; should be evaluated for consideration during preparation of CEQA documents, as recommended by the CDFG.

note: currently, all CNPS list 1B and 2 taxa are considered "Special Plants" by the CDFG.

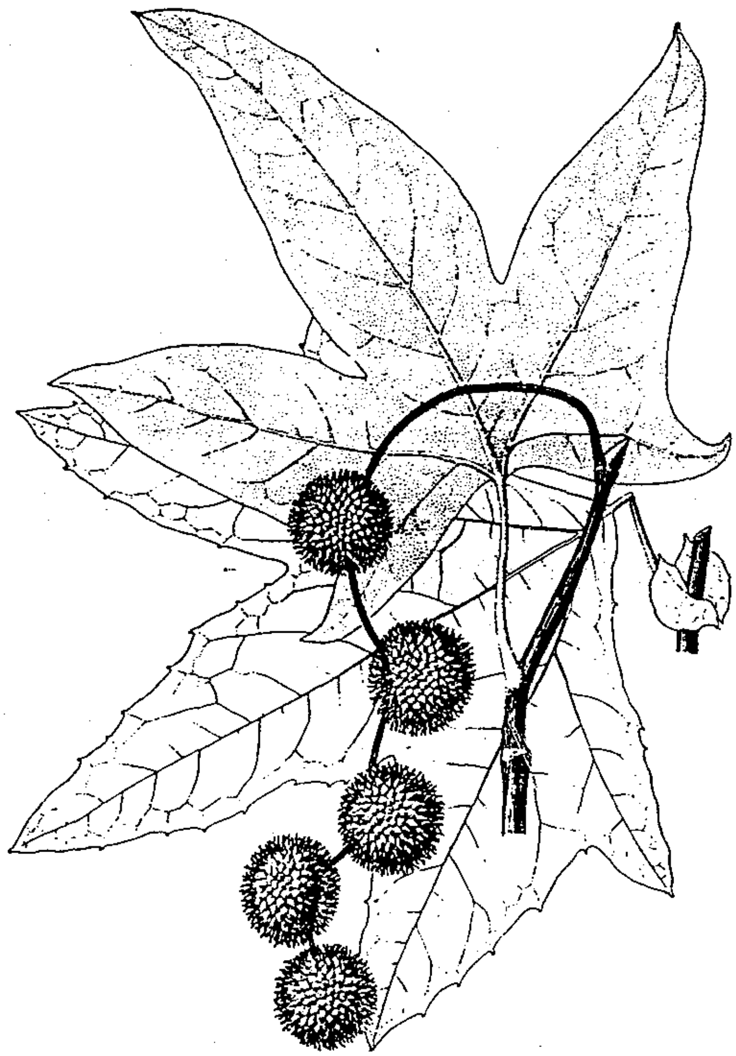
ORDER: CHARADRIIFORMES (Shorebirds, Gulls, and Relatives)
Family: Charadriidae (Plovers and Relatives)
Killdeer (*Charadrius vociferus*)
Long-billed curlew (*Numenius americanus*)
Family: Laridae (Gulls and Allies)
Herring gull (*Larus argentatus*)
Ring-billed gull (*Larus delawarensis*)
Family: Scolopacidae (Sandpipers and Relatives)
Common Snipe (*Gallinago gallinago*)
ORDER: COLUMBIFORMES (Pigeons and Doves)
Family: Columbidae (Pigeons and Doves)
Rock Dove (*Columba livia*)
Mourning Dove (*Zenaida macroura*)
ORDER: STRIGIFORMES (Owls)
Family: Strigidae (Typical Owls)
Burrowing Owl *(Athene cunicularia)*
ORDER: PICIFORMES (Woodpeckers and Relatives)
Family: Picidae (Woodpeckers and Wrynecks)
Nuttall's Woodpecker (*Picoides nuttallii*)
Downy Woodpecker (*Picoides pubescens*)
Northern Flicker (*Colaptes auratus*)
ORDER: GRUIFORMES (Cranes and allies)
Family: Rallidae (Rails, Gallinules and Coots)
Moorhen (*Gallinula chloropus*)
Sora (*Porzana carolina*)
Virginia Rail (*Rallus limicola*)
ORDER: PASSERIFORMES (Perching Birds)
Family: Tyrannidae (Tyrant Flycatchers)
Black Phoebe (*Sayornis nigricans*)
Say's Phoebe (*Sayornis saya*)
Family: Hirundinidae (Swallows)
Tree swallow (*Tachycineta bicolor*)
Family: Corvidae (Jays, Magpies, and Crows)
Western Scrub-Jay (*Aphelocoma californica*)
American Crow (*Corvus brachyrhynchos*)
Family: Troglodytidae (Wrens)
Marsh wren (*Cistothorus palustris*)
Family: Muscicapidae (Old World Warblers, Gnatcatchers, Kinglets, Thrushes, Bluebirds, and Wrentit)
Ruby-crowned Kinglet (*Regulus calendula*)
American Robin (*Turdus migratorius*)
Family: Mimidae (Mockingbirds and Thrashers)
Northern Mockingbird (*Mimus polyglottos*)

Family: Motacillidae (Wagtails and Pipits)
American Pipit (*Anthus rubescens*)
Family: Laniidae (*Shrikes*)
Loggerhead Shrike (*Lanius ludovicianus*)
Family: Sturnidae (Starlings)
European Starling (*Sturnus vulgaris*)
Family: Emberizidae (Wood Warblers, Sparrows, Blackbirds, and Relatives)
Yellow-rumped Warbler (*Dendroica coronata*)
Spotted towhee (*Pipilo maculatus*)
Chipping Sparrow (*Spizella passerina*)
Savannah Sparrow (*Passerculus sandwichensis*)
Song Sparrow (*Melospiza melodia*)
Golden-crowned Sparrow (*Zonotrichia atricapilla*)
White-crowned Sparrow (*Zonotrichia leucophrys*)
Red-winged Blackbird (*Agelaius phoeniceus*)
Western Meadowlark (*Sturnella neglecta*)
Brewer's Blackbird (*Euphagus cyanocephalus*)
Brown-headed Cowbird (*Molothrus ater*)
Family: Fringillidae (Finches)
House Finch (*Carpodacus mexicanus*)
Family: Passeridae (Weaver Finches)
House Sparrow (*Passer domesticus*)

CLASS: MAMMALIA
ORDER: MARSUPIALIA (Opossums, Kangaroos, and Relatives)
Family: Didelphidae (Opossums)
Virginia Opossum (*Didelphis virginiana*)
ORDER: RODENTIA (Squirrels, Rats, Mice, and Relatives)
Family: Sciuridae (Squirrels, Chipmunks, and Marmots)
California Ground Squirrel (*Spermophilus beecheyi*)
Family: Geomyidae (Pocket Gophers)
Botta's Pocket Gopher (*Thomomys bottae*)
Family: Cricetidae (Deer Mice and Relatives)
Deer Mouse (*Peromyscus maniculatus*)
Family: Muridae (Old World Rats and Mice)
Norway Rat (*Rattus norvegicus*)
House Mouse (*Mus mus*)
ORDER: CARNIVORA (Carnivores)
Family: Procyonidae (Raccoons and Relatives)
Raccoon (*Procyon lotor*)
Family: Mustelidae (Weasels, Badgers, and Relatives)
Striped Skunk (*Mephitis mephitis*)

EXHIBIT B

PRELIMINARY WETLANDS DELINEATION AND JURISDICTIONAL DETERMINATION OF THE EMERSON AND BURROUGHS PROPERTIES, OAKLEY, CONTRA COSTA COUNTY, CALIFORNIA



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SUMMARY

A routine wetlands delineation and jurisdictional determination was conducted on the Emerson and Burroughs properties on November 5 and 6, 1998. The study area covers approximately 1,100 acres of low-lying, relatively level land situated just east of the City of Oakley in northeastern Contra Costa County. Current land uses include a commercial dairy, pasture for dairy cows and beef cattle, cultivation for livestock fodder, and rural residential. Numerous outbuildings and structures such as barns, sheds, feed lots and corrals are present on the property. Several single-family residences are on the property. A small vineyard is also present. Both properties are dissected by a complex series of drainage and irrigation ditches and canals, and the Contra Costa Canal crosses the southern portion of the study area. The site is surrounded by extensive open lands with farms and scattered residences. Adjacent land uses consist primarily of agricultural activities, including farming and livestock grazing. The nearby waters of Big Break and Dutch Slough are popular recreational areas used for fishing, boating, water skiing and other activities.

The study area consists predominantly of disturbed lands at or below sea level from which the naturally-occurring vegetation has been entirely removed by grading, filling, cultivation, draining, irrigating and livestock grazing. Both parcels were diked and drained and have been continuously farmed since the mid-1800s. Cultivated fields and ruderal vegetation represent the dominant habitats. In low-lying areas or on fallow sites, patches of such native plant communities as valley freshwater marsh, alkali meadow, Great Valley willow scrub, Great Valley mixed riparian forest and inland dunes are present, representing either remnants of the original vegetation or sites on which native species have become reestablished. Although regularly maintained, many of the drainage ditches and irrigation canals support freshwater marsh vegetation.

Soil types mapped on site form a complex mosaic including Capay clay, wet, Delhi sand, Egbert mucky clay loam, Kingile muck, Marcuse clay, Piper loamy sand, Piper fine sandy loam, Rindge muck, Ryde silt loam, Sacramento clay, Shima muck, Sycamore silty clay loam and Sycamore silty clay loam, clay substratum. Of these eleven soil series, eight are considered to be hydric, two may contain inclusions of hydric soils, and one is considered not to be hydric by the Natural Resources Conservation Service.

Hydrology on the site has been greatly altered by the construction of levees, excavation and regular maintenance of drainage ditches, operation of sump pumps and regular and deep irrigation. Natural hydrology currently is restricted to direct precipitation and backwater flooding. High water table in portions of the site may also saturate the ground from below. Ponding occurs at several locations within the study area where soils are incompletely drained.

Based on this preliminary delineation, the study area supports a total of approximately 43.8 acres of potential ACOE jurisdictional wetlands. A summary table showing all potential ACOE-jurisdictional habitats is presented below.

Depending upon the final project design and the amount of potential direct and indirect impacts to wetlands, permits from the U.S. Army Corps of Engineers, the California Department of Fish and Game and the Regional Water Quality Control Board may be required for project approval. In addition, consultation between the ACOE and the U.S. Fish and Wildlife Service may also be required due to the presence of potentially suitable habitat for the state- and federally-listed Endangered species.

Summary of Potential Wetlands and Other Waters of the U.S. within the Study Area

Resource	Area in Acres (sq. ft.)
Wetlands	
Freshwater Marsh	33 acres (1,439,471 sq. ft.)
Alkali Meadow	9.7 acres (421,216 sq. ft.)
Willow Scrub	1.1 acres (49,216 sq. ft.)
Total Potential Wetlands	43.8 acres (1,909,812 sq. ft.)

1.0 INTRODUCTION

The study area is located in Oakley, along Dutch Slough between Marsh Creek and Jersey Island Road, in northeastern Contra Costa County (Figure 1). The site consists of two separate, unconnected parcels covering a total of approximately 1,100 acres. An approximately 400 acre parcel stands between the two portions of the site area and is not a part of the present study. Sycamore Associates LLC was contracted with to perform a formal wetlands delineation and jurisdictional determination for the study area. This report presents the results of our field investigations and outlines the permitting implications of these results.

2.0 METHODS AND LIMITATIONS

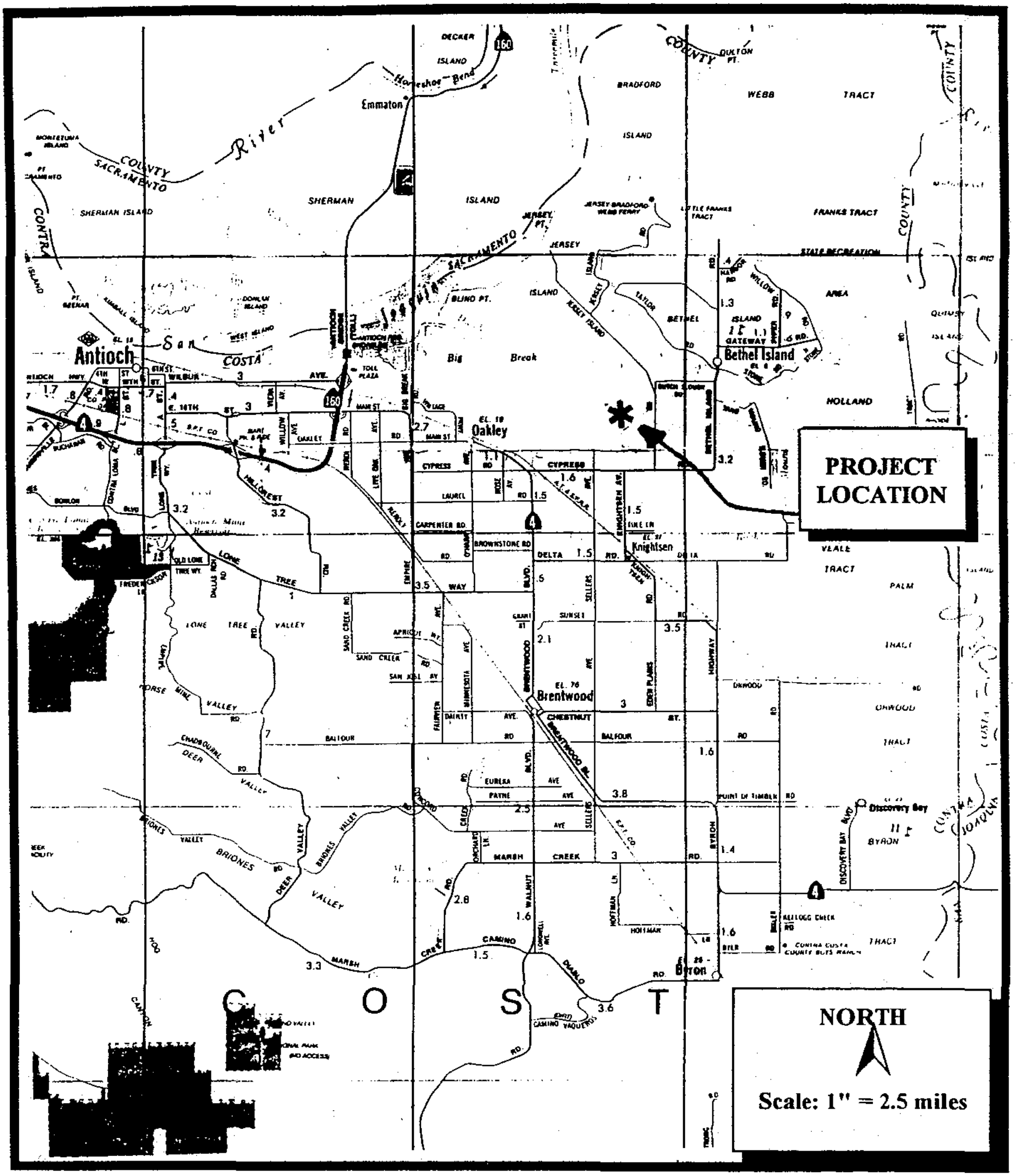
A reconnaissance survey of the study area was performed by Sycamore wetlands ecologist Michael Wood on October 30, 1998. A formal wetlands delineation was performed by Mr. Wood and Sycamore biologists Chris Rogers, Christopher Thayer with assistance by Stillwater Sciences biologist Emily Strauss. Field work was performed on November 5 and 6, 1998. The entire study area was surveyed on foot and by car. A routine wetlands delineation and jurisdictional determination was performed in accordance with the procedures outlined in the U.S. Army Corps of Engineers' (ACOE) Wetlands Delineation Manual (Environmental Laboratory 1987).

Data on vegetation, hydrology and soils were collected at a total of 47 sample locations (Appendix A). The extent of potential wetlands and waters of the U.S. was mapped on a 1" = 200' scale topographic map (Figure 2). A color aerial photograph (approximately 1" = 585', flown May, 1998) and a black and white aerial photograph (1" = 2,000', flown 1970; USDA 1977) were reviewed to aid in mapping.

Nomenclature used in this report conforms to Hickman (1993) for plants. Plant community names conform to Holland (1986) and Sawyer and Keeler-Wolf (1996); wetland community names conforming to Cowardin, *et al.* (1979) are also given. Background information on tidal and formerly tidal wetlands was obtained from Botanical Research Group (BRG 1992a, b).

3.0 SETTING

The study area covers approximately 1,103 acres on two discontinuous parcels located just east of the City of Oakley in northeastern Contra Costa County. The westernmost parcel (Emerson Ranch) consists of approximately 613 acres. It is bordered by Marsh Creek to the west, Cypress Road to the south, Dutch Slough to the north and Emerson Slough and Sellers Avenue to the east. The eastern parcel (Burroughs Ranch) consists of approximately 490 acres. It is bordered by Dutch Slough to the north, Little Dutch Slough to the west, Cypress Road to the south and Jersey Island Road to the east. Topography of both properties



SYCAMORE
ASSOCIATES
L.L.C.

Regional Location of Study Area

FIGURE 1

is mostly level. Levees have been constructed along the northern portions of both properties adjacent to the waters of Marsh Creek, Dutch Slough and Emerson Slough, where elevation is near or below sea level.

The Emerson Ranch currently supports a commercial dairy comprised of 4,300 cows. A majority of the property is under cultivation for livestock fodder or is used as pasture. Fields are regularly disked and planted with forage plants. Numerous outbuildings and structures such as barns, sheds, feed lots and corrals are present on the property. In addition, some areas of the ranch are used for feed storage and for the stockpiling of manure. A wastewater holding pond is located near the center of the parcel, and is connected to a series of pumps and a pipe system. Livestock effluent mixed with delta water is regularly disposed of by flooding fields on the property. Portions of the property are also plowed and currently under cultivation for dairy feed and silage. Two single-family residences are on the property. A small vineyard is also present.

The Burroughs Ranch formerly supported a dairy operation, which has been abandoned. Numerous associated buildings including barns and sheds remain from this operation. All of the property is currently used for grazing of beef cattle. Pastures are regularly flooded with delta water pumped into actively maintained irrigation ditches. A single occupied residence is present on site and another is present in a small out-holding.

Both properties are dissected by a complex series of drainage and irrigation ditches and canals. Irrigation water is pumped from Dutch Slough. Although the Contra Costa Canal crosses the southern portion of the study area, it is not used as a source of irrigation water. The study area is surrounded by extensive open lands with farms and scattered residences. Adjacent land uses consist primarily of agricultural activities, including farming and livestock grazing. The Ironhouse Sanitary District operates a waste water treatment facility west of Marsh Creek. Effluent is pumped via pipes across the Emerson property and Dutch Slough to Jersey Island for disposal. The nearby waters of Big Break and Dutch Slough are popular recreational areas used for fishing, boating, water skiing and other activities. Big Break Regional Shoreline, a public open space, is located just west of the study area, on the west side of Marsh Creek.

3.1 Characterization of the Vegetation

The study area consists predominantly of disturbed lands on which the naturally-occurring vegetation has been entirely removed by grading, filling, cultivation, draining, irrigating and livestock grazing. Both parcels have been continuously farmed since the mid-1800s. Cultivated fields and ruderal vegetation represent the dominant habitats. In low-lying areas or on fallow sites, patches of such native plant communities as valley freshwater marsh, alkali meadow, Great Valley willow scrub and interior dunes are present, representing either remnants of the original vegetation or sites on which native species have become reestablished. Although regularly maintained, many of the drainage ditches and irrigation canals support freshwater marsh vegetation, and some are occupied by narrow bands of Great Valley mixed riparian forest. Vegetation communities are described in more detail below.

Disturbed and Cultivated Lands

Disturbed lands are those on which the native vegetation has been completely removed by grading, cultivation, and development. Disturbed areas include paved and unpaved roadways, quarries, vacant lots, developments, parking areas, and storage yards. Such areas are not expected to support any naturally occurring vegetation, although invasive native species may become reestablished. Large portions of the study area occupied by a large commercial dairy operation support no vegetation whatsoever.

Cultivated lands within the study area are plowed and actively farmed for dairy forage and silage. Species under cultivation during the time of the present surveys include alfalfa (*Medicago sativa*), Sudan grass (*Sorghum bicolor*) and clover (*Trifolium* sp.). In addition, numerous irrigated fields used as pasture for livestock and support an assemblage of mostly herbaceous, non-native, annual and perennial grasses and forbs. Common species observed in irrigated pastures in the study area include tall fescue (*Festuca arundinacea*), Dallis grass (*Paspalum dilatatum*), Bermuda grass (*Cynodon dactylon*), Italian ryegrass (*Lolium multiflorum*), rabbitfoot grass (*Polypogon monspeliensis*), millet (*Setaria* sp.), clover (*Trifolium* spp.), common nutsedge (*Cyperus eragrostis*), curly dock (*Rumex crispus*), common plantain (*Plantago major*), bristly ox-tongue (*Picris echioides*) and many others. In places, some native species, including salt grass (*Distichlis spicata*) and meadow barley (*Hordeum brachyantherum*) are also present.

Landscaped lands associated with home sites and buildings are similarly disturbed but the native vegetation has been replaced with horticultural species.

Ruderal Vegetation

Ruderal habitat is that from which the native vegetation has been completely removed by grading, cultivation, or other surface disturbances. Such areas, if left undeveloped, may become recolonized by invasive exotic species as well as native species. The native vegetation may ultimately become at least partially restored if the soils are left intact and there is no further disturbance.

A majority of the property has been subject to a long period of cultivation and grazing. Ruderal habitat is present in many upland areas of the study area, including levees, roadsides, building sites, pastures and the margins of cultivated fields. The native vegetation on these lands has been completely removed and in some instances replaced by ruderal (weedy) non-native and native plant species where left fallow. Weedy non-native species detected within the study area include bristly ox-tongue, Italian ryegrass, horse weed (*Conyza canadensis*), giant reedgrass (*Arundo donax*), wild oats (*Avena* spp.), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), pepper-grass (*Lepidium latifolium*), yellow star thistle (*Centaurea solstitialis*), milk thistle (*Silybum marianum*) and wild radish (*Raphanus sativus*), among others. Native species which have become established on ruderal sites include dogbane (*Apocynum cannabinum*) and common reed (*Phragmites australis*). Ruderal sites along the sides of levees support dense thickets of Himalayan blackberry (*Rubus discolor*) and scattered mature individuals of black walnut (*Juglans californica*), presumably planted by bird-carried seed from nearby orchards.

Ruderal habitat is not specifically described by Sawyer and Keeler-Wolf (1995) and would be classified as upland following Cowardin, *et al.* (1979).

<u>Valley Freshwater Marsh</u>

Valley freshwater marsh typically occurs in low-lying sites that are permanently flooded with fresh water and lacking significant current. It is found on nutrient-rich mineral soils that are saturated for all or most of the year. This vegetation community is most extensive where surface flow is slow or stagnant or where the water table is so close to the surface as to saturate the soil from below. Valley freshwater marsh is distributed along the coast and in coastal valleys near river mouths and around the margins of lakes, springs, and streams (Holland 1986). This vegetation community characteristically forms a dense vegetative cover dominated by perennial, emergent monocots 1-15 feet high that reproduce by underground rhizomes.

Within the study area, Valley freshwater marsh is commonly found in drainage ditches and irrigation canals, in low-lying areas that do not drain, and on the river side of levees. Characteristic species present on site include common tule (*Scirpus acutus* var. *occidentalis*), three-square (*Scirpus americanus*), California bulrush (*Scirpus californicus*), cattail (*Typha* spp.), western goldenrod (*Euthamia occidentalis*) and water knotweed (*Polygonum amphibium* var. *emersum*), among others. It forms an extensive stand at the northern end of the Burroughs property and scattered patches in the northern portion of the Emerson Ranch.

Valley freshwater marsh habitat on site most closely corresponds to the Bulrush-Cattail Series following Sawyer and Keeler-Wolf (1995). Following Cowardin, *et al.* (1979), this plant community is classified as palustrine semi-permanently flooded emergent wetland.

<u>Alkali Meadow</u>

Alkali meadow is typically a sparse to densely vegetated plant community consisting of relatively few low-growing plant species. It occurs on fine-textured, more or less permanently moist, alkaline soils. Alkali meadow is distributed in valley bottoms and on the lower edges of alluvial slopes east of the Cascades and the Sierra Nevada as well as throughout the Sacramento and San Joaquin valleys and into Livermore Valley.

Within the study area, alkali meadow is fairly well-developed on fallow, low-lying areas on sandy to loamy soils. Characteristic plant species detected include Mediterranean barley, saltgrass, pickleweed (*Salicornia virginica*), alkali heath (*Frankenia salina*), common nutsedge, Bermuda grass, creeping wildrye (*Leymus triticoides*), yerba mansa (*Anemopsis californica*) and three-square (*Scirpus maritimus*), among others.

On site, alkali meadow most closely corresponds to the Saltgrass Series, as described in Sawyer and Keeler-Wolf (1995). Portions of this plant community would be classified as a palustrine seasonally flooded wetland as described by Cowardin, *et al.* (1979).

Great Valley Willow Scrub

Great Valley willow scrub typically consists of a dense, shrubby, streamside thicket dominated by any of several species of willows. An herbaceous understory may be present or not. This native plant community occurs close to river channels on fine-grained sand and gravel bars with a high water table. It is distributed along all the major rivers and most smaller streams throughout the Great Central Valley watershed below 1,000 feet in elevation (Holland 1986).

Within the study area, Great Valley willow scrub consists of scattered individual willows and isolated stands in the northern portions of both properties. Patches of willows also occur along the levees on both parcels, and have established dense, linear stands along some of the drainage ditches, particularly in the southeastern portion of the Burroughs property. Dominant species occurring within the study area include red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), shining or Pacific willow (*Salix lucida* ssp. *lasiandra*), sandbar willow (*Salix exigua*) and Goodding's willow (*Salix gooddingii*).

Great Valley willow scrub conforms to the Narrowleaf Willow Series, Black Willow Series, Arroyo Willow, Pacific Willow, Red Willow Series as described in Sawyer and Keeler-Wolf (1995) and would be classified as a palustrine shrub-scrub wetland following Cowardin, *et al.* (1979).

Great Valley Mixed Riparian Forest

Great Valley mixed riparian forest is a tall, dense winter-deciduous forest, typically with a fairly closed canopy. It consists of any of a number of tall riparian trees with an understory of shade-tolerant shrubs and lianas. It occurs on low gradient floodplains with fine-textured alluvium, usually away from active river channels but subject to periodic flooding. It is distributed on depositional streams throughout the Great Central Valley below 500 feet in elevation. It was once extensive in the Sacramento and San Joaquin valleys, where it has since been cleared for agriculture, flood control and urban expansion.

Within the study area, Great Valley mixed riparian forest occurs in narrow bands along artificial drainage ditches. It is most well developed in the southern portion of the Burroughs property along an west-east flowing irrigation ditch north of the Contra Costa Canal. Dominant overstory species occurring within the study area include red willow, arroyo willow, black willow, black walnut, Fremont cottonwood (*Populus fremontii*) and a few valley oaks (*Quercus lobata*) and sycamores (*Platanus racemosa*). Understory vegetation includes California rose (*Rosa californica*), Himalayan blackberry, bulrush, three-square and cattail, among others.

Great Valley mixed riparian forest within the study area most closely conforms to the Mixed Willow Series as described in Sawyer and Keeler-Wolf (1995) and would be classified as a Palustrine forested or shrub-scrub wetland following Cowardin, *et al.* (1979).

Interior Dunes

Interior dunes support an open, primarily perennial, winter- and spring-growing herbaceous community with scattered low shrubs or live oaks. Shrubs are generally less than waist high and widely scattered. Annual forbs and grasses form a discontinuous ground canopy interspersed with an open ground layer. This community occurs at low elevations in the vicinity of the Sacramento-San Joaquin Delta. It occupies deposits of sand or pockets of sandy soils formed from windblown stream deposits, on mounds and ridges that have become more prominent as the surrounding organic soils subsided.

Within the study area, a highly disturbed interior dunes community occurs on the western side of the Emerson property adjacent to a vineyard. This site is located on a small, highly disturbed dune from three to ten feet above the surrounding lands. The dominant species occurring within this community on site is silver bush lupine (*Lupinus albifrons*). Herbaceous vegetation includes telegraph weed (*Heterotheca grandiflora*), yellow star thistle, and Russian thistle (*Salsola tragus*), among others. While other sand mounds are present within the study area, none have been found to support notable populations of native plant species.

Interior dunes are not specifically described by Sawyer and Keeler-Wolf (1995) and would be classified as upland following Cowardin, *et al.* (1979).

3.2 Characterization of the Soils

Soil types mapped on site form a complex mosaic including Capay clay, wet, Delhi sand, Egbert mucky clay loam, Kingile muck, Marcuse clay, Piper loamy sand, Piper fine sandy loam, Rindge muck, Ryde silt loam, Sacramento clay, Shima muck, Sycamore silty clay loam and Sycamore silty clay loam, clay substratum (USDA 1977). The mapping of these soil types was not necessarily confirmed in the field. A description of the soils occurring on site is presented below.

Capay

The Capay series consists of moderately well-drained soils on lower edges of valley fill and on old benches that have been slowly dissected. These soils formed in alluvium from sedimentary rock. Slopes are 0 to 9 percent and elevation ranges from 10 to 500 feet above sea level. The average annual temperature is 59° F, the average annual frost-free season is 250 to 300 days and the average annual rainfall is 14 to 16 inches. Permeability is slow, run-off is slow and the hazard of erosion is slight. The series is classified as a Typic Chromoxerert. Although the series itself is not classified as a hydric soil type, it can contain

inclusions of the hydric Marcuse series in depressions. Soil types in this series mapped as occurring within the study area include Capay clay, 2 to 9 percent slopes.
The specific mapping unit occurring on the study area is Capay clay, wet, 0 to 2 percent slopes. Runoff is very slow, and there is no hazard of erosion where the soil is tilled and exposed. Included in this mapping unit are areas of Rincon clay loam, wet, Brentwood clay loam, wet, and Marcuse clay. Capay clay wet is not considered a hydric soil, but inclusions of Marcuse clay are listed as hydric (USDA 1993).

Delhi

The Delhi series consists of somewhat excessively drained soils. These soils formed in wind-modified stream deposits of mixed origin. Slopes are 2 to 9 percent. Vegetation consists of annual grasses and forbs and scattered live oaks. Elevation ranges from 10 to 150 feet above mean sea level. The average annual air temperature is 59° F, average annual rainfall is 12 to 14 inches, and the frost-free season is 260 to 300 days per year. These soils are generally moist to a depth of 60 inches from December through February and are dry from May through October in most years. Delhi soils are classified as Typic Xeropsamments.

The specific mapping unit occurring on site, Delhi sand, 2 to 9 percent slopes, has rapid permeability, run-off is slow or very slow and the hazards of soil blowing and water erosion are slight where the soil is tilled and exposed.

This is the only Delhi soil mapped in Contra Costa County. Included in this soil unit as mapped are areas of Lougenour loam in places near the delta. Areas of Delhi sand that have slopes of 0 to 2 percent are also included. Delhi sand 2 to 9 percent slopes is not considered a hydric soil type, however, inclusions of Lougenour loam are classified as hydric (USDA 1991, 1993).

Egbert

The Egbert series consists of very poorly drained soils on level tracts of the San Joaquin River delta. Drainage has been altered by the use of reclamation structures. These soils formed in alluvium in old stream channels and other areas. Slopes are 0 to 2 percent. Elevation ranges from 5 to 15 feet above sea level. The average annual temperature is 60 F, the average annual rainfall is 12-14 inches and the average annual frost-free period is 250 to 300 days. Vegetation typically consists of annual grasses, forbs, rushes and sedges.

On site, the specific mapping unit is Egbert mucky clay loam. Included within this unit are areas of Kingile muck, Ryde silt and Merritt loam. Permeability is slow, runoff is very slow, and there is no hazard of erosion. The seasonal high water table is at 1.5 to 4 feet below the surface. The Egbert series is classified as a Fluvaquentic Haplaquoll. It is considered a hydric soil type (USDA 1991, 1993).

Kingile

The Kingile series consists of very poorly drained soils in fresh-water marshes and old river channels. Slopes are less than 2 percent and elevation ranges from 10 to 15 feet below sea level. The average annual air temperature is 60° F, the frost-free season is from 260 to 300 days, and the average annual rainfall is 12-14 inches. Vegetation is tules and reeds. The Kingile series is classified as a Terric Medisaprist.

The specific mapping unit on site is Kingile muck. Included with it in mapping are areas of Egbert mucky clay loam, Webile muck, Shima muck and Venice muck. Kingile muck is subject to ponding, or water runs off very slowly. There is no hazard of water erosion, but soil blowing is a moderate hazard where the soil is tilled and exposed. Kingile muck is considered to be a hydric soil (USDA 1993).

Marcuse

The Marcuse series consists of poorly and very poorly drained soils that formed in alluvium from sedimentary rock. These soils are along lower edges of valley fill and on rims of basins. Slopes are 0 to 2 percent and elevation ranges from 0 to 5 feet above mean sea level. Average annual air temperature is 60° F, and the frost-free season is from 250 to 275 days. Annual rainfall averages 10 to 14 inches. These soils are saturated from mid-December to early March unless they are artificially drained. Vegetation consists of saltbush, pickleweed and meadow barley. Marcuse series soils are classified as Vertic Halaquepts.

The specific soil in this series mapped in the study area is Marcuse clay. This soil is poorly drained and is subject to ponding, or water runs off very slowly. There is no hazard of erosion. Included with this soil in mapping are areas of Marcuse clay, strongly alkali, and Sacramento clay, alkali. Marcuse clay is classified as hydric (USDA 1993).

Piper

The Piper series consists of poorly drained soils formed on low eolian mounds and ridges that have become more prominent as the surrounding organic soils subsided. These soils are on the delta. Slopes are 0 to 5 percent and elevations range from 0 to 25 feet above sea level. The average annual temperature is 60 F, the average annual rainfall is 12-16 inches and the average annual frost-free season is 250-300 days. Vegetation typically consists of annual grasses, chiefly ripgut brome and red brome. This series is classified as an Aeric Haplaquept.

Two units of the Piper series are mapped as occurring on site. Piper loamy sand includes areas of Shima muck and Piper fine sandy loam. This soil is subject to frequent ponding and runoff is very slow. Permeability is rapid. The seasonal high water table is 2.5 to 4 feet below the surface. Piper fine sandy loam includes areas of Shima muck and Piper loamy sand. Runoff is slow to medium and permeability is slow in about 80 percent of the area and moderate in 20 percent of the area depending on the degree of cementation. Both Piper units are considered hydric (USDA 1991, 1993).

Rindge

The Rindge series consists of very poorly drained organic soils that formed in marshes. These soils are found don the Sacramento-San Joaquin Delta. Slopes are 0 to 2 percent and elevation ranges from 5 to 15 feet below sea level. The average annual air temperature is 59°F, the average annual rainfall is 12-16 inches and the average annual frost-free season is 250-310 days. Native vegetation consists of reeds and tules. Soils of the Rindge series are classified as Typic Medisaprists.

The specific mapping unit on site is Rindge muck. Runoff is very slow and soil blowing is a moderate hazard where the soil is tilled and exposed. This soil is subject to peat fires in the summer. If allowed to dry, the soil shrinks irreversibly and will repel water. Rindge muck is considered a hydric soil type (USDA 1993).

Ryde

The Ryde series consists of very poorly drained soils which are found on the Sacramento-San Joaquin Delta. Slopes are from 0 to 2 percent, and elevation ranges from 5 feet above sea level to 10 feet below sea level. The average annual air temperature is 59°F, the average annual rainfall is 12-16 inches and the average annual frost-free season is 260-300 days. Vegetation consists of tules, reeds and sedges. Depth of the water table ranges from 40 to 50 inches during the growing season and to within a foot of the surface during the winter.

The specific unit mapped as occurring on site is Ryde silt loam. Permeability is moderate, runoff is very slow and there is no hazard of erosion where the soil is tilled and exposed. Included in mapping of this unit are areas of Kingile muck, Rindge muck and Egbert silty clay. Ryde silt loam is considered a hydric soil (USDA 1993).

Sacramento

The Sacramento series consists of poorly drained and very poorly drained soils that formed in mixed alluvium. These soils are adjacent to the organic soils on the Sacramento-San Joaquin Delta. Slopes are from 0 to 2 percent and elevation ranges from near sea level to 60 feet. The average annual air temperature is 59°F, the average annual rainfall is 12-16 inches and the average annual frost-free season is 260-300 days. Vegetation consists of annual grasses and forbs. This soil has been artificially drained, and the water table has been lowered to a depth of 4 to 5 feet.

The specific unit mapped as occurring on site is Sacramento clay. Permeability is slow and runoff is slow. There is no hazard of erosion. Included in the mapping of this unit are areas of Egbert clay adjacent to organic soils and small areas of Marcuse clay. Soils of the Sacramento series are classified as Vertic Haplaquols and are considered hydric soils (USDA 1993).

Shima

The Shima series consists of very poorly drained organic soils underlain by sand at a depth of less than 36 inches. These soils are in marshes on the Sacramento-San Joaquin River delta. They formed mainly from the remains of reeds and tules. Slopes are less than 1 percent and elevation is slightly below sea level. The average annual temperature is 60 F, the average annual rainfall is 12 to 14 inches and the average annual growing season is 260 to 310 days. The series is classified as a Typic Medisaprist.

The specific unit mapped as occurring on site is Shima muck. Included in this unit are areas of Piper and Webile soils. Permeability is rapid and runoff is very slow. There is no hazard of erosion. The seasonal high water table is at 2 to 4 feet below the surface. The unit is considered hydric (USDA 1991, 1993).

Sycamore

The Sycamore series consists of poorly drained soils that formed in alluvium from sedimentary rock. Slopes are 0 to 2 percent and elevation ranges from 10 to 300 feet above sea level. Annual air temperature is 59° F, annual rainfall is 14-18 inches and the frost-free season is 275-300 days per year. Vegetation consists of annual grasses and forbs. Sycamore series soils are classified as Aeric Haplaquepts. The specific units mapped as occurring on site include Sycamore silty clay loam and Sycamore silty clay loam, clay substratum.

Sycamore silty clay loam is a nearly level soil of flood plains. Included with this soil in mapping are areas of Omni clay. Also included are areas of Sorrento silty clay on higher, better drained areas adjacent to channels of streams, areas of Laugenour loam and areas of Delhi sand. Runoff is slow, and the hazard of erosion is none to slight.

Sycamore silty clay loam, clay substratum are nearly level soils formed on flood plains and low terraces. This soil is underlain by clay at a depth of 40-60 inches. It is an Inceptisol and is classified as a fine silty mixed non-acid, thermic Aeric Haplaquept. It has a Capability Class of IIw-2 (17) indicating that drainage is typically a problem for cultivation due to a moderately slow to slow permeability rate and a perched water table at 40-50 inches. Run-off is slow to very slow and soils are ponded in places. Soils are poorly drained and have a high shrink-swell capacity.

Although this series is not classified as hydric by the Concord Field Office of the USDA, unnamed soils in depressions and inclusions in the Omni series are present and are considered hydric (USDA 1993).

3.3 Characterization of the Hydrology

The study area is situated on mostly level land near or below sea level and protected at its lower (northern) end by a series of maintained levees. Numerous excavated drainage ditches and irrigation canals divide the property into separate pastures and fields of varying sizes. The ditches drain surface flows toward the northern end of the property. The ditches vary in width from 6 to 20 feet and most are regularly maintained by dredging. Many of the ditches periodically support stands of tules and cattails. Lands within the study area have been under active and continuous cultivation since the mid 1800s, when the levees were constructed and the lands drained. Currently, the lands are alternately drained via ditches and sump pumps and flooded as a means of disposing of cattle effluent. Irrigation is frequent and intense throughout the year.

Natural hydrology on the site is restricted to direct precipitation backwater flooding. A high water table in some areas may also saturate the ground from below. Ponding occurs at several locations on the property where soils are incompletely drained. Elevations decrease from south to north, becoming as much as ten feet below sea level near Dutch Slough. Due to the levees surrounding the low lying portions of the property, surface flow off site does not occur. During the present survey, most of the drainage ditches contained flowing or standing water. Standing water or soil saturated to the surface was also present in many portions of the property mapped as valley freshwater marsh or alkali meadow wetlands.

A total of approximately one mile of the Contra Costa Canal crosses the study area. Waters contained in the canal are not hydrologically connected to any other waters on the study area.

4.0 PRELIMINARY FINDINGS

4.1 Wetlands

Wetlands are defined as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (§404 Clean Water Act). Indicators of all three wetlands parameters (hydric soils, hydrophytic vegetation, wetlands hydrology) must be present for a site to be classified as a wetland (Environmental Laboratory 1987).

Based on this preliminary wetlands delineation, a total of 43.8 acres (1,909,812 square feet) of potential wetlands occur on site. Habitats consist of 33 acres (1,439,471 square feet) of Valley freshwater marsh, 9.7 acres (421,216 square feet) of alkali meadow and 1.1 acres (49,125 square feet) of Great Valley willow scrub. A summary of all wetlands is presented in Table 1. The location and size of all potential jurisdictional wetlands are shown in Figure 2.

Hydrophytic Vegetation

Hydrophytic vegetation includes those plant species that possess physiological features or reproductive adaptations that allow them to persist in soils subject to prolonged inundation and anaerobic soil conditions. Plant species are classified by their probability of being associated with wetlands or uplands. Obligate (OBL) species almost always (>99% of the time) occur in wetlands. Facultative Wetland (FACW) species occur in wetlands 67-99% of the time. Facultative (FAC) species have an equal probability 33-66% to occur in wetlands. Facultative Upland (FACU) and Obligate Upland (UPL) species occur in wetlands 1-33% and <1% of the time, respectively. For a sample point to meet this criterion, more than 50 percent of the dominant plant species in each of the strata must be OBL, FACW, or FAC indicator species.

All plant species within the study area were identified and their wetland indicator status recorded; the wetland indicator status of each was obtained from the National List of Plant Species that Occur in Wetlands, Region 0, California (Reed 1988). Dominant plant species were determined using the "50/20 Rule". The wetland indicator status of the most common species detected within potential wetlands is provided in Table 2.

TABLE 1

SUMMARY OF WETLANDS AND OTHER WATERS OF THE U.S. WITHIN THE STUDY AREA

Resource	Area in Acres (sq. ft.)
Wetlands	
Freshwater Marsh	33 acres (1,439,471 sq. ft.)
Alkali Meadow	9.7 acres (421,216 sq. ft.)
Willow Scrub	1.1 acres (49,125 sq. ft.)
Total Potential Wetlands	43.8 acres (1,909,812 sq. ft.)

TABLE 2
WETLAND INDICATOR STATUS OF
COMMON PLANT SPECIES DETECTED WITHIN POTENTIAL WETLANDS

Scientific Name	Common Name	Indicator Status
Amaranthus sp.[1]	pigweed	not listed
Ambrosia psilostachya	western ragweed	FAC
Apium graveolens[1]	celery	FACW*
Aster subulatus var.ligulatus	saltmarsh aster	FACW
Atriplex triangularis[1]	spearscale	FACW
Bromus tectorum[1]	cheat grass	not listed
Centurea solstitialis[1]	yellow star thistle	not listed
Cirsium vulgare[1]	bull thistle	FACU
Cynodon dactylon[1]	Bermuda grass	FAC
Cyperus eragrostis	umbrella sedge	OBL
Cyperus strigosus	straw-colored cyperus	FACW
Distichlis spicata	salt grass	FACW
Echinochloa crus-galli[1]	barnyard grass	FACW
Elymus elymiodes	squirrel-tail grass	FACU-
Epilobium ciliatum	northern willow herb	FACW
Festuca arundinacea[1]	tall fescue	FAC-
Frankenia salina	alkali heath	FACW+
Hordeum marinum ssp. *gussoneanum*[1]	Mediterranean barley	FAC
Hordeum murinum[1]	hare barley	not listed
Juncus balticus	wire rush	OBL
Lactuca serriola[1]	wild lettuce	FAC
Leymus triticoides	alkali ryegrass	FAC+
Lolium multiflorum[1]	Italian ryegrasss	not listed
Lotus corniculatus[1]	birdfoot trefoil	FAC
Lythrum hyssopifolia[1]	hyssop loosestrife	FACW
Malva parviflora[1]	cheeseweed	not listed
Malvella leprosa	alkali mallow	FAC*
Medicago polymorpha[1]	bur clover	not listed
Medicago sativa[1]	alfalfa	not listed
Paspalum dilatatum[1]	dallis grass	FAC
Picris echioides[1]	bristly ox-tongue	FAC*
Plantago major[1]	broadleaf plantain	FACW-
Polygonum amphibium	water knotweed	OBL
Polygonum persicaria[1]	lady's thumb	FACW
Polygonum punctatum	water smartweed	OBL
Polypogon monspeliensis[1]	rabbitfoot grass	FACW+
Rumex crispus[1]	curly dock	FACW-

Table 2 (Continued)

Salicornia virginica	pickleweed	OBL
Scirpus acutus var. *occidentalis*	common tule	OBL
Scirpus americanus	three-square	OBL
Scirpus californicus	California bulrush	OBL
Scirpus maritimus	three-square	OBL
Sonchus asper[1]	prickly sow-thistle	FAC
Sorghum bicolor[1]	Sudan grass	FAC*
Trifolium repens[1]	white clover	FACU+
Trifolium sp. [1]	clover	not listed
Typha angustifolia	narrow-leaf cattail	OBL
Vicia sativa[1]	common vetch	FACU
Xanthium strumarium	eastern cocklebur	FAC+

[1] indicates non-native species

Hydric Soils

Hydric soils include non-drained organic soils, mineral soils with a high water table, ponded soils, and flooded soils. During field reconnaissance, the soil at most sample points was examined to a depth of 16-20 inches. Characteristic field indicators of hydric soils include the presence of a histic epipedon, the presence of sulfidic material, the presence of an aquic or peraquic moisture regime, reducing soil conditions, soil color (including gleyed soils or soils with a low matrix chroma, with or without bright mottles), iron or manganese concretions, and soils listed as hydric by the USDA. Soils information was compared with the Contra Costa County Soil Survey (USDA 1977).

Field indicators of hydric soils detected include gleyed or low matrix chroma colors, the presence of sulfidic odor, the presence of an aquic moisture regime, reducing conditions and organic streaking in sandy soils. Eight of eleven soil series mapped as occurring on site (Egbert, Kingile, Marcuse, Piper, Rindge, Ryde, Sacramento, and Shima) are listed as hydric by the USDA (1991, 1993). Delhi soils are not considered hydric. The remaining soils (Capay and Sycamore) are not listed as hydric, but may contain hydric inclusions. Within potential wetland areas, soils are considered to exhibit strong field indicators of hydric conditions.

Wetland Hydrology

In order for the hydrology parameter to be met, a site must be seasonally inundated or saturated for at least 12.5 percent of the growing season; areas inundated or saturated for 5-12.5 percent of the growing season might or might not meet the parameter. Given the location of the study area, a particular site would need to be inundated or saturated to within

12 inches of the soil surface for around 30 consecutive days during the growing season to meet the wetland hydrology criterion.

At the time of the present survey, all areas on the study area mapped as wetlands (Figure 2) exhibited clear field indicators of wetland hydrology. Primary field indicators detected included inundation, saturation in the upper 12 inches, water marks, drift lines, sediment deposits, and a clear wetland drainage pattern. Secondary field indicators detected included oxidized root channels, water stained leaves and the FAC neutral test. The topography of the site and its low-lying position indicate that some areas are saturated from below by a high water table and are most likely inundated or saturated to within 12 inches of the soil surface for a significant portion of the growing season.

4.2 Unvegetated Waters of the U.S.

Waters of the U.S. are defined as 1) waters used in interstate or foreign commerce, 2) waters subject to the ebb and flow of tide, 3) all interstate waters including interstate wetlands, intrastate lakes, rivers, streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce, and 4) areas that are or could be used for recreation by interstate or foreign travellers, fish or shellfish that is sold in interstate or foreign commerce, or industrial purposes in interstate commerce (§328.3(a). The Environmental Protection Agency (EPA) has expanded the definition of "waters" to include "waters" used to irrigate crops sold in interstate commerce, and habitats that are used by birds protected by treaty or birds that cross state lines, and habitat for endangered species (51 FR 41217), as well as impoundments of "waters", tributaries of "waters", and territorial seas (§328.3(a)(4),(5),(6).

The width of a "waters" is defined as that portion which falls within the limits of ordinary high water. Field indicators of ordinary high water include clear and natural lines on opposite sides of the banks, scouring, sedimentary deposits, drift lines, exposed roots, shelving, destruction of terrestrial vegetation, and the presence of litter or debris. Typically, the width of "waters" corresponds to the two-year flood event.

None of the existing drainage ditches or irrigation canals are considered to fall under the jurisdiction of the ACOE. All such features within the study area are excavated in dry ground and are regularly maintained as part of ongoing agricultural operations. Ditches that pass through wetlands are dominated by wetland vegetation and are addressed in Section 4.1, above. While no ACOE-jurisdictional unvegetated waters of the U.S. are present within the study area, all portions of Dutch Slough, Emerson Slough and Little Dutch Slough are under ACOE jurisdiction.

5.0 PERMITTING IMPLICATIONS

Waters of the U.S. including wetlands are considered sensitive biological resources and fall under the jurisdiction of several regulatory agencies. Impacts to waters of the U.S. including wetlands might require federal, state, and/or local permits or agreements. Avoiding impacts to waters of the U.S. or wetlands would negate the need for agency involvement. Prior to the issuance of any development permit for actions that would result in unavoidable impacts to jurisdictional "waters" or wetlands, the following agencies should be notified:

U.S. Army Corps of Engineers (Sacramento District)
California Department of Fish and Game
California Regional Water Quality Control Board
U.S. Fish and Wildlife Service

U.S. Army Corps of Engineers

Section 404 of the Clean Water Act (CWA) of 1972 regulates activities that result in the discharge of dredged or fill material into waters of the U.S., including wetlands. The primary intent of the CWA is to authorize the Environmental Protection Agency (EPA) to regulate water quality through the restriction of pollution discharges. The ACOE is the principal authority to regulate discharges of dredged or fill material into waters of the U.S., although the EPA has a specific oversight role over the ACOE authority.

Projects that include potential dredge or fill impacts to waters of the U.S. including wetlands must, under most circumstances, be reviewed by the ACOE pursuant to Section 404 of the CWA. Aggregate wetland impacts (defined as direct fill or indirect effects of fill) over three acres require a standard Individual Permit. Projects impacting one to three acres of wetlands are subject to a Preconstruction Notification (PCN), which includes coordination with federal and state agencies. Projects impacting between 1/3 and one acre will require notification and review by the ACOE. All permitees who utilize the Nationwide Permit 26 for impacts to less than 1/3 of an acre are required to report the location and acreage of impacts to the ACOE. A PCN and Individual Permit are also required for any project that would result in cumulative impacts to more than 500 linear feet of a stream or for projects that run parallel to a stream. Additional regional requirements for maintaining upland buffer areas between authorized projects and open waters or streams may be conditions for granting any ACOE permit. Activities authorized under either a Nationwide or Individual Permit require compliance with ACOE Section 404 regulations, EPA Section 404(b)(1) Guidelines, NEPA, the Endangered Species Act, Section 106 of the National Historic Preservation Act, Section 401 of the Clean Water Act and the Coastal Zone Management Act.

In order for any authorization by a Nationwide Permit to be valid, certain general conditions must be met, including 1) appropriate erosion and siltation controls must be used and maintained during construction, 2) the project must not substantially disrupt the movement of those species of aquatic life indigenous to the water body, 3) the activity must comply with any regional conditions which may have been added by the District Engineer, 4) and individual state water quality certification must be obtained or waived, 5) the activity must not jeopardize the continued existence of an Endangered or Threatened species or a species proposed for such designation; the project proponent must notify the District Engineer if any listed species or critical habitat might be affected or is in the vicinity of the project, and 6) the project proponent must notify the District Engineer of the proposed discharge (see below).

Individual permits require the submission of an individual application and compliance with the ACOE's formal review process. This process provides opportunities for public notice and comment, requires the preparation of an alternatives analysis pursuant to EPA Section 404 (b)(1) and requires compliance with the National Environment Policy Act (NEPA) environmental review process. The average time necessary for the ACOE to process an Individual Permit is 120 days, although controversial projects can take up to two years or more.

There are two simple methods for the verification of ACOE jurisdiction. One method is to attend one of the ACOE's monthly interagency preapplication consultations. At these meetings, it would be determined if the project proponent must apply for a permit or if the project falls under ACOE jurisdiction and what type of permit may be required. During the interagency meeting, it would also be determined what course of action would be required to meet other federal, state and local regulations.

It is recommended that the applicant make a request for verification to the ACOE Sacramento district office. The following information should be provided to the ACOE: 1) name, address, and phone number of the general permittee; 2) location of planned work; 3) brief description of the proposed work, it purpose, and the approximate size of the waters, including wetlands, which would be lost or substantially adversely modified as a result of the work, and; 4) any specific information on the resources, such as a copy of this report and delineation map. The ACOE will typically respond within 30 days, notifying the project proponent as to what jurisdiction, if any, the ACOE may exert. If the ACOE does not respond within 30 calendar days, the activity may proceed. It is nonetheless recommended that the district office be contacted before engaging in the activity even if it has not responded in the 30-day period. Once verified, a wetland delineation is valid for three to five years.

No matter what type of permit the ACOE determines is required for the proposed program, the regulatory guidelines require a permit applicant to justify project-related impacts to waters of the U.S. including wetlands and to provide mitigation for unavoidable impacts. In order of preference, these include avoidance, minimization and compensation. There are three types of compensatory mitigation. These include wetland enhancement, wetland restoration, and wetland creation. With the incorporation of sensitive project design and sensitive construction practices, impacts to "waters" or wetlands can frequently be avoided or minimized.

California Department of Fish and Game

The CDFG has jurisdictional authority over wetland resources associated with rivers, streams, and lakes under California Fish and Game Code Sections 1600 to 1607. The CDFG has the authority to regulate work that will substantially divert, obstruct, or change the natural flow of a river, stream, or lake; substantially change the bed, channel, or bank of a river, stream, or lake; or use material from a streambed. Typical activities regulated by CDFG under Sections 1600-1607 authority include rechannelling and diverting streams, stabilizing banks, implementing flood control projects, river and stream crossings, diverting water, damming streams, gravel mining, and logging operations.

The CDFG encourages completion of a Streambed Alteration Agreement, which is not a permit, but rather a mutual agreement between the CDFG and the project proponent. The CDFG generally evaluates the information gathered during preparation of the environmental assessment document and attempts to satisfy their resource concerns during the permitting process. In accordance with their policy of "no net loss" of wetland habitat, the Streambed Alteration Agreement can impose conditions on the proposed activity to ensure no net loss of wetlands values or acreage. Typically, a Streambed Alteration Agreement will also include a mitigation program for impacts to all wetlands, regardless of acreage. The CDFG also typically requires the establishment of a buffer zone immediately adjacent to creeks and wetlands. The buffer zone, measured from the upland edge of riparian vegetation might be as little as ten feet wide or as much as 100 feet wide.

The applicant is required to contact the CDFG prior to the initiation of any construction, either during the preapplication interagency consultation or through separate consultation. The CDFG will then stipulate what its permitting concerns are and should give the applicant an idea of what type of conditions on project approval he/she can expect. Because the CDFG has a policy of no net loss of wetlands, complete mitigation for all impacts to wetlands may be required as a condition of approval. As part of a Streambed Alteration Agreement with the CDFG, for projects resulting in unavoidable impacts to wetlands, mitigation measures in the form of replacement of lost wetlands values and functions may be required to minimize adverse environmental effects. One of three acceptable types of mitigation are typically required. These include, in order of decreasing preference, on site in-kind replacement, off site in-kind replacement, and mitigation banking.

California Regional Water Quality Control Board

Pursuant to Section 401 of the Clean Water Act and EPA 404(b)(1) Guidelines, any applicant for a federal permit to conduct any activity which may result in any discharge into navigable waters must provide a certification from the California Regional Water Quality Control Board (CRWQCB) that such discharge will comply with the state water quality standards (Title 23, California Administrative Code, Section 3830 *et. seq.*). The CRWQCB has a policy of no-net-loss of wetlands in effect and typically requires mitigation for all impacts to wetlands before it will issue a water quality certification.

Projects that would result in discharges into waters of the U.S. but qualify for certain Nationwide Permits may also require state water quality certification or waiver thereof. Upon receipt of notification from the permittee, the ACOE issues a public notice for review by the CRWQCB. If the CRWQCB fails or refuses to act on certification requirements within a reasonable time (e.g., 60 days after receipt of the ACOE notice), the certification requirement is waived (CRWQCB 1988). If a CRWQCB issues a water quality certification which includes special conditions, the district engineer will add these conditions as conditions of the Nationwide Permit.

U.S. Fish and Wildlife Service

Wetlands in the region of the study area have recently been determined to support the state- and federally-listed Endangered giant garter snake (*Thamnophis gigas*) and other federally-listed species. The federal Endangered Species Act (ESA) requires that all federal agencies ensure that their actions do not jeopardize the continued existence of federally listed species or adversely modify their critical habitat. Therefore, the federal ESA becomes an issue for activities disturbing wetlands only when the property contains a federally-listed species or supports suitable habitat within the range of such species that may be adversely affected by a permit decision. In that event, the ACOE must initiate consultation with the U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS), pursuant to Section 7 of the ESA.

One of the general conditions on the issuance of a Nationwide Permit by the ACOE permit states that "the activity must not jeopardize the continued existence of an Endangered or Threatened species or a species proposed for such designation." Furthermore, the project proponent must notify the District Engineer if any listed species or critical habitat might be affected or is in the vicinity of the project. Generally, if a federally-listed species could be affected by the filling of wetlands, the project proponent will be required to apply for an Individual Permit. At this point, based on the project description and recommended mitigation measures, the ACOE can, at its discretion, state that the project would have "no effect" on the species or is "not likely to adversely effect" the species. If the USFWS concurs with this evaluation, the ACOE can issue its permit. If the USFWS does not concur, a Section 7 consultation will be initiated, the product of which will be recommendations for additional studies and/or mitigation measures.

If the USFWS concludes in its biological opinion that the project would jeopardize a federally listed species and that there are no reasonable and prudent alternatives to minimize effects on the species, the ACOE is required under Section 404(b)(1) Guidelines to deny the permit.

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APPENDIX A

WETLAND DELINEATION FIELD FORMS

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Christopher Thayer Sycamore Associates (925) 284-1766	State:	California

Community ID: Freshwater Marsh

Do normal circumstances exist on the site?	YES		
Is the site significantly disturbed (Atypical Situation)?	YES (drained)	Transect ID:	
Is the area a potential Problem Area?	NO	Plot ID:	Sample Point # B-1

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Atriplex triangularis*	95	herb	FACW	1. *Polygonum amphibium*	10	herb	OBL
2.				2. *Lactuca serriola*	2	herb	FAC
3.				3. *Epilobium ciliatum*	1	herb	FACW
4.				4.			
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100 %

Remarks:
Dense herbaceous cover, clearly dominated by wetland indicator species, site is not regularly plowed, but has been cultivated historically.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Field Observations:

Depth of surface water: none (inches)
Depth to free water in pit: >12 (inches)
Depth to saturated soil: 15 (inches)

Wetland Hydrology Indicators

Primary Indicators:

__ inundated
__ saturated in upper 12 inches
__ water marks
__ drift lines
__ sediment deposits
X drainage pattern in wetlands

Secondary Indicators:

X oxidized root channels in upper 12 inches
__ water-stained leaves
__ local soil survey data
X FAC neutral test
X other (see below)

Remarks:
Soil moist thoughout. Site 6-7 feet below sea level on diked reclaimed land. Artificially drained by series of maintained ditches and some pumps. Presumed to be inundated or saturated to within 12" of the surface for a significant portion of the growing season. Increased saturation is likely if pumping ceases.

SOILS

Map unit name
(Series and Phase): Shima muck
Taxonomy (Subgroup) Terric Medisaprists

Drainage Class: very poorly drained

Soil type confirmed in field? Yes

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
12	A	2.5 N	none	N/A	clay loam (high amount of organic material)

Hydric Soil Indicators

__ histosol
__ histic epipedon
__ sulfidic odor
X aquic moisture regime
X reducing conditions
X gleyed or low chroma colors

__ concretions
__ high organic content in surface layer in sandy soils
__ organic streaking in sandy soils
X listed on local hydric soils list
X listed on national hydric soils list
__ other (see below)

Remarks:
Soil chroma is very dark. Soil color is presumed to have evolved under saturated conditions.

WETLAND DETERMINATION

Hydrophytic vegetation present? YES
Wetland hydrology present? YES
Hydric soils present? YES

Is this sampling point within a wetland? YES

Remarks:
Strong field indicators of hydric soils and wetland hydrology. Relatively strong field indicators of hydrophytic vegetation. Site has been altered by historic plowing, draining and grazing.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Chris Rogers		
	Sycamore Associates (925) 284-1766	State:	California

Community ID: Freshwater Marsh

Do normal circumstances exist on the site?	YES		
Is the site significantly disturbed (Atypical Situation)?	YES (drained)	Transect ID:	
Is the area a potential Problem Area?	NO	Plot ID:	Sample Point # B-2

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Xanthium strumarium*	70	herb	FAC+	1. *Polygonum amphibium*	5	herb	OBL
2. *Atriplex triangularis*	20	herb	FACW	2.			
3.				3.			
4.				4.			
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100 %

Remarks:
Somewhat distinct vegetation zone, clearly dominated by wetland indicator species, site is not regularly plowed, but has been cultivated historically.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: 14 (inches)
Depth to saturated soil: 13 (inches)

Wetland Hydrology Indicators
Primary Indicators:
__ inundated
__ saturated in upper 12 inches
__ water marks
__ drift lines
__ sediment deposits
X drainage pattern in wetlands
Secondary Indicators:
__ oxidized root channels in upper 12 inches
__ water-stained leaves
__ local soil survey data
X FAC neutral test
X other (see below)

Remarks:
Site is slightly elevated, soil wet thoughout profile. Site drains to channels at perimeter . Likely seasonally high groundwater saturates upper 12 inches. Artificially drained by series of maintained ditches and some pumps. Presumed to be inundated or saturated to within 12" of the surface for a significant portion of the growing season. Increased saturation is likely if pumping ceases.

SOILS

Map unit name (Series and Phase): Shima muck

Taxonomy (Subgroup): Terric Medisaprists

Drainage Class: very poorly drained

Soil type confirmed in field? Yes

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
0-18+	A	N 2.5/0	none	N/A	clay/ clay loam (loose and well drained)

Hydric Soil Indicators

- X histosol
- __ histic epipedon
- __ sulfidic odor
- X aquic moisture regime
- X reducing conditions
- X gleyed or low chroma colors
- __ concretions
- __ high organic content in surface layer in sandy soils
- __ organic streaking in sandy soils
- X listed on local hydric soils list
- X listed on national hydric soils list
- __ other (see below)

Remarks:
Soil chroma is very dark. Soil color is presumed to have evolved under saturated conditions.

WETLAND DETERMINATION

Hydrophytic vegetation present? YES
Wetland hydrology present? YES - high groundwater ?
Hydric soils present? YES

Is this sampling point within a wetland? YES

Remarks:
Strong field indicators of hydric soils and wetland hydrology. Relatively strong field indicators of hydrophytic vegetation. Site has been altered by historic plowing, draining and grazing.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Michael Wood		
	Sycamore Associates (925) 284-1766	State:	California

Community ID: Freshwater Marsh

Do normal circumstances exist on the site?	YES		
Is the site significantly disturbed (Atypical Situation)?	YES (drained)	Transect ID:	
Is the area a potential Problem Area?	NO	Plot ID:	Sample Point # B-3

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Atriplex triangularis*	60	herb	FACW	1. *Lactuca serriola*	3	herb	FAC
2. *Polygonum amphibium*	35	herb	OBL	2. *Xanthium strumarium*	3	herb	FAC+
3.				3. *Rumex crispus*	2	herb	FACW-
4.				4.			
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100 %

Remarks:
Ruderal, fallow, formerly cropped, clearly dominated by wetland indicator species, site is not regularly plowed, but has been cultivated historically.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: 16 (inches)
Depth to saturated soil: 12 (inches)

Wetland Hydrology Indicators
Primary Indicators:

- __ inundated
- X saturated in upper 12 inches (in pit)
- __ water marks
- __ drift lines
- __ sediment deposits
- X drainage pattern in wetlands

Secondary Indicators:

- __ oxidized root channels in upper 12 inches
- __ water-stained leaves
- __ local soil survey data
- X FAC neutral test
- X other (see below)

Remarks:

Soil moist throughout. Site 6-7 feet below sea level on diked reclaimed land. Artificially drained by series of maintained diches and some pumps. Presumed to be inundated or saturated to within 12" of the surface for a significant portion of the growing season. Increased saturation is likely if pumping ceases.

SOILS

Map unit name
(Series and Phase): Shima muck
Taxonomy (Subgroup) Terric Medisaprists

Drainage Class: very poorly drained

Soil type confirmed in field? Yes

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
0-18	A	N 2.5/0	none	N/A	clay loam

Hydric Soil Indicators

__ histosol
__ histic epipedon
X sulfidic odor
X aquic moisture regime
X reducing conditions
X gleyed or low chroma colors

__ concretions
__ high organic content in surface layer in sandy soils
__ organic streaking in sandy soils
X listed on local hydric soils list
X listed on national hydric soils list
__ other (see below)

Remarks:
The soil chroma is very dark. Soil color is presumed to have evolved under saturated conditions.

WETLAND DETERMINATION

Hydrophytic vegetation present? YES
Wetland hydrology present? YES
Hydric soils present? YES

Is this sampling point within a wetland? YES

Remarks:

Strong field indicators of hydric soils and wetland hydrology. Relatively strong field indicators of hydrophytic vegetation. Site has been altered by historic plowing, draining and grazing.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Christopher Thayer Sycamore Associates (925) 284-1766	State:	California

Community ID: Freshwater Marsh

Do normal circumstances exist on the site?	YES	
Is the site significantly disturbed (Atypical Situation)?	YES (artificially drained)	Transect ID:
Is the area a potential Problem Area?	NO	Plot ID: Sample Point # B-4

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Picris echioides*	75	herb	FAC*	1. *Lactuca serriola*	5	herb	FAC
2. *Atriplex triangularis*	20	herb	FACW	2. *Xanthium strumarium*	5	herb	FAC+
3.				3. *Rumex crispus*	2	herb	FACW-
4.				4. *Festuca arundinacea*	2	herb	FAC-
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100 %

Remarks:
Dense vegetation 20 feet west of solid *Scirpus acutus* stand. Site clearly dominated by weak wetland indicator species.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: >16 (inches)
Depth to saturated soil: 16 (inches)

Wetland Hydrology Indicators

Primary Indicators:

__ inundated (nearby)
__ saturated in upper 12 inches (in pit)
__ water marks
__ drift lines
__ sediment deposits
X drainage pattern in wetlands

Secondary Indicators:

__ oxidized root channels in upper 12 inches
__ water-stained leaves
__ local soil survey data
__ FAC neutral test
__ other (see below)

Remarks:
Soil moist thoughout. Site 6-7 feet below sea level on diked reclaimed land. Artificially drained by series of maintained ditches and some pumps. Presumed to be inundated or saturated to within 12" of the surface for a significant portion of the growing season. Increased saturation is likely if pumping ceases.

SOILS

Map unit name
(Series and Phase): Shima muck
Taxonomy (Subgroup) Terric Medisaprists

Drainage Class: very poorly drained

Soil type confirmed in field? Yes

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Inclusion layer	Soil texture, concretions structure, etc.
12	A	2.5Y 2/0	10 YR 3/3 in layer 1/2 inch thick at 12 inches.	clay loam

Hydric Soil Indicators

- __ histosol
- __ histic epipedon
- __ sulfidic odor
- X aquic moisture regime
- X reducing conditions
- X gleyed or low chroma colors
- __ concretions
- __ high organic content in surface layer in sandy soils
- __ organic streaking in sandy soils
- X listed on local hydric soils list
- X listed on national hydric soils list
- __ other (see below)

Remarks:
Soil chroma is very dark. Soil color is presumed to have evolved under saturated conditions.

WETLAND DETERMINATION

Hydrophytic vegetation present? YES
Wetland hydrology present? YES
Hydric soils present? YES

Is this sampling point within a wetland? YES

Remarks:
Strong field indicators of hydric soils and wetland hydrology. Relatively strong field indicators of hydrophytic vegetation. Site has been altered by historic plowing, draining and grazing.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Michael Wood Sycamore Associates (925) 284-1766	State:	California

Community ID: Ruderal Wetland

Do normal circumstances exist on the site?	YES		
Is the site significantly disturbed (Atypical Situation)?	YES (drained)	Transect ID:	
Is the area a potential Problem Area?	NO	Plot ID:	Sample Point # B-5

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Festuca arundinacea*	90	herb	FAC-	1. *Atriplex triangularis*	12	herb	FACW
2.				2. *Picris echioides*	8	herb	FAC*
3.				3. *Lactuca serriola*	2	herb	FAC
4.				4.			
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 0 %

Remarks: Fallow, formerly cropped land.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Field Observations:

Depth of surface water:	0	(inches)
Depth to free water in pit:	>18	(inches)
Depth to saturated soil:	>18	(inches)

Wetland Hydrology Indicators

Primary Indicators:

- __ inundated
- __ saturated in upper 12 inches (in pit)
- __ water marks
- __ drift lines
- __ sediment deposits
- __ drainage pattern in wetlands

Secondary Indicators:

- __ oxidized root channels in upper 12 inches
- __ water-stained leaves
- __ local soil survey data
- __ FAC neutral test
- __ other (see below)

Remarks:

Artificially drained, low-lying field, 6 feet below sea level, diked.

SOILS

Map unit name
(Series and Phase): Shima muck
Taxonomy (Subgroup) Terric Medisaprists

Drainage Class: Very poorly drained

Soil type confirmed in field? No

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
0-6	Ap	N 2.5/0	None	n/a	clay loam
0-10		10 YR 3/1			clay loam
10+	B	10Y 5/1			sandy clay

Hydric Soil Indicators

- __ histosol
- __ histic epipedon
- X sulfidic odor
- X aquic moisture regime
- X reducing conditions
- X gleyed or low chroma colors
- __ concretions
- __ high organic content in surface layer in sandy soils
- __ organic streaking in sandy soils
- X listed on local hydric soils list
- X listed on national hydric soils list
- __ other (see below)

Remarks: Strong field indicators of hydric soils presumed due to saturation.

WETLAND DETERMINATION

Hydrophytic vegetation present? YES
Wetland hydrology present? YES
Hydric soils present? YES

Is this sampling point within a wetland? YES

Remarks:

Weak field indicators of hydrophytic vegetation and wetland hydrology. Strong field indicators of hydric soils.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Chris Rogers		
	Sycamore Associates (925) 284-1766	State:	California

Community ID: Freshwater marsh

Do normal circumstances exist on the site?	YES		
Is the site significantly disturbed (Atypical Situation)?	YES (drained)	Transect ID:	
Is the area a potential Problem Area?	NO	Plot ID:	Sample Point # B-6

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Juncus balticus*	100	herb	OBL	1.			
2. *Polygonum amphibium*	20	herb	OBL	2.			
3.				3.			
4.				4.			
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100 %

Remarks:
Clearly dominated by wetland indicator species, site is not regularly plowed, but has been cultivated historically.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: >16 (inches)
Depth to saturated soil: >16 (inches)

Wetland Hydrology Indicators
Primary Indicators:
__ inundated
__ saturated in upper 12 inches (in pit)
__ water marks
__ drift lines
__ sediment deposits
X drainage pattern in wetlands
Secondary Indicators:
X oxidized root channels in upper 12 inches
__ water-stained leaves
__ local soil survey data
X FAC neutral test
X other (see below)

Remarks:
Soil moist thoughout. Site 6-7 feet below sea level on diked reclaimed land. Artificially drained by series of maintained ditches and some pumps. Presumed to be inundated or saturated to within 12" of the surface for a significant portion of the growing season. Increased saturation is likely if pumping ceases.

SOILS

Map unit name
(Series and Phase): Shima muck
Taxonomy (Subgroup) Terric Medisaprists

Drainage Class: very poorly drained

Soil type confirmed in field? No

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
*0-6	A	N 2.5/0	none	N/A	clay, clay loam
6-16	B	10 Y 4/1	7.5 YR 5/8	m-m-p	sandy

* inclusions of light sand from below, uncommon

Hydric Soil Indicators

- X histosol
- __ histic epipedon
- __ sulfidic odor
- X aquic moisture regime
- X reducing conditions
- X gleyed or low chroma colors
- __ concretions
- __ high organic content in surface layer in sandy soils
- X organic streaking in sandy soils
- X listed on local hydric soils list
- X listed on national hydric soils list
- __ other (see below)

Remarks:
Organic-enriched horizon overlying gley sandy soil, mottles evidence of saturation within 12 inches.

WETLAND DETERMINATION

Hydrophytic vegetation present? YES
Wetland hydrology present? YES
Hydric soils present? YES

Is this sampling point within a wetland? YES

Remarks:
Strong field indicators of hydric soils and wetland hydrology. Relatively strong field indicators of hydrophytic vegetation. Site has been altered by historic plowing, draining and grazing.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Michael Wood Sycamore Associates (925) 284-1766	State:	California

Community ID: Alkali Grassland

Do normal circumstances exist on the site?	YES		
Is the site significantly disturbed (Atypical Situation)?	YES (drained)	Transect ID:	
Is the area a potential Problem Area?	NO	Plot ID:	Sample Point # B-7

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Leymus triticoides*	95	herb	FAC+	1.			
2. *Malvella leprosa*	35	herb	FAC*	2.			
3.				3.			
4.				4.			
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100%

Remarks:
Dense herbaceous cover, clearly dominated by wetland indicator species, site is not regularly plowed, but has been cultivated historically.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: >18 (inches)
Depth to saturated soil: >18 (inches)

Wetland Hydrology Indicators
Primary Indicators:
- __ inundated
- __ saturated in upper 12 inches (in pit)
- __ water marks
- __ drift lines
- __ sediment deposits
- X drainage pattern in wetlands

Secondary Indicators:
- __ oxidized root channels in upper 12 inches
- __ water-stained leaves
- __ local soil survey data
- __ FAC neutral test
- X other (see below)

Remarks:
Soil moist thoughout. Site 6-7 feet below sea level on diked reclaimed land. Artificially drained by series of maintained ditches and some pumps. Presumed to be inundated or saturated to within 12" of the surface for a significant portion of the growing season. Increased saturation is likely if pumping ceases.

SOILS

Map unit name
(Series and Phase): Shima muck
Taxonomy (Subgroup) Terric Medisaprists

Drainage Class: Very poorly drained

Soil type confirmed in field? No

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
0-18	Ap	N 2.5/0	none	N/A	loam

Hydric Soil Indicators

- __ histosol
- __ histic epipedon
- __ sulfidic odor
- __ aquic moisture regime
- __ reducing conditions
- X gleyed or low chroma colors
- __ concretions
- __ high organic content in surface layer in sandy soils
- __ organic streaking in sandy soils
- ✓ listed on local hydric soils list
- __ listed on national hydric soils list
- __ other (see below)

Remarks:
Soil chroma is very dark. Soil color is presumed to have evolved under saturated conditions.

WETLAND DETERMINATION

Hydrophytic vegetation present? YES
Wetland hydrology present? NO
Hydric soils present? YES

Is this sampling point within a wetland? YES

Remarks:
Strong indication of hydric soils. Moderate indication of hyrophytic vegetation. Evidence of hydrology lacking due to active draining.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Christopher Thayer Sycamore Associates (925) 284-1766	State:	California

		Community ID: ruderal upland
Do normal circumstances exist on the site?	YES	
Is the site significantly disturbed (Atypical Situation)?	YES (drained)	Transect ID:
Is the area a potential Problem Area?	NO	Plot ID: Sample Point # B-8

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Ambrosia psilostachya*	90	herb	FAC	1. *Cirsium vulgare*	5	herb	FACU
2.				2. *Urtica dioica*	3	herb	FACW
3.				3. *Distichlis spicata*	1	herb	FACW
4.				4. *Raphanus sativus*	1	herb	not listed
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100 %

Remarks:
Vegetation is distinct from surounding wetlands. Site is dominated by weak wetland indicator species.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Wetland Hydrology Indicators
Primary Indicators:
__ inundated (nearby)
__ saturated in upper 12 inches (in pit)
__ water marks
__ drift lines
__ sediment deposits
__ drainage pattern in wetlands

Secondary Indicators:
__ oxidized root channels in upper 12 inches
__ water-stained leaves
__ local soil survey data
__ FAC neutral test
__ other (see below)

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: >16 (inches)
Depth to saturated soil: >16 (inches)

Remarks:
Site is elevated from surrounding wetlands. Oxidized root zones at 14-16 inches. Site is not presumed to be inundated or saturated to within 12" of the surface for a significant portion of the growing season.

SOILS

Map unit name (Series and Phase): Shima muck	Drainage Class: Very poorly drained
Taxonomy (Subgroup) Terric Medisaprists	Soil type confirmed in field? No

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
12	A	10 YR 2/1	none	N/A	sandy loam

Hydric Soil Indicators

- __ histosol
- __ histic epipedon
- __ sulfidic odor
- __ aquic moisture regime
- __ reducing conditions
- X gleyed or low chroma colors
- __ concretions
- __ high organic content in surface layer in sandy soils
- __ organic streaking in sandy soils
- X listed on local hydric soils list
- __ listed on national hydric soils list
- __ other (see below)

Remarks:
Low matrix chroma is not expected to be due to saturation.

WETLAND DETERMINATION

Hydrophytic vegetation present?	YES	Is this sampling point within a wetland? NO
Wetland hydrology present?	NO	
Hydric soils present?	YES	

Remarks:
Weak field indicators of hydrophytic vegetation and hydric soils evident. Wetland hydrology is presumed not to be present.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Chris Rogers		
	Sycamore Associates (925) 284-1766	State:	California

Community ID: Ruderal wetland

Do normal circumstances exist on the site?	YES	
Is the site significantly disturbed (Atypical Situation)?	YES (drained)	Transect ID:
Is the area a potential Problem Area?	NO	Plot ID: Sample Point # B-9

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Picris echioides*	60	herb	FAC*	1. *Atriplex triangularis*	15	herb	FACW
2. *Lactuca serriola*	20	herb	FAC	2. *Epilobium ciliatum*	10	herb	FACW
3.				3. *Polygonum amphibium*	5	herb	OBL
4.				4. *Ambrosia psilostachya*	2	herb	FAC
5.				5. *Vicia sativa*	2	herb	FACU
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100 %

Remarks:
Dense herbaceous cover, clearly dominated by wetland indicator species, site is not regularly plowed, but has been cultivated historically.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: >16 (inches)
Depth to saturated soil: 16 (inches)

Wetland Hydrology Indicators
Primary Indicators:
__ inundated
__ saturated in upper 12 inches (in pit)
__ water marks
__ drift lines
__ sediment deposits
X drainage pattern in wetlands
Secondary Indicators:
X oxidized root channels in upper 12 inches
__ water-stained leaves
__ local soil survey data
__ FAC neutral test
__ other (see below)

Remarks:
Soil moist thoughout. Site 6-7 feet below sea level on diked reclaimed land. Artificially drained by series of maintained ditches and some pumps. Presumed to be inundated or saturated to within 12" of the surface for a significant portion of the growing season. Increased saturation is likely if pumping ceases.

SOILS

Map unit name
(Series and Phase): Shima muck
Taxonomy (Subgroup) Terric Medisaprists

Drainage Class: Very poorly drained

Soil type confirmed in field? No

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
0-6	A	N 2.5 2/0	none	N/A	clay loam
6-10	B	2.5 Y 2/0	2.5 YR 3/6	m-m-p	clay loam
0-6	A	N 2.5 2/0	none	N/A	clay loam
0-6	A	10 YR 2/1	none	N/A	saturated clay

Hydric Soil Indicators

X histosol
__ histic epipedon
__ sulfidic odor
X aquic moisture regime
X reducing conditions
X gleyed or low chroma colors
__ concretions
__ high organic content in surface layer in sandy soils
__ organic streaking in sandy soils
X listed on local hydric soils list
X listed on national hydric soils list
__ other (see below)

Remarks:
Mottles around old vegetation- organic matter, probably from past plowing. Soil chroma is very dark. Soil color is presumed to have evolved under saturated conditions.

WETLAND DETERMINATION

Hydrophytic vegetation present? YES
Wetland hydrology present? YES
Hydric soils present? YES

Is this sampling point within a wetland? YES

Remarks:
Strong field indicators of hydric soils and wetland hydrology. Relatively strong field indicators of hydrophytic vegetation. Site has been altered by historic plowing, draining and grazing.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Emily Strauss		
	Sycamore Associates (925) 284-1766	State:	California

Community ID: Actɵve Pasture

Do normal circumstances exist on the site?	Yes	
Is the site significantly disturbed (Atypical Situation)?	Yes (drained, plowed)	Transect ID:
Is the area a potential Problem Area?	No	Plot ID: Sample Point # B-10

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Trifolium* sp.	50	herb	unknown	1. *Rumex crispus*	15	herb	FACW-
2. *Cynodon dactylon*	20	herb	FAC	2. *Plantago* sp.	2	herb	
3. *Paspalum dilatatum*	20	herb	FAC	3. *Lolium multiflorum*	1	herb	not listed
4.				4. *Polypogon monspeliensis*	1	herb	FACW+
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 67 %

Remarks:
Vegetation is in tussocks; cultivated *Trifolium* growing in lowest areas

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Wetland Hydrology Indicators
Primary Indicators:
- __ inundated (nearby)
- __ saturated in upper 12 inches (in pit)
- __ water marks
- __ drift lines
- __ sediment deposits
- __ drainage pattern in wetlands

Secondary Indicators:
- __ oxidized root channels in upper 12 inches
- __ water-stained leaves
- __ local soil survey data
- __ FAC neutral test
- __ other (see below)

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: >15 (inches)
Depth to saturated soil: >15 (inches)

Remarks:

Soil damp throughout but especially at bottom of pit. Site is drained and plowed. Site is presumed not to be inundated or saturated for a sifnificant portion of the growing season.

SOILS

Map unit name (Series and Phase): Shima muck	Drainage Class: Very poorly drained
Taxonomy (Subgroup): Terric Medisaprists	Soil type confirmed in field? No

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
0-15	A	7.5 YR 2.5/1	7.5 YR 4/4	few, obvious	sandy loam

Hydric Soil Indicators

- __ histosol
- __ histic epipedon
- X sulfidic odor
- __ aquic moisture regime
- __ reducing conditions
- X gleyed or low chroma colors
- __ concretions
- __ high organic content in surface layer in sandy soils
- __ organic streaking in sandy soils
- X listed on local hydric soils list
- __ listed on national hydric soils list
- __ other (see below)

Remarks:
Vegetation is fairly different here than at B-11, but soil moisture and chroma are very similar

WETLAND DETERMINATION

Hydrophytic vegetation present?	YES	Is this sampling point within a wetland?	NO
Wetland hydrology present?	NO		
Hydric soils present?	YES		

Remarks:

Weak indicators of hydrophytic vegetation and soils. Presumed not to be saturated for a significant portion of the growing season.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Emily Strauss		
	Sycamore Associates (925) 284-1766	State:	California

		Community ID: Alkali meadow
Do normal circumstances exist on the site?	YES	
Is the site significantly disturbed (Atypical Situation)?	YES (drained)	Transect ID:
Is the area a potential Problem Area?	NO	Plot ID: Sample Point # B-11

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Cyperus eragrostis*	100	herb	OBL	1.			
2.				2.			
3.				3.			
4.				4.			
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100 %

Remarks:
Area dominated by umbrella sedge.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: >15 (inches)
Depth to saturated soil: >15 (inches)

Wetland Hydrology Indicators
Primary Indicators:

__ inundated (nearby)
__ saturated in upper 12 inches (in pit)
__ water marks
__ drift lines
__ sediment deposits
__ drainage pattern in wetlands

Secondary Indicators:

X oxidized root channels in upper 12 inches
X water-stained leaves
__ local soil survey data
__ FAC neutral test
__ other (see below)

Remarks:

Damp at bottom but not saturated (and damp throughout). Presumed to be inundated or saturated to within 12" of the surface for a significant portion of the growing season. Increased saturation is likely if pumping ceases.

SOILS

Map unit name
(Series and Phase): Shima muck
Taxonomy (Subgroup) Terric Medisaprists

Drainage Class: very poorly drained

Soil type confirmed in field? No

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
0-15		7.5 YR 2.5/1	7.5 YR 4/4	few	sandy loam

Hydric Soil Indicators

- __ histosol
- __ histic epipedon
- X sulfidic odor - faint
- __ aquic moisture regime
- __ reducing conditions
- X gleyed or low chroma colors
- __ concretions
- __ high organic content in surface layer in sandy soils
- __ organic streaking in sandy soils
- X listed on local hydric soils list
- __ listed on national hydric soils list
- __ other (see below)

Remarks:
Soil chroma is very dark. Soil color is presumed to have evolved under saturated conditions.

WETLAND DETERMINATION

Hydrophytic vegetation present? YES
Wetland hydrology present? YES
Hydric soils present? YES

Is this sampling point within a wetland? YES

Remarks:
Strong field indicators of hydrophytic vegetation and hydric soils. Wetland hydrology presumed to be present.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Emily Strauss, Chris Rogers Sycamore Associates (925) 284-1766	State:	California

Community ID: Alkali meadow

Do normal circumstances exist on the site?	YES	
Is the site significantly disturbed (Atypical Situation)?	YES (drained)	Transect ID:
Is the area a potential Problem Area?	NO	Plot ID: Sample Point # B-12

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Cyperus eragrostis*	60	herb	OBL	1. *Distichlis spicata*	8	herb	FACW
2. *Cynodon dactylon*	30	herb	FAC	2. *Trifolium repens*	2	herb	notlisted
3.				3.			
4.				4.			
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100 %

Remarks:
Distinct vegetation boundary with nearby irrigation pasture that corresponds somewhat with topography, other sites nearby show evidence of high groundwater and saturation of high groundwater near surface and independent of irrigation.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: >15 (inches)
Depth to saturated soil: >15 (inches)

Wetland Hydrology Indicators
Primary Indicators:

__ inundated
__ saturated in upper 12 inches (in pit)
__ water marks
__ drift lines
__ sediment deposits
X drainage pattern in wetlands

Secondary Indicators:

__ oxidized root channels in upper 12 inches
__ water-stained leaves
X local soil survey data
__ FAC neutral test
__ other (see below)

Remarks:

Damp, but not saturated. Site is below sea level; artificially drained.

SOILS

Map unit name
(Series and Phase): Shima muck
Taxonomy (Subgroup) Terric Medisaprists

Drainage Class: very poorly drained

Soil type confirmed in field? No

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
0-7	A	N 2.5/0	7.5 YR 5/8	few, small, prominent	sandy clay loam
7-16	B	6 Y 5/5	5 YR 4/6		
			2.5 Y 5/6	many, large, prominent	sand

Hydric Soil Indicators

__ histosol
__ histic epipedon
__ sulfidic odor - faint
__ aquic moisture regime
__ reducing conditions
X ~~gleyed or~~ low chroma colors
X gleyed - bottom

__ concretions
__ high organic content in surface layer in sandy soils
__ organic streaking in sandy soils
X listed on local hydric soils list
__ listed on national hydric soils list
__ other (see below)

Remarks:
Evidence of saturation within 12 inches of surface (gleyed sand with mottles in lower horizon)

WETLAND DETERMINATION

Hydrophytic vegetation present? YES
Wetland hydrology present? YES
Hydric soils present? YES

Is this sampling point within a wetland? YES

Remarks:

Wetland hydrology presumed to be present.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Emily Strauss Sycamore Associates (925) 284-1766	State:	California

		Community ID: Alkali meadow
Do normal circumstances exist on the site?	YES	
Is the site significantly disturbed (Atypical Situation)?	YES (drained)	Transect ID:
Is the area a potential Problem Area?	NO	Plot ID: Sample Point # B-13

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Cynodon dactylon*	50	herb	FAC	1. *Leymus triticoides*	10	herb	FAC+
2. *Festuca arundinacea*	30	herb	FAC-	2. *Polygonum amphibium*	6	herb	OBL
3.				3. *Cirsium vulgare*	2	herb	FACU
4.				4. *Rumex crispus*	2	herb	FACW-
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 50 %

Remarks:
Area is bout 25 feet from a bulrush wetland; and slightly lower (1.5 feet) in elevation than a nearby upland area dominated by *Lactuca* and grasses. This area is surrounded by ditches and is pumped; not grazed, not irrigated pasture, not plowed.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: >15 (inches)
Depth to saturated soil: >15 (inches)

Wetland Hydrology Indicators
Primary Indicators:
__ inundated (nearby)
__ saturated in upper 12 inches (in pit)
__ water marks
__ drift lines
__ sediment deposits
X drainage pattern in wetlands
Secondary Indicators:
__ oxidized root channels in upper 12 inches
__ water-stained leaves
X local soil survey data
__ FAC neutral test
__ other (see below)

Remarks:

Soil is damp throughout, but not saturated. Site is below sea level; artificially drained and pumped.

SOILS

Map unit name
(Series and Phase): Piper loamy sand
Taxonomy (Subgroup) Aeric Haplaquepts

Drainage Class: Poorly drained

Soil type confirmed in field? NO

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
0-15		2.5 Y 2.5/1	none	N/A	clay loam

Hydric Soil Indicators

- __ histosol
- __ histic epipedon
- __ sulfidic odor - faint
- __ aquic moisture regime
- __ reducing conditions
- X ~~gleyed or~~ low chroma colors
- __ concretions
- __ high organic content in surface layer in sandy soils
- __ organic streaking in sandy soils
- X listed on local hydric soils list
- X listed on national hydric soils list
- __ other (see below)

Remarks:
Soil chroma is very dark. Soil color is presumed to have evolved under saturated conditions.

WETLAND DETERMINATION

Hydrophytic vegetation present? YES
Wetland hydrology present? YES
Hydric soils present? YES

Is this sampling point within a wetland? YES

Remarks:
Weak field indicators of hydric soils and hydrophytic vegetation. Wetland hydrology presumed to be present. Site is presumed to be saturated to within 12" of the surface for a significant portion of the growing season.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs - under T -towers	County:	CONTRA COSTA
Investigator:	Emily Strauss		
	Sycamore Associates (925) 284-1766	State:	California

Community ID: Alkali meadow

Do normal circumstances exist on the site?	YES		
Is the site significantly disturbed (Atypical Situation)?	YES (drained)	Transect ID:	
Is the area a potential Problem Area?	YES*	Plot ID:	Sample Point # B-14

*(complex mosaic of freshwater marsh and wetland, cultivation history, drainage, changes in groundwater)

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Festuca arundinacea*	50	herb	FAC-	1. *Lotus corniculatus*	10	herb	FAC
2. *Leymus triticoides*	50	herb	FAC+	2. *Distichlis spicata*	10	herb	FACW
3.				3.			
4.				4.			
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100 %

Remarks:
Grassland, slightly higher than scirpus marsh, but lower than *Anemopsis* site.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: >12 (inches)
Depth to saturated soil: >12 (inches)

Wetland Hydrology Indicators
Primary Indicators:

__ inundated
__ saturated in upper 12 inches (in pit)
__ water marks
__ drift lines
__ sediment deposits
X drainage pattern in wetlands

Secondary Indicators:

X oxidized root channels in upper 12 inches
__ water-stained leaves
X local soil survey data
__ FAC neutral test
__ other (see below)

Remarks:
Site is below sea level; artificially drained and pumped. Evidence of high groundwater within 12 inches, would be higher without pumping and draining.

SOILS

Map unit name (Series and Phase): Piper loamy sand	Drainage Class: poorly drained
Taxonomy (Subgroup) Aeric haploquepts	Soil type confirmed in field? Yes

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
0-5		2.5 Y 3/2	none	N/A	sandy loam
5-8		2.5 Y 5/4	7.5 YR 6/8	m-m-p	sandy clay loam
8-16+		10 Y 4/1	7.5 YR 5/8	f-l-p	gleyed sand

Hydric Soil Indicators

- __ histosol
- __ histic epipedon
- __ sulfidic odor - faint
- X aquic moisture regime
- __ reducing conditions
- X gleyed or low chroma colors
- __ concretions
- __ high organic content in surface layer in sandy soils
- __ organic streaking in sandy soils
- X listed on local hydric soils list
- __ listed on national hydric soils list
- __ other (see below)

Remarks:
Soil profile shows signs of saturation from high groundwater (gleyed lower horizon), plus periodic episodes of higher groundwater (abundant redox in 5-8 inch horizon) Organic grassland in upper horizon. Soil has been historically plowed.

WETLAND DETERMINATION

Hydrophytic vegetation present?	YES	Is this sampling point within a wetland?	YES
Wetland hydrology present?	YES high groundwater		
Hydric soils present?	YES		

Remarks:
Site drained and pumped. would develop stronger hydrologic indicators if stopped. Gleyed sand indicates saturation within 12 inches. Presume to be saturated to within 12" of the surface for a significant portion of the growing season.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Emily Strauss, Chris Rogers Sycamore Associates (925) 284-1766	State:	California

Community ID: Disturbed alkali meadow

Do normal circumstances exist on the site?	YES		
Is the site significantly disturbed (Atypical Situation)?	YES (drained)	Transect ID:	
Is the area a potential Problem Area?	NO	Plot ID:	Sample Point # B-15

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Festuca arundinacea*	25	herb	FAC-	1. *Lactuca serriola*	5	herb	FAC
2. *Cynodon dactylon*	25	herb	FAC	2.			
3. *Hordeum murinum leporinum*	25	herb	NI	3.			
4. *Leymus triticoides*	20	herb	FAC+	4.			
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 50 %

Remarks:
Grassland, slightly higher than Scirpus marsh, but lower than *Anemopsis* site.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: >15 (inches)
Depth to saturated soil: >15 (inches)

Wetland Hydrology Indicators
Primary Indicators:
__ inundated (nearby)
__ saturated in upper 12 inches (in pit)
__ water marks
__ drift lines
__ sediment deposits
X drainage pattern in wetlands

Secondary Indicators:
__ oxidized root channels in upper 12 inches
__ water-stained leaves
X local soil survey data
__ FAC neutral test
__ other (see below)

Remarks:

Almost dry throughout the pit. Site is below sea level; artificially drained and pumped.

SOILS

Map unit name
(Series and Phase): Piper loamy sand
Taxonomy (Subgroup) Aeric Haplaquepts

Drainage Class: Poorly drained

Soil type confirmed in field? YES

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
0-5		2.5 Y 3/2	none	N/A	sandy loam
5-8		2.5 Y 6/4	7.5 YR 6/8	common-medium-prominent	sandy loam
8-12		2.5 Y 6/4	7.5 YR 5/8	common-large-prominent	sand
		2.5 Y 6/2	7.5 YR 5/8	common-large-prominent	sand

Hydric Soil Indicators

- __ histosol
- __ histic epipedon
- __ sulfidic odor - faint
- __ aquic moisture regime
- __ reducing conditions
- __ gleyed or low chroma colors
- __ concretions
- __ high organic content in surface layer in sandy soils
- __ organic streaking in sandy soils
- X listed on local hydric soils list
- __ listed on national hydric soils list
- __ other (see below)

Remarks:
Soils have been historically plowed.

WETLAND DETERMINATION

Hydrophytic vegetation present? YES
Wetland hydrology present? YES
Hydric soils present? YES

Is this sampling point within a wetland? YES

Remarks:
Site drained and pumped, would develop stronger hydrologic indicators if stopped. Presumed to be saturated to within 12" of the surface for a significant portion of the growing season.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Michael Wood		
	Sycamore Associates (925) 284-1766	State:	California

		Community ID: Alkali Meadow
Do normal circumstances exist on the site?	Yes	
Is the site significantly disturbed (Atypical Situation)?	Yes (drained0	Transect ID:
Is the area a potential Problem Area?	No	Plot ID: Sample Point # B-16

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Distichlis spicata*	100	herb	FACW	1. *Juncus balticus*	10	herb	OBL
2.				2. *Elymus* sp.	1	herb	
3.				3.			
4.				4.			
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100 %

Remarks:
Mowed.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: >15 (inches)
Depth to saturated soil: >15 (inches)

Wetland Hydrology Indicators
Primary Indicators:

__ inundated (nearby)
__ saturated in upper 12 inches (in pit)
__ water marks
__ drift lines
__ sediment deposits
X drainage pattern in wetlands

Secondary Indicators:

__ oxidized root channels in upper 12 inches
__ water-stained leaves
X local soil survey data
__ FAC neutral test
__ other (see below)

Remarks:

Partially drained. Presumed to be in saturation based on strong hydric indicators.

SOILS

Map unit name (Series and Phase): Piper loamy sand	Drainage Class: poorly drained
Taxonomy (Subgroup) Aeric Haplaquepts	Soil type confirmed in field? NO

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
0-1	O	10YR 3/2	none	n/a	organic clay loam
1-6	A	10 Y 2.5/0	none	n/a	clay loam
6-15	B	5 GY 4/0	orange	common - large-diss.	sandy clay loam.
8-12		2.5 Y 6/4	7.5 YR 5/8	common-large-prominent	sand
		2.5 Y 6/2	7.5 YR 5/8	common-large-prominent	sand

Hydric Soil Indicators

- __ histosol
- __ histic epipedon
- __ sulfidic odor
- X aquic moisture regime
- X reducing conditions
- X gleyed or low chroma colors
- __ concretions
- __ high organic content in surface layer in sandy soils
- __ organic streaking in sandy soils
- X listed on local hydric soils list
- X listed on national hydric soils list
- __ other (see below)

Remarks:
Soil has been historically plowed.

WETLAND DETERMINATION

Hydrophytic vegetation present? YES
Wetland hydrology present? YES
Hydric soils present? YES

Is this sampling point within a wetland? YES

Remarks:
Site drained and pumped, would develop stronger hydrologic indicators if stopped. Gleyed sand indicates saturation within 12 inches.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Michael Wood Sycamore Associates (925) 284-1766	State:	California

		Community ID: Alkali Meadow
Do normal circumstances exist on the site?	YES	
Is the site significantly disturbed (Atypical Situation)?	YES (drained)	Transect ID:
Is the area a potential Problem Area?	NO	Plot ID: Sample Point # B-17

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Distichlis spicata*	100	herb	FACW	1. *Juncus balticus*	15	herb	OBL
2.				2. *Scirpus americanus* (?)	8	herb	OBL
3.				3.			
4.				4.			
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100%

Remarks:
low-lying fallow field.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: 6 (inches)
Depth to saturated soil: 5 (inches)

Wetland Hydrology Indicators
Primary Indicators:
__ inundated (nearby)
X saturated in upper 12 inches (in pit)
__ water marks
__ drift lines
__ sediment deposits
__ drainage pattern in wetlands

Secondary Indicators:
__ oxidized root channels in upper 12 inches
__ water-stained leaves
X local soil survey data
__ FAC neutral test
__ other (see below)

Remarks:

Isolated by roads, low-lying, moist at surface.

SOILS

Map unit name
(Series and Phase): Piper loamy sand
Taxonomy (Subgroup) Aeric Haplaquepts

Drainage Class: Poorly drained

Soil type confirmed in field? No

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
0-2	Ap	10YR 3/2	none	N/A	loam
2-12	Ap	10 Y 2.5/0	none	N/A	clay loam

Hydric Soil Indicators

__ histosol
__ histic epipedon
X sulfidic odor - faint
X aquic moisture regime
X reducing conditions
X gleyed or low chroma colors

__ concretions
__ high organic content in surface layer in sandy soils
__ organic streaking in sandy soils
X listed on local hydric soils list
__ listed on national hydric soils list
__ other (see below)

Remarks:
Strong field indicators of hydric soils presumed to be present due to saturation.

WETLAND DETERMINATION

Hydrophytic vegetation present? YES
Wetland hydrology present? YES
Hydric soils present? YES

Is this sampling point within a wetland? YES

Remarks: Strong indicators of all three wetland criteria.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Chris Rogers Sycamore Associates (925) 284-1766	State:	California

Community ID:Cultivated field

Do normal circumstances exist on the site?	YES	
Is the site significantly disturbed (Atypical Situation)?	YES (irrigated pasture)	Transect ID:
Is the area a potential Problem Area?	NO	Plot ID: Sample Point # B-18

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Cynodon dactylon*	35	herb	FAC	1. *Trifolium repens*	20	herb	not
2. *Festuca arundinacea*	25	herb	FAC-	2. *Lolium multiflorum*	20	herb	listed
3.				3.			
4.				4.			
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 50 %

Remarks:
Vegetation composition consistent throughout pasture

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Wetland Hydrology Indicators
Primary Indicators:
- __ inundated (nearby)
- __ saturated in upper 12 inches (in pit)
- __ water marks
- __ drift lines
- __ sediment deposits
- __ drainage pattern in wetlands

Secondary Indicators:
- __ oxidized root channels in upper 12 inches
- __ water-stained leaves
- __ local soil survey data
- __ FAC neutral test
- __ other (see below)

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: >12 (inches)
Depth to saturated soil: >12 (inches)

Remarks:

Irrigated by ditches on west side of pasture. No evidence of high groundwater (endosaturation).

SOILS

Map unit name
(Series and Phase): Piper loamy sand
Taxonomy (Subgroup) Aeric haploquepts

Drainage Class: poorly drained

Soil type confirmed in field? YES

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
0-7	A	10YR 3/3			sandy loam
7-12	B_1	10 YR 6/4	7.5 YR 5/8	c-l-p	sandy
12+	B_2	N 2/0			

Hydric Soil Indicators

- __ histosol
- __ histic epipedon
- __ sulfidic odor - faint
- X aquic moisture regime
- __ reducing conditions
- __ gleyed or low chroma colors
- __ concretions
- __ high organic content in surface layer in sandy soils
- __ organic streaking in sandy soils
- X listed on local hydric soils list
- __ listed on national hydric soils list
- __ other (see below)

Remarks:
Redoxomorphic features in B_1 from irrigation of sandy soil. A horizon organic - enriched from grassland vegetation. No indication of past hydric soil. Hydric features are presumed to have evolved as a result of ongoing irrigation practices.

WETLAND DETERMINATION

Hydrophytic vegetation present? NO
Wetland hydrology present? NO
Hydric soils present? YES

Is this sampling point within a wetland? NO

Remarks:
Weak field indicators of hydric soils due to ongoing irrigation. Evidence of hydrology due to deep and regular irrigation.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Michael Wood		
	Sycamore Associates (925) 284-1766	State:	California

Community ID: Alkali grassland

Do normal circumstances exist on the site?	YES		
Is the site significantly disturbed (Atypical Situation)?	YES (drained)	Transect ID:	
Is the area a potential Problem Area?	NO	Plot ID:	Sample Point # B-19

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Distichlis spicata*	95	herb	FACW	1.			
2.				2.			
3.				3.			
4.				4.			
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100 %

Remarks:
Salt incrustations at surface. Dense monoculture of saltgrass is clearly distinct from surroung non-native grassland. Site has not been suitable to cultivation.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: >12 (inches)
Depth to saturated soil: >12 (inches)

Wetland Hydrology Indicators
Primary Indicators:

__ inundated (nearby)
__ saturated in upper 12 inches (in pit)
__ water marks
__ drift lines
__ sediment deposits
__ drainage pattern in wetlands

Secondary Indicators:

__ oxidized root channels in upper 12 inches
__ water-stained leaves
__ local soil survey data
__ FAC neutral test
__ other (see below)

Remarks:
No field indicators present. Soil is moist in pit but not saturated. Site is presumed not to be inundated or saturated to within 12" of the surface for a significant portion of the growing season.

SOILS

Map unit name
(Series and Phase): Piper fine loamy sand
Taxonomy (Subgroup) Aeric Haploquepts

Drainage Class: poorly drained

Soil type confirmed in field? No

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
1-3	A	2.5 Y 3/2			clayey
3-4	A	2.5 Y 2/0			clay
4-9	B	10 YR 5/6	with streaks of 10 YR 5/1		sandy
9-12	B	2.5 N/1			sandy clay loam

Hydric Soil Indicators

__ histosol
__ histic epipedon
__ sulfidic odor - faint
__ aquic moisture regime
__ reducing conditions
X gleyed or low chroma colors

__ concretions
__ high organic content in surface layer in sandy soils
__ organic streaking in sandy soils
X listed on local hydric soils list
__ listed on national hydric soils list
__ other (see below)

Remarks:

WETLAND DETERMINATION

Hydrophytic vegetation present? YES
Wetland hydrology present? NO
Hydric soils present? YES

Is this sampling point within a wetland? NO

Remarks: Weak field indicators of hydrophytic vegetation and hydric soils. Hydrology parameter not met.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Emily Strauss		
	Sycamore Associates (925) 284-1766	State:	California

Community ID: Irrigated Pasture

Do normal circumstances exist on the site?	YES		
Is the site significantly disturbed (Atypical Situation)?	YES (drained)	Transect ID:	
Is the area a potential Problem Area?	NO	Plot ID:	Sample Point # B-20

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Cynodon dactylon*	60	herb	FAC	1. *Rumex crispus*	15	herb	FACW-
2. *Paspalum dilatatum*	30	herb	FAC	2. *Trifolium* sp.	5	herb	
3.				3.			
4.				4.			
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100 %

Remarks:

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Wetland Hydrology Indicators
Primary Indicators:

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: >15 (inches)
Depth to saturated soil: >15 (inches)

__ inundated (nearby)
__ saturated in upper 12 inches (in pit)
__ water marks
__ drift lines
__ sediment deposits
__ drainage pattern in wetlands

Secondary Indicators:

__ oxidized root channels in upper 12 inches
__ water-stained leaves
__ local soil survey data
__ FAC neutral test
__ other (see below)

Remarks:

B-20 is located in one of the lowest sections of the three pastures. Soil throughout pit was damp, but not saturated. Wetland hydrology is presumed not to be present. *Cynodon* is much browner in this area, potentially indicating that it had been inundated by water this summer. No other hydrologic indicators (water marks, drift lines, etc.) are evident. Some of the *Cynodon* was dead; other clumps were alive. Wetland vegetation supported by artificial irrigation.

SOILS

Map unit name
(Series and Phase): Sacramento clay
Taxonomy (Subgroup) Vertic Haplaquolls

Drainage Class: Poorly to very poorly drained

Soil type confirmed in field?

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
0-15	A	10 YR 2/2	none	N/A	loamy clay (with some sand visible)

Hydric Soil Indicators

__ histosol
__ histic epipedon
__ sulfidic odor - faint
__ aquic moisture regime
__ reducing conditions
__ gleyed or low chroma colors

__ concretions
__ high organic content in surface layer in sandy soils
__ organic streaking in sandy soils
X listed on local hydric soils list
__ listed on national hydric soils list
__ other (see below)

Remarks: Matrix chroma of 2 without mottles.

WETLAND DETERMINATION

Hydrophytic vegetation present? YES
Wetland hydrology present? NO
Hydric soils present? NO

Is this sampling point within a wetland? NO

Remarks:
Weak hydrophitic vegetation supported by artificial irrigation. Other wetland parameters not met.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	OAKLEY	Date:	11/6/98
Applicant/Owner	Burroughs	County:	CONTRA COSTA
Investigator:	Christopher Thayer Sycamore Associates (925) 284-1766	State:	California

Community ID: Irrigated Pasture

Do normal circumstances exist on the site?	NO	
Is the site significantly disturbed (Atypical Situation)?	YES (irrigated, drained)	Transect ID:
Is the area a potential Problem Area?	YES	Plot ID: Sample Point # B-21

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Paspalum dilatatum*	30	herb	FAC	1. *Cynodon dactylon*	2	herb	FAC
2. *Scirpus* sp.	30	herb	OBL	2. *Plantago major*	2	herb	FACW-
3.				3. *Rumex crispus*	1	herb	FACW-
4.				4.			
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100 %

Remarks:
Muddy area with bare, moist earth abundant. Low corner of field.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: >16 (inches)
Depth to saturated soil: 0 (inches)

Wetland Hydrology Indicators

Primary Indicators:

__ inundated (nearby)
__ saturated in upper 12 inches (in pit)
__ water marks
__ drift lines
__ sediment deposits
__ drainage pattern in wetlands

Secondary Indicators:

__ oxidized root channels in upper 12 inches
__ water-stained leaves
X local soil survey data
__ FAC neutral test
__ other (see below)

Remarks:

Standing water in cow hoofprints and tire tracks. Heavy clay soil saturated at surface. Lowest portion of irrigated field used for dairy pasture. High water table may be indicated by surface saturation.

SOILS

Map unit name
(Series and Phase): Sacramento clay
Taxonomy (Subgroup) Vertic Haplaquolls

Drainage Class: poor to very poorly drained

Soil type confirmed in field? YES

Profile Description:

Depth (inches)	Horizon	Matrix color (Munsell-moist)	Mottle colors (Munsell-moist)	Mottle (abundance size, contrast)	Soil texture, concretions structure, etc.
0-16	A	5 Y 4/2	None	N/A	clay -moist

Hydric Soil Indicators

- __ histosol
- __ histic epipedon
- __ sulfidic odor - faint
- X aquic moisture regime
- __ reducing conditions
- X gleyed or low chroma colors
- __ concretions
- __ high organic content in surface layer in sandy soils
- __ organic streaking in sandy soils
- X listed on local hydric soils list
- __ listed on national hydric soils list
- __ other (see below)

Remarks:
Clay does not drain, stays moist.

WETLAND DETERMINATION

Hydrophytic vegetation present? YES
Wetland hydrology present? YES
Hydric soils present? YES

Is this sampling point within a wetland? YES

Remarks:
Low portion of irrigated field. Heavy clay soils drain poorly, retain moisture long enough to allow hydrophytic vegetation to survive. Strong indicators of hydrophytic vegetation and hydric soils. Presumed to be saturated to within 12" of surface for a significant portion of the growing season.

Full map provided upon request.

SHEET 1 OF 2

PRELIMINARY WETLAND DELINEATION AND JURISDICTIONAL DETERMINATION AT THE EMERSON AND BURROUGHS PROPERTIES, OAKLEY, CONTRA COSTA COUNTY

November 6, 1998
revised December 14, 1998

LEGEND

Potential ACOE-Jurisdictional Wetlands

Alkali Meadow
total: 9.5 acres (416,016 sq. ft.)

Valley Freshwater Marsh (FWM)
total: 33 acres (1,417,071 sq. ft.)

Great Valley Willow Scrub (Willows)
total: 1.1 acres (49,125 sq. ft.)

Sample Point

Total ACOE-Jurisdictional Habitat:
43.2 acres (1,882,212 sq. ft.)

NORTH

Scale 1" = 200'

Prepared by:

Sycamore Associates LLC
3400 Mt. Diablo Blvd., Suite 13
Lafayette, CA 94549
(925) 284-1766

EXHIBIT C

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

REPLY TO
ATTENTION OF

December 30, 1998

Regulatory Branch (199800679)

Michael Wood
Sycamore Associates LLC
3400 Mt. Diablo Blvd. Suite 13
Lafayette, California 94549

Dear Mr. Wood:

This letter concerns the delineation of waters of the United States, including wetlands, you have provided for the Emerson & Burroughs Ranches. These properties consist of two unconnected parcels covering approximately 1,100 acres along Dutch slough between Marsh Creek and Jersey Island Road, in Oakley, Contra Costa County, California.

We have reviewed and verified the report titled **Preliminary Wetland Delineation and Jurisdictional Determination at the Emerson and Burroughs Properties, Oakley, Contra Costa County, California, December 7, 1998**, and accompanying maps, sheets 1 and 2 dated November 6, 1998, Revised December 14, 1998, which show approximately 43.2 acres of waters of the United States, including wetlands, within the surveyed area. Our jurisdiction in this area is under Section 404 of the Clean Water Act. A Department of the Army permit is required prior to discharging dredged or fill materials into waters of the United States. Accordingly, a permit will be required prior to filling any of the waters present on the property. The type of permit required will depend on the type and amount of waters which would be lost or adversely modified by fill activities.

This verification is valid for five years from the date of this letter unless new information warrants revision of the determination before the expiration date. Please refer to identification number 199800679 in any correspondence concerning this project. If you have any questions, please write to Ginger Fodge, Room 1480 at the letterhead address, or telephone (916)557-5258.

Sincerely,

Bob Junell

fn Jim Monroe, P.E., Esq.
Chief, Delta Office

EXHIBIT D

PRELIMINARY GEOTECHNICAL RECONNAISSANCE

CYPRESS CORRIDOR PLANNING AREA

OAKLEY, CALIFORNIA

SUBMITTED

TO

SOPAC & ASSOCIATES

PORTERVILLE, CALIFORNIA

PREPARED

BY

ENGEO INCORPORATED

PROJECT NO. 4603.5.001.01

JANUARY 4, 1999

ENGEO INCORPORATED

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
MATERIALS TESTING

Project No.
4603.5.001.01

January 4, 1999

Ms. Sopac Tompkins
Sopac & Asscoiates
32657 Indian Reservation Road
Porterville, CA 93257

Subject: Cypress Corridor Planning Area
Oakley, California

PRELIMINARY GEOTECHNICAL RECONNAISSANCE

Dear Ms. Tompkins:

With your authorization, we conducted a preliminary geotechnical reconnaissance for the Cypress Corridor Planning Area in Oakley, which is located in northeastern Contra Costa County, California.

The accompanying report contains our preliminary conclusions and recommendations for the 1,500-acre site. Based on the previous geotechnical studies in the area, we find that from a geotechnical standpoint the project site is suitable for its proposed use. The primary geotechnical considerations for the proposed residential development are levee stability, liquefaction potential, and the possible presence of soft compressible soils. We believe that the potential geotechnical hazards can be reduced by proper design. Additional geotechnical studies will be required in order to provide detailed grading and foundation recommendations.

We are pleased to have been of service to you and look forward to consulting further with you and your design team on this project.

Very truly yours,

ENGEO INCORPORATED

REGISTERED PROFESSIONAL ENGINEER
PAUL C. GUERIN
2099
EXP.3/31/01
GEOTECHNICAL
STATE OF CALIFORNIA

Paul Guerin

Paul C. Guerin

Reviewed by:

U. Eliahu

Uri Eliahu

pcg/jd:georecon

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Letter of Transmittal

SYNOPSIS

ENGEO Incorporated has conducted a preliminary geotechnical reconnaissance for the Cypress Corridor Planning Area property located in Oakley, which is in northeastern Contra Costa County, California. The purpose of this study is to provide a preliminary evaluation of the existing geotechnical conditions at the site and establish preliminary geotechnical guidelines for site development. The scope of our effort included a review of existing published data and previous geotechnical reports for nearby properties, several site visits, preliminary geotechnical evaluations and preparation of this report.

The project site is located in the delta area of Contra Costa County, California. It is bounded by Dutch Slough to the north, Jersey Island Road to the east, Cypress Road to the south, and a drainage canal to the west. Deep alluvial soils have been mapped in this region. The ground surface of much of the site is below sea level. Levees currently provide flood protection from the delta. Agricultural drainage channels traverse the site. Water is pumped from the drainage ditches, maintaining the ground-water levels several feet below the existing ground surface.

At this time, it is proposed to develop the site for residential and recreational use. Many of the residential lots will be situated below sea level and will be protected from flooding by the perimeter levees. The reliability of the perimeter levees will be a primary focus of subsequent geotechnical studies. It is expected that some raising and strengthening will be needed for the levees.

The site is located within the seismically-active northern California area. However, no known active or potentially active faults are known to cross the site. Ground shaking is considered the most likely geologic hazard at the site. The potential for earthquake-induced liquefaction, seismic settlement, and lateral spreading should be analyzed during subsequent studies based on site-specific data. Design should address these seismic issues as planning proceeds.

The soil conditions at adjacent properties and as described in geologic publications consist generally of silty clays overlying loose to dense sands. Localized areas of peat may exist at this site as well. Free ground water is generally several feet below existing ground surface.

Analyses of the existing levee slopes for various stability conditions will be required during future geotechnical design studies. Based on knowledge acquired to date of existing soils conditions, it is our opinion that the existing levees can be suitably strengthened at this site.

The possible presence of loose sand and organic soils may become primary geotechnical constraints for site development. In our opinion, organic soils, if found at the site, are unsuitable for use in structural fills and embankments. These soils should be removed prior to the placement of fill. The unsuitable soil can be disposed of on site in nonstructural fills. Soft and loose soil will require densification where slope stability and/or settlement are of concern.

Foundation soil conditions of the graded development are expected to be significantly variable, both in soil type and perhaps also in consistency. Because of this, various types of building foundations may have to be used. Some will consist of conventional foundations such as mat slabs. Deep foundations or rigid waffle slabs may have to be considered where warranted by adverse soil and ground-water conditions.

GEOTECHNICAL RECONNAISSANCE

Purpose and Scope

The purpose of this preliminary geotechnical reconnaissance is to evaluate the feasibility of site development for residential use and to provide preliminary grading concepts for the proposed 1500-acre development.

The scope of our effort included a review of existing published data and previous geotechnical reports for nearby properties, preliminary geotechnical evaluations and preparation of this report.

This report was prepared for the exclusive use of Sopac & Associates and their design team consultants. In the event changes are made in the character, design or layout of the development, the conclusions and recommendations contained in this report should be reviewed by ENGEO to determine whether modifications to the report are necessary.

Site Location and Description

The project site is located a short distance east of downtown Oakley, California (Figure 1) and is within the limits of this newly-incorporated city. The nearly square group of parcels is located on the north side of Cypress Road and the west side of Jersey Island Road. The site topography is generally flat with some slight manmade and natural rises in the terrain. Existing site elevations range from approximately 10 feet below mean sea level (MSL) to approximately 10 feet above MSL. More than half of the site is below mean sea level.

Three landowners divide the overall site into sections, separated by waterways off Dutch Slough. Levees at the perimeter of the parcels rise to elevations generally ranging from +7.6 to +10 feet. These levees protect the low-lying ground from flooding. A large irrigation canal runs east-west through the southern portion of the site. Numerous smaller irrigation and drainage canals traverse the property. The site currently exists primarily as undeveloped agricultural land utilized for grazing, row crops, and vineyards. A Record Boundary depicts numerous roadway, power, drainage, and pipeline easements throughout the project area. Large overhead transmission lines and Jersey Island Road pass through the northeast corner of the site.

An active dairy operates on the western parcel. The dairy includes numerous buildings, a large pond, and large waste piles. The central parcel was formerly operated as a dairy and also contains a cluster of farm buildings. The eastern parcel contains abandoned farm buildings and several residential structures. An environmental site assessment by ENGEO (1999) contains a more detailed description of site improvements.

Various portions of the site have been graded slightly in the past.

Proposed Development

It is our understanding that the currently-proposed development will include a residential community with several recreational and commercial parcels. As currently envisioned, much of the development will occur below mean sea level and most parcels will be below standard flood protection elevations, which are in the range of +7 to +10 feet. Therefore, the perimeter levees will serve to protect the development areas from flooding. The existing, permanent dewatering systems will have to be maintained and perhaps enhanced to control ground-water levels within the levees.

Access to the community will be provided from Cypress Road and Jersey Island Road.

GEOLOGY

Regional Geology

The site is located in the Sacramento-San Joaquin Delta, within the Great Valley Geomorphic Province of California. The Coast Ranges Geomorphic Province is located to the west.

The Great Valley Geomorphic Province consists, geologically, of an elongated structural trough that has been filled with a sequence of sedimentary deposits (now lithified into rock) ranging from Jurassic to recent in age. In the San Joaquin Delta, sedimentary bedrock is up to six miles in thickness (Atwater, 1982). Geophysical evidence suggests that the Great Valley is underlain at depth with rocks of the Sierra Nevada Province and that the Coast Range Fault and associated faults along the west side of the valley mark the boundary with the Coast Ranges Province which is underlain by Franciscan Assemblage rocks.

Older sedimentary bedrock of the Great Valley Geomorphic Province is predominantly of marine origin, with younger bedrock becoming continental in origin. The sediments forming these rocks were derived from erosion of the Sierra Nevada Mountains to the east, and to a lesser extent, from the Coast Ranges to the west.

Bedrock in the region is mantled by a hundred feet or more of soil, consisting of sands, silty clays and peat.

The delta area has formed where two major waterways drain the Central Valley and join to flow through one outlet towards San Francisco Bay. This area currently consists of a braided pattern of freshwater channels and sloughs encircling a series of low-lying islands. Most of the islands are currently below the water level found in the surrounding channels. Levees have been constructed along the channels to prevent the flooding of the adjacent land.

Site Geology

The near-surface sediments across the site consist of eolian, flood plain, and alluvial deposits. These sediments are typically irregularly-stratified, poorly-consolidated deposits of peat, clay, silt, sand, and minor gravels. The exact thickness of these sedimentary deposits is not known.

The surficial geology of the Delta has been mapped by Atwater (1982) as shown in Figure 3. Sediments on the site are mapped as younger Marsh Creek alluvium, and eolian deposits of the upper Modesto Formation, overlying flood plain alluvium from the San Joaquin River. Atwater's geologic map included basal elevations of peat and peaty mud deposits. Basal elevations for peat and mud deposits are between -3 and -16 feet below MSL according to Atwater. Age-dating of sediments at -75 feet below MSL reveal an age of approximately 38,000 years.

The surficial soil encountered in the exploratory borings drilled at nearby sites consists of silty clays overlying loose to very dense sands. These materials were found in places to be interbedded with sandy clays.

Site Seismicity

The site is located in an area of moderate seismicity. No faults, active or otherwise, are known to traverse the project site (see Figure 4). In addition, no portion of the site is mapped within any Seismic Special Study Zone.

The closest active fault, as identified by the California Division of Mines and Geology, is the Concord fault located approximately 19 miles to the west. Other nearby active faults include the Calaveras fault, 22 miles to the southwest; the Hayward fault, 32 miles to the west; and the San Andreas fault, 50 miles to the west.

The Coast Ranges – Sierran Block (CRSB) boundary is mapped approximately 2 miles east of the property. This boundary is considered a seismically-active thrust fault; however, since the fault does not extend to the ground surface, it is not zoned by the State of California. The CRSB is considered capable of causing the highest ground shaking at the site, estimated at up to 0.59g according to attenuation relationships by Idriss (1994), but the recurrence interval is believed longer than for the closer strike-slip faults.

Because of the presence of active faults in the region, the area is considered seismically active. Numerous small earthquakes occur every year in the region, and large (>M7) earthquakes have been recorded and can be expected to occur in the future. Table I lists distances to known active and potentially-active faults located within 100 miles of the site and summarizes their estimated earthquake magnitudes and ground shaking potentials. Figure 4 shows the approximate locations of these faults and significant historic earthquakes recorded within the San Francisco region.

Site Soils

The site is mapped by the Soil Survey of Contra Costa County (1977) as shown in Figure 5. The predominant soil across the southern area is Sacramento clay (Sa). Egbert Mucky clay loam (Ea) is mapped along the eastern side of the parcel. Other types of surface soils identified on the site are shown on Figure 5.

Based on borings drilled in the site vicinity, silty clays are encountered at the ground surface and are often thinly interbedded with sands. The surficial clay deposit is 5 to 8 feet thick and is generally stiff in consistency. A Plasticity Index of 53 was determined for a sample of Sacramento clay (Sa) recovered during drilling at a site to the east. This indicates a very high potential for swelling for the clay tested.

Sands underlie the surficial deposits across the site to the east. Based on the boring data, (ENGEO, 1990a and 1990b; Kleinfelder, 1988), the upper 10 to 20 feet of sand is loose to medium dense. The sand deposits become dense to very dense with depth.

Peat was encountered in some of the borings to the east and may extend locally into the subject property.

Ground water was encountered at depths of about 3 to 4 feet below existing ground surface at the property to the east.

DISCUSSION

Seismic Hazards

Since no known active or potentially active faults cross the site, the probability of experiencing ground rupture is low. The major potential seismic hazard at the site is ground shaking from a nearby moderate to major seismic event. The degree of shaking is dependent on the magnitude of the event, the distance to its epicenter, and the nature of the underlying soils.

For this study, a probabilistic seismic hazard evaluation has been conducted. In this analysis, a computer program (EZ-FRISK) was used to model the seismic setting of the region and is able to explicitly account for uncertainty relating to:

- Earthquake magnitude
- Rupture length
- Location of rupture
- Maximum possible earthquake magnitude
- Attenuation relationship

The program calculates, by summation from earthquake sources, the total average annual expected number of occurrences of an acceleration greater than each of several specified values. Once the annual probability is obtained, the probability of the level of ground acceleration being exceeded over a specified time period can be calculated by the following equation:

$$P = 1 - e^{-pT}$$

in which P is the probability of the level of ground acceleration being exceeded in T years and p is the annual probability of exceedance.

Using this method, a horizontal ground acceleration of 0.35g is predicted to have a 10 percent probability of exceedance in a 50-year design life.

Liquefaction. During earthquakes, ground shaking may cause a loss of strength in cohesionless saturated soils. This process is called liquefaction, and it occurs most commonly in loose sands associated with a high water table.

Soil boring and gradation data indicate marginal liquefaction resistance for properties to the east. This hazard should be carefully evaluated during future geotechnical studies. If the hazard is present on site, it can possibly be mitigated by densification, dewatering, or burial beneath nonliquefiable materials such as clays.

Earthquake-Induced Settlement. Settlement due to the densification of poorly-consolidated granular soils can occur as a result of earthquake vibrations. Most settlements occur in areas of wet sands subjected to liquefaction or densification of loose sands located above a water table. Earthquake-induced settlements at the site due to densification can be mitigated by densification or proper foundation design.

Tsunamis and Seiches. Tsunamis are long sea waves, generated by displacements associated with earthquakes. These waves can reach great heights when they encounter shallow water. The subject development will be located far enough from the ocean that the potential for tsunamis affecting it is remote.

Seiches are caused by seismically-induced ground motions imparted to bodies of water which cause them to oscillate from side to side. Seiches may be expected to occur in the channel located adjacent to the site during strong earthquakes. The possibility of the occurrence of seiches should be considered in levee design to adequately protect the proposed development.

Lateral Spreading and Earthquake-Induced Landsliding. Lateral spreading and earthquake-induced landsliding involve lateral ground movements caused by earthquake vibrations. These lateral ground movements are often associated with a weakening or failure of an embankment or soil mass overlying a layer of liquefied sands or silts. In our opinion, adequately designed embankments, analyzed considering the potential for pore pressure buildup associated with ground shaking, should mitigate the potential for lateral embankment movements and landsliding.

Ground Subsidence

Ground subsidence is a widespread phenomenon throughout the Delta. Possible causes of subsidence have been categorized as related to shallow and deep phenomena. Shallow subsidence is primarily related to a reduction in the thickness of the alluvium by oxidation of the surficial organic peaty soils. Other causes of shallow subsidence or depletion are wind erosion and consolidation following the lowering of the water table. No areas of major amounts of shallow subsidence are mapped within the boundaries of the subject property.

Deep subsidence is thought to result from such factors as natural gas and ground-water withdrawal and tectonic subsidence related to movements of the earth's crust. Rates of deep subsidence have been estimated at 0.006 inches per year in the Delta (1 inch in more than 160 years).

Flooding

The site is located within a 100-year flood plain. According to FEMA, the water surface elevation during peak runoff from the 100-year flood is +7.0 feet. This finding is based on the results of a 1986 study performed by the Corps of Engineers. The FEMA short-term hazard mitigation standard for levees is an elevation of +8.2 feet (1-foot freeboard). Flooding is now controlled by the site levees. The existing perimeter levees crest at elevations ranging from approximately +7.6 to +10 feet, hence occasionally below the FEMA short-term standard. The perimeter levee will therefore, at a minimum, need to be raised in some locations to protect the low-lying improvements within. Furthermore, we expect that the levees will be required by regulatory agencies to meet other geometrical and stability criteria. This will likely require buttressing and widening of the existing levees.

CONCLUSIONS AND RECOMMENDATIONS

General

Based on our studies, we conclude that the proposed project is feasible from a geotechnical standpoint; however, there are several considerations that must be thoroughly addressed at the design stage:

1. Stability of existing levees.
2. Settlement of raised levees and adjacent residential areas.
3. Levee construction techniques.
4. Control of seepage through the levees.
5. Foundation design.

Embankment Stability

Detailed embankment stability analyses were not within the contracted scope of work for this study. However, some guidelines for future analyses and our opinion regarding the expected results are described in the following paragraphs. Future geotechnical studies at the site should include additional site explorations with a substantial laboratory testing program in order to determine soil strength characteristics for slope stability analyses.

The embankments should be analyzed for various stability conditions using the strength parameters developed from testing. The design slopes should be analyzed for the following conditions: (1) end of construction, (2) long-term slope stability for static and seismic conditions, and (3) other stability conditions such as for lateral spreading.

1. End-of-Construction

   This represents a short-term condition that occurs immediately after raising the levees. At that time, the levees and foundation soils have not had time to consolidate under the weight of the new fill and pore pressures may not have dissipated. Total stresses should be used to analyze the new levee geometry. Undrained strengths of the existing soils and fill soils should be estimated based on laboratory shear strength data. In our opinion, a minimum acceptable factor of safety of 1.3 should be used for this condition. Peat and soft clay may be found in localized areas. Since the new loads are expected to be minor and the site soils have consolidated under the weight of the existing levees, we anticipate adequate factors of safety for this condition.

2. Long-Term Static Condition

This represents the normal post-construction condition when the levee and foundation soils have consolidated under the additional weight of fill. However, high water should be assumed in Dutch Slough. Pore pressures within the embankments and foundations have dissipated. An effective stress analysis should be used to analyze the stability of the slopes. Depending on the reliability, quantity, and quality of the soil strength data, a factor of safety of at least 1.5 to 2 should be required for this condition.

3. Seismic Loading Following Levee Construction

Based on a study of past performance of a large number of earth embankments subjected to strong earthquake shaking, Seed (1979) concluded it is likely that embankments constructed of compacted soils that do not build up large pore pressures, nor show more than 15 percent strength loss, will survive strong earthquake shaking with no major damage. The majority of earth embankments located within 5 miles of the San Andreas fault performed well during the 1906 earthquake (8.25 Richter magnitude). Based on this study, Seed recommended that for a magnitude 8.25 earthquake, a pseudo-static coefficient of 0.15g and a minimum factor of safety of 1.15 be used as design criteria regardless of the distance between the embankment and the causative fault. For a magnitude 6.5 earthquake and lesser ones, Seed recommends using a pseudo-static coefficient of 0.10g.

However, the existing levees may contain soils that undergo strength loss due to ground shaking. If these soils are encountered in future studies, residual soil strengths should be incorporated into the seismic analyses.

4. Other Stability Considerations

The long-term performance of the embankments will require consideration of additional environmental factors that may cause embankment soil movements. These factors include creep, soil softening, lateral spreading, and wave erosion. Creep and soil softening are somewhat related. As compacted clay soils saturate, they lose strength. At the relatively low embankment confining pressures, clays will also lose density by swelling. This phenomenon increases the propensity for creep (soil deformation under constant stress). Lateral spreading of relatively high and saturated embankments has been observed locally at similar projects. All the above behaviors should be considered during future geotechnical studies.

The potential for wave erosion should also be evaluated jointly by the Geotechnical and Civil Engineers.

Settlement

The addition of fills at the site will impose new loads on the underlying natural soils and cause them to settle. As discussed earlier, we recommend removal of the soft clays and peat soils, where practical, prior to filling. These soils, if left in place, would lead to substantial consolidation settlements. Time-dependent settlement analyses may have to be conducted locally where removal of compressible soils is impractical from a construction standpoint.

Seepage Considerations

Ground water is controlled at the site with a series of drainage ditches that lower the water to several feet below existing grades. Water in the ditches is controlled by pumps that discharge water to the slough. In this way, a continual water cycle occurs where seepage occurs through and under the levees; the water is collected in the ditches and then discharged back to the slough. The dewatering system can be stressed during periods of high rainfall and high river levels. This system should be carefully analyzed as part of future studies and redundant methods should be implemented to make certain that water levels do not rise above prescribed levels after development.

Construction Aspects of Development

Peat and soft soils containing organic matter at relatively shallow depth will require mitigation during grading. The site located just east of this project is covered with soils containing 25 to 45 percent organic matter as determined by ASTM D-2974. In addition, the eastern portions of the nearby site contain silts and clays having high moisture contents, rendering them too weak to support fills or to be used as fill.

In our opinion, both highly-organic soils and wet, soft soils, if any exist at this site, should be removed prior to placement of fill for the embankments. Dairy operation remnants, organic waste from the dairy operation, and organic soils should not be used as engineered fill. Any existing fill areas will need to be regraded. Soft, wet soils will require aeration before being used in filling. Soils that are not suitable for use as engineered fill may be placed (1) in nonstructural fills such as parks, (2) along perimeter levee sides to create biologic habitat, or (3) in wetlands area. With the exception of the highly organic soils, all on-site soils are suitable for use in engineered fills. We anticipate that the most economical method for mass grading and levee buttressing is the use of conventional earth-moving equipment and dewatering. Extreme caution must be exercised when excavations are performed near any existing perimeter levees to avoid destabilizing them. This risk can be reduced by avoiding excavations near the levees and/or by construction of a system of temporary containment levees. These containment levees could serve as future residential areas, and provide additional flood protection.

In order to perform grading using conventional equipment, dewatering will be required when excavations extend below the level of the ground-water surface and particularly when excavations extend through the clayey cap into sandy soils below ground water.

Foundations

Foundation design must consider the potential of differential soil movements. In general, long-term settlement is not a major concern for this project provided the soft clay deposits, if any, beneath the fills are removed during mass grading and loose sands are recompacted.

Expansive soils tend to shrink and swell with seasonal variations in moisture content. Some of the clays that will be used for filling may exhibit a very high potential for swelling. These clays should be placed selectively, where possible.

On a preliminary basis, it is our opinion that conventional building foundations will be suitable on level lots. More rigid waffle slabs or deepened pier and pile foundations with stiffened grade beams may be appropriate when locating buildings over soft soils. Rigid waffle slabs may also be preferred over swelling soils.

Future Geotechnical Studies

As mentioned above, based on the preliminary studies to date, it is our opinion that this project site is suitable for residential and commercial development. However, additional geotechnical design studies will be required to more fully evaluate embankment design and performance. Such studies will also be required to develop site-specific foundation designs and construction methods.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

This report is issued with the understanding that it is the responsibility of the owner to transmit the information and recommendations of this report to developers, contractors, buyers, architects, engineers, and designers for the project so that the necessary steps can be taken by the contractors and subcontractors to carry out such recommendations in the field. The conclusions and recommendations contained in this report are solely professional opinions.

The professional staff of ENGEO Incorporated strives to perform its services in a proper and professional manner with reasonable care and competence but is not infallible. There are risks of earth movement and property damages inherent in land development. We are unable to eliminate all risks or provide insurance; therefore, we are unable to guarantee or warrant the results of our work.

This report is based upon field and other conditions discovered at the time of preparation of ENGEO's work. This document must not be subject to unauthorized reuse, that is, reuse without written authorization of ENGEO. Such authorization is essential because it requires ENGEO to evaluate the document's applicability given new circumstances, not the least of which is passage of time. Actual field or other conditions will necessitate clarifications, adjustments, modifications or other changes to ENGEO's work. Therefore, ENGEO must be engaged to prepare the necessary clarifications, adjustments, modifications or other changes before construction activities commence or further activity proceeds. If ENGEO's scope of services does not include on-site construction observation, or if other persons or entities are retained to provide such services, ENGEO cannot be held responsible for any or all claims, including, but not limited to claims arising from or resulting from the performance of such services by other persons or entities, and any or all claims arising from or resulting from clarifications, adjustments, modifications, discrepancies or other changes necessary to reflect changed field or other conditions.

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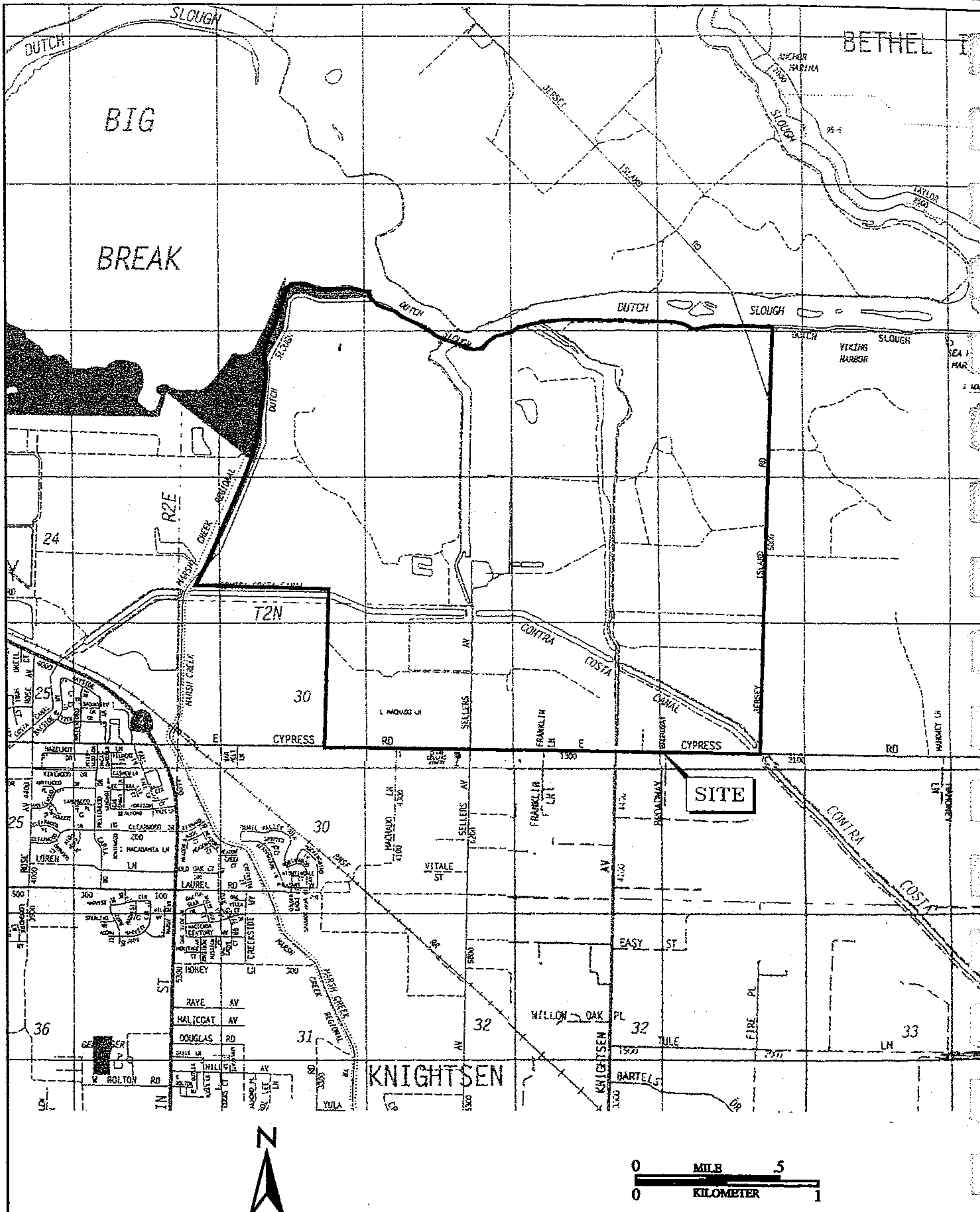
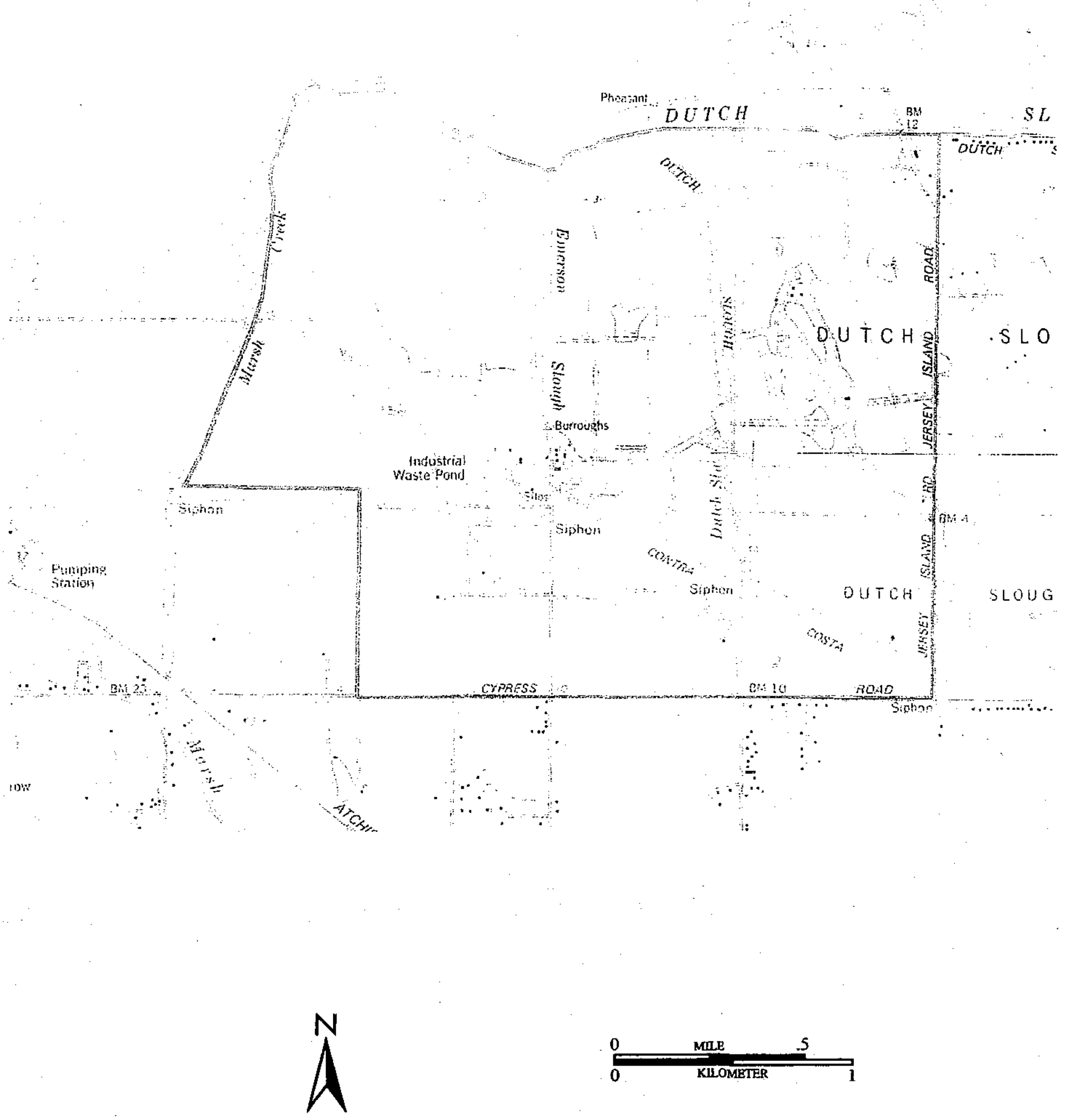
APPENDIX



BASE: THOMAS BROTHERS

ENGEO INCORPORATED	SITE LOCATION MAP CYPRESS CORRIDOR OAKLEY, CALIFORNIA	PROJECT NO.: 4603.5.001.01 DATE: JANUARY 1999 DRAWN BY: DB CHECKED BY: JE	FIGURE 1



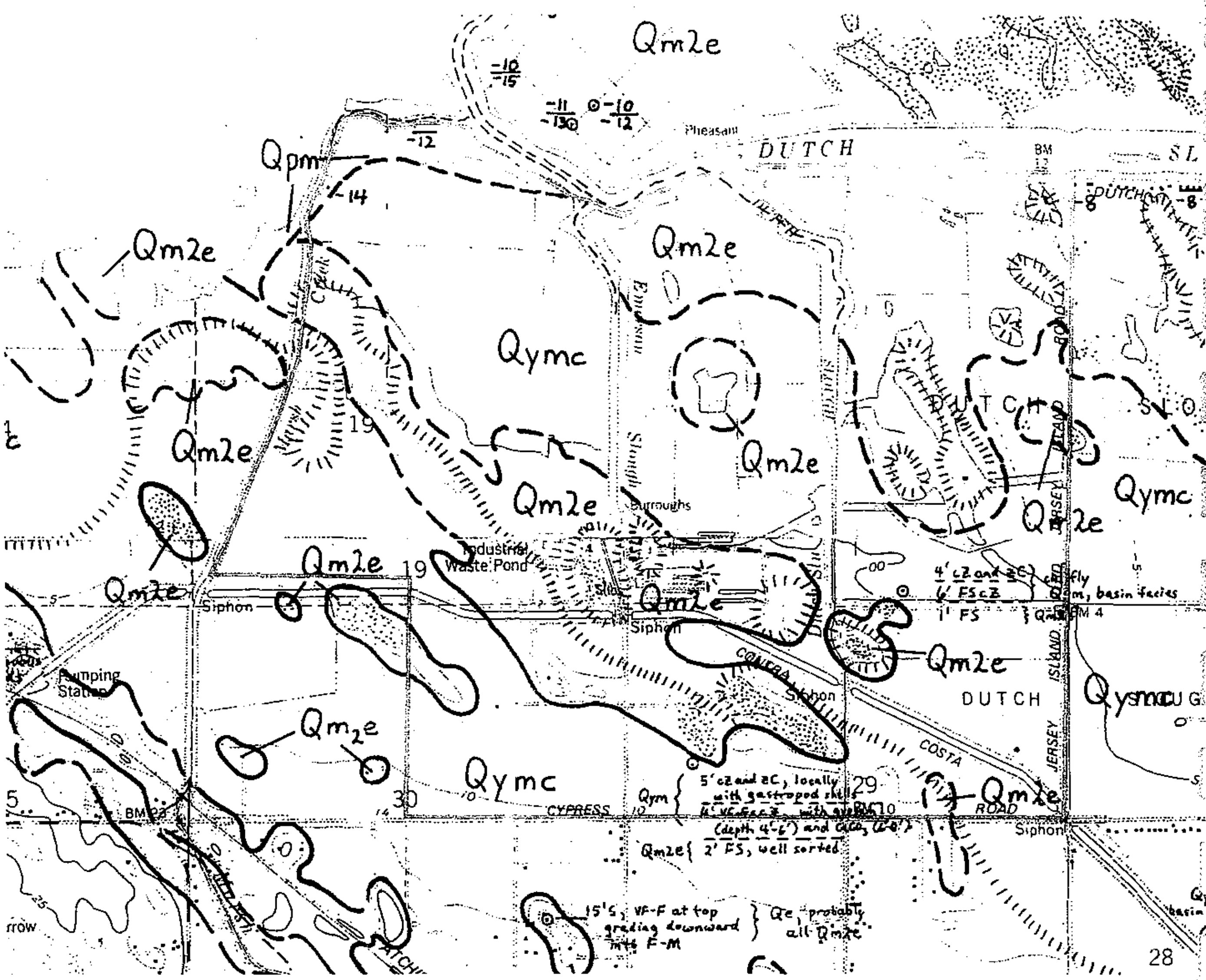
BASE: USGS

ENGEO INCORPORATED

SITE PLAN
CYPRESS CORRIDOR
OAKLEY, CALIFORNIA

PROJECT NO.: 4603.5.001.01
DATE: JANUARY 1999
DRAWN BY: B CHECKED BY: JE

FIGURE NO. 2



EXPLANATION

Qpm PEAT AND MUD OF TIDAL WETLANDS AND WATERWAYS (HOLOCENE)

Qm2e EOLIAN DEPOSITS OF UPPER MEMBER OF THE MODESTO FORMATION (UPPER PLEISTOCENE)

Qymc YOUNGER ALLUVIUM OF MARSH CREEK AND VICINITY (HOLOCENE AND UPPER PLEISTOCENE)

IIIIIIIII LANDWARD MARGIN OF TIDAL WETLAND AT LOW RIVER STAGES CIRCA 1850, QUERIED WHERE LOCATION MAY ERR BY MORE THAN 1000 FEET

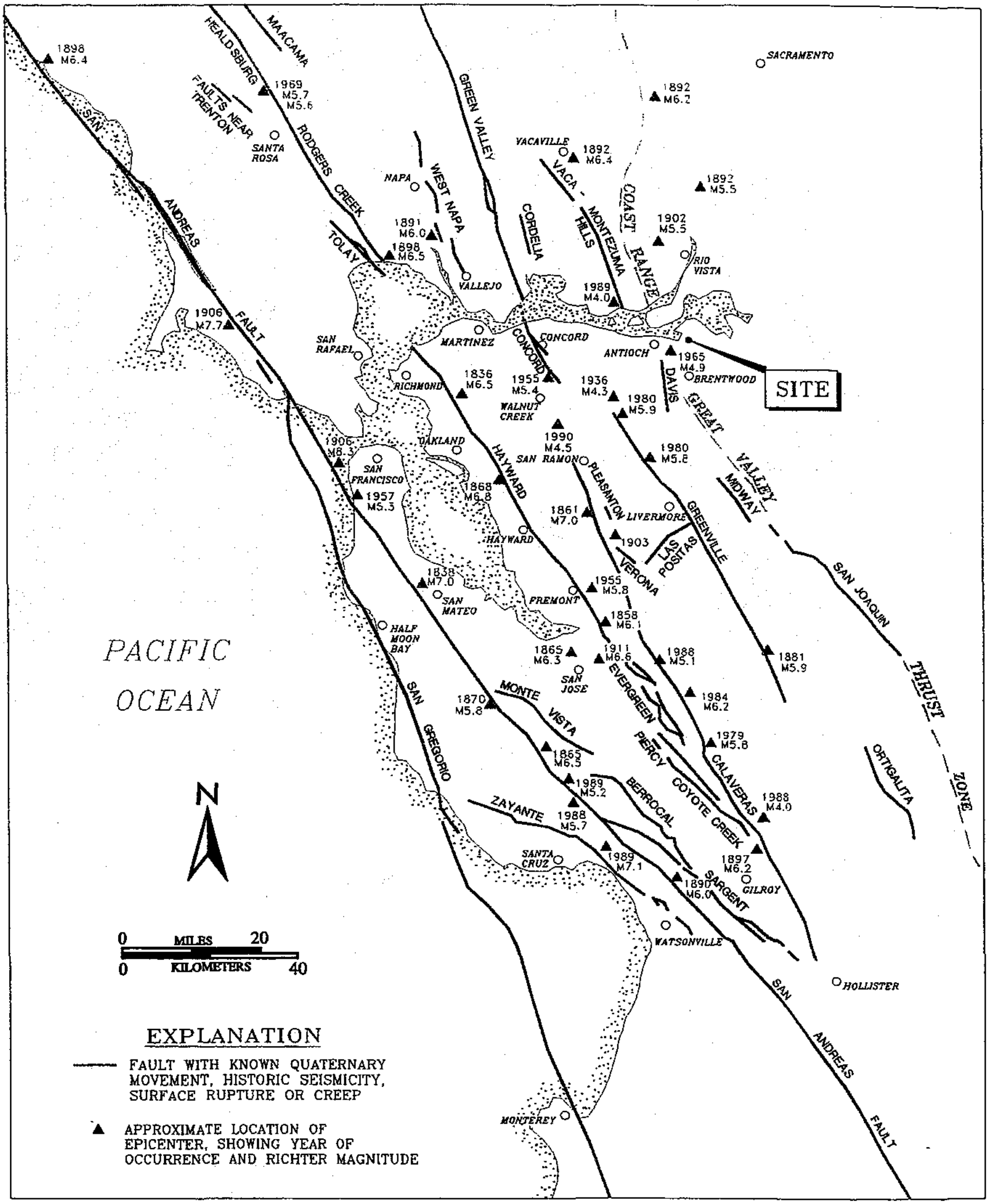
N

0 MILE .5

0 KILOMETER

SOURCE: ATWATER, 1982

ENGEO INCORPORATED	GEOLOGIC MAP CYPRESS CORRIDOR OAKLEY, CALIFORNIA	PROJECT NO.: 4603.5.001.01 DATE: JANUARY 1999 DRAWN BY: CB CHECKED BY: JF	FIGURE 3



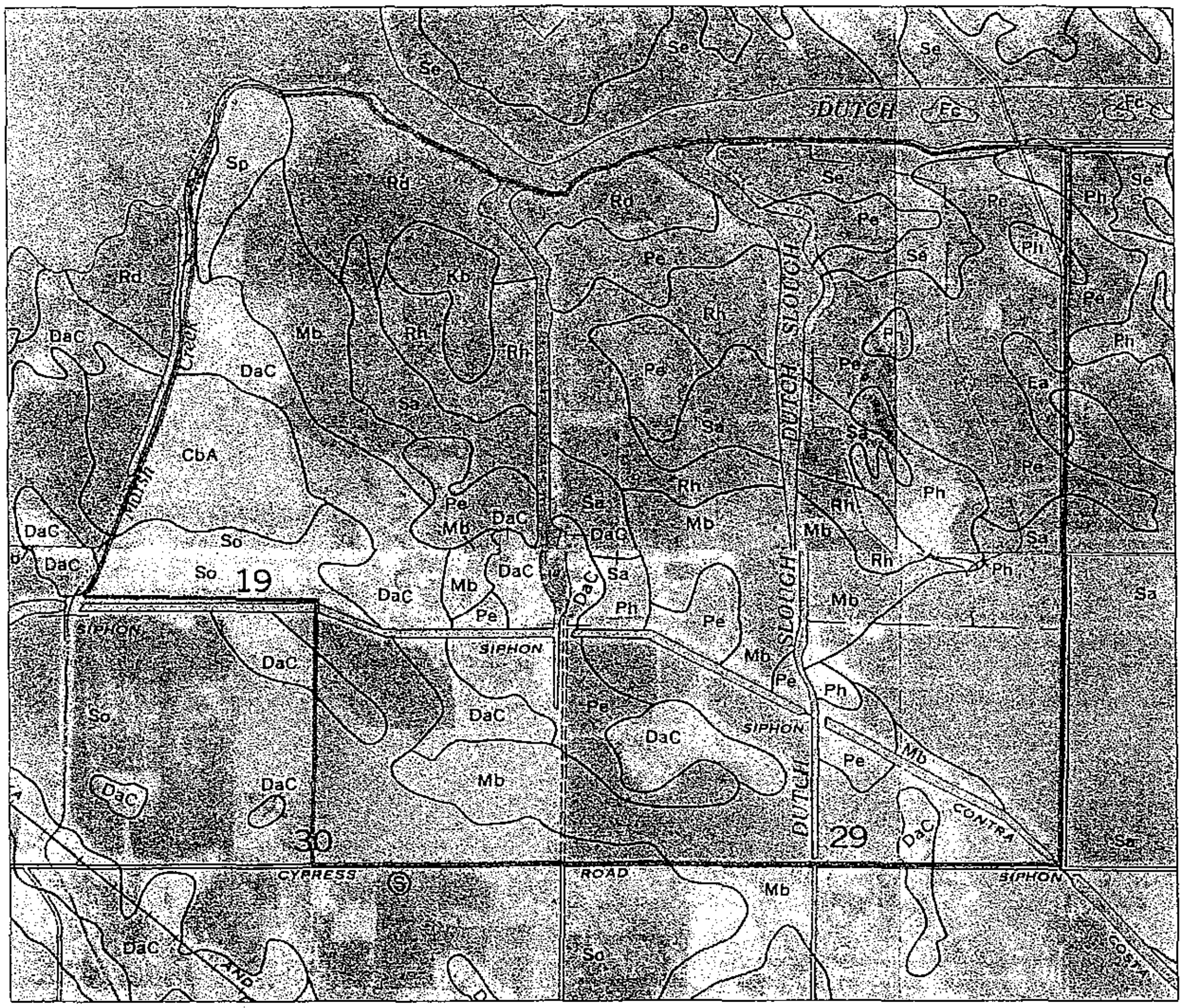
ENGEO INCORPORATED

REGIONAL FAULTING AND SEISMICITY

CYPRESS CORRIDOR

OAKLEY, CALIFORNIA

PROJECT NO.: 4603.5.001.01	FIGURE NO. 4
DATE: JANUARY 1999	
DRAWN BY: B	CHECKED BY: LE



EXPLANATION

CbA CAPAY CLAY, WET, 0 TO 2% SLOPES

DaC DELHI SAND, 2 TO 9% SLOPES

Ea EGBERT MUCKY CLAY LOAM

Kb KINGILE MUCK

Mb MARCUSE CLAY

Pe PIPER LOAMY SAND

Ph PIPER FINE SANDY LOAM

Rd RINDGE MUCK

Rh RYDE SILT LOAM

Sa SACRAMENTO CLAY

Se SHIMA CLAY

So SYCAMORE SILTY CLAY LOAM

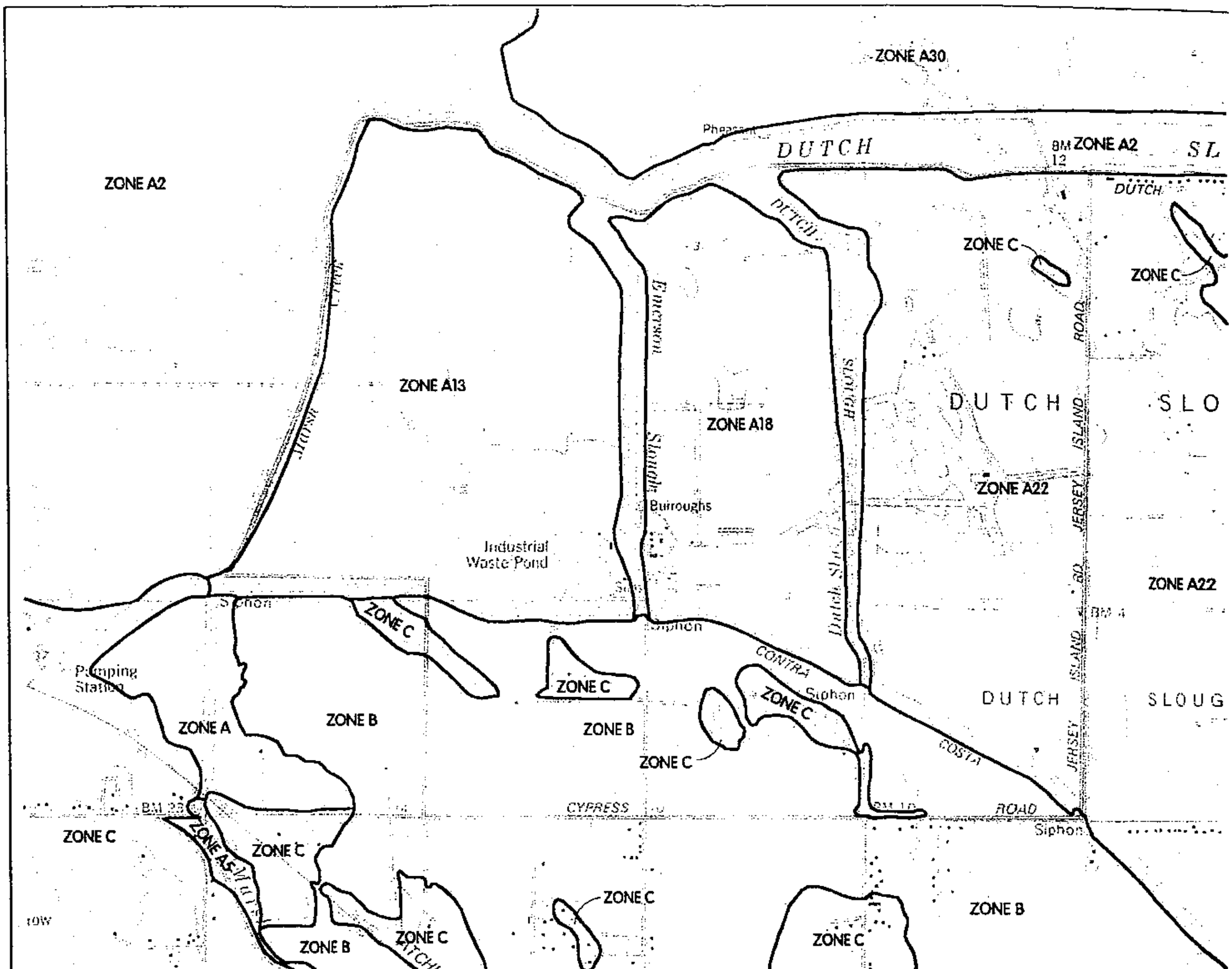
Sp SYCAMORE SILTY CLAY LOAM, CLAY SUBSTRATUM

N

0 MILE .5
0 KILOMETER 1

SOURCE: USDA

ENGEO INCORPORATED	SOIL SURVEY MAP CYPRESS CORRIDOR OAKLEY, CALIFORNIA	PROJECT NO.: 4603.5.001.01 DATE: JANUARY 1999 DRAWN BY: CB CHECKED BY: JE
		FIGURE NO. 5



KEY TO MAP

500-Year Flood Boundary	ZONE B
100-Year Flood Boundary	
Zone Designations	ZONE A1 / ZONE A5
100-Year Flood Boundary	ZONE B
500-Year Flood Boundary	
Base Flood Elevation Line With Elevation In Feet**	513
Base Flood Elevation in Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7×
Zone D Boundary	
River Mile	•M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

0 MILE .5

0 KILOMETER 1

EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)

N

SOURCE: FEMA

ENGEO INCORPORATED

FLOOD ZONE MAP
CYPRESS CORRIDOR
OAKLEY, CALIFORNIA

PROJECT NO.: 4603.5.001.01
DATE: JANUARY 1999
DRAWN BY: JB CHECKED BY: JE

FIGURE 6

ENGEO INCORPORATED

TABLE I

REGIONAL ACTIVE AND POTENTIALLY ACTIVE FAULTS

FAULT NAME	Approx. Distance mi (km)	Max. Credible Event			Max. Probable Event		
		Max. Cred. Mag.	Peak Site Acc. g	Site Intens MM	Max. Prob. Mag.	Peak Site Acc. g	Site Intens MM
CALAVERAS	22 (35)	7.50	0.168	VIII	6.80	0.121	VII
COAST RANGES - SIERRAN BLOCK	3 (5)	8.00	0.583	X	6.70	0.469	X
CONCORD	18 (29)	6.70	0.136	VIII	6.90	0.149	VIII
CORDELIA	28 (45)	6.70	0.090	VII	4.25	0.014	IV
GREEN VALLEY	23 (37)	7.00	0.127	VIII	6.90	0.121	VII
GREENVILLE	15 (24)	7.30	0.203	VIII	6.90	0.173	VIII
HAYWARD	32 (51)	7.50	0.125	VII	7.10	0.100	VII
HEALDSBURG - ROGERS CREEK	43 (69)	7.00	0.069	VI	7.00	0.069	VI
LAS POSITAS	23 (37)	6.30	0.086	VII	5.50	0.049	VI
MAACAMA	65 (105)	7.60	0.068	VI	6.90	0.040	V
ORTIGALITA	69 (111)	7.00	0.041	V	6.90	0.037	V
PALO COLORADO-SAN GREGORIO	54 (87)	7.70	0.087	VII	7.30	0.066	VI
RINCONADA	91 (146)	7.50	0.045	VI	6.25	0.014	III
SAN ANDREAS (Creeping)	74 (119)	7.00	0.037	V	7.10	0.041	V
SAN ANDREAS (Northern)	50 (80)	8.00	0.112	VII	7.60	0.088	VII
SARGENT	61 (98)	7.00	0.047	VI	6.80	0.040	V
WEST NAPA	34 (55)	6.50	0.063	VI	6.50	0.063	VI
ZAMORA	50 (80)	6.50	0.049	VI	4.75	0.011	III

18 FAULTS FOUND WITHIN THE SPECIFIED 100-MILE SEARCH RADIUS.

THE COAST RANGES - SIERRAN BLOCK FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 2.9 MILES AWAY.

LARGEST MAXIMUM-CREDIBLE SITE ACCELERATION: 0.583 g

LARGEST MAXIMUM-PROBABLE SITE ACCELERATION: 0.469 g

SITE COORDINATES:
LATITUDE: 38 N
LONGITUDE: 121.67 W

ATTENUATION RELATION: IDRISS (1994) HORIZ. - DEEP SOIL

EXHIBIT E

PRELIMINARY GEOTECHNICAL EXPLORATION

CYPRESS CORRIDOR PLANNING AREA

OAKLEY, CALIFORNIA

SUBMITTED

TO

SOPAC & ASSOCIATES

PORTERVILLE, CALIFORNIA

PREPARED

BY

ENGEO INCORPORATED

PROJECT NO. 4603.5.002.01

AUGUST 23, 1999

ENGEO INCORPORATED

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
MATERIALS TESTING

Project No.
4603.5.002.01

August 23, 1999

Ms. Sopac Tompkins
Sopac & Associates
32657 Indian Reservation Road
Porterville, CA 93257

Subject: Cypress Corridor Planning Area
Oakley, California

PRELIMINARY GEOTECHNICAL EXPLORATION

Dear Ms. Tompkins:

With your authorization, we conducted a preliminary geotechnical exploration for the Emmerson and Burroughs properties within the Cypress Corridor Planning Area. The Cypress Corridor planning area is located east of Oakley in northeastern Contra Costa County, California. The exploration included 8 test borings, 18 cone penetrometer soundings, and 35 test pits, as well as laboratory testing and preliminary geotechnical design analyses for levees.

The accompanying report contains our preliminary conclusions and recommendations for the 1,500-acre site. Based on the above-described exploration, we find that, from a geotechnical standpoint, the project site is suitable for its proposed use. The primary geotechnical considerations for the proposed residential development are levee stability, liquefaction potential, and the presence of soft compressible soils. We believe that the potential geotechnical hazards can be reduced by following the preliminary geotechnical design recommendations presented in this report. Additional geotechnical studies will be required in order to provide detailed grading and foundation recommendations.

We are pleased to have been of service to you and look forward to consulting further with you and your design team on this project.

Very truly yours,

ENGEO INCORPORATED

for Phil Stuecheli

Paul C. Guerin

pcg/jd:georecon

Reviewed by:

Uri Eliahu

TABLE OF CONTENTS

PRELIMINARY GEOTECHNICAL EXPLORATION

Purpose and Scope

The purpose of this preliminary geotechnical exploration is to evaluate the feasibility of site development for residential use and to provide preliminary grading concepts for the proposed 1500-acre development. The subsurface explorations undertaken for this study were limited to the Emmerson and Burroughs parcels. The owners of the Gilbert parcel declined to participate in the current exploration. Subsurface exploration of that parcel was therefore specifically excluded from the scope of this study.

The scope of our effort included the following:

1. Review of our Geotechnical Reconnaissance Report dated January 4, 1998.
2. Review of published geologic maps and reports.
3. Examination of stereographic aerial photographs flown in 1992.
4. Drilling and sampling of 8 test borings to depths of 20 to 40 feet using hollow-stem augers. The borings were logged in the field by our engineering geologists. The boring logs are presented as Figures 7 to 14.
5. 18 cone penetrometer soundings to depths of 22 to 52 feet by John Sarmiento Associates, presented in Appendix.
6. Excavation and logging of 35 Test pits to depths of up to 16 feet. The test pit logs are presented as Figures 15 to 26.
7. Laboratory testing of relatively undisturbed and bulk samples of site soils, presented as Figures 27 to 35.
8. Engineering Analyses.
9. Preparation of this report.

This report was prepared for the exclusive use of Sopac & Associates and their design team consultants. In the event changes are made in the character, design or layout of the development, the conclusions and recommendations contained in this report should be reviewed by ENGEO to determine whether modifications to the report are necessary.

Site Location and Description

The project site is located a short distance east of downtown Oakley, California (Figure 1) and is within the limits of this newly-incorporated city. The Cypress Corridor Planning area consists of a nearly square group of parcels located on the north side of Cypress Road and the west side of Jersey Island Road. The Planning area properties are further subdivided into the Emmerson, Gilbert and Burroughs parcels as shown on Figure 1. As described above, the Gilbert parcel was not included in the scope of this exploration. The southwest corners of the Emmerson and Gilbert parcels are crossed by the Contra Costa Canal. The site topography is generally flat with the exception of a number of northwest-trending low, elongated ridges locally referred to as "sandmounds". Other elevated areas include levees and dikes associated with drainage canals and the Contra Costa Canal. Existing site elevations range from approximately 10 feet below mean sea level (MSL) to approximately 10 feet above MSL. More than half of the site is below mean sea level.

The three landowners divide the overall site into sections, separated by the waterways of Emmerson Slough and Dutch Slough (see Figure 2). The artificial channel of Marsh Creek borders the west side of the Emmerson parcels. Levees at the perimeter of the parcels rise to elevations generally ranging from +7.6 to +10 feet. These levees protect the low-lying ground from flooding. Numerous small irrigation and drainage canals traverse the property. The site currently exists primarily as undeveloped agricultural land utilized for grazing, row crops, and vineyards. A Record Boundary depicts numerous roadway, power, drainage, and pipeline easements throughout the project area. Large overhead transmission lines and Jersey Island Road pass through the northeast corner of the site.

An active dairy operates on the Emmerson parcel. The dairy includes numerous buildings, a large pond, and large waste piles. The central parcel was formerly operated as a dairy and also contains a cluster of farm buildings. The eastern parcel contains abandoned farm buildings and several residential structures. An environmental site assessment by ENGEO (1999) contains a more detailed description of site improvements.

There has been minor grading on the three parcels to construct roads, dikes, and level areas for buildings and other improvements. The most extensive previous grading is located in the vicinity of the Emmerson Dairy.

Proposed Development

It is our understanding that the currently-proposed development will include a residential community with several recreational and commercial parcels. As currently envisioned, much of the development will occur below mean sea level and most will occur below standard flood protection elevations, which are in the range of +7 to +10 feet. Therefore, the perimeter levees will serve to protect the development areas from flooding. The existing, permanent dewatering systems will have to be maintained and perhaps enhanced to control ground-water levels within the levees.

Access to the community will be provided from Cypress Road and Jersey Island Road.

GEOLOGY

Regional Geology

The site is located in the Sacramento Delta, within the Great Valley Geomorphic Province of California. The Coast Ranges Geomorphic Province is located to the west. The Great Valley Geomorphic Province consists of an elongated structural trough that has been filled with a sequence of sedimentary deposits ranging from Jurassic to recent in age. In the San Joaquin Delta, sedimentary bedrock is up to six miles in thickness (Atwater, 1982). Geophysical evidence suggests that the Great Valley is underlain at depth with granitic rocks of the Sierra Nevada Province. The adjacent Coast Ranges Geomorphic Province is underlain at depth by Franciscan Assemblage rocks. In the Project area, the bedrock mantled by several hundred feet of unconsolidated alluvium.

The Sacramento Delta lies at the junction of the Sacramento and San Joaquin rivers, the two major waterways that drain the Central Valley. This area currently consists of a braided pattern of brackish to freshwater tidally-influenced channels and sloughs encircling a series of low-lying islands.

Regional Seismicity

The site is located in an area of moderate seismicity. No faults, active or otherwise, are known to come to the surface within or very close to the project site (see Figure 4). In addition, no portion of the site is mapped within any Seismic Special Study Zone. The closest active strike-slip fault with surface expression, as identified by the California Division of Mines and Geology, is the Concord fault located approximately 19 miles to the west. Other nearby active strike-slip faults include the Calaveras fault, 22 miles to the southwest; the Hayward fault, 32 miles to the west; and the San Andreas fault, 50 miles to the west.

Because of the presence of active faults in the region, the area is considered seismically active. Numerous small earthquakes occur every year in the region, and large (>M7) earthquakes have been recorded and can be expected to occur in the future. Table I lists distances to known active and potentially-active strike-slip faults located within 100 miles of the site and summarizes their estimated earthquake magnitudes and ground shaking potentials. Figure 4 shows the approximate locations of these faults and significant historic earthquakes recorded within the San Francisco region.

A significant seismic source listed in Table I but not shown on Figure 4 is the Coast Ranges – Sierran Block (CRSB) boundary, mapped along the west side of the Central Valley. As the name implies, it is the approximate boundary between the actively uplifting east side of the Coast Range crustal block and the west side of the Sierran crustal block. The west side of the Sierran block is covered by the thick veneer of sedimentary rock that fills the Central Valley. The boundary between the two blocks is thought to be a zone of tectonic crustal shortening and compression. The compression is structurally accommodated by a series of generally west-dipping buried or "blind" thrust faults, along which Coast Range rocks have been thrust eastward over Central Valley sediments. According to Wakabayashi and Smith (1994), the CRSB can be divided into a series of segments that are thought to be seismically independent. The local segments of the CRSB, according to the California Division of Mines and Geology (Peterson, et al., 1996) pass through the delta in approximately the site vicinity. Since the CRSB thrust faults are thought to exist entirely in the subsurface, the exact location of the boundary, e.g., a "surface fault trace" can not be defined. However, it should be assumed that an earthquake on the local segment of the CRSB could occur in the subsurface below or a few miles east or west of the site.

The historic seismicity of the eastern Coast Ranges includes a number of earthquakes in the M 5.0 to M 6.8 range, including the M 6.3 1889 Antioch-Collinsville earthquake, the M 6.4-6.8, 1892 Vacaville-Winters earthquakes, and the M 6.0-6.5 1983 Coalinga earthquakes. Based on historic seismicity and segment lengths, it is believed that the CRSB is generally capable of producing M 6.0-6.8 earthquakes. According to attenuation relationships by Idriss (1994), this would generate ground shaking at the site that could be as much as 0.3 to 0.6g, higher than any other seismic source in the Coast Ranges. The actual location of a possible earthquake epicenter in the CRSB can not be easily estimated, so the maximum ground shaking levels at the site could vary as described above. However, the recurrence interval for the local segments of the CRSB is believed to be in the range of 500 to 650 years (Peterson, et al. 1996), much longer than the for the nearby strike-slip faults (commonly 150 to 250 years).

Since the CRSB faults are not known to extend to the ground surface, the State of California has not defined Earthquake Fault Hazard Zones around the postulated traces.

Site Geology

The near-surface sediments across the site consist of eolian (wind-blown), tidal wetland, lacustrine (lake-deposited) and alluvial deposits. These sediments are typically irregularly-stratified, poorly-consolidated deposits of peat, clay, silt, sand, and minor gravel.

The surficial geology of the Delta has been mapped by Atwater (1982) as shown in Figure 3. The geology of the surficial deposits on the site has been largely influenced by changes in sea level during the Late Pleistocene. Most of the high-standing areas in the site vicinity are the crests of old sand dunes and are underlain by sandy eolian deposits deposited during the later part of the most recent low-stand of sea level. According to Atwater, these eolian deposits formerly extended across most of the surface of the site, but are now buried in low-lying areas by younger sediments.

The alluvial fan of Marsh Creek extends across the site and Atwater's map and text imply that alluvium of Marsh creek typically overlies the sandy eolian deposits in low-lying areas. According to Atwater (1982), much of the alluvium in the site vicinity consists of gray silt and clay deposited in near sea-level flood basins and ephemeral lakes.

We obtained A map dated 1871 titled "United States Surveys", that shows the extent of sloughs in the project area prior construction of levees and drainage channels. At that time, the area was still a natural tidal marsh. The map shows that Dutch Slough formerly passed through the central portion of the Emmerson parcel and across the south-central portions of the Gilbert and Burroughs parcels. The channel of Marsh creek apparently dissipated into the tidal marsh. The present channel of Marsh Creek was created artificially to direct the drainage to the Bay. Likewise, the existing channels of Emmerson Slough and the south-trending spur of Dutch Slough were apparently created by a combination of levee construction and dredging. Unfortunately, the geodetic base for a map of that age can not be very accurately registered to a modern map. However, the approximate location of the old channel of Dutch Slough can be inferred from the pattern of exposure of dune sand and intertidal marsh deposits, as shown on Figure 3.

Existing Levee and Canal Embankment Fills

As described above, there are a number of levee and dike embankments on the subject properties. Dutch Slough is retained by a perimeter levee along the north and east sides of The Emmerson and Gilbert properties and along the north and west side of the Burroughs property. The elevation at the crest of the existing levees varies from approximately +7.6 to +10 feet. Levee side slopes are typically inclined at between 1.5 to 2 H:1V. Based on examination of exposed soils, the levees appear to have been constructed from nearby native soils consisting mainly of sands and clays. Based on experience with other levees in the delta, it should be assumed that the fill comprising the existing levees is uncompacted and relatively weak. The levees are founded directly on the surface of the native soils. The composition of the levee foundation soils varies across the site depending on the local conditions that existed at the time the levees were constructed in the late 1800s. At some locations, the levees rest on as much as 10 feet or more of soft clay and peat; at other locations the levees were constructed on dune sand.

Other embankments on the site appear to have been constructed by method similar to those used for the perimeter levees. Fills associated with roads and the dairy improvements should also be treated as unengineered and uncompacted.

Intertidal Marsh Clay and Peat

The upper soil layers low-lying areas of the site (typically at elevations of +3 feet and lower) consists of stiff to soft fine-grained silty clay and clayey silt with lenses of peat. These fine-grained soils are interpreted to be intertidal marsh deposits, as described above. This soils type was mapped by Attwater as "Qpm"; the same symbol is used on Figure 2. The marsh soils are thin or absent in the vicinity of sandmounds and at elevations above the former tidal range. The marsh deposits were observed and logged directly in test pits and logged in test borings and cone penetrometer soundings. In the test pits, we observed a surface layer of stiff expansive clay that was typically 1 to 3 feet thick. This layer is interpreted to be the desiccated surface of the former marsh soils. Below the stiff surface layer, the marsh soils consist of thin layers of clayey silt and silty clay typically of medium stiff to soft consistency. Lenses of soft fibrous to granular peat and organic silt are interbedded with the silts and clays. The total thickness of the marsh soils ranges from a few feet to a maximum of approximately 8 feet. The thickest soft clays and peat occur along a trend that passes diagonally through the mid-portion of the Emmerson property and the south part of the Burroughs property. This trend appears to approximately coincide with the former location of Dutch slough as described above and shown on Figure 3.

A Plasticity Index (PI) of 54 was obtained from a sample of the marsh soils recovered from Boring 3. This soil would be classified as a clay of high plasticity.

Fine-Grained Alluvium

Fine grained alluvium, probably deposited from Marsh Creek occurs at the surface between sand mounds at elevations typically higher than +3 feet. The alluvium typically consists of stiff to very stiff olive gray to gray-brown silty to sandy clay. This unit was mapped by Attwater (1982) as "Qymc". We have used the same symbol on Figure 2. The alluvium was also found to occur at many locations in the subsurface below the marsh deposits and above the dune sand. The total thickness of the fine-grained alluvium varies from about 5 to 10 feet.

Dune Sand

Fine-to-medium grained silty sand interpreted to be dune sand occurs at the surface on the upper portions of sand mounds. The dune sand is typically covered by up to 10 to 15 feet of fine-grained soils in the low-lying areas between sand mounds, especially along the former trend of Dutch Slough. The dune sands are typically 20 to 35 feet thick with a base elevation at approximately –20 to –40 feet. Interbedded layers of stiff clay and sandy clay up to 10 feet thick were detected in a number of cone penetrometer soundings at elevations of –15 to –25 feet. These interbedded fine grained soils may be lenses of alluvium. We also noted isolated lenses of hard cemented sand in the Test Pit 13, so it is possible that some subsurface layers interpreted to be stiff clays may instead be cemented sands.

The texture and grain-size of the sand are relatively homogeneous and consistent throughout the site. Relatively homogeneous sands are characteristic of eolian sand deposits due to the sorting caused by wind transport. The gradation analyses show that the sands can be characterized as fine to medium grained silty sand. The fines content is typically 10 to 15 percent.

The test borings and cone penetrometer soundings typically found that the upper 5 to 20 feet of the sand is of loose to medium dense consistency. Deeper layers are of dense to hard consistency. The elevation of dense sand varies between approximately –5 to –25, but is typically at an elevation between –20 and –25.

Older Alluvium

Sandy to silty clay and clayey sand interpreted to be older alluvium was encountered in Borings 1 and 8 and cone penetrometer soundings 3, 7, 15, 16, 17 and 18. The alluvium is very stiff to hard and varies in depth from approximately 20 to 40 feet below the surface.

Ground Water

The static groundwater elevation varies across the Cypress Corridor Planning Area depending on the elevations of drainage ditches and the proximity to the waters of Dutch and Emmerson Sloughs. On the Burroughs property, the groundwater was found to vary between –2 and –10 feet. On the Emmerson Parcel, we observed groundwater elevations between close to sea level at the south end to as deep as –12 at the north end. The existing groundwater levels are maintained by pumping from drainage ditches. We would expect the level of groundwater to vary seasonally. The groundwater elevation could also be locally affected by fluctuations in the level of water in the sloughs.

Soils Survey Maps

The site is mapped by the Soil Survey of Contra Costa County (1977) as shown in Figure 5. The predominant soil across the southern area is Sacramento clay (Sa). Egbert Mucky clay loam (Ea) is mapped along the eastern side of the parcel. Other types of surface soils identified on the site are shown on Figure 5.

Seismic Hazards

Since no known active or potentially active faults cross the site, the probability of experiencing ground rupture is low. The major potential seismic hazard at the site is strong ground shaking from a nearby moderate to major seismic event. The degree of shaking is dependent on the magnitude of the event, the distance to its epicenter, and the nature of the underlying soils.

For this study, a probabilistic seismic hazard evaluation has been conducted. In this analysis, a computer program (EZ-FRISK) was used to model the seismic setting of the region and is able to explicitly account for uncertainty relating to:

- Earthquake magnitude
- Rupture length
- Location of rupture
- Maximum possible earthquake magnitude
- Attenuation relationship

The program calculates, by summation from earthquake sources, the total average annual expected number of occurrences of an acceleration greater than each of several specified values. Once the annual probability is obtained, the probability of the level of ground acceleration being exceeded over a specified time period can be calculated by the following equation:

$$P = 1 - e^{-pT}$$

in which P is the probability of the level of ground acceleration being exceeded in T years and p is the annual probability of exceedence.

Using this method, a horizontal ground acceleration of 0.30g is predicted to have a 10 percent probability of exceedence in a 50-year design life.

Liquefaction. During earthquakes, ground shaking may cause a loss of strength in cohesionless saturated soils. This process is called liquefaction, and it occurs most commonly in loose sands associated with a high water table. For this exploration, we evaluated the liquefaction potential of the dune sands by measuring penetration resistance using the Standard Penetration Test (SPT) and the cone penetrometer. As described above, the upper 10 to 20 feet of the dune sands appear to be of a loose consistency. Across much of the site, the sands are also saturated. The data from SPT measurements and cone penetrometer soundings was evaluated based on the work of Seed and Idriss (1982) and Robertson and Wride (1997). Based on these analyses it appears that the upper, loose sand layers are liquefiable.

Liquefaction-Induced Settlement. The design level site acceleration was determined for the base of the loose dune sands (approximately 20 feet below the ground surface). The site acceleration was determined using attenuation relationships developed by Idriss (1994). We estimate that volumetric strains on the order of 1½ to 2¾ percent could be expected during a M_w 6.7 earthquake occurring on the nearby CRSB. The total liquefaction induced settlements across the site range from less than ¼-inch up to approximately 4 inches.

In addition to the above analysis, we also evaluated the capping effect of any overlying non-liquefiable soils. In order for liquefaction induced ground surface settlement to occur, the pore water pressure generated within the liquefied strata must exert a sufficient enough force to break through the overlying soil and vent to the surface resulting in sand boils or fissures.

In 1985, Ishiara presented preliminary empirical criteria to assess the potential for ground surface disruption at liquefiable sites based on the relationship between thickness of liquefiable sediments and thickness of overlying non-liquefiable soil. In general, Ishiara concluded that liquefiable soils capped by at least 10 feet on non-liquefiable soil would not significantly vent to the surface. A more recent study by Youd and Garris (1995) expanded on the work of Ishihara to include data from over 308 exploratory borings, 15 different earthquakes, and several ranges of recorded peak ground acceleration.

The potentially liquefiable soils at the site are relatively shallow and are not generally capped by a sufficient thickness of non-liquefiable soils to prevent venting. Therefore in our opinion, there is a relatively high probability that sands susceptible to liquefaction would be significantly vented to the surface during a seismic event, and the above estimated settlements would be experienced.

Liquefaction induced settlements at the site can be mitigated by densification of loose sands or an increase in foundation stiffness to accommodate design settlements. The liquefaction potential, in the areas of the proposed levees, would require mitigation through the densification of the loose sand. The liquefaction potential, in the areas of the proposed residential structures, could be mitigated with either of the above methods.

Tsunamis and Seiches. Tsunamis are long sea waves, generated by displacements associated with earthquakes. These waves can reach great heights when they encounter shallow water. The subject development will be located far enough from the ocean that the potential for tsunamis affecting it is remote.

Seiches are caused by seismically-induced ground motions imparted to bodies of water which cause them to oscillate from side to side. Seiches may be expected to occur in the channel located adjacent to the site during strong earthquakes. The possibility of the occurrence of seiches should be considered in levee design to adequately protect the proposed development.

Lateral Spreading and Earthquake-Induced Landsliding. Lateral spreading and earthquake-induced landsliding involve lateral ground movements caused by earthquake vibrations. These lateral ground movements are often associated with a weakening or failure of an embankment or soil mass overlying a layer of liquefied sands or weak soils such as soft clay or peat. The potential for lateral spreading appears to be high where existing levees and embankments are underlain at shallow depth by liquefiable sands. Earthquake-induced landslides, possibly in the form of rotational slumps could occur where existing levees are founded on thicker layers of marsh soils and peat.

In our opinion these hazards are significant mainly for the existing, unengineered levees and embankments. New levees and embankments constructed for the proposed development can be designed and constructed to mitigate the effects of liquefiable or weak foundation soils as described below.

Ground Subsidence

Ground subsidence is a widespread phenomenon throughout the Delta. Possible causes of subsidence have been categorized as related to shallow and deep phenomena. Shallow subsidence is primarily related to a reduction in the thickness of the alluvium by oxidation of the surficial organic peaty soils. Other causes of shallow subsidence or depletion are wind erosion and consolidation following the lowering of the water table. No areas of major amounts of shallow subsidence are mapped within the boundaries of the subject property.

Deep subsidence is thought to result from such factors as natural gas and ground-water withdrawal and tectonic subsidence related to movements of the earth's crust. Rates of deep subsidence have been estimated at 0.006 inches per year in the Delta (1 inch in more than 160 years).

Flooding

The site is located within a 100-year flood plain, as shown on Figure 6. According to FEMA, the water surface elevation during peak runoff from the 100-year flood is +7.0 feet. This finding is based on the results of a 1986 study performed by the Corps of Engineers. The FEMA short-term hazard mitigation standard for levees is an elevation of +8.2 feet (1-foot freeboard). Flooding is now controlled by the site levees. The existing perimeter levees crest at elevations ranging from approximately +7.6 to +10 feet, hence occasionally below the FEMA short-term standard. The perimeter levee will therefore, at a minimum, need to be raised in some locations to protect the low-lying improvements within. Furthermore, we expect that the levees will be required by regulatory agencies to meet other geometrical and stability criteria. This will likely require buttressing and widening of the existing levees.

CONCLUSIONS AND RECOMMENDATIONS

General

Based on our studies, we conclude that the proposed project is feasible from a geotechnical standpoint. There are a number of significant geotechnical concerns that will need to be considered in the design of the project, including the presence of liquefiable sands, compressible clay and peat, highly expansive soils and the control of seepage. In addition, it appears that the stability of the existing perimeter levees is not adequate for the proposed residential construction, and that new, well-engineered levees will need to be constructed. However, it is our opinion that the existing geotechnical concerns can be mitigated if our recommendations are incorporated in the design of the project.

Liquefaction

The most significant geotechnical concern to be considered in the design of the project is the presence of liquefiable dune sand in the near subsurface across most of the site. The test borings and cone penetrometer soundings typically found that the upper 5 to 20 feet of the sand is potentially liquefiable. Deeper layers are of dense to hard consistency. The elevation of dense sand varies between approximately –5 to –25, but is typically at an elevation between –20 and –25. The liquefiable sands will require mitigation prior to construction of critical improvements, such as levees or other significant embankments. The liquefiable sands will require mitigation prior to construction of the foundations of the proposed new levees. The liquefiable sands form the foundations of many of the existing perimeter levees. It will therefore be necessary to mitigate the existing levees during the construction of the project. Liquefaction-related settlement will also be a design consideration for design of foundations and utilities.

Embankment Stability

Detailed embankment stability analyses were not within the contracted scope of work for this study. However, some guidelines for future analyses and our opinion regarding the expected results are described in the following paragraphs. Future geotechnical studies at the site should include additional site explorations with a substantial laboratory testing program in order to determine soil strength characteristics for slope stability analyses.

The embankments should be analyzed for various stability conditions using the strength parameters developed from testing. The design slopes should be analyzed for the following conditions: (1) end of construction, (2) long-term slope stability for static and seismic conditions, and (3) other stability conditions such as lateral spreading.

1. End-of-Construction

   This represents a short-term condition that occurs immediately after raising the levees. At that time, the levees and foundation soils have not had time to consolidate under the weight of the new fill and pore pressures may not have dissipated. Total stresses should be used to analyze the new levee geometry. Undrained strengths of the existing soils and fill soils should be estimated based on laboratory shear strength data. In our opinion, a minimum acceptable factor of safety of 1.3 should be used for this condition. Peat and soft clay may be found in localized areas. Since the new loads are expected to be minor and the site soils have consolidated under the weight of the existing levees, we anticipate adequate factors of safety for this condition.

2. Long-Term Static Condition

   This represents the normal post-construction condition when the levee and foundation soils have consolidated under the additional weight of fill. However, high water should be assumed in Dutch Slough. Excess pore pressures within the embankments and foundations will be assumed to have dissipated. An effective stress analysis should be used to analyze the stability of the slopes. Depending on the reliability, quantity, and quality of the soil strength data, a factor of safety of at least 1.5 to 2.0 should be required for this condition.

3. Seismic Loading Following Levee Construction

Based on a study of past performance of a large number of earth embankments subjected to strong earthquake shaking, Seed (1979) concluded it is likely that embankments constructed of compacted soils which do not build up large pore pressures, nor show more than 15 percent strength loss will survive strong earthquake shaking with no major damage. The majority of earth embankments located within 5 miles of the San Andreas fault performed well during the 1906 earthquake (8.25 Richter magnitude). Based on this study, Seed recommended that for a magnitude 8.25 earthquake, a pseudo-static coefficient of 0.15g and a minimum factor of safety of 1.15 be used as design criteria. For a magnitude 6.5 earthquake and lesser ones, Seed recommends using a pseudo-static coefficient of 0.10g.

However, some of the existing levees appear to be founded on, and may contain, soils that undergo strength loss during ground shaking. Residual soil strengths should be incorporated into the seismic stability analyses.

4. Other Stability Considerations

The long-term performance of the embankments will require consideration of additional environmental factors that may cause embankment soil movements. These factors include creep, soil softening, lateral spreading, and wave erosion. Creep and soil softening are somewhat related. As compacted clay soils saturate, they lose strength. At the relatively low embankment confining pressures, clays will also lose density by swelling. This phenomenon increases the propensity for creep (soil deformation under constant stress). Lateral creep of relatively high and saturated embankments has been observed locally at similar projects. All the above behaviors should be considered during future geotechnical studies.

The potential for wave erosion should also be evaluated jointly by the Geotechnical and Civil Engineers.

Settlement

Another significant geotechnical concern is the presence of relatively thin layers of compressible clay and peat in the near subsurface of the low-lying areas of the site. The addition of fills at the site will impose new loads on the underlying natural soils and cause them to settle. We recommend removal of the soft clays and peat soils, where practical, prior to filling. These soils, if left in place, would lead to substantial consolidation settlements. Time-dependent settlement analyses may have to be conducted locally where removal of compressible soils is impractical from a construction standpoint.

In addition, liquefaction induced settlement may be experienced during a large seismic event. As discussed earlier, the detrimental effects of liquefaction induced settlements can be minimized by densifying the loose near surface sands. The liquefaction potential of the loose sands can be reduced by several methods: (1) removing and recompacting, (2) in-place vibro compaction, (3) the installation of stone columns, and (4) deep dynamic densification. The viability of each of these methods depends on the consistency, depth and grain size of the liquefiable soils.

As an alternative, the proposed residential structures could be designed to accommodate the expected liquefaction induced settlement. In addition, the associated underground utilities will require flexible connections and adequate fall to also accommodate the expected settlement. It should be noted however, that the subsurface soils beneath the proposed earth embankment levees will require one of the above mentioned methods of improvement.

Seepage Considerations

Ground water is controlled at the site with a series of drainage ditches that lower the water to several feet below existing grades. Water in the ditches is controlled by pumps that discharge water to the slough. Thus a continual water cycle occurs where seepage occurs through and under the levees; the water is collected in the ditches and then discharged back to the slough. The dewatering system can be stressed during periods of high rainfall and high river levels. This system should be carefully analyzed as part of future studies and redundant methods should be implemented to make certain that water levels do not rise above prescribed levels after development.

Construction Aspects of Development

Peat and soft soils containing organic matter at relatively shallow depth will require mitigation during grading. The site located just east of this project is covered with soils containing 25 to 45 percent organic matter as determined by ASTM D-2974. In addition, the eastern portions of the nearby site contain silts and clays having high moisture contents, rendering them too weak to support fills or to be used as fill.

In our opinion, both highly-organic soils and wet, soft soils, if any exists at this site, should be removed prior to placement of fill for the embankments. Dairy operation remnants, organic waste from the dairy operation, and organic soils should not be used as engineered fill. Any existing fill areas will need to be regraded. Soft, wet soils will require aeration before being used in filling. Soils that are not suitable for use as engineered fill may be placed (1) in nonstructural fills such as parks, (2) along perimeter levee sides to create biologic habitat, or (3) in wetlands area. With the exception of the highly organic soils, all on-site soils are suitable for use in engineered fills. We anticipate that the most economical method for mass grading and levee buttressing is the use of conventional earth moving equipment and dewatering. Extreme caution must be exercised when excavations are performed near any existing perimeter levees to avoid destabilizing them. This risk can be reduced by avoiding excavations near the levees and/or by construction of a system of temporary containment levees.

In order to perform grading using conventional equipment, dewatering will be required when excavations extend below the level of the ground-water surface and particularly when excavations extend through the clayey cap into sandy soils below ground water.

Foundations

Foundation design must consider the potential of differential soil movements. In general, long-term settlement is not a major concern for this project provided the soft clay deposits, if any, beneath the fills are removed during mass grading and loose sands are recompacted.

Expansive soils tend to shrink and swell with seasonal variations in moisture content. Some of the clays that will be used for filling may exhibit a very high potential for swelling. These clays should be placed selectively, where possible.

On a preliminary basis, it is our opinion that conventional building foundations will be suitable on level lots. More rigid waffle slabs or deepened pier and pile foundations with stiffened grade beams may be appropriate when locating buildings over soft or liquefiable soils. Rigid waffle slabs may also be preferred over swelling soils.

Future Geotechnical Studies

As mentioned above, based on the preliminary studies to date, it is our opinion that this project site is suitable for residential and commercial development. However, additional geotechnical design studies will be required to more fully evaluate embankment design and performance as well as earthquake-induced hazards. Such studies will also be required to develop site-specific foundation designs and construction methods.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

This report is issued with the understanding that it is the responsibility of the owner to transmit the information and recommendations of this report to developers, contractors, buyers, architects, engineers, and designers for the project so that the necessary steps can be taken by the contractors and subcontractors to carry out such recommendations in the field. The conclusions and recommendations contained in this report are solely professional opinions.

The professional staff of ENGEO Incorporated strives to perform its services in a proper and professional manner with reasonable care and competence but is not infallible. There are risks of earth movement and property damages inherent in land development. We are unable to eliminate all risks or provide insurance; therefore, we are unable to guarantee or warrant the results of our work.

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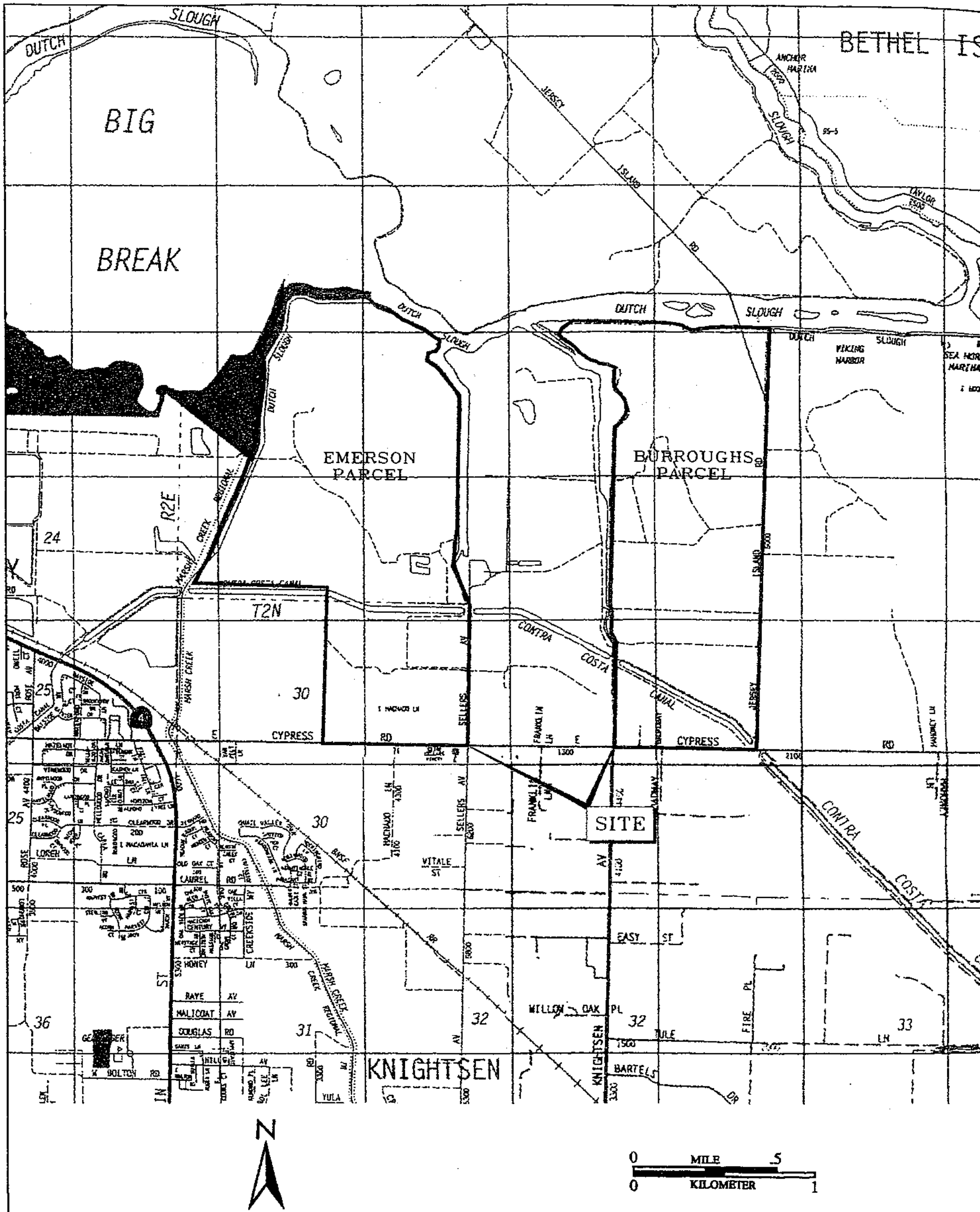
LIST OF FIGURES AND TABLE



BASE: THOMAS BROTHERS

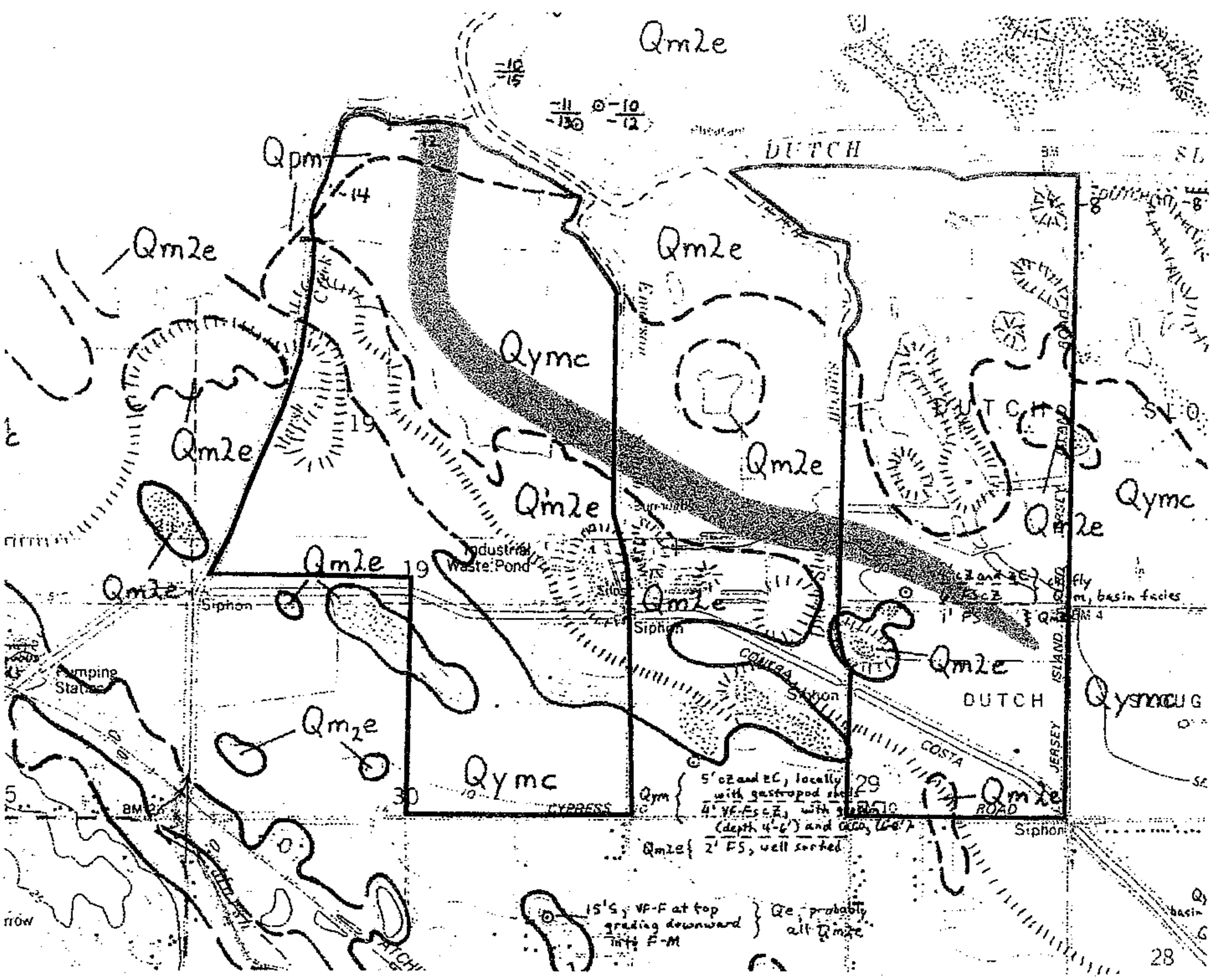
ENGEO INCORPORATED

SITE LOCATION MAP

A PORTION OF THE CYPRESS CORRIDOR PLANNING AREA

OAKLEY, CALIFORNIA

PROJECT NO.: 4603.5.002.01	FIGURE NO. 1
DATE: JUNE 1999	
DRAWN BY: CB	CHECKED BY: DSH



EXPLANATION

Qpm PEAT AND MUD OF TIDAL WETLANDS AND WATERWAYS (HOLOCENE)

Qm2e EOLIAN DEPOSITS OF UPPER MEMBER OF THE MODESTO FORMATION (UPPER PLEISTOCENE)

Qymc YOUNGER ALLUVIUM OF MARSH CREEK AND VICINITY (HOLOCENE AND UPPER PLEISTOCENE)

LANDWARD MARGIN OF TIDAL WETLAND AT LOW RIVER STAGES CIRCA 1850, QUERIED WHERE LOCATION MAY ERR BY MORE THAN 1000 FEET

INFERRED APPROXIMATE FORMER LOCATION OF DUTCH SLOUGH

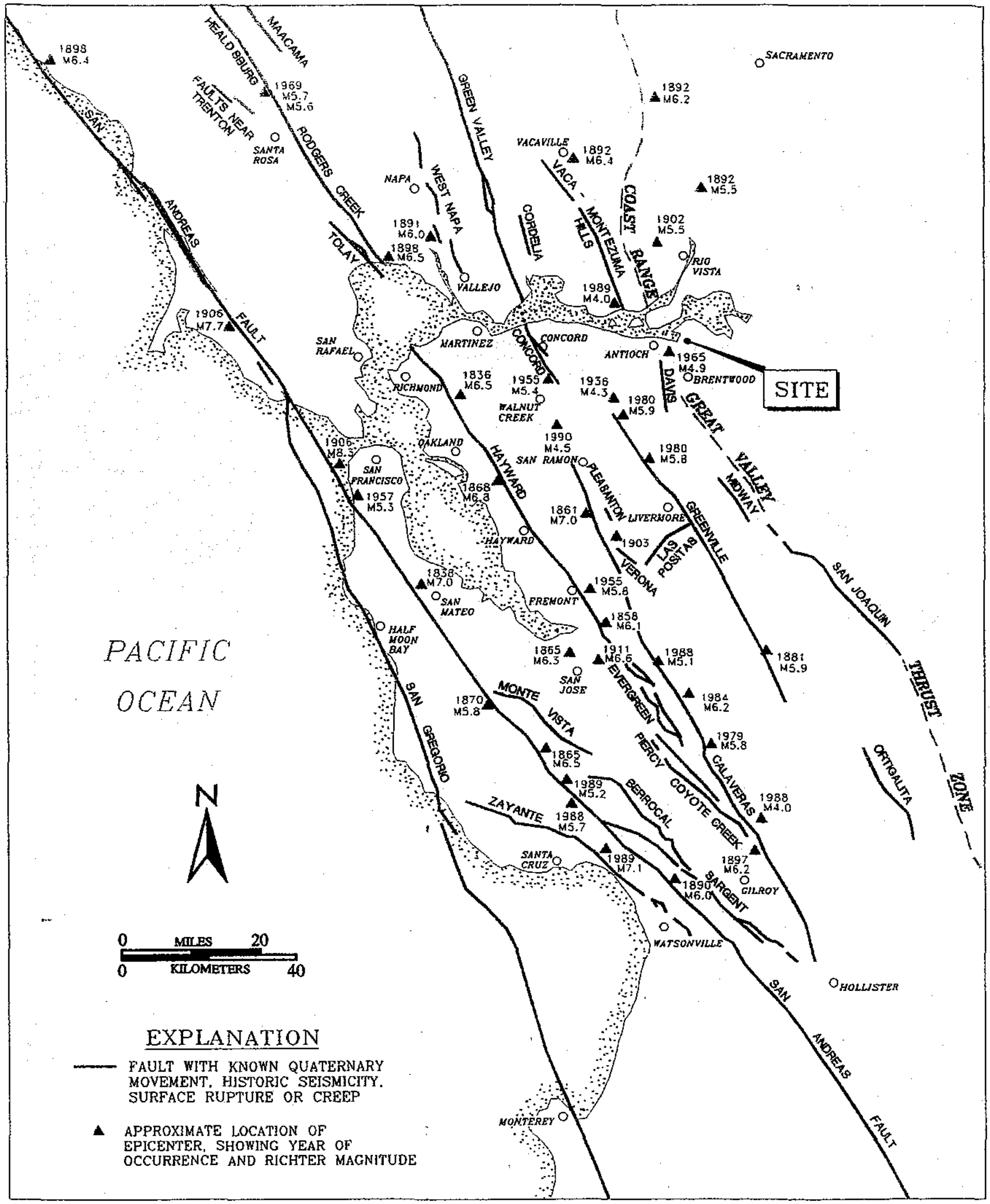
N

0 MILE .5

0 KILOMETER 1

SOURCE: ATWATER, 1982

ENGEO INCORPORATED	GEOLOGIC MAP CYPRESS CORRIDOR OAKLEY, CALIFORNIA	PROJECT NO.: 4603.5.002.01 DATE: JUNE 1999 DRAWN BY:	CHECKED BY:	FIGURE NO. 3



ENGEO INCORPORATED	REGIONAL FAULTING AND SEISMICITY A PORTION OF THE CYPRESS CORRIDOR PLANNING AREA OAKLEY, CALIFORNIA	PROJECT NO.: 4603.5.002.01 DATE: JUNE 1999 DRAWN BY: JB CHECKED BY: [illegible]	FIGURE NO. 4

EXPLANATION

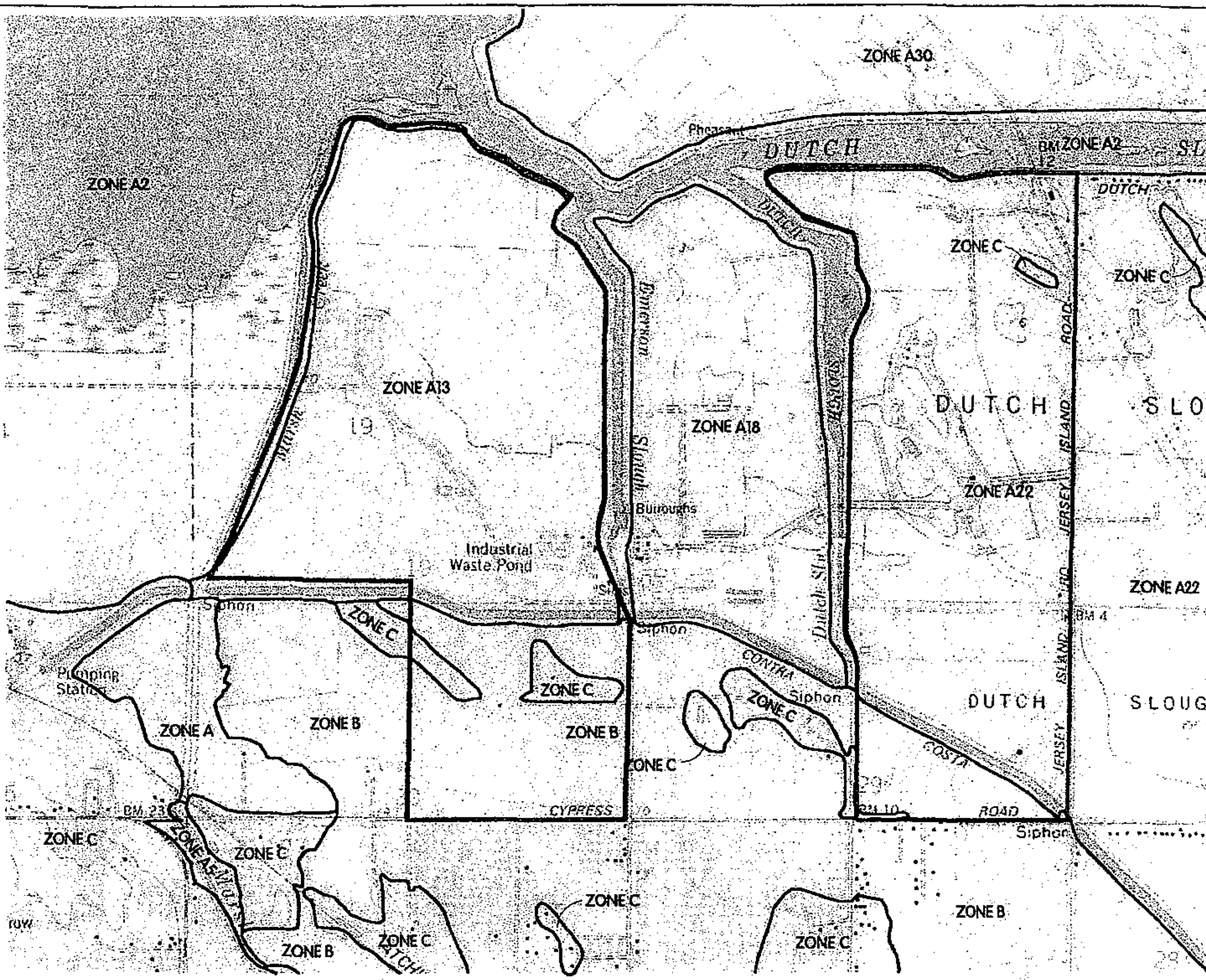
CbA CAPAY CLAY, WET, 0 TO 2% SLOPES
DaC DELHI SAND, 2 TO 9% SLOPES
Ea EGBERT MUCKY CLAY LOAM
Kb KINGILE MUCK
Mb MARCUSE CLAY
Pe PIPER LOAMY SAND
Ph PIPER FINE SANDY LOAM
Rd RINDGE MUCK
Rh RYDE SILT LOAM
Sa SACRAMENTO CLAY
Se SHIMA CLAY
So SYCAMORE SILTY CLAY LOAM
Sp SYCAMORE SILTY CLAY LOAM, CLAY SUBSTRATUM

N

0 MILE .5
0 KILOMETER 1

SOURCE: USDA

ENGEO INCORPORATED	SOIL SURVEY MAP A PORTION OF THE CYPRESS CORRIDOR PLANNING AREA OAKLEY, CALIFORNIA	PROJECT NO.: 4603.5.002.01 DATE: JUNE 1999 DRAWN BY: CHECKED BY:	FIGURE NO. 5



KEY TO MAP

500-Year Flood Boundary	———
	ZONE B
100-Year Flood Boundary	———
Zone Designations	ZONE A1 / ZONE A5
100-Year Flood Boundary	———
	ZONE B
500-Year Flood Boundary	———
Base Flood Elevation Line With Elevation In Feet**	~~~513~~~
Base Flood Elevation in Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7×
Zone D Boundary	— — —
River Mile	•M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

0 MILE .5
0 KILOMETER 1

EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)

N

SOURCE: FEMA

ENGEO INCORPORATED	FLOOD ZONE MAP A PORTION OF THE CYPRESS CORRIDOR PLANNING AREA OAKLEY, CALIFORNIA	PROJECT NO.: 4603.5.002.01 DATE: JUNE 1999 DRAWN BY: [initials] CHECKED BY: [initials]	FIGURE NO. 6

KEY TO BORING LOGS

MAJOR TYPES			DESCRIPTION
COARSE-GRAINED SOILS MORE THAN HALF OF MAT'L LARGER THAN #200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	Well graded gravels, little or no fines
			Poorly graded gravels or gravel-sand mixture
		GRAVELS WITH OVER 12 % FINES	Silty gravels, gravel and silt mixtures
			Clayey gravels, gravel and clay mixtures
			Clayey sandy gravel, gravel-sand-clay mixtures
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	Well graded sands, little or no fines
		SANDS WITH OVER 12 % FINES	Silty sand, sand-silt mixtures
			Clayey sand, sand-clay mixtures
FINE-GRAINED SOILS MORE THAN HALF OF MAT'L SMALLER THAN #200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		Silt
			Clay
			Clayey silt, silt-clay mixtures
			Silty clay, clay-silt mixtures
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		Gravelly clay, clay-gravel mixtures
			Sandy silty clay, clay-silt-sand mixtures
			Gravelly silt, silt-gravel mixtures
	HIGHLY ORGANIC SOILS		Peat and other highly organic soils
BEDROCK	SEDIMENTARY BEDROCK OTHER BEDROCK TYPES DESCRIBED ON LOGS		Sandstone
			Siltstone
			Claystone

RELATIVE DENSITY

SANDS AND GRAVELS	BLOWS/FOOT (S.P.T.)
VERY LOOSE	0-4
LOOSE	4-10
MEDIUM DENSE	10-30
DENSE	30-50
VERY DENSE	OVER 50

CONSISTENCY

SILTS AND CLAYS	STRENGTH*	BLOWS/FOOT (S.P.T.)
VERY SOFT	0-1/4	0-2
SOFT	1/4-1/2	2-4
MEDIUM STIFF	1/2-1	4-8
STIFF	1-2	8-15
VERY STIFF	2-4	15-30
HARD	OVER 4	OVER 30

SAMPLER SYMBOLS

- Modified California (3" O.D.) sampler
- S.P.T. - Split Spoon sampler
- Bulk - Bag sample
- Lost - Sample attempted, no recovery
- Shelby tube

LINE TYPES

- Solid - Layer Break
- Angled - Approximate Layer Break
- ------ Dashed - Gradational Layer Break

(S.P.T.) Number of blows of 140 lb. hammer falling 30" to drive a 2-inch O.D. (1-3/8 inch I.D.) Sampler.

* Unconfined compressive strength in tons/sq. ft., asterisk on log means determined by Pocket Penetrometer.

ENGEO

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF PROBE: March 30, 1999 SURFACE ELEVATION: Approx. feet (meters) DESCRIPTION	RATE OF PENET. (SEC./FT.)	qu UNCON. COMP. STRENGTH (TSF) *FIELD PENET. APPROX.	IN PLACE DRY UNIT WEIGHT (PCF)	IN PLACE MOIST. CONTENT % DRY WEIGHT
0				SILTY SAND, yellow brown, moist, medium dense.				
	1			Becomes wetter. No recovery.				
5		1-1-1			9*			
	2			∇ SILTY SAND, with trace gravel, olive brown, wet, loose. *Water level at time of drilling.* SILTY SAND, with trace gravel, olive brown, wet, loose.	8*			
10	3	1-2-2		SILTY SAND, gray, saturated, medium dense, with SANDY SILT lens.	18*			
	4							
15	5	1-3-1		SILTY SAND, gray, saturated, dense.	41*			
				Becomes coarser grained.				
20	6	1-4-2 1-4-1		SILTY SAND, gray, saturated, very dense.	84*			
	7							
25	8	1-5-1		Same. SILTY SAND, gray, dense.	26*			
30	9							

ENGEO INCORPORATED

A PORTION OF THE CYPRESS CORRIDOR PLANNING AREA
OAKLEY, CALIFORNIA

PROBE NO.: B1

DATE: June 1999

PROJ. NO.: 4603.5.002.01

CHECKED BY

FIGURE NO. 7

METPROBE 4603.GPJ 6/22/99

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF PROBE: March 30, 1999 SURFACE ELEVATION: Approx. feet (meters) DESCRIPTION	RATE OF PENET. (SEC./FT.)	qu UNCON. COMP. STRENGTH (TSF) *FIELD PENET. APPROX.	IN PLACE DRY UNIT WEIGHT (PCF)	IN PLACE MOIST. CONTENT % DRY WEIGHT
		1-6-1		SILTY SAND, gray to yellowish brown, wet, very dense.	83*			
	10							
35	11	1-7-1		CLAYEY SAND/SANDY CLAY, mottled brown and olive, moist, very stiff to dense.	45*			
40	12	1-8-1		SILTY CLAY, mottled olive and brown, moist, very stiff to hard. *Bottom of boring at approximately 40 feet.*	28*			
	13							
45	14							
50	15							
	16							
55	17							
60	18							

METPROBE 4603.GPJ 6/22/99

ENGEO INCORPORATED	A PORTION OF THE CYPRESS CORRIDOR PLANNING AREA OAKLEY, CALIFORNIA	PROBE NO.: B1 DATE: June 1999 PROJ. NO.: 4603.5.002.01 CHECKED BY	FIGURE NO. 7

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF PROBE: March 30, 1999 SURFACE ELEVATION: Approx. feet (meters) DESCRIPTION	RATE OF PENET. (SEC./FT.)	qu UNCON. COMP. STRENGTH (TSF) *FIELD PENET. APPROX.	IN PLACE DRY UNIT WEIGHT (PCF)	IN PLACE MOIST. CONTENT % DRY WEIGHT
0				SILTY SAND, brown, dry-moist, loose to medium dense.				
	1							
5		2-1-2 2-1-1		SILTY SAND, yellow brown, moist, medium dense.	11*	0.75		
	2							
10	3	2-2-1		SILTY SAND, yellow brown, moist, medium dense.	13*			
				∇ *Water level at time of drilling.*				
	4							
15		2-3-1		SILTY SAND, yellow brown, saturated, medium dense.	17*			
	5	2-4-1		SILTY SAND, yellow brown, saturated, medium dense.	17*			
20	6	2-5-1		SILTY SAND, yellow brown, saturated, dense. *Bottom of boring at approximately 21 feet.*	34			
	7							
25	8							
30	9							

METPROBE 4603.GPJ 6/22/99

ENGEO
INCORPORATED

A PORTION OF THE CYPRESS CORRIDOR
PLANNING AREA
OAKLEY, CALIFORNIA

PROBE NO.: B2
DATE: June 1999
PROJ. NO.: 4603.5.002.01
CHECKED BY

FIGURE NO. 8

DATE OF PROBE: March 30, 1999

SURFACE ELEVATION: Approx. feet (meters)

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DESCRIPTION	RATE OF PENET. (SEC./FT.)	qu UNCON. COMP. STRENGTH (TSF) *FIELD PENET. APPROX.	IN PLACE DRY UNIT WEIGHT (PCF)	IN PLACE MOIST. CONTENT % DRY WEIGHT
0				SILTY CLAY, dark brown, moist, medium stiff, roots pervaisive.				
	1			SILTY CLAY, gray, moist, medium stiff. PI=54				
5		3-1-1			4*			
	2	3-2-1		SANDY CLAY, mottled black-olive-yellow brown, moist, stiff, abundant organics. Interbedded sands and clays.	11*	0.75	95.0	28.0
10	3			SILTY SAND, gray, wet, medium dense, with organics.				
		3-3-1		SANDY CLAY, olive gray, wet, stiff, organics. ▽ *Water level at time of drilling.*	9*	2.25*	105.0	23.0
	4							
15				SILTY CLAY, mottled gray, yellow brown, moist, very stiff, organics.				
	5	3-4-1		SILTY SAND with clay, mottled gray-yellow brown-olive, moist, medium dense.	17*	5.0*	111.0	19.0
20	6							
		3-5-1		SILTY SAND, yellow brown, wet, medium dense. *Bottom of boring at approximately 21.5 feet.*	27*			
	7							
25								
	8							
	9							
30								

ÆTPROBE 4603.GPJ 6/22/99

ENGEO
INCORPORATED

A PORTION OF THE CYPRESS CORRIDOR
PLANNING AREA
OAKLEY, CALIFORNIA

PROBE NO.: B3

DATE: June 1999

PROJ. NO.: 4603.5.002.01

CHECKED BY

FIGURE NO. 9

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF PROBE: March 31, 1999 SURFACE ELEVATION: Approx. feet (meters) DESCRIPTION	RATE OF PENET. (SEC./FT.)	qu UNCON. COMP. STRENGTH (TSF) *FIELD PENET. APPROX.	IN PLACE DRY UNIT WEIGHT (PCF)	IN PLACE MOIST. CONTENT % DRY WEIGHT
0				CLAYEY SAND, dark brown, moist, roots and organics.				
	1				4*			
5	2	4-1-1		SILTY SAND, gray to yellowish brown, saturated, loose. *Water level at the end of drilling.*	5*			
10	3	4-2-1		SILTY SAND, gray, saturated, medium dense.	28*			
	4							
15	5	4-3-1		SILTY SAND, gray, saturated, dense.	30*			
20	6	4-4-1		SILTY SAND, olive gray, medium dense. *Water level at time of drilling.*	13*			
	7							
25	8	4-5-1		SILTY SAND, olive gray, saturated, very dense.	49*			
30	9			*Boring terminated at 30 feet due to binding of auger center pin.*				

METPROBE 4603.GPJ 6/22/99

ENGEO
INCORPORATED

A PORTION OF THE CYPRESS CORRIDOR
PLANNING AREA
OAKLEY, CALIFORNIA

PROBE NO.: B4

DATE: June 1999

PROJ. NO.: 4603.5.002.01

CHECKED BY DKH

FIGURE NO. 10

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF PROBE: March 31, 1999 SURFACE ELEVATION: Approx. feet (meters) DESCRIPTION	RATE OF PENET. (SEC./FT.)	qu UNCON. COMP. STRENGTH (TSF) *FIELD PENET. APPROX.	IN PLACE DRY UNIT WEIGHT (PCF)	IN PLACE MOIST. CONTENT % DRY WEIGHT
0				SILTY SAND, olive brown, wet, loose, organics.				
	1				5*			
5				SILTY SAND, yellow brown, loose, saturated.				
	2	5-1-1		∇ *Water level at time of drilling.*	8*			
10	3							
		5-2-1		SILTY SAND, yellow brown, saturated, medium dense.	20*			
	4							
15				Heaving sand - boring abandoned. *Boring terminated at 15 feet.*				
	5							
20	6							
	7							
25	8							
30	9							

METPROBE 4603.GPJ 6/22/99

ENGEO INCORPORATED

A PORTION OF THE CYPRESS CORRIDOR
PLANNING AREA
OAKLEY, CALIFORNIA

PROBE NO.: B5

DATE: June 1999

PROJ. NO.: 4603.5.002.01

CHECKED BY: DH

FIGURE NO. 11

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF PROBE: March 31, 1999 / SURFACE ELEVATION: Approx. feet (meters) / DESCRIPTION	RATE OF PENET. (SEC./FT.)	qu UNCON. COMP. STRENGTH (TSF) *FIELD PENET. APPROX.	IN PLACE DRY UNIT WEIGHT (PCF)	IN PLACE MOIST. CONTENT % DRY WEIGHT
0				SILTY CLAY, olive brown, wet, stiff, roots, organics.				
5	1	6-1-1		SILTY CLAY, mottled olive brown, wet, medium stiff, organics. PI=36	3*	0.45	89.0	32.0
	2	6-2-1		SILTY CLAY, mottled olive brown to gray, wet, stiff, organics. ∇ *Water level at time of drilling.*	7*	2.0*		
10	3							
	4	6-3-1		SILTY CLAY, mottled olive brown-gray-yellow brown, wet, stiff, organics.	10*	2.0*		35.0
15	5							
		6-4-1		SILTY SAND, yellow brown, saturated, loose				
20	6	6-5-1		SILTY SAND, yellow brown, saturated, loose (disturbed sample). *Bottom of boring at approximately 20.5 feet.*	12*			
25	7, 8							
30	9							

METPROBE 4603.GPJ 6/22/99

ENGEO INCORPORATED

A PORTION OF THE CYPRESS CORRIDOR
PLANNING AREA
OAKLEY, CALIFORNIA

PROBE NO.: B6

DATE: June 1999

PROJ. NO.: 4603.5.002.01

CHECKED BY

FIGURE NO. 12

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF PROBE: April 1, 1999 SURFACE ELEVATION: Approx. feet (meters) DESCRIPTION	RATE OF PENET. (SEC./FT.)	qu UNCON. COMP. STRENGTH (TSF) *FIELD PENET. APPROX.	IN PLACE DRY UNIT WEIGHT (PCF)	IN PLACE MOIST. CONTENT % DRY WEIGHT
0				SILTY CLAY, olive brown, wet, soft, roots, organics.				
	1	7-1-2		3 inch layer of CLAYEY SAND, olive brown, wet. ▽ SILTY CLAY, olive brown, wet, soft, organics. *Water level at time of drilling.*	3*	0.5*	88.0	33.0
5	2							
	3	7-2-1		SANDY CLAY, mottled gray and olive brown, wet, very stiff, organics. SILTY SAND, gray, saturated.	9*	2.75*	112.0	18.0
10	4							
		7-3-1		SILTY SAND with clay, gray to yellow brown, saturated, medium dense.	18			
15	5							
20	6	7-4-1		SILTY SAND to SILTY SAND with clay, olive gray to yellow brown, saturated, medium dense to dense. *Bottom of boring at approximately 20 feet.*	28			
25	7, 8							
30	9							

METPROBE 4603.GPJ 6/22/99

ENGEO INCORPORATED	A PORTION OF THE CYPRESS CORRIDOR PLANNING AREA OAKLEY, CALIFORNIA	PROBE NO.: B7 DATE: June 1999 PROJ. NO.: 4603.5.002.01 CHECKED BY DH	FIGURE NO. 13

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF PROBE: April 1, 1999 SURFACE ELEVATION: Approx. feet (meters) DESCRIPTION	RATE OF PENET. (SEC./FT.)	qu UNCON. COMP. STRENGTH (TSF) *FIELD PENET. APPROX.	IN PLACE DRY UNIT WEIGHT (PCF)	IN PLACE MOIST. CONTENT % DRY WEIGHT
0				SANDY CLAY, dark brown, moist, soft, roots, organics.				
	1	8-1-2		SILTY SAND, gray to yellow brown, loose, wet, organics.	8*		112.0	18.0
5	2			∇ *Water level at time of drilling.*				
10	3	8-2-1		SILTY SAND, olive gray, saturated, medium dense.	17*			
15	4	8-3-1		SILTY SAND, olive gray, saturated, medium dense.	18*			
20	5, 6	8-4-1		SILTY SAND to SANDY SILT, olive gray, medium dense, saturated.	26*			
	7			Layer of SANDY CLAY, olive gray, saturated, very stiff.				
25		8-5-1		SANDY SILT, olive gray, saturated, very stiff.	41*			
	8				29*			
30	9			SILTY CLAY, yellow brown, very stiff.	27*	4.5		

ENGEO INCORPORATED	A PORTION OF THE CYPRESS CORRIDOR PLANNING AREA OAKLEY, CALIFORNIA	PROBE NO.: B8 DATE: June 1999 PROJ. NO.: 4603.5.002.01 CHECKED BY
		FIGURE NO. 14

METPROBE 4603.GPJ 6/22/99

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DATE OF PROBE: April 1, 1999 SURFACE ELEVATION: Approx. feet (meters) DESCRIPTION	RATE OF PENET. (SEC./FT.)	qu UNCON. COMP. STRENGTH (TSF) *FIELD PENET. APPROX.	IN PLACE DRY UNIT WEIGHT (PCF)	IN PLACE MOIST. CONTENT % DRY WEIGHT
		8-6-1		SILTY CLAY, yellow brown, wet, very stiff.				
	10							
35	11	8-7-1		SILT CLAY, olive gray to yellow brown, moist, hard.	36*	>4.5		
40	12	8-8-2 8-8-1		SILTY CLAY, mottled yellow brown to olive brown, moist, very stiff. *Bottom of boring at approximately 41.5 feet.*	28*	>4.5		
	13							
45	14							
50	15							
	16							
55	17							
60	18							

TEST PIT LOGS

Test Pit Number	Depth (Feet)	Description
TP-1	0 – 2	Silty CLAY, gray-brown, stiff, moist, with roots (CH).
	2 – 4	Organic clayey SILT, gray-brown and orange-brown mottled, medium stiff, moist, with lenses of organic material (MH).
	4 – 6	Peat and clayey SILT, gray and dark gray mottled, soft, wet (OH-MH).
		Ground water at 6 feet.
	6 – 10	Silty CLAY gray and brown mottled, very stiff, with roots (CH).
	10 – 11	Sandy CLAY, light gray, very stiff, saturated (CL-SC).
	11 – 13	Silty SAND, light gray, medium dense, saturated (SM).
		Bottom of test pit at 13 feet.
TP-2	0 – 2	Silty CLAY, gray-brown, stiff, moist, with roots (CH).
	2 – 5	Peat and clayey SILT, gray and dark gray mottled, soft, wet (OH-MH).
		Ground water seepage at 5 feet.
	5 – 10	Silty CLAY, gray and olive-brown mottled, very stiff, moist (CH).
	10 – 12	Sandy CLAY, light gray, very stiff, saturated (CL-SC).
	12 – 16	Clayey silty SAND, gray and olive-brown mottled, medium dense, saturated (SC-SM).
		Bottom of test pit at 16 feet.

TEST PIT LOGS

Test Pit Number	Depth (Feet)	Description
TP – 3	0 – 2	Silty CLAY, gray-brown, stiff, moist, with roots (CH).
	2 – 2.5	Silty CLAY, dark gray, soft, moist (CH).
	2.5 – 3	Peat and clayey SILT, gray and dark gray mottled, soft, wet (OH-MH).
	3 – 3.5	Silty CLAY, dark gray, soft, wet (CH).
	3.5 – 5	Peat and clayey SILT, gray and dark gray mottled, soft, wet (OH-MH).
		Ground water at 5 feet.
	5 – 9	Silty CLAY, gray and brown mottled, stiff, moist (CH).
	9 – 11	Silty SAND, gray and orange-brown mottled, with clay cement (SM).
		Bottom of test pit at 11 feet.
TP – 4	0 – 4	Silty CLAY, gray-brown, stiff, moist, with roots (CH).
	4 – 7	Silty CLAY, brown and olive-brown mottled, medium stiff, moist (CH).
	7 – 9	Silty SAND, gray, medium dense, wet (SM).
		Bottom of test pit at 9 feet.
TP – 5	0 – 5	Silty SAND, brown and red-brown mottled, medium dense, dry to slightly moist (SM).
		Bottom of test pit at 5 feet.
TP – 6	0 – 2	Clayey SILT, brown, stiff, moist.
	2 – 5	Silty SAND, gray, medium dense, wet (SM).
		Bottom of test pit at 5 feet.

TEST PIT LOGS

Test Pit Number	Depth (Feet)	Description
TP – 7	0 – 2	Silty CLAY, gray-brown, stiff, moist, with roots (CH).
	2 – 4	Silty CLAY, olive brown and brown mottled, medium stiff, moist (CH).
	4 – 5	Sandy CLAY, gray, medium stiff, moist (CL).
	5 – 8	Silty SAND, gray, medium dense, wet (SM).
		Bottom of test pit at 8 feet.
TP – 8	0 – 1	Silty CLAY, gray-brown, stiff, moist, with roots (CH).
	1 – 5	Silty SAND, yellow-brown, medium dense (SM).
		Bottom of test pit at 5 feet.
TP – 9	0 – 1	Silty CLAY, brown, medium stiff, moist, with roots.
	1 – 1.5	Sandy silty CLAY, gray (calc), stiff, moist, with roots.
	1.5 – 3	Silty CLAY, dark gray, stiff, moist.
	3 – 4	Silty CLAY, black, soft, medium stiff, wet.
	4 – 6	Silty SAND, gray, dense, wet.
		Bottom of test pit at 6 feet.
TP – 10	0 – 1.5	Silty SAND, brown, loose, moist, with roots.
	1.5 – 4	Silty SAND, yellow brown, medium dense, wet.
		Bottom of test pit at 4 feet.
TP – 11	0 – 1.25	Silty SAND, light brown, with roots.
	1.25 – 1.75	Silty CLAY, black, medium stiff, moist, with organics.
	1.75 – 4	Silty SAND, brown to gray, dense, wet.

TEST PIT LOGS

Test Pit Number	Depth (Feet)	Description
		Bottom of test pit at 4 feet.
TP-12	0 - .75	Silty SAND, light brown, medium dense, moist with roots and wood (FILL).
	.75 – 3	Clayey silty SAND, brown, dense, wet, with roots.
	3 – 6	Silty CLAY, black, soft to medium stiff, wet.
	6 – 7	Silty CLAY, gray, soft to medium stiff, wet.
	7 – 9	Silty SAND, gray, dense, wet.
		Bottom of test pit at 9 feet.
TP – 13	0 – 2.5	Silty SAND, light brown, medium dense, moist, with roots.
	2.5 – 3	Silty CLAY, gray, stiff, moist.
	3 – 3.5	Silty CLAY, black, medium stiff, moist, with roots.
	3.5 – 4	Sandy silty CLAY, light brown to gray, stiff, moist, with roots.
	4 – 5	Silty SAND, gray to white, dense, wet.
	5 – 7	Silty SANDSTONE, hard rock, slightly vesicular, moderately strong.
		Ground water at 6 feet. Bottom of test pit at 7 feet.
TP-14	0 – 2	Sandy silty CLAY, black, stiff, moist, with roots.
	2 – 3.5	Silty SAND, light brown/orange mottled, medium dense, wet, with roots.
	3.5 – 7	Silty SAND, gray, dense, wet, with roots to 5 feet.
		Bottom of test pit at 7 feet.

TEST PIT LOGS

Test Pit Number	Depth (Feet)	Description
TP – 15	0 - .5	Silty SAND, black, loose, moist, with roots.
	.5 – 1	Silty SAND, mottled orange/light brown, loose, moist.
	1 – 5	Silty SAND, light brown to orange, dense, wet.
		Bottom of test pit at 5 fet.
TP – 16	0 – 2	Silty SAND, yellow brown, loose, moist, with roots.
	2 – 8	Silty SAND, light brown, dense, moist to wet, with roots to 4 feet.
		Bottom of test pit at 8 feet.
TP – 17	0 – 1	Silty CLAY, brown, medium stiff, moist, with roots.
	1 – 2	Silty CLAY, light brown, stiff, moist, with roots.
	2 – 3	Sandy silty CLAY, dark brown, stiff, moist, with roots.
	3 – 4	Silty SAND, dark brown, dense, moist.
	4 – 6	Silty SAND, brown, medium dense, wet, caving on sides.
		Bottom of test pit at 6 feet.
TP – 18	0 – 2	Silty CLAY, brown, stiff, moist, with roots.
	2 – 3	Sandy silty CLAY, brown, medium stiff, moist to wet, with roots.
	3 – 4	Silty CLAY, brown, medium stiff, wet.
	4 – 5	Clayey silty SAND, light brown, medium dense, wet, caving on sides.
	5 – 7	Silty SAND, gray, medium dense, wet, caving on sides.
		Bottom of test pit at 7 feet.

TEST PIT LOGS

Test Pit Number	Depth (Feet)	Description
TP – 19	0 – 2	Sandy silty CLAY, brown, stiff, moist.
	2 – 3	Silty CLAY, brown/orange mottled, stiff, moist.
	3 – 5	Silty CLAY, brown, soft, wet.
	5 – 7	Silty CLAY, gray with brown mottled, stiff, moist.
	7 – 10	Silty SAND, gray, medium dense, wet.
		Bottom of test pit at 10 feet.
TP – 20	0 – 2	Sandy silty CLAY, brown, stiff to very stiff, clam shells, with roots.
	2 – 3	Sandy silty CLAY, mottled black/brown/white/calcified, very stiff, moist.
	3 – 4	Silty SAND, gray, medium dense, wet.
	4 – 7	Silty SAND, mottled light brown/gray, dense, wet.
		Bottom of test pit at 7 feet.
TP – 21	0 – 4	Silty CLAY, brown, stiff, moist, with roots to 2 feet.
	4 – 7	Silty CLAY, mottled gray/brown, very stiff, moist to wet.
	7 – 11	Silty SAND, mottled gray/brown, medium dense, wet.
	11 – 13	Silty SAND, gray, dense, wet.
		Bottom of test pit at 13 feet.

TEST PIT LOGS

Test Pit Number	Depth (Feet)	Description
TP – 22	0 – 1.5	Silty CLAY, brown, stiff, moist, with roots.
	1.5 – 2.5	Silty CLAY, mottled gray/brown/black, stiff, moist.
	2.5 – 6	Silty CLAY, mottled gray/brown/black, very stiff, moist.
	6 – 12	Silty SAND, gray, medium dense, wet, caving on sides.
		Bottom of test pit at 12 feet.
TP – 23	0 - 1	Silty CLAY, brown, medium stiff, moist, with roots.
	1 - 3	Silty CLAY, brown, stiff, moist, with roots.
	3 – 7	Silty CLAY, mottled gray/brown/black, medium stiff, moist.
	7 – 9	Silty SAND, brown/gray, medium dense, wet, caving on sides.
	9 – 11	Silty SAND, gray, dense, wet.
		Bottom of test pit at 11 feet.
TP – 24	0 – 1.75	Silty CLAY, brown, soft, moist, with roots.
	1.75 – 2.25	Clayey silty SAND, gray, dense, moist.
	2.25 – 4	Silty SAND, gray brown, medium dense, wet.
	4 – 10	Silty SAND, mottled gray/brown, dense, wet.
		Bottom of test pit at 10 feet.
TP – 25	0 – 2	Silty CLAY, black, medium stiff, moist, with roots.
	2 – 7	PEAT, black, highly organic, soft wet, brown organics throughout, rotten egg odor, layers of thick brown organics.
	7 – 11	Silty SAND, gray, dense, wet.
		Bottom of test pit at 11 feet.

TEST PIT LOGS

Test Pit Number	Depth (Feet)	Description
TP – 26	0 - .25	Silty CLAY, black, loose, moist, grass root zone, highly organic.
	.25 – 1	Silty CLAY, mottled light gray/brown, stiff, moist, with roots.
	1 – 3.5	Silty CLAY, mottled light gray/gray/brown, medium stiff, moist.
	3.5 – 7	PEAT, black, highly organic, soft, wet.
	7 – 10	Silty SAND, gray, dense, wet.
		Bottom of test pit at 10 feet.
TP – 27	0 - .5	Sandy silty CLAY, black, organic rich, loose, moist, with roots.
	.5 – 2	Silty CLAY, light gray, stiff, moist, with roots.
	2 – 2.25	Silty CLAY, mottled brown/gray, stiff, moist, with roots.
	2.25 – 3	Silty CLAY, mottled gray/black/brown, medium stiff, moist, with roots.
	3 – 3.25	Silty CLAY, mottled brown/gray, soft, moist, with roots.
	3.25 – 4	Silty SAND, black, dense, wet.
	4 – 6	Silty SAND, gray, dense, wet.
	6 – 9	Silty SAND, light gray, dense, wet.
		Bottom of test pit at 9 feet.

TEST PIT LOGS

Test Pit Number	Depth (Feet)	Description
TP – 28	0 – 1.5	Silty CLAY, mottled gray/black/brown, stiff, moist, with roots.
	1.5 – 2	Sandy silty CLAY, mottled orange/black/brown, stiff, moist, with roots.
	2 – 3	Silty CLAY black/gray, soft to medium stiff, moist.
	3 – 3.5	Sandy silty CLAY, black, soft to medium stiff, wet.
	3.5 – 5	Silty SAND, gray/brown, dense, wet.
	5 – 9	Silty SAND, light gray, dense, wet.
	9 – 10	Silty SAND, gray, dense, wet.
		Bottom of test pit at 10 feet.
TP – 29	0 – 2	Silty CLAY, brown, medium stiff, moist, with roots.
	2 – 3.5	Silty CLAY, mottled orange/gray, stiff, moist.
	3.5 – 6	Sandy silty CLAY, black, soft, wet, organics, with roots
		Ground water at 6 feet.
	6 – 8	Silty SAND, black, dense, wet.
	8 – 10	Silty SAND, light gray, dense, wet.
		Bottom of test pit at 10 feet.

TEST PIT LOGS

Test Pit Number	Depth (Feet)	Description
TP – 30	0 – 2	Silty CLAY, gray, loose to medium stiff, moist, with roots.
	2 – 2.25	Silty CLAY, black/orange/brown, stiff, moist, with roots.
	2.25 – 4	Silty CLAY, black, stiff, wet, organics, with roots. 1-inch-thick layers of light gray silty CLAY at 32 inches and 44 inches.
	4 – 4.5	Silty CLAY, peat, black/red, highly organic, soft, wet.
	4.5 – 5	Silty CLAY, light gray, soft, moist.
	5 – 5.5	Sandy silty CLAY, black, organics, soft, wet.
	5.5 – 7	Silty CLAY with sand, light gray, stiff, moist.
	7 – 10	Silty SAND, light gray, dense, wet.
		Bottom of test pit at 10 feet.
TP – 31	0 – 2	Sandy silty CLAY, black, organics, soft, spongy, moist, with roots.
	2 – 3	Sandy silty CLAY, interbedded back/orange/brown, moist, stiff, with roots.
	3 – 3.5	Silty SAND, black, dense, wet.
	3.5 – 10	Silty SAND, gray, dense, wet.
		Bottom of test pit at 10 feet.

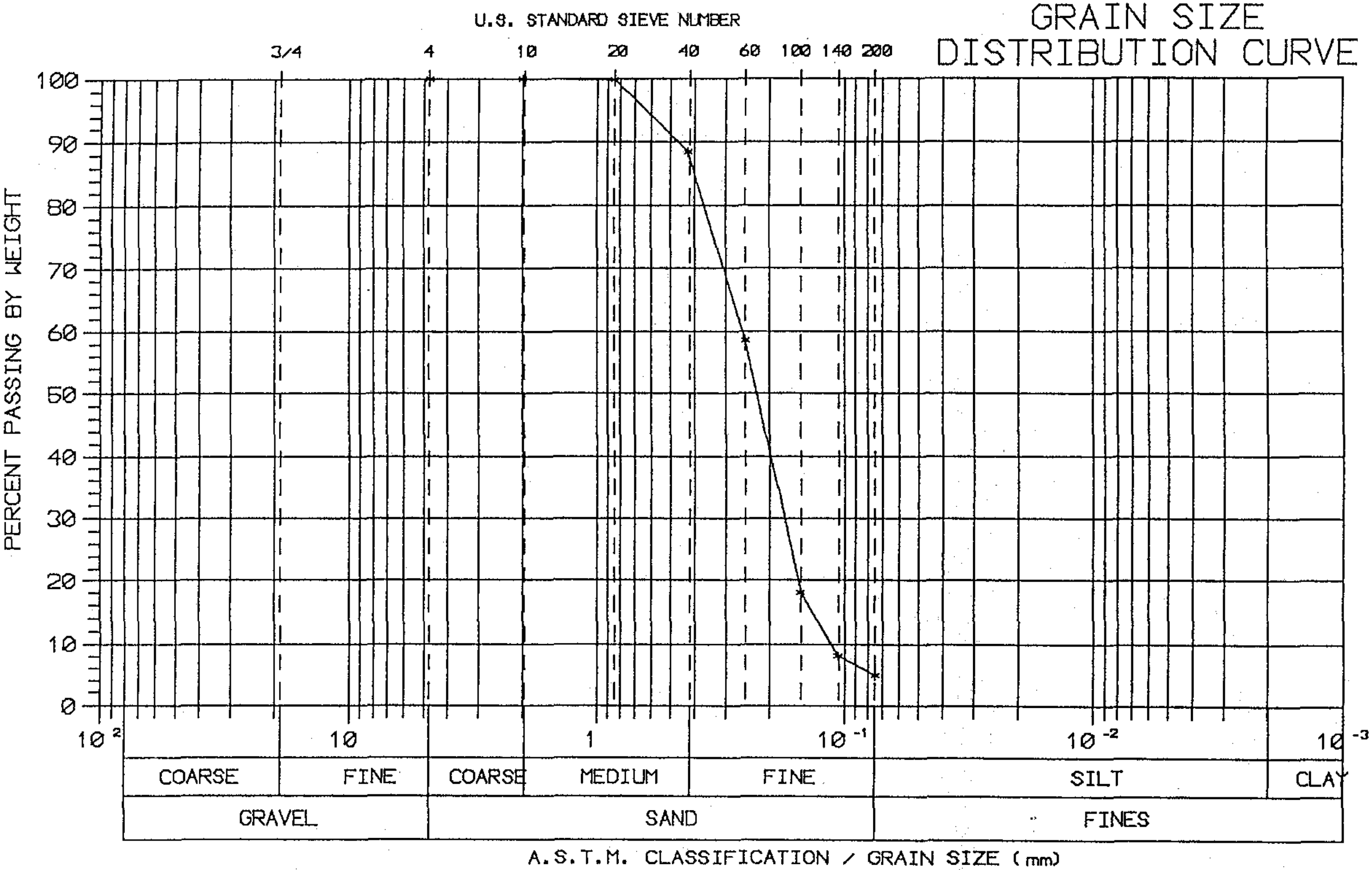
TEST PIT LOGS

Test Pit Number	Depth (Feet)	Description
TP – 32	0 – 2	Silty CLAY, black, medium stiff, moist, with roots.
	2 – 2.25	Silty CLAY, light gray, medium stiff, moist.
	2.25 – 3	Silty CLAY, black organic peat, soft, wet.
	3 – 3.25	Sandy silty CLAY, light brown, stiff, moist.
	3.25 – 4	Silty CLAY, black, highly organic peat, soft, wet.
	4 – 6	Silty CLAY, light gray, soft, wet.
	6 – 7	Sandy silty CLAY, light gray, stiff, wet.
	7 – 10	Silty SAND, gray, dense, wet.
		Bottom of test pit at 10 feet.
TP – 33	0 – 1	Silty CLAY, brown, medium stiff, moist, with roots.
	1 – 2.5	Silty CLAY, mottled brown/gray/back, stiff, moist, with roots.
	2.5 – 3	Silty CLAY, light gray, soft, wet.
	3 – 4	PEAT, black, organic, soft wet.
	4 – 5	Silty CLAY, gray, medium stiff, moist.
	5 – 6	Sandy silty CLAY, light gray, medium stiff, wet.
	6 – 9	Silty SAND, light gray, dense, wet.
	9 – 12	Silty SAND, gray, dense, wet.
		Bottom of test pit at 12 feet.

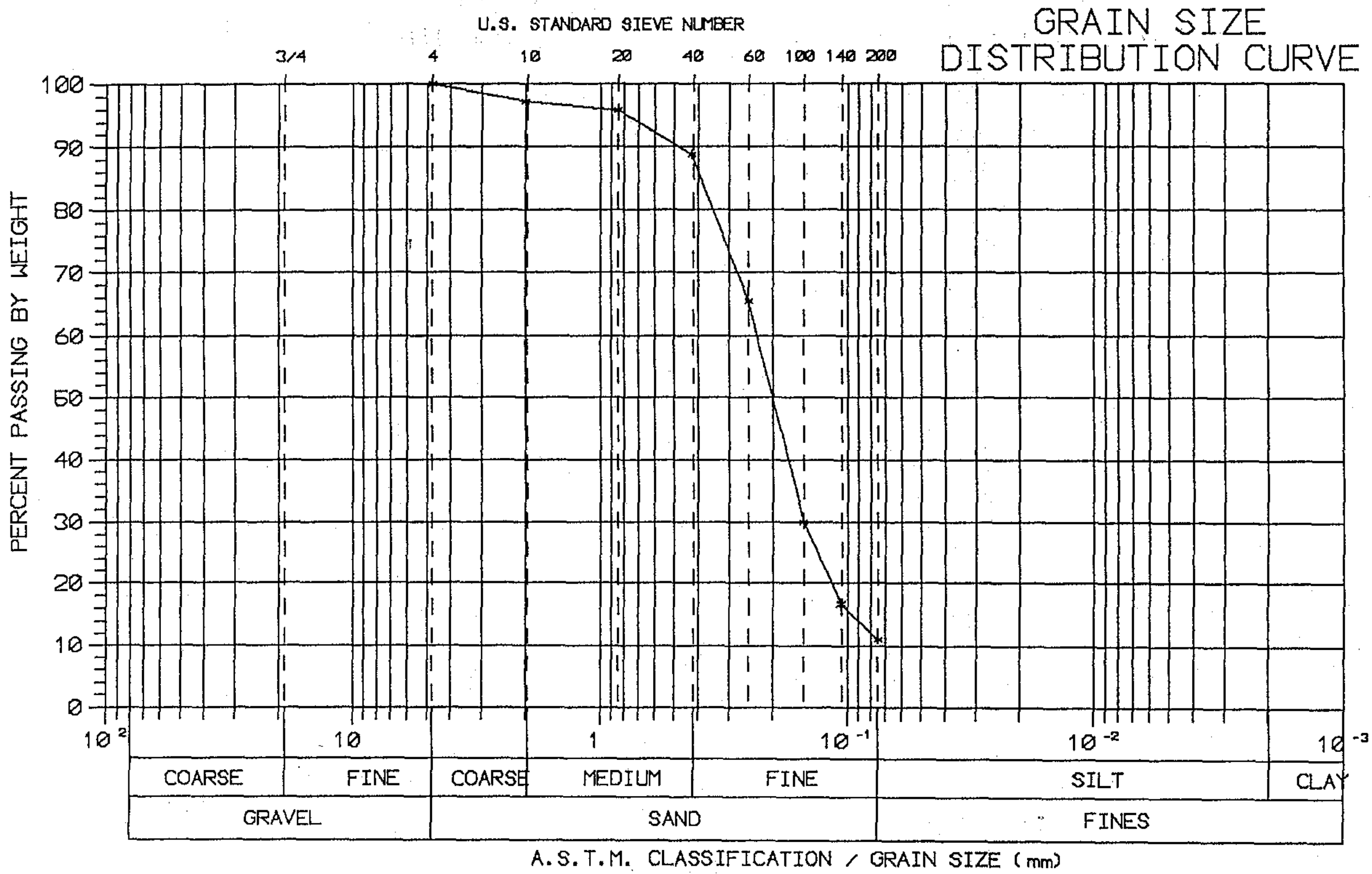
TEST PIT LOGS

Test Pit Number	Depth (Feet)	Description
TP – 34	0 – 2	Silty CLAY, brown, medium stiff, moist.
	2 – 3.5	Silty CLAY, mottled brown/gray, stiff, moist, with roots.
	3.5 – 4	Silty CLAY, gray, soft, wet.
	4 – 8	PEAT, black, organic, soft, very wet, smells.
	8 – 9	Silty CLAY, light gray, stiff, moist.
	9 – 10	Silty SAND, light gray, dense, wet.
	10 –14	Silty SAND, gray, dense, wet.
		Bottom of test pit at 14 feet.
TP – 35	0 – 2	Silty SAND, brown, dense, moist, with roots.
	2 – 5	Silty SAND, light brown, dense, moist.
	5 – 10	Silty SAND, mottled light brown/orange, very dense, hard, wet.
		Ground water at 9 feet. Bottom of test pit at 10 feet.

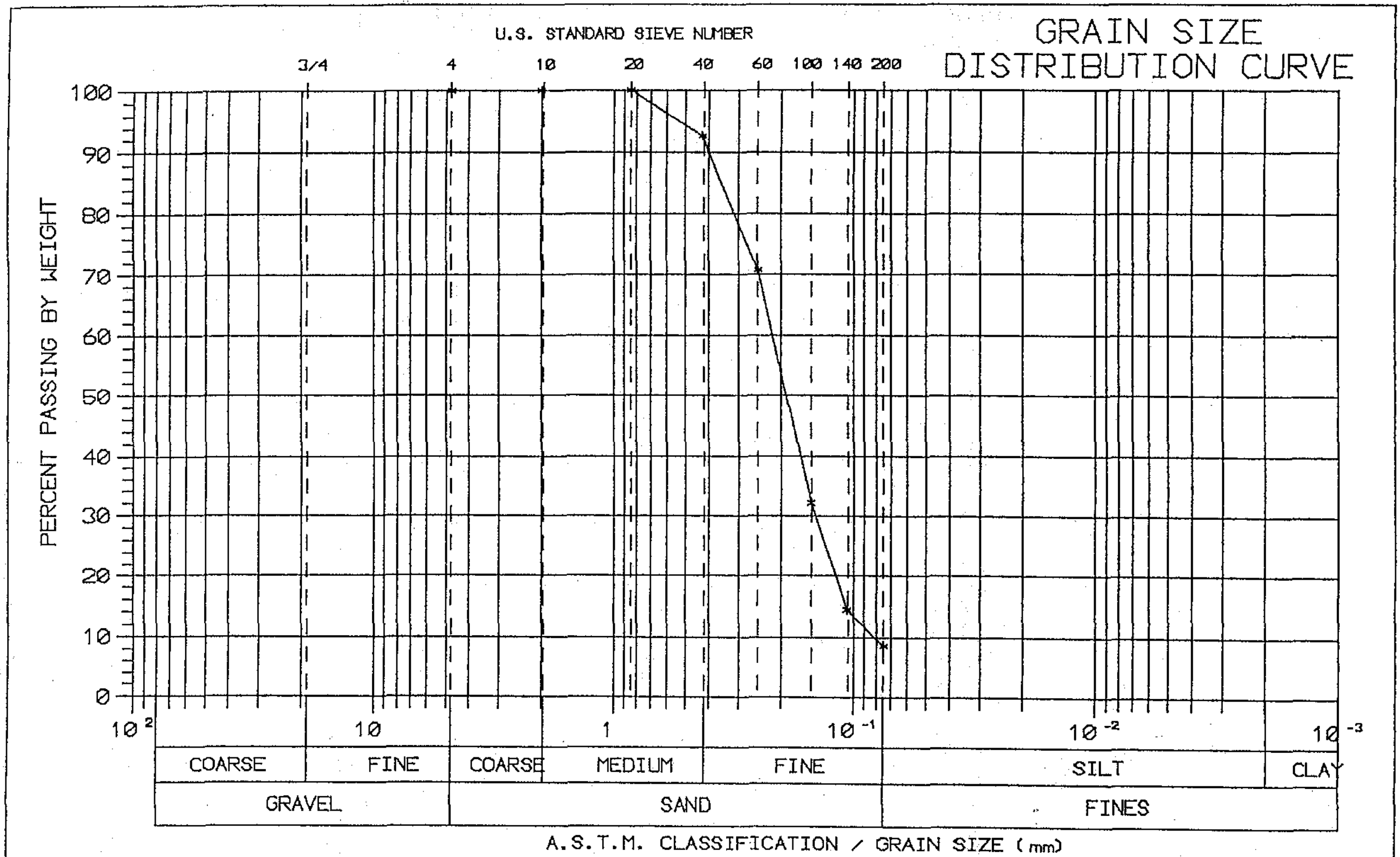
GRAIN SIZE DISTRIBUTION CURVE



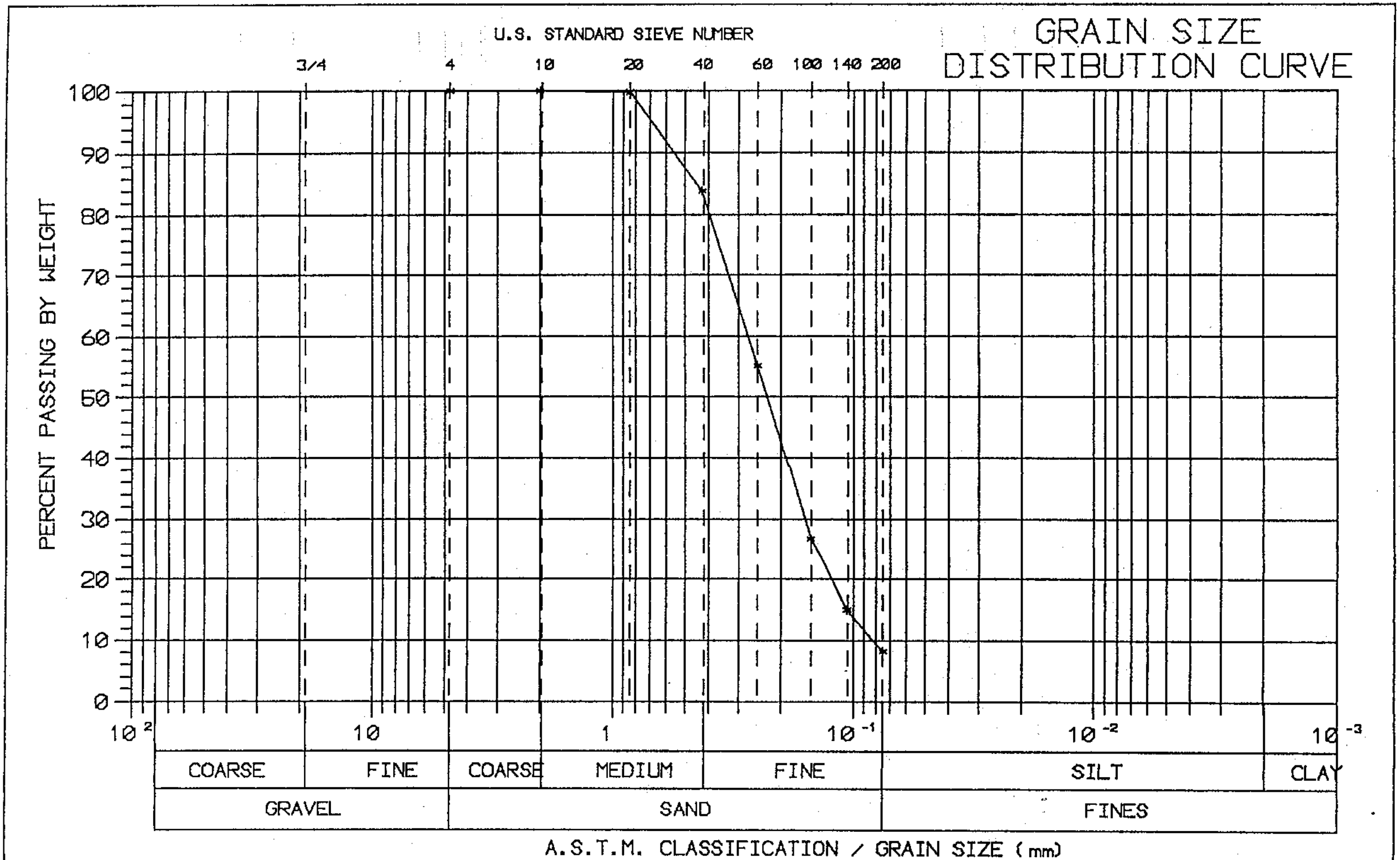
ENGEO INCORPORATED	CYPRESS Oakley, California		FIGURE NO: 27
	SAMPLE NO: 1-1-1 DATE: 04-26-1999	JOB NO: 4603.5.002.01	



ENGEO INCORPORATED	CYPRESS Oakley, California		FIGURE NO: 28
	SAMPLE NO: 2-1-2 DATE: 04-26-1999	JOB NO: 4603.5.002.01	



ENGEO INCORPORATED	CYPRESS Oakley, California		FIGURE NO: 29
	SAMPLE NO: 4-1-1 DATE: 04-26-1999	JOB NO: 4603.5.002.01	



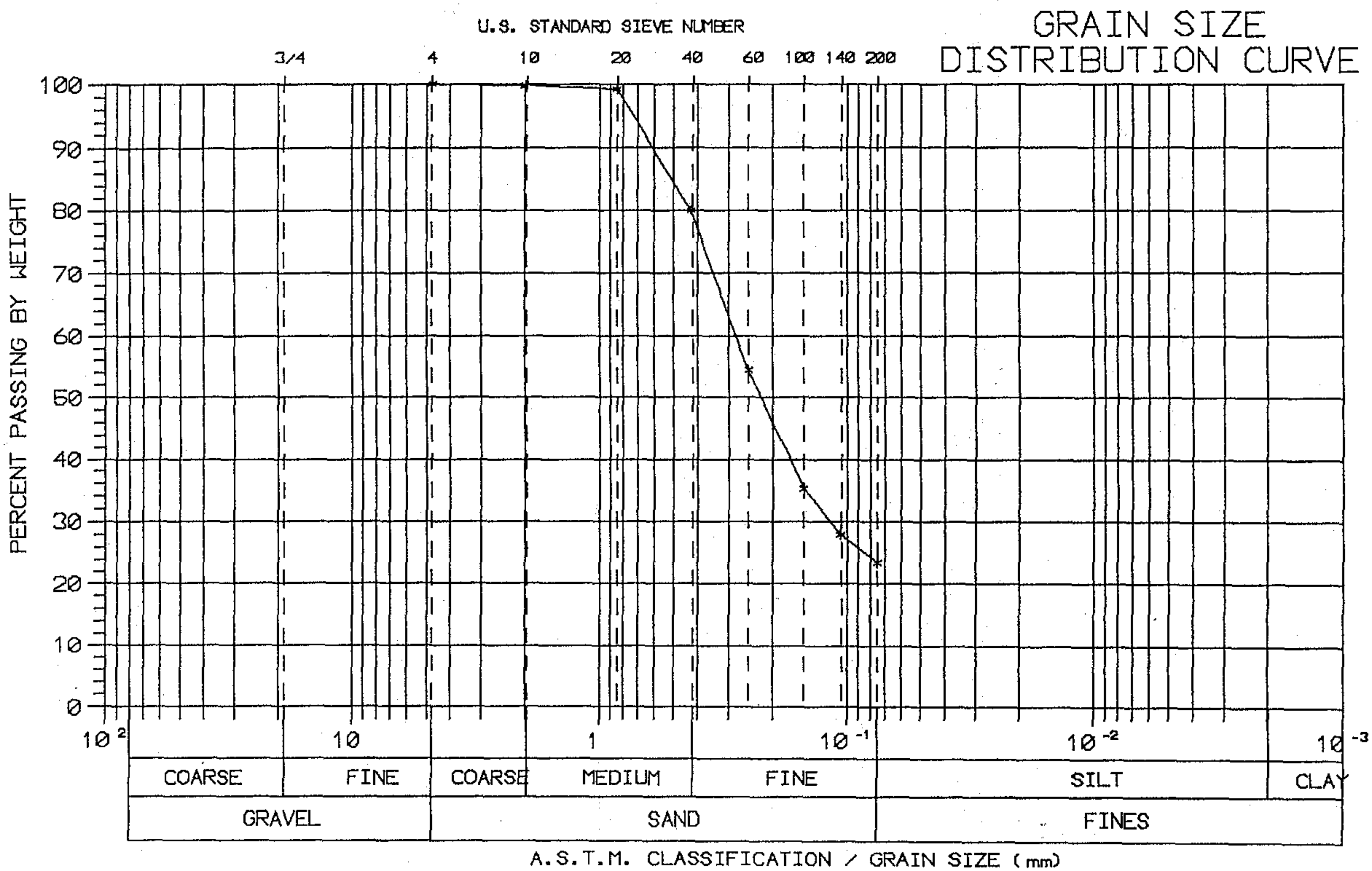
ENGEO INCORPORATED

CYPRESS
Oakley, California

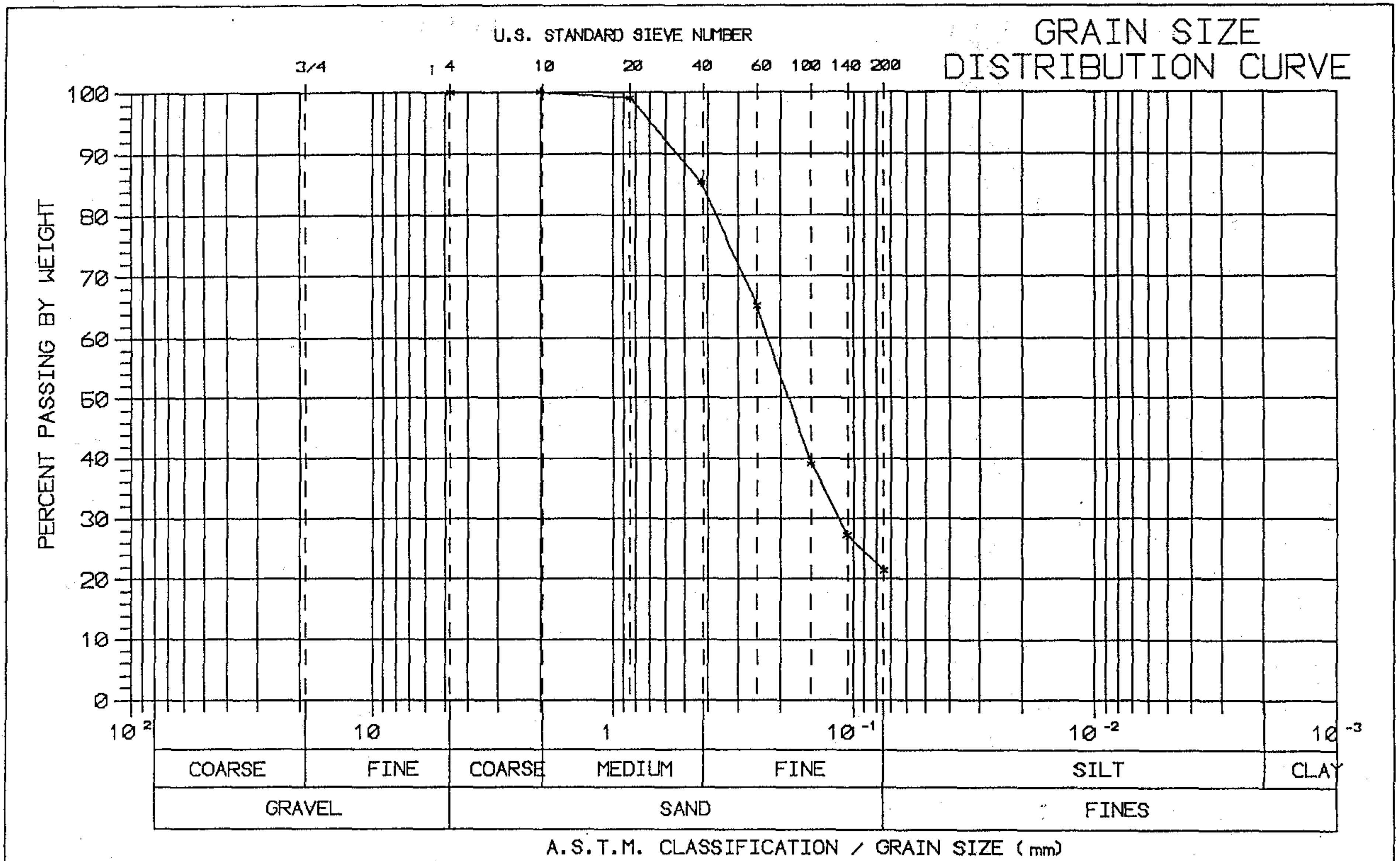
SAMPLE NO: 4-4-1
DATE: 04-26-1999

JOB NO: 4603.5.002.01

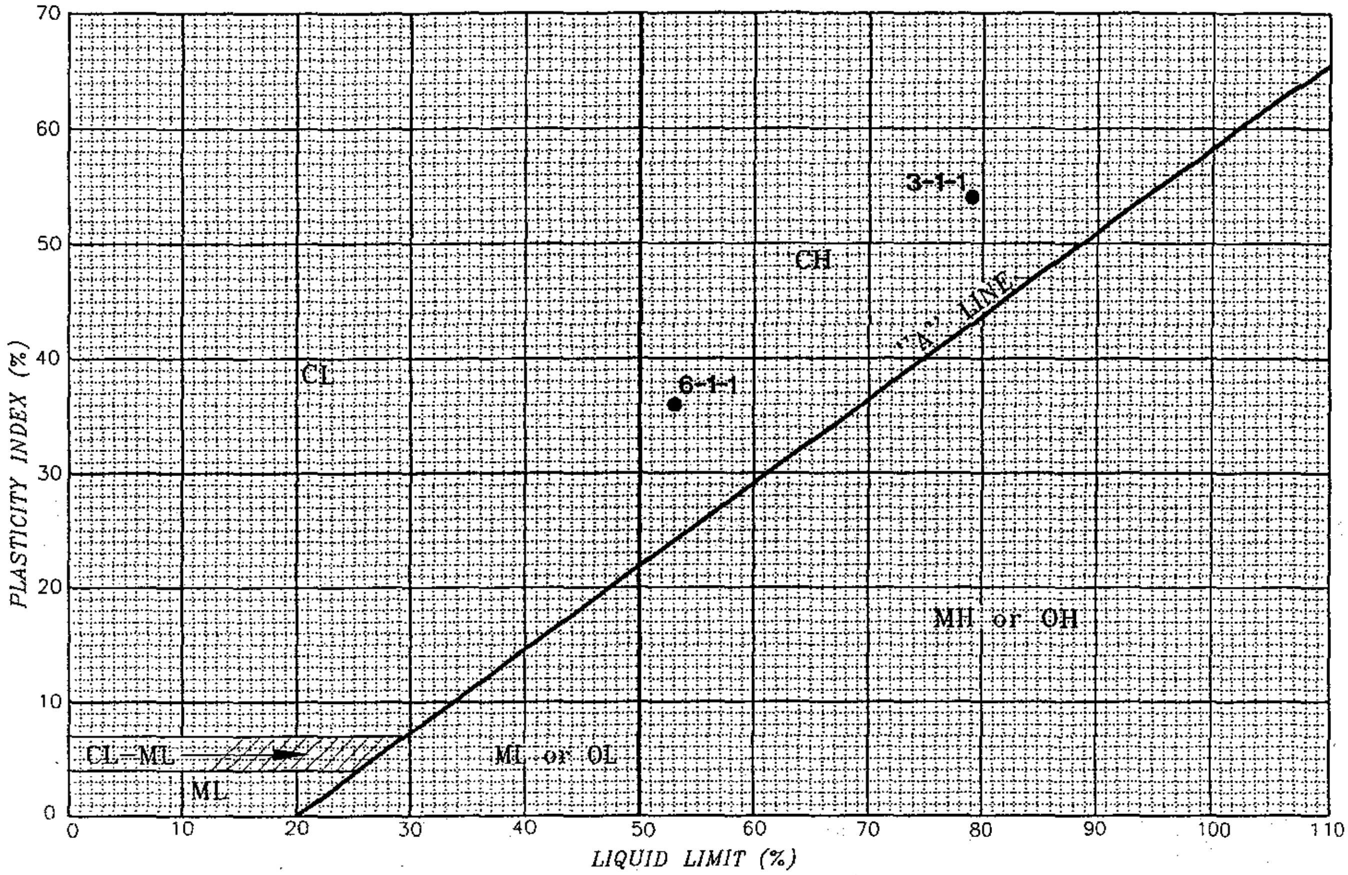
FIGURE NO: 30



ENGEO INCORPORATED	CYPRESS Oakley, California		FIGURE NO: **31**
	SAMPLE NO: 7-3-1 DATE: 04-26-1999	JOB NO: 4603.5.002.01	



ENGEO INCORPORATED	CYPRESS Oakley, California		FIGURE NO: 32
	SAMPLE NO: 8-1-2 DATE: 04-26-1999	JOB NO: 4603.5.002.01	



NO.	SAMPLE DEPTH IN FEET (METERS)	NATURAL WATER CONTENT (%)	ATTERBERG LIMITS			PERCENT PASSING NO. 200 SIEVE	UNIFIED SOIL CLASSIFI-CATION SYMBOL
			LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)		
3-1-1	4.5 (1.4)	--	79	25	54	--	CH
6-1-1	4.0 (1.2)	--	53	17	36	--	CH

ENGEO INCORPORATED

PLASTICITY CHART

A PORTION OF THE CYPRESS CORRIDORE PLANNING AREA

OAKLEY CALIFORNIA

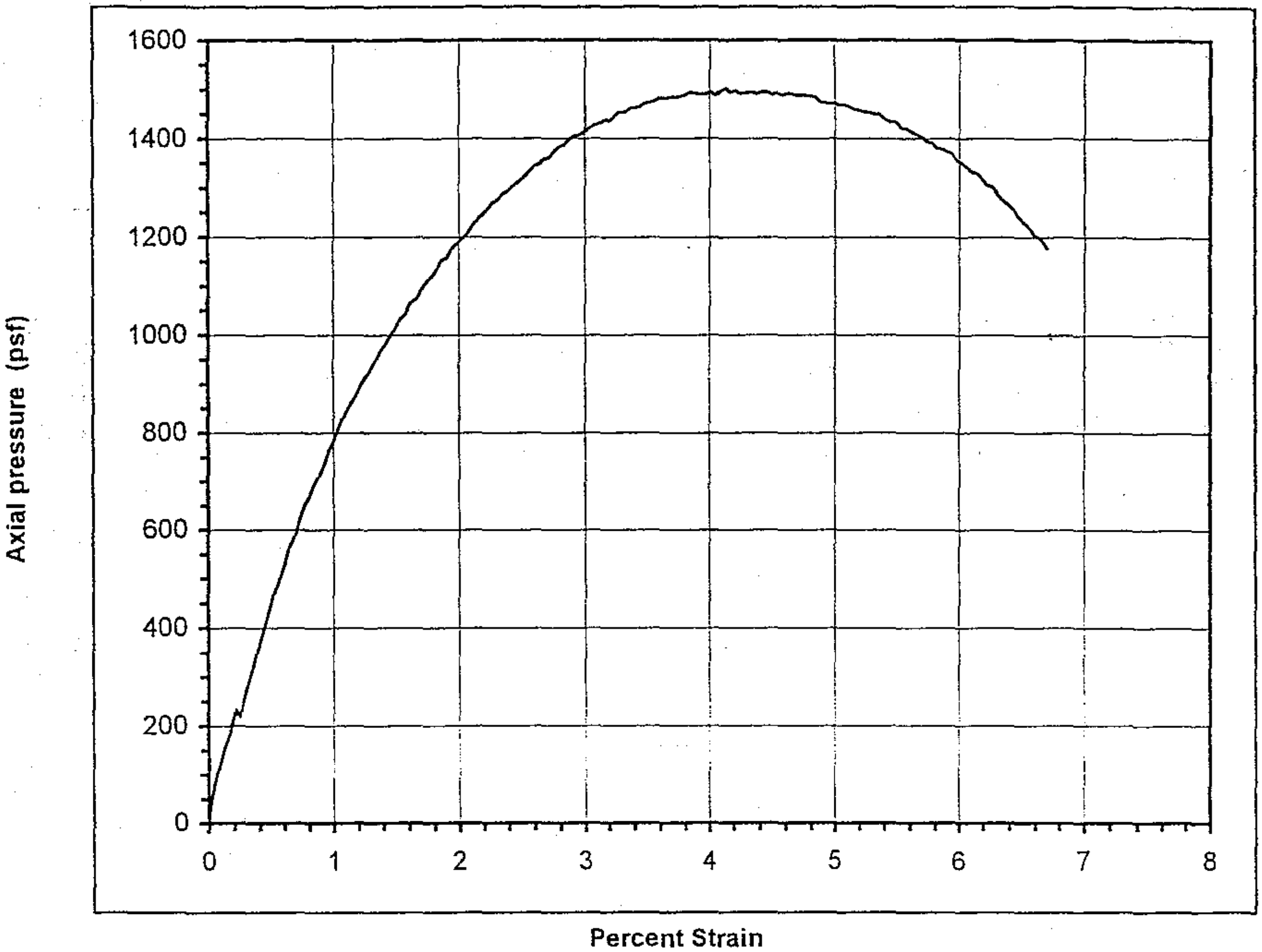
PROJECT NO.: 4603.5.002.01

DATE: MAY 1999

DRAWN BY: LB | CHECKED BY: DH

FIGURE NO. 33

Unconfined Compression Test
ASTM Test Method D2166



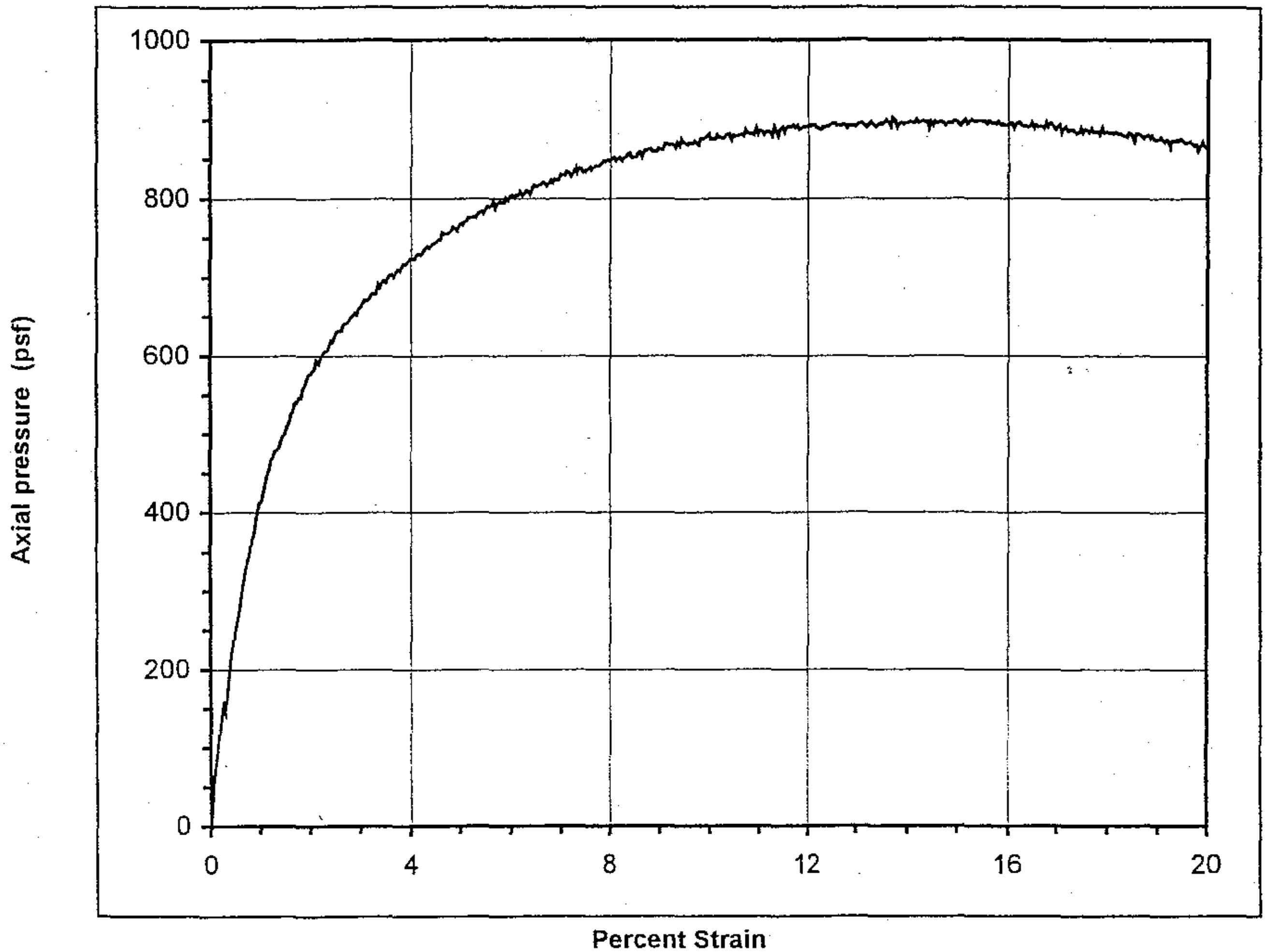
Unconfined Compressive Strength: 1490 psf 0.8 tsf

Sample Description: Very dark gray sandy silty Clay

Initial Diameter:	2.375	in.	Sample Number:	2-1	
Initial Height:	5.37	in.	Boring Number:	3	
Strain Rate:	1.216	%/min	Dry Unit Weight:	95.2	pcf
Total Strain:	6.69	%	Moisture Content:	28.2	%
			Depth of Sample:		ft.

ENGEO INCORPORATED	CYPRESS Oakley, California	Job No.: 4603500201	Figure No.
		Sample Number: 3-2-1	34
		Date: 4/30/99	

Unconfined Compression Test
ASTM Test Method D2166



Unconfined Compressive Strength: 900 psf 0.5 tsf

Sample Description: Dark brown silty Clay to Clay with fine sand

Initial Diameter:	2.375 in.		Sample Number:	1-1	
Initial Height:	4.73 in.		Boring Number:	6	
Strain Rate:	1.241 %/min		Dry Unit Weight:	89.0	pcf
Total Strain:	19.97 %		Moisture Content:	31.5	%
			Depth of Sample:		ft.

ENGEO INCORPORATED	CYPRESS Oakley, California	Job No.: 4603500201	Figure No.
		Sample Number: 6-1-1	35
		Date: 4/30/99	

TABLE I
REGIONAL ACTIVE AND POTENTIALLY ACTIVE FAULTS

FAULT NAME	Approx. Distance mi (km)	Max. Credible Event			Max. Probable Event		
		Max. Cred. Mag.	Peak Site Acc. g	Site Intens MM	Max. Prob. Mag.	Peak Site Acc. g	Site Intens MM
CALAVERAS	22 (36)	7.30	0.152	VIII	7.00	0.128	VIII
CONCORD	19 (30)	6.50	0.116	VII	5.70	0.070	VI
CORDELIA	29 (47)	6.75	0.088	VII	3.50	0.011	III
GREEN VALLEY	24 (39)	6.80	0.110	VII	6.20	0.077	VII
GREENVILLE	15 (25)	6.50	0.140	VIII	6.00	0.100	VII
HAYWARD	32 (52)	7.30	0.111	VII	7.00	0.090	VII
HEALDSBURG - ROGERS CREEK	44 (71)	6.80	0.058	VI	6.40	0.043	VI
LAS POSITAS	23 (36)	6.50	0.097	VII	4.50	0.023	IV
PALO COLORADO-SAN GREGORIO	55 (88)	7.60	0.079	VII	7.00	0.050	VI
SAN ANDREAS (Northern)	50 (81)	8.50	0.145	VIII	8.00	0.108	VII
WEST NAPA	36 (57)	6.50	0.059	VI	3.00	0.008	III
ZAMORA	50 (81)	6.50	0.038	V	5.25	0.013	III

12 FAULTS FOUND WITHIN THE SPECIFIED 60-MILE SEARCH RADIUS.

THE ANTIOCH FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 7.1 MILES AWAY.

LARGEST MAXIMUM-CREDIBLE SITE ACCELERATION: 0.227 g

LARGEST MAXIMUM-PROBABLE SITE ACCELERATION: 0.155 g

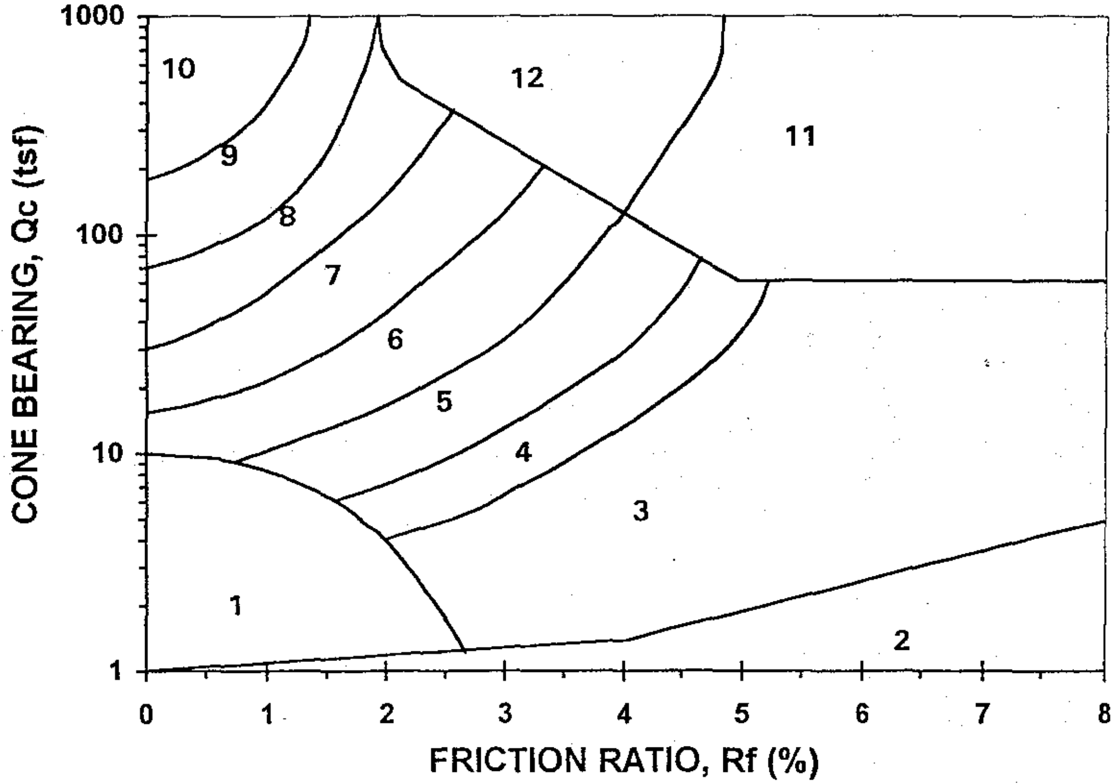
ATTENUATION RELATION: IDRISS (1987) - MEAN

SOIL CONDITIONS: DEEP SOIL

APPENDIX

JOHN SARMIENTO ASSOCIATES
Cone Penetrometer Soundings

SIMPLIFIED SOIL BEHAVIOR TYPE CLASSIFICATION FOR STANDARD ELECTRONIC CONE PENETROMETER



ZONE	Qc/N[1]	Su Factor (Nk)[2]	SOIL BEHAVIOR TYPE[1]
1	2	15 (10 for Qc <= 9 tsf)	Sensitive Fine Grained
2	1	15 (10 for Qc <= 9 tsf)	Organic Material
3	1	15 (10 for Qc <= 9 tsf)	CLAY
4	1.5	15	Silty CLAY to CLAY
5	2	15	Clayey SILT to Silty CLAY
6	2.5	15	Sandy SILT to Clayey SILT
7	3	---	Silty SAND to Sandy SILT
8	4	---	SAND to Silty SAND
9	5	---	SAND
10	6	---	Gravelly SAND to SAND
11	1	15	Very Stiff Fine Grained (*)
12	2	---	SAND to Clayey SAND (*)

(*) Overconsolidated or Cemented

Qc = Tip Bearing
Fs = Sleeve Friction
Rf = Fs/Qc*100 = Friction Ratio

References: [1]Robertson, 1986, Olsen, 1988
[2]Bonaparte & Mitchell, 1979 (young bay mud Qc <= 9)
[2]Estimated from local experience (fine grained soils Qc > 9)

Note: Testing performed in accordance with ASTM D3441

John Sarmiento & Associates
Cone Penetrometer Testing Services

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01(EGO-14)

CPT NO.: CPT-1
DATE : 03-11-1999
Groundwater estimated at 3.0 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	8.41	0.371	4.4	8	13	0.06	----	1.68	CLAY	110-120
1.00	8.19	0.352	4.3	8	13	0.12	----	1.63	''	''
1.50	9.47	0.483	5.1	9	15	0.17	----	1.25	''	''
2.00	8.91	0.439	4.9	9	14	0.23	----	1.76	''	''
2.50	7.18	0.334	4.6	7	11	0.29	----	1.41	''	''
3.00	7.00	0.289	4.1	7	11	0.34	----	1.37	''	100-110
3.50	7.66	0.312	4.1	8	12	0.39	----	1.49	''	110-120
4.00	10.25	0.412	4.0	10	16	0.45	----	1.34	''	''
4.50	9.72	0.374	3.8	10	16	0.51	----	1.26	''	''
5.00	22.89	0.211	0.9	9	15	0.56	----	3.01	Sandy SILT to Clayey SILT	100-110
5.50	23.14	0.230	1.0	9	15	0.62	----	3.04	''	''
6.00	18.63	0.314	1.7	7	12	0.68	----	2.44	''	110-120
6.50	25.77	0.414	1.6	10	16	0.74	----	3.39	''	120-130
7.00	32.79	0.267	0.8	11	17	0.80	42	----	Silty SAND to Sandy SILT	110-120
7.50	38.49	0.381	1.0	13	21	0.85	43	----	''	''
8.00	45.16	0.663	1.5	15	24	0.92	43	----	''	120-130
8.50	46.87	0.360	0.8	16	25	0.98	43	----	''	110-120
9.00	56.11	0.157	0.3	19	30	1.04	44	----	''	120-130
9.50	71.84	0.273	0.4	18	29	1.11	45	----	SAND to Silty SAND	''
10.00	77.17	0.594	0.8	19	31	1.17	45	----	''	''
10.50	81.75	0.313	0.4	20	33	1.23	45	----	''	''
11.00	82.49	0.252	0.3	21	33	1.29	45	----	''	''
11.50	80.72	0.208	0.3	20	32	1.36	45	----	''	''
12.00	76.12	0.256	0.3	19	30	1.42	44	----	''	''
12.50	79.81	0.145	0.2	20	31	1.48	44	----	''	''
13.00	75.76	0.197	0.3	19	28	1.54	44	----	''	''
13.50	75.82	0.189	0.2	19	28	1.61	44	----	''	''
14.00	72.83	0.183	0.3	18	26	1.67	43	----	''	''
14.50	81.27	0.254	0.3	20	29	1.73	44	----	''	''
15.00	87.51	0.303	0.3	22	30	1.79	44	----	''	''
15.50	85.55	0.302	0.4	21	29	1.86	44	----	''	''
16.00	75.15	0.268	0.4	19	25	1.92	43	----	''	''
16.50	88.36	0.324	0.4	22	30	1.98	44	----	''	''
17.00	94.65	0.305	0.3	24	31	2.04	44	----	''	''
17.50	91.18	0.267	0.3	23	30	2.11	44	----	''	''
18.00	46.51	0.435	0.9	16	20	2.17	40	----	Silty SAND to Sandy SILT	110-120
18.50	58.13	1.089	1.9	19	25	2.23	41	----	''	130-140
19.00	82.62	0.351	0.4	21	26	2.29	43	----	SAND to Silty SAND	120-130
19.50	66.44	0.151	0.2	17	21	2.36	41	----	''	''
20.00	61.69	0.551	0.9	15	19	2.42	41	----	''	''
20.50	38.06	0.631	1.7	13	15	2.48	38	----	Silty SAND to Sandy SILT	''
21.00	44.42	0.535	1.2	15	18	2.54	39	----	''	''
21.50	22.76	0.817	3.6	11	13	2.61	----	2.86	Clayey SILT to Silty CLAY	130-140
22.00	84.08	1.004	1.2	21	24	2.67	42	----	SAND to Silty SAND	120-130
22.50	151.05	0.351	0.2	30	35	2.74	45	----	SAND	''
23.00	159.53	0.521	0.3	32	36	2.80	45	----	''	''
23.50	162.02	0.511	0.3	32	37	2.86	45	----	''	''
24.00	69.21	1.051	1.5	23	26	2.93	41	----	Silty SAND to Sandy SILT	130-140
24.50	39.52	0.698	1.8	16	17	2.99	----	5.07	Sandy SILT to Clayey SILT	120-130
25.00	41.54	0.950	2.3	17	18	3.06	----	5.34	''	130-140
25.50	40.77	0.592	1.5	14	15	3.12	37	----	Silty SAND to Sandy SILT	120-130
26.00	114.56	1.200	1.0	29	31	3.18	43	----	SAND to Silty SAND	''
26.50	174.62	0.676	0.4	35	37	3.25	44	----	SAND	''
27.00	152.14	0.555	0.4	30	32	3.31	44	----	''	''
27.50	214.58	0.695	0.3	43	45	3.37	45	----	''	''
28.00	212.52	0.797	0.4	43	44	3.43	45	----	''	''
28.50	203.16	0.783	0.4	41	42	3.50	45	----	''	''
29.00	194.27	0.818	0.4	39	40	3.56	45	----	''	''
29.50	177.54	1.032	0.6	36	36	3.62	44	----	''	''
30.00	236.86	1.047	0.4	47	48	3.68	45	----	''	''
30.50	261.98	1.241	0.5	52	52	3.75	46	----	''	''
31.00	246.24	1.474	0.6	49	49	3.81	45	----	''	''
31.50	237.47	0.970	0.4	47	47	3.87	45	----	''	''
32.00	231.00	1.044	0.5	46	46	3.93	45	----	''	''
32.50	236.84	1.355	0.6	47	47	4.00	45	----	''	''

John Sarmiento & Associates
Cone Penetration Testing Service

PROJECT: CYPRESS CORRIDOR PLANNING AREA CPT NO.: CPT-1
LOCATION: CONTRA COSTA COUNTY DATE : 03-11-1999
PROJ. NO.: 4603.002.01(EGO-14) Groundwater estimated at 3.0 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	8.41	0.371	4.4	8	13	0.06	----	1.68	CLAY	110-120
1.00	8.19	0.352	4.3	8	13	0.12	----	1.63	''	''
1.50	9.47	0.483	5.1	9	15	0.17	----	1.25	''	''
2.00	8.91	0.439	4.9	9	14	0.23	----	1.76	''	''
2.50	7.18	0.334	4.6	7	11	0.29	----	1.41	''	''
3.00	7.00	0.289	4.1	7	11	0.34	----	1.37	''	100-110
3.50	7.66	0.312	4.1	8	12	0.39	----	1.49	''	110-120
4.00	10.25	0.412	4.0	10	16	0.45	----	1.34	''	''
4.50	9.72	0.374	3.8	10	16	0.51	----	1.26	''	''
5.00	22.89	0.211	0.9	9	15	0.56	----	3.01	Sandy SILT to Clayey SILT	100-110
5.50	23.14	0.230	1.0	9	15	0.62	----	3.04	''	''
6.00	18.63	0.314	1.7	7	12	0.68	----	2.44	''	110-120
6.50	25.77	0.414	1.6	10	16	0.74	----	3.39	''	120-130
7.00	32.79	0.267	0.8	11	17	0.80	42	----	Silty SAND to Sandy SILT	110-120
7.50	38.49	0.381	1.0	13	21	0.85	43	----	''	''
8.00	45.16	0.663	1.5	15	24	0.92	43	----	''	120-130
8.50	46.87	0.360	0.8	16	25	0.98	43	----	''	110-120
9.00	56.11	0.157	0.3	19	30	1.04	44	----	''	120-130
9.50	71.84	0.273	0.4	18	29	1.11	45	----	SAND to Silty SAND	''
10.00	77.17	0.594	0.8	19	31	1.17	45	----	''	''
10.50	81.75	0.313	0.4	20	33	1.23	45	----	''	''
11.00	82.49	0.252	0.3	21	33	1.29	45	----	''	''
11.50	80.72	0.208	0.3	20	32	1.36	45	----	''	''
12.00	76.12	0.256	0.3	19	30	1.42	44	----	''	''
12.50	79.81	0.145	0.2	20	31	1.48	44	----	''	''
13.00	75.76	0.197	0.3	19	28	1.54	44	----	''	''
13.50	75.82	0.189	0.2	19	28	1.61	44	----	''	''
14.00	72.83	0.183	0.3	18	26	1.67	43	----	''	''
14.50	81.27	0.254	0.3	20	29	1.73	44	----	''	''
15.00	87.51	0.303	0.3	22	30	1.79	44	----	''	''
15.50	85.55	0.302	0.4	21	29	1.86	44	----	''	''
16.00	75.15	0.268	0.4	19	25	1.92	43	----	''	''
16.50	88.36	0.324	0.4	22	30	1.98	44	----	''	''
17.00	94.65	0.305	0.3	24	31	2.04	44	----	''	''
17.50	91.18	0.267	0.3	23	30	2.11	44	----	''	''
18.00	46.51	0.435	0.9	16	20	2.17	40	----	Silty SAND to Sandy SILT	110-120
18.50	58.13	1.089	1.9	19	25	2.23	41	----	''	130-140
19.00	82.62	0.351	0.4	21	26	2.29	43	----	SAND to Silty SAND	120-130
19.50	66.44	0.151	0.2	17	21	2.36	41	----	''	''
20.00	61.69	0.551	0.9	15	19	2.42	41	----	''	''
20.50	38.06	0.631	1.7	13	15	2.48	38	----	Silty SAND to Sandy SILT	''
21.00	44.42	0.535	1.2	15	18	2.54	39	----	''	''
21.50	22.76	0.817	3.6	11	13	2.61	----	2.86	Clayey SILT to Silty CLAY	130-140
22.00	84.08	1.004	1.2	21	24	2.67	42	----	SAND to Silty SAND	120-130
22.50	151.05	0.351	0.2	30	35	2.74	45	----	SAND	''
23.00	159.53	0.521	0.3	32	36	2.80	45	----	''	''
23.50	162.02	0.511	0.3	32	37	2.86	45	----	''	''
24.00	69.21	1.051	1.5	23	26	2.93	41	----	Silty SAND to Sandy SILT	130-140
24.50	39.52	0.698	1.8	16	17	2.99	----	5.07	Sandy SILT to Clayey SILT	120-130
25.00	41.54	0.950	2.3	17	18	3.06	----	5.34	''	130-140
25.50	40.77	0.592	1.5	14	15	3.12	37	----	Silty SAND to Sandy SILT	120-130
26.00	114.56	1.200	1.0	29	31	3.18	43	----	SAND to Silty SAND	''
26.50	174.62	0.676	0.4	35	37	3.25	44	----	SAND	''
27.00	152.14	0.555	0.4	30	32	3.31	44	----	''	''
27.50	214.58	0.695	0.3	43	45	3.37	45	----	''	''
28.00	212.52	0.797	0.4	43	44	3.43	45	----	''	''
28.50	203.16	0.783	0.4	41	42	3.50	45	----	''	''
29.00	194.27	0.818	0.4	39	40	3.56	45	----	''	''
29.50	177.54	1.032	0.6	36	36	3.62	44	----	''	''
30.00	236.86	1.047	0.4	47	48	3.68	45	----	''	''
30.50	261.98	1.241	0.5	52	52	3.75	46	----	''	''
31.00	246.24	1.474	0.6	49	49	3.81	45	----	''	''
31.50	237.47	0.970	0.4	47	47	3.87	45	----	''	''
32.00	231.00	1.044	0.5	46	46	3.93	45	----	''	''
32.50	236.84	1.355	0.6	47	47	4.00	45	----	''	''

John Sarmiento & Associates
Cone Penetration Testing Service

PROJECT: CYPRESS CORRIDOR PLANNING AREA   CPT NO.: CPT-2
LOCATION: CONTRA COSTA COUNTY   DATE : 03-11-1999
PROJ. NO.: 4603.002.01(EGO-14)   Groundwater estimated at 3.0 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	6.84	0.472	6.9	7	11	0.06	----	1.36	CLAY	110-120
1.00	5.30	0.448	8.4	5	8	0.12	----	1.05	Organic Material	''
1.50	5.41	0.358	6.6	5	9	0.17	----	1.07	CLAY	100-110
2.00	5.49	0.340	6.2	5	9	0.22	----	1.08	''	''
2.50	4.80	0.292	6.1	5	8	0.27	----	0.93	''	''
3.00	3.80	0.298	7.8	4	6	0.33	----	0.73	Organic Material	''
3.50	2.81	0.172	6.1	3	4	0.37	----	0.52	CLAY	90-100
4.00	2.04	0.120	5.9	2	3	0.42	----	0.37	Organic Material	85-90
4.50	1.75	0.108	6.2	2	3	0.47	----	0.30	''	''
5.00	1.63	0.122	7.5	2	3	0.51	----	0.28	''	''
5.50	2.13	0.093	4.4	2	3	0.55	----	0.37	CLAY	''
6.00	3.76	0.081	2.2	4	6	0.60	----	0.69	''	90-100
6.50	10.14	0.341	3.4	7	11	0.65	----	1.31	Silty CLAY to CLAY	110-120
7.00	40.17	0.911	2.3	16	26	0.72	----	5.31	Sandy SILT to Clayey SILT	130-140
7.50	28.80	0.676	2.3	12	18	0.78	----	3.79	''	120-130
8.00	20.67	0.345	1.7	8	13	0.85	----	2.70	''	''
8.50	24.09	0.398	1.7	10	15	0.91	----	3.15	''	''
9.00	34.74	0.195	0.6	12	19	0.97	42	----	Silty SAND to Sandy SILT	110-120
9.50	34.24	0.102	0.3	11	18	1.02	42	----	''	''
10.00	33.14	0.141	0.4	11	18	1.08	41	----	''	''
10.50	30.88	0.195	0.6	10	16	1.14	41	----	''	''
11.00	33.33	0.159	0.5	11	18	1.20	41	----	''	''
11.50	35.16	0.088	0.3	12	19	1.25	41	----	''	''
12.00	36.81	0.079	0.2	12	20	1.31	41	----	''	''
12.50	39.68	0.126	0.3	13	21	1.37	41	----	''	''
13.00	47.83	0.124	0.3	16	26	1.43	42	----	''	''
13.50	69.83	0.244	0.3	17	28	1.49	44	----	SAND to Silty SAND	120-130
14.00	83.33	0.272	0.3	21	32	1.55	44	----	''	''
14.50	95.88	0.312	0.3	24	37	1.61	45	----	''	''
15.00	104.75	0.364	0.3	26	39	1.68	45	----	''	''
15.50	113.43	0.400	0.4	28	41	1.74	45	----	''	''
16.00	121.87	0.332	0.3	30	44	1.80	46	----	''	''
16.50	122.66	0.378	0.3	31	43	1.86	45	----	''	''
17.00	115.32	0.298	0.3	29	40	1.93	45	----	''	''
17.50	92.16	0.216	0.2	23	32	1.99	44	----	''	''
18.00	87.55	0.259	0.3	22	30	2.05	44	----	''	''
18.50	98.51	0.331	0.3	25	33	2.11	44	----	''	''
19.00	61.22	0.430	0.7	15	20	2.18	42	----	''	''
19.50	49.47	0.630	1.3	16	21	2.24	40	----	Silty SAND to Sandy SILT	''
20.00	95.22	0.541	0.6	24	31	2.30	44	----	SAND to Silty SAND	''
20.50	118.09	0.455	0.4	30	37	2.36	44	----	''	''
21.00	139.91	0.246	0.2	28	35	2.43	45	----	SAND	''
21.50	84.32	0.369	0.4	21	26	2.49	43	----	SAND to Silty SAND	''
22.00	35.22	0.427	1.2	12	14	2.55	38	----	Silty SAND to Sandy SILT	''
22.50	23.05	0.503	2.2	9	11	2.61	----	2.90	Sandy SILT to Clayey SILT	''
23.00	22.19	0.467	2.1	9	11	2.68	----	2.78	''	''
23.50	26.97	0.871	3.2	13	16	2.74	----	3.41	Clayey SILT to Silty CLAY	130-140
24.00	25.19	0.752	3.0	13	15	2.81	----	3.17	''	''
24.50	24.94	0.592	2.4	10	11	2.87	----	3.13	Sandy SILT to Clayey SILT	120-130
25.00	23.47	0.637	2.7	12	13	2.93	----	2.93	Clayey SILT to Silty CLAY	''
25.50	28.55	0.934	3.3	14	16	3.00	----	3.61	''	130-140
26.00	107.67	0.518	0.5	27	30	3.06	43	----	SAND to Silty SAND	120-130
26.50	77.13	0.525	0.7	19	21	3.12	41	----	''	''
27.00	42.50	0.652	1.5	14	15	3.19	37	----	Silty SAND to Sandy SILT	''
27.50	103.04	1.188	1.2	26	28	3.25	42	----	SAND to Silty SAND	''
28.00	163.57	2.099	1.3	33	35	3.32	44	----	SAND	130-140
28.50	217.63	2.000	0.9	44	46	3.38	46	----	''	120-130
29.00	215.92	1.723	0.8	43	45	3.44	45	----	''	''
29.50	208.15	1.200	0.6	42	43	3.50	45	----	''	''
30.00	228.68	1.032	0.5	46	47	3.57	46	----	''	''
30.50	241.74	1.009	0.4	48	50	3.63	46	----	''	''
31.00	239.52	1.088	0.5	48	49	3.69	46	----	''	''
31.50	243.32	1.351	0.6	49	49	3.75	46	----	''	''
32.00	210.07	1.977	0.9	42	42	3.82	45	----	''	''
32.50	211.15	1.744	0.8	42	42	3.88	45	----	''	''

John Sarmiento & Associates
Cone Penetration Testing Service

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01(EGO-14)

CPT NO.: CPT-3
DATE : 03-11-1999
Groundwater measured at 3.3 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	83.75	0.425	0.5	21	33	0.06	>48	----	SAND to Silty SAND	''
1.00	18.84	0.445	2.4	9	15	0.12	----	2.50	Clayey SILT to Silty CLAY	''
1.50	8.31	0.534	6.4	8	13	0.18	----	1.64	CLAY	110-120
2.00	6.66	0.453	6.8	7	11	0.24	----	1.31	''	''
2.50	4.82	0.309	6.4	5	8	0.29	----	0.93	''	100-110
3.00	3.50	0.228	6.5	3	6	0.34	----	0.67	''	90-100
3.50	2.33	0.147	6.3	2	4	0.39	----	0.43	Organic Material	''
4.00	2.23	0.147	6.6	2	4	0.44	----	0.40	''	''
4.50	2.45	0.125	5.1	2	4	0.48	----	0.44	CLAY	''
5.00	2.03	0.132	6.5	2	3	0.53	----	0.35	Organic Material	''
5.50	1.93	0.101	5.2	2	3	0.58	----	0.33	''	85-90
6.00	5.82	0.414	7.1	6	9	0.63	----	1.10	CLAY	110-120
6.50	7.24	0.479	6.6	7	12	0.69	----	1.38	''	''
7.00	6.82	0.513	7.5	7	11	0.74	----	1.29	''	''
7.50	6.90	0.444	6.4	7	11	0.80	----	1.30	''	''
8.00	8.28	0.502	6.1	8	13	0.86	----	1.57	''	''
8.50	10.65	0.478	4.5	11	17	0.92	----	1.36	''	120-130
9.00	11.61	0.511	4.4	12	19	0.98	----	1.48	''	''
9.50	21.75	0.516	2.4	11	17	1.04	----	2.83	Clayey SILT to Silty CLAY	''
10.00	25.48	0.635	2.5	10	16	1.11	----	3.32	Sandy SILT to Clayey SILT	''
10.50	20.16	0.577	2.9	10	16	1.17	----	2.61	Clayey SILT to Silty CLAY	''
11.00	15.02	0.520	3.5	10	16	1.23	----	1.92	Silty CLAY to CLAY	''
11.50	12.83	0.639	5.0	13	21	1.29	----	1.62	CLAY	''
12.00	10.49	0.582	5.5	10	17	1.36	----	1.31	''	''
12.50	10.57	0.423	4.0	11	17	1.41	----	1.32	''	110-120
13.00	11.91	0.371	3.1	8	12	1.47	----	1.49	Silty CLAY to CLAY	''
13.50	27.86	0.497	1.8	11	17	1.53	----	3.61	Sandy SILT to Clayey SILT	120-130
14.00	41.68	0.791	1.9	17	25	1.60	----	5.45	''	130-140
14.50	50.67	0.313	0.6	17	25	1.66	42	----	Silty SAND to Sandy SILT	120-130
15.00	44.06	0.555	1.3	15	21	1.72	41	----	''	''
15.50	109.23	0.241	0.2	27	38	1.78	45	----	SAND to Silty SAND	''
16.00	69.49	0.262	0.4	17	24	1.84	43	----	''	''
16.50	79.21	0.241	0.3	20	27	1.91	43	----	''	''
17.00	63.56	0.312	0.5	16	21	1.97	42	----	''	''
17.50	104.95	0.301	0.3	26	35	2.03	44	----	''	''
18.00	49.92	0.448	0.9	17	22	2.09	41	----	Silty SAND to Sandy SILT	''
18.50	56.46	0.225	0.4	19	25	2.15	41	----	''	''
19.00	70.78	0.216	0.3	18	23	2.22	42	----	SAND to Silty SAND	''
19.50	89.39	0.306	0.3	22	28	2.28	43	----	''	''
20.00	110.71	0.369	0.3	28	35	2.34	44	----	''	''
20.50	119.51	0.446	0.4	30	37	2.40	44	----	''	''
21.00	117.30	0.355	0.3	29	36	2.47	44	----	''	''
21.50	97.87	0.334	0.3	24	30	2.53	43	----	''	''
22.00	87.35	0.304	0.3	22	26	2.59	42	----	''	''
22.50	71.65	0.199	0.3	18	21	2.65	41	----	''	''
23.00	90.47	0.494	0.5	23	26	2.72	42	----	''	''
23.50	124.16	1.428	1.2	31	36	2.78	44	----	''	''
24.00	45.11	1.204	2.7	18	21	2.85	----	5.82	Sandy SILT to Clayey SILT	130-140
24.50	139.72	0.522	0.4	28	31	2.91	44	----	SAND	120-130
25.00	157.88	0.597	0.4	32	35	2.97	44	----	''	''
25.50	172.50	0.729	0.4	34	38	3.03	45	----	''	''
26.00	194.67	0.637	0.3	39	43	3.10	45	----	''	''
26.50	240.64	0.884	0.4	48	52	3.16	46	----	''	''
27.00	241.46	1.610	0.7	48	52	3.22	46	----	''	''
27.50	237.73	0.988	0.4	48	50	3.28	46	----	''	''
28.00	235.59	1.409	0.6	47	50	3.35	46	----	''	''
28.50	211.40	1.207	0.6	42	44	3.41	45	----	''	''
29.00	216.21	0.761	0.4	43	45	3.47	45	----	''	''
29.50	231.98	0.818	0.4	46	48	3.53	46	----	''	''
30.00	218.15	1.110	0.5	44	45	3.60	45	----	''	''
30.50	194.63	1.129	0.6	39	39	3.66	45	----	''	''
31.00	169.87	0.955	0.6	34	34	3.72	44	----	''	''
31.50	118.83	1.887	1.6	30	30	3.79	42	----	SAND to Silty SAND	130-140

John Sarmiento & Associates
Cone Penetration Testing Service

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01(EGO-14)

CPT NO.: CPT-3
DATE : 03-11-1999
Groundwater measured at 3.3 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
32.00	31.16	0.990	3.2	16	16	3.85	----	3.90	Clayey SILT to Silty CLAY	130-140
32.50	27.92	0.924	3.3	14	14	3.92	----	3.46	''	''
33.00	26.76	0.899	3.4	13	13	3.99	----	3.30	''	''
33.50	25.47	0.817	3.2	13	13	4.06	----	3.13	''	''
34.00	24.32	0.693	2.9	12	12	4.12	----	2.97	''	120-130
34.50	26.15	0.740	2.8	13	13	4.19	----	3.21	''	130-140
35.00	28.72	0.783	2.7	14	14	4.25	----	3.55	''	''
35.50	93.51	1.036	1.1	23	23	4.32	40	----	SAND to Silty SAND	120-130
36.00	202.88	1.526	0.8	41	40	4.38	44	----	SAND	''

DEPTH = Sampling interval (2 inches)
Qc = Tip bearing resistance
Fs = Sleeve friction resistance
Rf = Tip/Sleeve ratio
SPT = Equivalent Standard Penetration Test*
TotStr = Total Stress using est. density**
Phi = Soil friction angle*
Su = Undrained Soil Strength* (Nk=10 for Qc<=9 tsf) (Nk=15 for Qc>9 tsf)

References: * Robertson and Campanella, 1988
** Olsen, 1989

John Sarmiento & Associates
Cone Penetration Testing Service

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01(EGO-14)

CPT NO.: CPT-4
DATE : 03-11-1999
Groundwater measured at 2.7 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	5.09	0.313	6.2	5	8	0.06	----	1.01	CLAY	100-110
1.00	5.25	0.315	6.0	5	8	0.11	----	1.04	''	''
1.50	3.50	0.297	8.5	3	6	0.16	----	0.68	Organic Material	''
2.00	2.97	0.224	7.6	3	5	0.21	----	0.57	''	90-100
2.50	2.17	0.192	8.9	2	3	0.26	----	0.41	''	''
3.00	1.89	0.119	6.3	2	3	0.30	----	0.35	''	85-90
3.50	1.40	0.087	6.2	1	2	0.34	----	0.25	''	''
4.00	0.83	0.042	5.0	1	1	0.39	----	0.13	''	''
4.50	1.36	0.125	9.2	1	2	0.43	----	0.23	''	''
5.00	3.60	0.242	6.7	4	6	0.48	----	0.67	CLAY	90-100
5.50	6.80	0.363	5.3	7	11	0.53	----	1.31	''	110-120
6.00	7.31	0.417	5.7	7	12	0.59	----	1.40	''	''
6.50	7.86	0.486	6.2	8	13	0.65	----	1.51	''	''
7.00	7.95	0.537	6.8	8	13	0.71	----	1.52	''	''
7.50	10.51	0.597	5.7	11	17	0.77	----	1.35	''	120-130
8.00	13.35	0.468	3.5	9	14	0.83	----	1.72	Silty CLAY to CLAY	''
8.50	13.55	0.425	3.1	9	14	0.89	----	1.75	''	''
9.00	11.72	0.394	3.4	8	13	0.95	----	1.50	''	110-120
9.50	17.14	0.470	2.7	9	14	1.01	----	2.22	Clayey SILT to Silty CLAY	120-130
10.00	15.29	0.380	2.5	8	12	1.08	----	1.97	''	''
10.50	14.88	0.436	2.9	7	12	1.14	----	1.91	''	''
11.00	21.80	0.443	2.0	9	14	1.20	----	2.83	Sandy SILT to Clayey SILT	''
11.50	27.49	0.389	1.4	11	18	1.26	----	3.58	''	''
12.00	26.69	0.160	0.6	9	14	1.32	39	----	Silty SAND to Sandy SILT	110-120
12.50	26.20	0.097	0.4	9	14	1.38	39	----	''	100-110
13.00	30.30	0.092	0.3	10	16	1.43	40	----	''	110-120
13.50	45.70	0.153	0.3	15	24	1.49	42	----	''	''
14.00	105.12	0.255	0.2	26	41	1.55	46	----	SAND to Silty SAND	120-130
14.50	87.21	0.184	0.2	22	33	1.62	45	----	''	''
15.00	53.22	0.261	0.5	18	27	1.68	42	----	Silty SAND to Sandy SILT	''
15.50	41.24	0.903	2.2	16	24	1.74	----	5.38	Sandy SILT to Clayey SILT	130-140
16.00	55.91	0.297	0.5	19	27	1.81	42	----	Silty SAND to Sandy SILT	120-130
16.50	85.86	0.321	0.4	21	30	1.87	44	----	SAND to Silty SAND	''
17.00	99.50	0.407	0.4	25	34	1.93	44	----	''	''
17.50	105.24	0.393	0.4	26	36	1.99	44	----	''	''
18.00	105.06	0.329	0.3	26	36	2.06	44	----	''	''
18.50	83.36	0.296	0.4	21	28	2.12	43	----	''	''
19.00	82.20	0.302	0.4	21	27	2.18	43	----	''	''
19.50	109.83	0.425	0.4	27	36	2.24	44	----	''	''
20.00	152.81	0.593	0.4	31	39	2.31	46	----	SAND	''
20.50	232.95	0.883	0.4	47	59	2.37	47	----	''	''
21.00	260.89	0.997	0.4	52	66	2.43	48	----	''	''
21.50	224.39	1.483	0.7	45	56	2.49	47	----	''	''
22.00	214.73	0.876	0.4	43	53	2.56	46	----	''	''
22.50	169.62	0.766	0.5	34	41	2.62	46	----	''	''
23.00	172.31	0.536	0.3	34	41	2.68	46	----	''	''
23.50	159.84	0.555	0.3	32	38	2.74	45	----	''	''
24.00	140.95	0.490	0.3	28	33	2.81	44	----	''	''
24.50	112.58	0.411	0.4	28	32	2.87	43	----	SAND to Silty SAND	''
25.00	127.68	0.488	0.4	26	29	2.93	44	----	SAND	''
25.50	152.26	0.595	0.4	30	34	2.99	44	----	''	''
26.00	174.26	0.501	0.3	35	39	3.06	45	----	''	''
26.50	197.62	0.833	0.4	40	44	3.12	45	----	''	''
27.00	197.25	0.862	0.4	39	43	3.18	45	----	''	''
27.50	209.29	1.072	0.5	42	45	3.24	46	----	''	''
28.00	170.29	1.030	0.6	34	37	3.31	44	----	''	''
28.50	166.01	0.933	0.6	33	35	3.37	44	----	''	''
29.00	211.19	0.914	0.4	42	45	3.43	45	----	''	''
29.50	207.03	0.519	0.3	41	43	3.49	45	----	''	''
30.00	204.16	0.665	0.3	41	42	3.56	45	----	''	''
30.50	209.11	0.899	0.4	42	43	3.62	45	----	''	''
31.00	201.77	0.894	0.4	40	41	3.68	45	----	''	''
31.50	222.56	0.939	0.4	45	45	3.74	45	----	''	''
32.00	230.38	1.430	0.6	46	46	3.81	45	----	''	''
32.50	251.23	1.441	0.6	50	50	3.87	46	----	''	''

John Sarmiento & Associates
Cone Penetration Testing Service

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01(EGO-14)

CPT NO.: CPT-5
DATE : 03-11-1999
Groundwater estimated at 3.0 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	5.36	0.338	6.3	5	9	0.06	----	1.07	CLAY	100-110
1.00	5.48	0.408	7.4	5	9	0.11	----	1.09	"	"
1.50	4.75	0.331	7.0	5	8	0.16	----	0.93	"	"
2.00	3.86	0.232	6.0	4	6	0.21	----	0.75	"	90-100
2.50	3.20	0.170	5.3	3	5	0.26	----	0.61	"	"
3.00	8.73	0.185	2.1	4	7	0.31	----	1.14	Clayey SILT to Silty CLAY	100-110
3.50	30.89	0.402	1.3	10	16	0.37	44	----	Silty SAND to Sandy SILT	120-130
4.00	43.24	0.264	0.6	14	23	0.43	46	----	"	110-120
4.50	34.68	0.088	0.3	12	18	0.48	44	----	"	"
5.00	25.63	0.190	0.7	9	14	0.54	43	----	"	100-110
5.50	20.80	0.118	0.6	8	13	0.59	----	2.73	Sandy SILT to Clayey SILT	"
6.00	32.05	0.091	0.3	11	17	0.65	43	----	Silty SAND to Sandy SILT	110-120
6.50	43.35	0.100	0.2	14	23	0.71	44	----	"	"
7.00	37.67	0.103	0.3	13	20	0.76	43	----	"	"
7.50	42.44	0.241	0.6	14	23	0.82	44	----	"	"
8.00	40.61	0.515	1.3	14	22	0.88	43	----	"	120-130
8.50	48.24	0.324	0.7	16	26	0.94	44	----	"	"
9.00	55.22	0.177	0.3	18	29	1.00	44	----	"	"
9.50	63.28	0.134	0.2	16	25	1.07	44	----	SAND to Silty SAND	"
10.00	69.28	0.132	0.2	17	28	1.13	45	----	"	"
10.50	71.84	0.182	0.3	18	29	1.19	45	----	"	"
11.00	88.10	0.189	0.2	22	35	1.25	45	----	"	"
11.50	84.68	0.266	0.3	21	34	1.32	45	----	"	"
12.00	93.91	0.316	0.3	23	38	1.38	45	----	"	"
12.50	109.36	0.325	0.3	27	43	1.44	46	----	"	"
13.00	97.98	0.234	0.2	24	38	1.50	45	----	"	"
13.50	83.39	0.230	0.3	21	31	1.57	44	----	"	"
14.00	72.09	0.229	0.3	18	27	1.63	44	----	"	"
14.50	74.88	0.221	0.3	19	27	1.69	44	----	"	"
15.00	94.75	0.246	0.3	24	34	1.75	44	----	"	"
15.50	92.07	0.274	0.3	23	32	1.82	44	----	"	"
16.00	78.37	0.153	0.2	20	27	1.88	43	----	"	"
16.50	62.31	0.164	0.3	16	21	1.94	42	----	"	"
17.00	50.14	0.158	0.3	17	22	2.00	41	----	Silty SAND to Sandy SILT	"
17.50	64.81	0.206	0.3	16	22	2.07	42	----	SAND to Silty SAND	"
18.00	93.22	0.293	0.3	23	31	2.13	44	----	"	"
18.50	99.09	0.366	0.4	25	32	2.19	44	----	"	"
19.00	93.48	0.440	0.5	23	30	2.25	43	----	"	"
19.50	89.51	0.888	1.0	22	28	2.32	43	----	"	"
20.00	120.85	1.247	1.0	30	38	2.38	44	----	"	"
20.50	140.36	0.355	0.3	28	35	2.44	45	----	SAND	"
21.00	135.17	0.408	0.3	27	33	2.51	44	----	"	"
21.50	127.62	0.326	0.3	26	31	2.57	44	----	"	"
22.00	145.05	0.462	0.3	29	34	2.63	45	----	"	"
22.50	176.90	0.411	0.2	35	41	2.69	45	----	"	"
23.00	159.56	0.440	0.3	32	37	2.76	45	----	"	"
23.50	137.61	0.499	0.4	28	31	2.82	44	----	"	"
24.00	183.66	0.587	0.3	37	42	2.88	45	----	"	"
24.50	222.65	0.764	0.3	45	50	2.94	46	----	"	"
25.00	242.46	0.910	0.4	48	54	3.01	46	----	"	"
25.50	261.97	0.885	0.3	52	58	3.07	46	----	"	"
26.00	246.32	0.757	0.3	49	54	3.13	46	----	"	"
26.50	176.24	0.657	0.4	35	38	3.19	45	----	"	"
27.00	109.06	1.839	1.7	36	39	3.26	42	----	Silty SAND to Sandy SILT	130-140
27.50	25.81	0.816	3.2	13	14	3.33	----	3.22	Clayey SILT to Silty CLAY	"
28.00	16.68	0.598	3.6	11	12	3.39	----	2.00	Silty CLAY to CLAY	120-130
28.50	121.45	1.372	1.1	30	32	3.45	43	----	SAND to Silty SAND	"
29.00	176.59	1.169	0.7	35	36	3.52	44	----	SAND	"
29.50	176.08	1.231	0.7	35	36	3.58	44	----	"	"
30.00	140.52	0.909	0.6	28	29	3.64	43	----	"	"
30.50	125.36	1.052	0.8	31	32	3.70	43	----	SAND to Silty SAND	"
31.00	174.84	0.852	0.5	35	35	3.77	44	----	SAND	"
31.50	210.06	0.740	0.4	42	42	3.83	45	----	"	"

LOCATION: CONTRA COSTA COUNTY DATE : 03-11-1999
PROJ. NO.: 4603.002.01(EGO-14) Groundwater estimated at 3.0 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
32.00	201.67	0.820	0.4	40	40	3.89	44	----	''	''
32.50	173.33	0.774	0.4	35	35	3.95	44	----	''	''
33.00	187.53	2.180	1.2	38	37	4.02	44	----	''	''
33.50	276.79	1.304	0.5	55	55	4.08	46	----	''	''
34.00	336.93	2.080	0.6	67	67	4.14	46	----	''	''
34.50	337.79	2.307	0.7	68	67	4.20	46	----	''	''
35.00	303.62	2.644	0.9	61	60	4.27	46	----	''	''
35.50	231.18	2.302	1.0	46	46	4.33	45	----	''	''
36.00	134.91	1.604	1.2	34	34	4.39	42	----	SAND to Silty SAND	''
36.50	37.85	0.514	1.4	13	13	4.45	35	----	Silty SAND to Sandy SILT	''
37.00	33.14	0.657	2.0	13	13	4.52	----	4.12	Sandy SILT to Clayey SILT	''
37.50	35.58	0.783	2.2	14	14	4.58	----	4.44	''	130-140
38.00	37.24	0.682	1.8	15	15	4.65	----	4.66	''	120-130
38.50	39.92	0.728	1.8	16	16	4.71	----	5.01	''	''
39.00	39.44	1.321	3.3	20	19	4.78	----	4.94	Clayey SILT to Silty CLAY	130-140
39.50	49.70	1.143	2.3	20	19	4.84	----	6.30	Sandy SILT to Clayey SILT	''
40.00	207.86	2.692	1.3	42	40	4.91	44	----	SAND	''
40.50	285.60	3.248	1.1	57	54	4.97	45	----	''	120-130
41.00	241.66	2.433	1.0	48	46	5.04	44	----	''	''
41.50	222.94	1.643	0.7	45	42	5.10	44	----	''	''
42.00	178.61	1.046	0.6	36	33	5.16	43	----	''	''

DEPTH = Sampling interval (2 inches)
Qc = Tip bearing resistance
Fs = Sleeve friction resistance
Rf = Tip/Sleeve ratio
SPT = Equivalent Standard Penetration Test*
TotStr = Total Stress using est. density**
Phi = Soil friction angle*
Su = Undrained Soil Strength* (Nk=10 for Qc<=9 tsf)
(Nk=15 for Qc>9 tsf)

References: * Robertson and Campanella, 1988
** Olsen, 1989

John Sarmiento & Associates
Cone Penetration Testing Service

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01(EGO-14)

CPT NO.: CPT-6
DATE : 03-11-1999
Groundwater estimated at 3.0 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	1.11	0.122	10.0	1	2	0.06	----	0.22	Organic Material	85-90
1.00	21.68	0.243	1.1	9	14	0.11	----	2.88	Sandy SILT to Clayey SILT	110-120
1.50	30.91	0.129	0.4	10	16	0.17	47	----	Silty SAND to Sandy SILT	''
2.00	29.56	0.113	0.4	10	16	0.23	46	----	''	''
2.50	27.30	0.074	0.3	9	15	0.28	44	----	''	''
3.00	24.55	0.087	0.4	8	13	0.34	43	----	''	100-110
3.50	26.57	0.104	0.4	9	14	0.39	43	----	''	110-120
4.00	34.26	0.155	0.5	11	18	0.45	44	----	''	''
4.50	50.16	0.255	0.5	17	27	0.51	46	----	''	120-130
5.00	69.29	0.339	0.5	17	28	0.57	47	----	SAND to Silty SAND	''
5.50	104.84	0.456	0.4	26	42	0.63	48	----	''	''
6.00	144.87	0.527	0.4	29	46	0.69	>48	----	SAND	''
6.50	172.61	0.693	0.4	35	55	0.76	>48	----	''	''
7.00	157.03	0.609	0.4	31	50	0.82	>48	----	''	''
7.50	150.12	0.593	0.4	30	48	0.88	48	----	''	''
8.00	137.72	0.470	0.3	28	44	0.94	48	----	''	''
8.50	124.46	0.407	0.3	31	50	1.01	47	----	SAND to Silty SAND	''
9.00	93.05	0.266	0.3	23	37	1.07	46	----	''	''
9.50	70.81	0.246	0.3	18	28	1.13	45	----	''	''
10.00	71.53	0.241	0.3	18	29	1.19	44	----	''	''
10.50	80.77	0.258	0.3	20	32	1.26	45	----	''	''
11.00	90.85	0.273	0.3	23	36	1.32	45	----	''	''
11.50	113.20	0.328	0.3	28	44	1.38	46	----	''	''
12.00	131.18	0.390	0.3	26	40	1.44	46	----	SAND	''
12.50	152.98	0.477	0.3	31	46	1.51	47	----	''	''
13.00	168.23	0.483	0.3	34	50	1.57	47	----	''	''
13.50	170.53	0.492	0.3	34	49	1.63	47	----	''	''
14.00	178.21	0.516	0.3	36	50	1.69	47	----	''	''
14.50	181.70	0.562	0.3	36	51	1.76	47	----	''	''
15.00	166.67	0.564	0.3	33	46	1.82	46	----	''	''
15.50	129.09	0.349	0.3	26	35	1.88	45	----	''	''
16.00	87.80	0.411	0.5	22	29	1.94	44	----	SAND to Silty SAND	''
16.50	60.78	0.242	0.4	15	20	2.01	42	----	''	''
17.00	71.23	0.314	0.4	18	23	2.07	42	----	''	''
17.50	86.32	0.327	0.4	22	28	2.13	43	----	''	''
18.00	97.38	0.303	0.3	24	31	2.19	44	----	''	''
18.50	108.87	0.325	0.3	27	34	2.26	44	----	''	''
19.00	107.58	0.260	0.2	27	34	2.32	44	----	''	''
19.50	124.35	0.340	0.3	31	38	2.38	44	----	''	''
20.00	119.01	0.363	0.3	30	36	2.44	44	----	''	''
20.50	122.81	0.505	0.4	31	37	2.51	44	----	''	''
21.00	144.06	0.546	0.4	29	34	2.57	45	----	SAND	''
21.50	132.71	0.614	0.5	27	31	2.63	44	----	''	''
22.00	121.02	0.546	0.5	30	35	2.69	44	----	SAND to Silty SAND	''

DEPTH = Sampling interval (2 inches)
Qc = Tip bearing resistance
Fs = Sleeve friction resistance
Rf = Tip/Sleeve ratio
SPT = Equivalent Standard Penetration Test*
TotStr = Total Stress using est. density**
Phi = Soil friction angle*
Su = Undrained Soil Strength* (Nk=10 for Qc<=9 tsf)
(Nk=15 for Qc>9 tsf)

References: * Robertson and Campanella, 1988
** Olsen, 1989

John Sarmiento & Associates
Cone Penetration Testing Service

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01(EGO-14)

CPT NO.: CPT-7
DATE : 03-11-1999
Groundwater estimated at 3.0 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	29.74	0.186	0.6	10	16	0.06	>48	----	Silty SAND to Sandy SILT	110-120
1.00	42.14	0.159	0.4	14	22	0.12	>48	----	''	''
1.50	41.46	0.155	0.4	14	22	0.17	48	----	''	''
2.00	32.24	0.111	0.3	11	17	0.23	46	----	''	''
2.50	28.62	0.083	0.3	10	15	0.29	45	----	''	''
3.00	32.78	0.076	0.2	11	17	0.34	44	----	''	''
3.50	34.80	0.115	0.3	12	19	0.40	44	----	''	''
4.00	36.21	0.133	0.4	12	19	0.46	44	----	''	''
4.50	37.97	0.135	0.4	13	20	0.52	44	----	''	''
5.00	35.23	0.116	0.3	12	19	0.57	44	----	''	''
5.50	35.23	0.109	0.3	12	19	0.63	43	----	''	''
6.00	30.77	0.076	0.2	10	16	0.69	43	----	''	''
6.50	19.65	0.109	0.6	8	13	0.74	----	2.57	Sandy SILT to Clayey SILT	100-110
7.00	32.84	0.115	0.3	11	18	0.80	42	----	Silty SAND to Sandy SILT	110-120
7.50	71.65	0.226	0.3	18	29	0.86	46	----	SAND to Silty SAND	120-130
8.00	109.95	0.366	0.3	27	44	0.92	47	----	''	''
8.50	115.89	0.364	0.3	29	46	0.98	47	----	''	''
9.00	123.02	0.347	0.3	31	49	1.04	47	----	''	''
9.50	105.37	0.265	0.3	26	42	1.11	46	----	''	''
10.00	129.81	0.343	0.3	26	42	1.17	47	----	SAND	''
10.50	139.35	0.391	0.3	28	45	1.23	47	----	''	''
11.00	125.41	0.396	0.3	31	50	1.29	47	----	SAND to Silty SAND	''
11.50	70.36	0.294	0.4	18	28	1.36	44	----	''	''
12.00	51.42	0.113	0.2	17	27	1.42	42	----	Silty SAND to Sandy SILT	''
12.50	58.21	0.192	0.3	19	30	1.48	43	----	''	''
13.00	82.65	0.317	0.4	21	31	1.54	44	----	SAND to Silty SAND	''
13.50	97.81	0.348	0.4	24	36	1.61	45	----	''	''
14.00	87.46	0.474	0.5	22	31	1.67	44	----	''	''
14.50	168.82	1.394	0.8	34	47	1.73	47	----	SAND	''
15.00	135.92	1.038	0.8	27	38	1.79	46	----	''	''
15.50	148.23	0.694	0.5	30	41	1.86	46	----	''	''
16.00	155.04	0.863	0.6	31	42	1.92	46	----	''	''
16.50	148.38	0.894	0.6	30	40	1.98	46	----	''	''
17.00	137.08	0.951	0.7	27	36	2.04	45	----	''	''
17.50	139.79	0.936	0.7	28	37	2.11	45	----	''	''
18.00	160.43	0.765	0.5	32	41	2.17	46	----	''	''
18.50	184.61	0.692	0.4	37	47	2.23	46	----	''	''
19.00	189.94	0.590	0.3	38	48	2.29	46	----	''	''
19.50	176.54	0.591	0.3	35	44	2.36	46	----	''	''
20.00	194.77	0.524	0.3	39	48	2.42	46	----	''	''
20.50	187.01	0.674	0.4	37	45	2.48	46	----	''	''
21.00	167.89	0.734	0.4	34	40	2.54	45	----	''	''
21.50	212.71	1.077	0.5	43	50	2.61	46	----	''	''
22.00	263.41	2.000	0.8	53	62	2.67	47	----	''	''
22.50	227.01	1.681	0.7	45	52	2.73	46	----	''	''
23.00	246.85	1.090	0.4	49	56	2.79	47	----	''	''
23.50	242.94	1.226	0.5	49	55	2.86	46	----	''	''
24.00	242.97	1.244	0.5	49	54	2.92	46	----	''	''
24.50	232.65	1.311	0.6	47	52	2.98	46	----	''	''
25.00	198.40	1.327	0.7	40	43	3.04	45	----	''	''
25.50	270.17	1.028	0.4	54	59	3.11	47	----	''	''
26.00	294.45	0.956	0.3	59	63	3.17	47	----	''	''
26.50	329.53	1.297	0.4	66	70	3.23	47	----	''	''
27.00	298.67	1.965	0.7	60	63	3.29	47	----	''	''
27.50	221.98	1.398	0.6	44	46	3.36	46	----	''	''
28.00	207.83	0.693	0.3	42	43	3.42	45	----	''	''
28.50	207.91	0.660	0.3	42	43	3.48	45	----	''	''
29.00	256.28	0.881	0.3	51	52	3.54	46	----	''	''
29.50	248.30	1.415	0.6	50	50	3.61	46	----	''	''
30.00	243.02	2.010	0.8	49	49	3.67	46	----	''	''
30.50	231.19	1.964	0.8	46	46	3.73	45	----	''	''
31.00	268.86	1.387	0.5	54	54	3.80	46	----	''	''
31.50	258.06	1.961	0.8	52	52	3.86	46	----	''	''

John Sarmiento & Associates
Cone Penetration Testing Service

LOCATION: CONTRA COSTA COUNTY DATE : 03-11-1999
PROJ. NO.: 4603.002.01(EGO-14) Groundwater estimated at 3.0 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
32.00	155.30	1.507	1.0	31	31	3.92	43	----	''	''
32.50	210.19	0.449	0.2	42	42	3.98	44	----	''	''
33.00	235.77	0.539	0.2	47	47	4.05	45	----	''	''
33.50	130.23	1.189	0.9	26	26	4.11	42	----	''	''
34.00	49.11	0.544	1.1	16	16	4.17	37	----	Silty SAND to Sandy SILT	''
34.50	55.64	0.796	1.4	19	18	4.23	37	----	''	''
35.00	35.53	0.777	2.2	14	14	4.30	----	4.45	Sandy SILT to Clayey SILT	130-140
35.50	30.53	0.502	1.6	12	12	4.36	----	3.78	''	120-130
36.00	32.92	0.405	1.2	11	11	4.42	34	----	Silty SAND to Sandy SILT	''
36.50	28.88	0.319	1.1	10	10	4.48	33	----	''	110-120
37.00	35.18	0.546	1.6	12	12	4.54	34	----	''	120-130
37.50	33.83	0.729	2.2	14	13	4.61	----	4.20	Sandy SILT to Clayey SILT	130-140
38.00	31.88	0.678	2.1	13	13	4.67	----	3.94	''	120-130
38.50	26.19	0.538	2.1	10	10	4.74	----	3.18	''	''
39.00	30.89	0.624	2.0	12	12	4.80	----	3.80	''	''
39.50	31.70	0.639	2.0	13	12	4.86	----	3.90	''	''
40.00	29.80	0.610	2.0	12	11	4.92	----	3.64	''	''
40.50	30.83	0.887	2.9	15	15	4.99	----	3.78	Clayey SILT to Silty CLAY	130-140
41.00	31.20	0.936	3.0	16	15	5.06	----	3.82	''	''
41.50	29.36	0.833	2.8	15	14	5.12	----	3.57	''	''
42.00	28.09	0.692	2.5	11	10	5.19	----	3.40	Sandy SILT to Clayey SILT	120-130
42.50	28.27	0.643	2.3	11	10	5.25	----	3.42	''	''
43.00	30.78	0.806	2.6	12	11	5.32	----	3.75	''	130-140
43.50	27.17	0.550	2.0	11	10	5.38	----	3.26	''	120-130
44.00	26.98	0.463	1.7	11	9	5.44	----	3.23	''	''
44.50	41.59	1.079	2.6	17	14	5.51	----	5.18	''	130-140
45.00	49.17	1.371	2.8	20	17	5.58	----	6.18	''	''
45.50	55.65	1.722	3.1	22	19	5.64	----	7.04	''	''
46.00	59.92	1.987	3.3	24	20	5.71	----	7.61	''	''
46.50	58.64	1.979	3.4	23	19	5.78	----	7.43	''	''
47.00	69.27	2.295	3.3	28	23	5.85	----	8.85	''	''
47.50	54.79	1.723	3.1	22	18	5.91	----	6.91	''	''
48.00	52.78	1.502	2.8	21	17	5.98	----	6.64	''	''
48.50	53.63	1.366	2.5	21	17	6.05	----	6.75	''	''
49.00	52.53	1.207	2.3	21	17	6.12	----	6.60	''	''
49.50	49.30	1.135	2.3	20	16	6.18	----	6.16	''	''
50.00	39.77	1.144	2.9	16	13	6.25	----	4.89	''	''
50.50	36.09	0.840	2.3	14	11	6.32	----	4.39	''	''
51.00	32.00	0.720	2.2	13	10	6.39	----	3.84	''	''
51.50	30.04	0.624	2.1	12	9	6.45	----	3.58	''	120-130
52.00	31.57	0.675	2.1	13	10	6.51	----	3.77	''	''

DEPTH = Sampling interval (2 inches)
Qc = Tip bearing resistance
Fs = Sleeve friction resistance
Rf = Tip/Sleeve ratio
SPT = Equivalent Standard Penetration Test*
TotStr = Total Stress using est. density**
Phi = Soil friction angle*
Su = Undrained Soil Strength* (Nk=10 for Qc<=9 tsf) (Nk=15 for Qc>9 tsf)

References: * Robertson and Campanella, 1988
** Olsen, 1989

PROJECT: CYPRESS CORRIDOR PLANNING AREA CPT NO.: CPT-8
LOCATION: CONTRA COSTA COUNTY DATE : 03-12-1999
PROJ. NO.: 4603.002.01(EGO-14) Groundwater estimated at 3.0 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	14.60	0.354	2.4	7	12	0.06	----	1.94	Clayey SILT to Silty CLAY	110-120
1.00	15.69	0.382	2.4	8	13	0.12	----	2.08	''	120-130
1.50	49.76	0.376	0.8	17	27	0.18	>48	----	Silty SAND to Sandy SILT	''
2.00	12.27	0.419	3.4	8	13	0.24	----	1.62	Silty CLAY to CLAY	''
2.50	7.69	0.300	3.9	8	12	0.30	----	1.51	CLAY	110-120
3.00	5.04	0.227	4.5	5	8	0.35	----	0.97	''	100-110
3.50	4.76	0.199	4.2	5	8	0.40	----	0.91	''	90-100
4.00	2.88	0.105	3.7	3	5	0.45	----	0.53	''	''
4.50	2.43	0.027	1.1	1	2	0.49	----	0.44	Sensitive Fine Grained	85-90
5.00	2.04	0.003	0.2	1	2	0.53	----	0.36	''	80-85
5.50	3.12	0.010	0.3	2	2	0.58	----	0.57	''	85-90
6.00	2.92	0.015	0.5	1	2	0.62	----	0.52	''	''
6.50	13.47	0.214	1.6	7	11	0.67	----	1.75	Clayey SILT to Silty CLAY	100-110
7.00	13.88	0.203	1.5	6	9	0.73	----	1.80	Sandy SILT to Clayey SILT	''
7.50	19.23	0.004	0.0	8	12	0.78	----	2.51	''	''
8.00	35.92	0.002	0.0	12	19	0.83	43	----	Silty SAND to Sandy SILT	110-120
8.50	43.08	0.040	0.1	14	23	0.89	44	----	''	''
9.00	49.99	0.098	0.2	17	27	0.95	44	----	''	120-130
9.50	62.19	0.091	0.1	16	25	1.01	45	----	SAND to Silty SAND	''
10.00	69.59	0.162	0.2	17	28	1.08	45	----	''	''
10.50	61.25	0.159	0.3	15	24	1.14	44	----	''	''
11.00	50.55	0.110	0.2	17	27	1.20	43	----	Silty SAND to Sandy SILT	''
11.50	39.96	0.328	0.8	13	21	1.26	42	----	''	110-120
12.00	37.33	0.322	0.9	12	20	1.32	41	----	''	''
12.50	20.44	0.300	1.5	8	13	1.37	----	2.63	Sandy SILT to Clayey SILT	''
13.00	22.28	0.240	1.1	9	14	1.43	----	2.88	''	100-110
13.50	62.13	0.687	1.1	21	33	1.49	43	----	Silty SAND to Sandy SILT	120-130
14.00	53.67	0.100	0.2	18	28	1.55	43	----	''	''
14.50	53.91	0.172	0.3	18	27	1.61	42	----	''	''
15.00	75.27	0.097	0.1	19	28	1.68	44	----	SAND to Silty SAND	''
15.50	97.61	0.213	0.2	24	36	1.74	45	----	''	''
16.00	113.16	0.366	0.3	28	41	1.80	45	----	''	''
16.50	121.36	0.264	0.2	30	42	1.86	45	----	''	''
17.00	95.96	0.223	0.2	24	33	1.93	44	----	''	''
17.50	111.69	0.350	0.3	28	38	1.99	45	----	''	''
18.00	148.52	0.475	0.3	30	40	2.05	46	----	SAND	''
18.50	143.12	0.408	0.3	29	38	2.11	46	----	''	''
19.00	97.01	0.234	0.2	24	32	2.18	44	----	SAND to Silty SAND	''
19.50	69.41	0.130	0.2	17	23	2.24	42	----	''	''
20.00	67.99	0.201	0.3	17	22	2.30	42	----	''	''
20.50	87.20	0.198	0.2	22	28	2.36	43	----	''	''
21.00	104.64	0.360	0.3	26	33	2.43	44	----	''	''
21.50	173.23	0.672	0.4	35	43	2.49	46	----	SAND	''
22.00	251.84	1.838	0.7	50	62	2.55	47	----	''	''
22.50	212.67	1.804	0.8	43	51	2.61	46	----	''	''
23.00	160.68	1.716	1.1	32	38	2.68	45	----	''	''
23.50	145.15	0.819	0.6	29	34	2.74	45	----	''	''
24.00	161.15	0.628	0.4	32	38	2.80	45	----	''	''
24.50	185.76	0.706	0.4	37	43	2.86	46	----	''	''
25.00	183.87	0.937	0.5	37	42	2.93	45	----	''	''
25.50	217.55	1.241	0.6	44	49	2.99	46	----	''	''
26.00	235.29	0.838	0.4	47	53	3.05	46	----	''	''
26.50	181.30	0.466	0.3	36	40	3.11	45	----	''	''
27.00	145.74	0.283	0.2	29	32	3.18	44	----	''	''
27.50	134.70	1.267	0.9	27	29	3.24	44	----	''	''
28.00	28.95	0.449	1.6	12	12	3.30	----	3.64	Sandy SILT to Clayey SILT	''
28.50	25.21	0.482	1.9	10	11	3.36	----	3.14	''	''
29.00	25.82	0.720	2.8	13	14	3.43	----	3.21	Clayey SILT to Silty CLAY	130-140
29.50	141.42	0.683	0.5	28	30	3.49	44	----	SAND	120-130
30.00	216.20	0.654	0.3	43	45	3.55	45	----	''	''
30.50	218.26	0.944	0.4	44	45	3.62	45	----	''	''
31.00	231.24	1.059	0.5	46	47	3.68	45	----	''	''
31.50	209.35	1.097	0.5	42	42	3.74	45	----	''	''
32.00	185.29	1.156	0.6	37	37	3.80	44	----	''	''
32.50	186.15	1.196	0.6	37	37	3.87	44	----	''	''
33.00	178.92	1.338	0.7	36	36	3.93	44	----	''	''

John Sarmiento & Associates
Cone Penetration Testing Service

PROJECT: CYPRESS CORRIDOR PLANNING AREA   CPT NO.: CPT-9
LOCATION: CONTRA COSTA COUNTY   DATE : 03-12-1999
PROJ. NO.: 4603.002.01(EGO-14)   Groundwater measured at 2.7 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	17.60	0.180	1.0	7	11	0.06	----	2.34	Sandy SILT to Clayey SILT	100-110
1.00	25.53	0.334	1.3	10	16	0.11	----	3.40	''	110-120
1.50	23.15	0.222	1.0	9	15	0.17	----	3.08	''	100-110
2.00	28.17	0.112	0.4	9	15	0.23	46	----	Silty SAND to Sandy SILT	110-120
2.50	28.41	0.043	0.2	9	15	0.28	45	----	''	''
3.00	27.18	0.036	0.1	9	14	0.34	44	----	''	''
3.50	27.56	0.054	0.2	9	15	0.40	44	----	''	''
4.00	31.90	0.060	0.2	11	17	0.45	44	----	''	''
4.50	37.78	0.041	0.1	13	20	0.51	44	----	''	''
5.00	41.26	0.100	0.2	14	22	0.57	44	----	''	''
5.50	46.94	0.153	0.3	16	25	0.63	45	----	''	''
6.00	51.05	0.219	0.4	17	27	0.69	45	----	''	120-130
6.50	51.53	0.175	0.3	17	27	0.75	45	----	''	''
7.00	60.71	0.235	0.4	15	24	0.81	45	----	SAND to Silty SAND	''
7.50	82.13	0.266	0.3	21	33	0.87	46	----	''	''
8.00	96.52	0.327	0.3	24	39	0.94	47	----	''	''
8.50	114.12	0.395	0.3	29	46	1.00	47	----	''	''
9.00	140.62	0.538	0.4	28	45	1.06	48	----	SAND	''
9.50	149.55	0.569	0.4	30	48	1.12	48	----	''	''
10.00	186.37	0.823	0.4	37	60	1.19	48	----	''	''
10.50	192.44	0.779	0.4	38	62	1.25	48	----	''	''
11.00	166.83	0.585	0.4	33	53	1.31	48	----	''	''
11.50	99.19	0.411	0.4	25	39	1.37	45	----	SAND to Silty SAND	''
12.00	72.46	0.624	0.9	18	28	1.44	44	----	''	''
12.50	111.19	0.430	0.4	28	42	1.50	46	----	''	''
13.00	118.75	0.364	0.3	30	44	1.56	46	----	''	''
13.50	83.41	0.238	0.3	21	30	1.62	44	----	''	''
14.00	102.69	0.334	0.3	26	37	1.69	45	----	''	''
14.50	97.79	0.296	0.3	24	34	1.75	44	----	''	''
15.00	132.79	0.283	0.2	27	37	1.81	46	----	SAND	''
15.50	150.45	0.720	0.5	30	41	1.87	46	----	''	''
16.00	111.24	2.386	2.1	37	50	1.94	45	----	Silty SAND to Sandy SILT	130-140
16.50	118.66	1.363	1.1	30	40	2.00	45	----	SAND to Silty SAND	120-130
17.00	143.65	0.428	0.3	29	38	2.07	46	----	SAND	''
17.50	161.71	0.461	0.3	32	42	2.13	46	----	''	''
18.00	191.93	0.401	0.2	38	49	2.19	46	----	''	''
18.50	158.64	0.756	0.5	32	40	2.25	46	----	''	''
19.00	142.50	1.480	1.0	29	36	2.32	45	----	''	''
19.50	43.95	1.420	3.2	22	27	2.38	----	5.70	Clayey SILT to Silty CLAY	130-140
20.00	113.87	0.983	0.9	28	35	2.45	44	----	SAND to Silty SAND	120-130
20.50	221.93	0.729	0.3	44	53	2.51	46	----	SAND	''
21.00	210.10	0.679	0.3	42	50	2.57	46	----	''	''
21.50	172.72	1.299	0.8	35	41	2.64	45	----	''	''
22.00	227.50	1.188	0.5	46	53	2.70	46	----	''	''
22.50	239.05	1.120	0.5	48	55	2.76	46	----	''	''
23.00	252.99	1.376	0.5	51	57	2.82	47	----	''	''
23.50	245.73	1.090	0.4	49	55	2.89	46	----	''	''
24.00	199.89	1.236	0.6	40	44	2.95	46	----	''	''
24.50	169.86	0.961	0.6	34	37	3.01	45	----	''	''
25.00	173.60	1.647	0.9	35	38	3.07	45	----	''	''
25.50	190.14	1.365	0.7	38	41	3.14	45	----	''	''
26.00	145.88	2.018	1.4	36	39	3.20	44	----	SAND to Silty SAND	130-140
26.50	170.93	1.299	0.8	34	36	3.27	44	----	SAND	120-130
27.00	217.61	1.421	0.7	44	46	3.33	45	----	''	''
27.50	219.75	1.335	0.6	44	46	3.39	45	----	''	''
28.00	201.25	0.871	0.4	40	42	3.45	45	----	''	''
28.50	183.11	1.203	0.7	37	38	3.52	44	----	''	''
29.00	178.96	1.052	0.6	36	36	3.58	44	----	''	''
29.50	188.26	1.942	1.0	38	38	3.64	44	----	''	''
30.00	191.00	1.332	0.7	38	38	3.71	44	----	''	''
30.50	197.99	1.914	1.0	40	40	3.77	44	----	''	''
31.00	202.03	1.874	0.9	40	40	3.83	44	----	''	''
31.50	212.49	1.884	0.9	42	42	3.89	45	----	''	''
32.00	214.96	1.408	0.7	43	43	3.96	45	----	''	''

John Sarmiento & Associates
Cone Penetration Testing Service

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01(EGO-14)

CPT NO.: CPT-10
DATE : 03-12-1999
Groundwater estimated at 3.0 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	9.53	0.403	4.2	10	15	0.06	----	1.27	CLAY	110-120
1.00	11.19	0.365	3.3	7	12	0.12	----	1.48	Silty CLAY to CLAY	''
1.50	8.09	0.296	3.7	8	13	0.17	----	1.60	CLAY	''
2.00	10.43	0.478	4.6	10	17	0.23	----	1.38	''	120-130
2.50	9.47	0.380	4.0	9	15	0.29	----	1.24	''	110-120
3.00	6.00	0.262	4.4	6	10	0.34	----	1.17	''	100-110
3.50	4.82	0.210	4.4	5	8	0.40	----	0.92	''	''
4.00	4.64	0.065	1.4	2	4	0.44	----	0.88	Sensitive Fine Grained	85-90
4.50	10.19	0.069	0.7	5	8	0.49	----	1.33	Clayey SILT to Silty CLAY	90-100
5.00	29.66	0.012	0.0	10	16	0.54	43	----	Silty SAND to Sandy SILT	110-120
5.50	32.10	0.053	0.2	11	17	0.60	43	----	''	''
6.00	32.04	0.041	0.1	11	17	0.66	43	----	''	''
6.50	35.47	0.079	0.2	12	19	0.72	43	----	''	''
7.00	38.89	0.050	0.1	13	21	0.77	43	----	''	''
7.50	44.21	0.018	0.0	15	24	0.83	44	----	''	''
8.00	46.29	0.072	0.2	15	25	0.89	44	----	''	''
8.50	46.97	0.103	0.2	16	25	0.95	44	----	''	''
9.00	45.74	0.118	0.3	15	24	1.00	43	----	''	''
9.50	45.38	0.112	0.2	15	24	1.06	43	----	''	''
10.00	43.05	0.129	0.3	14	23	1.12	43	----	''	''
10.50	40.23	0.103	0.3	13	21	1.18	42	----	''	''
11.00	41.75	0.117	0.3	14	22	1.23	42	----	''	''
11.50	42.44	0.098	0.2	14	23	1.29	42	----	''	''
12.00	43.47	0.144	0.3	14	23	1.35	42	----	''	''
12.50	47.75	0.238	0.5	16	25	1.41	42	----	''	''
13.00	56.80	0.459	0.8	19	30	1.47	43	----	''	120-130
13.50	26.47	0.358	1.4	11	16	1.53	----	3.43	Sandy SILT to Clayey SILT	''
14.00	19.56	0.504	2.6	10	15	1.59	----	2.50	Clayey SILT to Silty CLAY	''
14.50	21.34	0.451	2.1	9	13	1.65	----	2.73	Sandy SILT to Clayey SILT	''
15.00	58.70	0.158	0.3	20	28	1.72	42	----	Silty SAND to Sandy SILT	''
15.50	66.21	0.264	0.4	17	24	1.78	43	----	SAND to Silty SAND	''
16.00	91.54	0.269	0.3	23	32	1.84	44	----	''	''
16.50	94.03	0.373	0.4	24	32	1.90	44	----	''	''
17.00	95.51	0.346	0.4	24	33	1.97	44	----	''	''
17.50	96.35	0.350	0.4	24	32	2.03	44	----	''	''
18.00	96.11	0.354	0.4	24	32	2.09	44	----	''	''
18.50	95.99	0.366	0.4	24	32	2.15	44	----	''	''
19.00	98.00	0.364	0.4	25	32	2.22	44	----	''	''
19.50	92.32	0.288	0.3	23	30	2.28	43	----	''	''
20.00	103.57	0.362	0.3	26	33	2.34	44	----	''	''
20.50	107.06	0.396	0.4	27	33	2.40	44	----	''	''
21.00	111.04	0.306	0.3	28	34	2.47	44	----	''	''
21.50	92.44	0.621	0.7	23	28	2.53	43	----	''	''
22.00	87.86	0.741	0.8	22	26	2.59	43	----	''	''
22.50	100.02	0.257	0.3	25	30	2.65	43	----	''	''
23.00	129.57	0.381	0.3	26	30	2.72	44	----	SAND	''
23.50	156.70	0.596	0.4	31	36	2.78	45	----	''	''
24.00	175.96	0.707	0.4	35	40	2.84	45	----	''	''
24.50	200.48	0.815	0.4	40	46	2.90	46	----	''	''
25.00	217.48	0.665	0.3	43	49	2.97	46	----	''	''
25.50	242.67	0.639	0.3	49	54	3.03	46	----	''	''
26.00	234.05	0.665	0.3	47	52	3.09	46	----	''	''
26.50	235.90	1.143	0.5	47	51	3.15	46	----	''	''
27.00	270.98	1.201	0.4	54	58	3.22	46	----	''	''
27.50	327.35	0.878	0.3	65	70	3.28	47	----	''	''
28.00	318.42	0.681	0.2	64	67	3.34	47	----	''	''
28.50	308.27	0.905	0.3	62	65	3.40	47	----	''	''
29.00	283.51	0.842	0.3	57	59	3.47	46	----	''	''
29.50	267.68	2.167	0.8	54	55	3.53	46	----	''	''
30.00	317.93	1.117	0.4	64	65	3.59	47	----	''	''
30.50	354.56	0.646	0.2	71	72	3.65	47	----	''	''
31.00	328.08	1.376	0.4	66	66	3.72	47	----	''	''
31.50	118.12	2.470	2.1	39	40	3.78	42	----	Silty SAND to Sandy SILT	130-140
32.00	59.18	1.262	2.1	20	20	3.85	38	----	''	''
32.50	177.55	0.865	0.5	36	35	3.91	44	----	SAND	120-130
33.00	199.99	1.603	0.8	40	40	3.98	44	----	''	''

PROJECT: CYPRESS CORRIDOR PLANNING AREA | CPT NO.: CPT-11 |

LOCATION: CONTRA COSTA COUNTY | DATE : 03-12-1999

PROJ. NO.: 4603.002.01(EGO-14) | Groundwater estimated at 3.0 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	7.63	0.484	6.3	8	12	0.06	----	1.52	CLAY	110-120
1.00	6.09	0.386	6.3	6	10	0.12	----	1.21	''	''
1.50	10.32	0.497	4.8	10	17	0.17	----	1.36	''	120-130
2.00	11.15	0.595	5.3	11	18	0.24	----	1.47	''	''
2.50	8.82	0.467	5.3	9	14	0.30	----	1.74	''	110-120
3.00	119.73	0.423	0.4	30	48	0.36	>48	----	SAND to Silty SAND	120-130
3.50	104.70	0.474	0.5	26	42	0.42	>48	----	''	''
4.00	70.40	0.100	0.1	18	28	0.48	47	----	''	''
4.50	63.61	0.149	0.2	16	25	0.54	46	----	''	''
5.00	64.35	0.225	0.3	16	26	0.61	46	----	''	''
5.50	72.85	0.320	0.4	18	29	0.67	46	----	''	''
6.00	42.40	0.155	0.4	14	23	0.73	44	----	Silty SAND to Sandy SILT	110-120
6.50	51.88	0.144	0.3	17	28	0.79	44	----	''	120-130
7.00	50.66	0.067	0.1	17	27	0.85	44	----	''	''
7.50	47.72	0.108	0.2	16	25	0.92	43	----	''	110-120
8.00	49.86	0.123	0.2	17	27	0.98	43	----	''	120-130
8.50	44.61	0.118	0.3	15	24	1.04	43	----	''	110-120
9.00	34.51	0.045	0.1	12	18	1.09	41	----	''	''
9.50	39.53	0.091	0.2	13	21	1.15	42	----	''	''
10.00	48.57	0.146	0.3	16	26	1.21	43	----	''	120-130
10.50	60.85	0.180	0.3	15	24	1.27	43	----	SAND to Silty SAND	''
11.00	71.13	0.179	0.3	18	28	1.34	44	----	''	''
11.50	71.86	0.200	0.3	18	28	1.40	44	----	''	''
12.00	65.25	0.218	0.3	16	25	1.46	43	----	''	''
12.50	61.59	0.090	0.1	15	23	1.52	43	----	''	''
13.00	47.05	0.275	0.6	16	23	1.58	41	----	Silty SAND to Sandy SILT	110-120
13.50	47.85	0.768	1.6	16	23	1.65	41	----	''	120-130
14.00	42.33	1.013	2.4	17	24	1.71	----	5.53	Sandy SILT to Clayey SILT	130-140
14.50	27.49	0.652	2.4	11	15	1.78	----	3.55	''	120-130
15.00	38.19	1.229	3.2	19	26	1.84	----	4.97	Clayey SILT to Silty CLAY	130-140
15.50	20.51	0.436	2.1	8	11	1.91	----	2.61	Sandy SILT to Clayey SILT	120-130
16.00	80.12	0.356	0.4	20	27	1.97	43	----	SAND to Silty SAND	''
16.50	32.32	0.590	1.8	13	17	2.03	----	4.17	Sandy SILT to Clayey SILT	''
17.00	22.04	0.199	0.9	9	11	2.09	----	2.80	''	100-110
17.50	69.73	0.272	0.4	17	22	2.15	42	----	SAND to Silty SAND	120-130
18.00	106.82	0.450	0.4	27	34	2.21	44	----	''	''
18.50	116.38	0.261	0.2	29	36	2.28	44	----	''	''
19.00	81.40	0.153	0.2	20	25	2.34	42	----	''	''
19.50	60.06	0.183	0.3	15	18	2.40	41	----	''	''
20.00	43.63	0.101	0.2	15	18	2.46	39	----	Silty SAND to Sandy SILT	110-120
20.50	64.35	0.031	0.0	16	19	2.52	41	----	SAND to Silty SAND	120-130
21.00	80.13	0.122	0.2	20	24	2.58	42	----	''	''
21.50	115.74	0.210	0.2	29	34	2.65	44	----	''	''
22.00	132.49	0.324	0.2	26	30	2.71	44	----	SAND	''
22.50	142.09	0.309	0.2	28	32	2.77	44	----	''	''
23.00	140.09	0.564	0.4	28	32	2.83	44	----	''	''
23.50	171.19	0.551	0.3	34	38	2.90	45	----	''	''
24.00	194.96	0.657	0.3	39	43	2.96	45	----	''	''
24.50	190.64	1.023	0.5	38	42	3.02	45	----	''	''
25.00	196.02	1.156	0.6	39	42	3.08	45	----	''	''
25.50	201.30	0.798	0.4	40	43	3.15	45	----	''	''
26.00	176.44	0.521	0.3	35	37	3.21	45	----	''	''
26.50	147.67	0.667	0.5	30	31	3.27	44	----	''	''
27.00	170.22	0.940	0.6	34	36	3.33	44	----	''	''
27.50	155.23	1.927	1.2	31	32	3.40	44	----	''	130-140
28.00	177.73	1.449	0.8	36	37	3.46	44	----	''	120-130
28.50	240.53	1.248	0.5	48	49	3.53	46	----	''	''
29.00	269.90	1.187	0.4	54	55	3.59	46	----	''	''
29.50	296.86	1.239	0.4	59	60	3.65	46	----	''	''
30.00	286.90	0.610	0.2	57	57	3.71	46	----	''	''
30.50	256.11	1.101	0.4	51	51	3.78	46	----	''	''
31.00	177.93	1.145	0.6	36	36	3.84	44	----	''	''
31.50	231.88	1.452	0.6	46	46	3.90	45	----	''	''
32.00	351.81	2.393	0.7	70	70	3.96	47	----	''	''
32.50	345.06	2.134	0.6	69	69	4.03	46	----	''	''

John Sarmiento & Associates

Cone Penetration Testing Service

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01(EGO-14)

CPT NO.: CPT-12
DATE : 03-12-1999
Groundwater estimated at 3.0 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	7.22	0.093	1.3	4	6	0.06	----	0.96	Clayey SILT to Silty CLAY	90-100
1.00	41.78	1.245	3.0	17	27	0.12	----	5.56	Sandy SILT to Clayey SILT	130-140
1.50	22.42	0.912	4.1	15	24	0.19	----	2.98	Silty CLAY to CLAY	''
2.00	118.12	0.486	0.4	30	47	0.25	>48	----	SAND to Silty SAND	120-130
2.50	84.75	0.270	0.3	21	34	0.32	48	----	''	''
3.00	55.72	0.100	0.2	19	30	0.38	46	----	Silty SAND to Sandy SILT	''
3.50	54.38	0.089	0.2	18	29	0.44	46	----	''	''
4.00	59.94	0.148	0.2	15	24	0.50	46	----	SAND to Silty SAND	''
4.50	67.63	0.179	0.3	17	27	0.57	46	----	''	''
5.00	67.70	0.222	0.3	17	27	0.63	46	----	''	''
5.50	73.69	0.286	0.4	18	29	0.69	46	----	''	''
6.00	82.43	0.313	0.4	21	33	0.75	46	----	''	''
6.50	57.12	0.151	0.3	19	30	0.82	44	----	Silty SAND to Sandy SILT	''
7.00	46.12	0.112	0.2	15	25	0.88	43	----	''	110-120
7.50	54.18	0.153	0.3	18	29	0.94	44	----	''	120-130
8.00	67.32	0.228	0.3	17	27	1.00	45	----	SAND to Silty SAND	''
8.50	63.44	0.194	0.3	16	25	1.06	44	----	''	''
9.00	61.27	0.163	0.3	15	25	1.12	44	----	''	''
9.50	67.01	0.220	0.3	17	27	1.19	44	----	''	''
10.00	60.98	0.162	0.3	15	24	1.25	43	----	''	''
10.50	60.91	0.203	0.3	15	24	1.31	43	----	''	''
11.00	66.41	0.192	0.3	17	26	1.37	44	----	''	''
11.50	62.76	0.113	0.2	16	24	1.44	43	----	''	''
12.00	57.00	0.063	0.1	19	28	1.50	42	----	Silty SAND to Sandy SILT	''
12.50	73.82	0.117	0.2	18	27	1.56	44	----	SAND to Silty SAND	''
13.00	66.95	0.126	0.2	17	24	1.62	43	----	''	''
13.50	93.12	0.234	0.3	23	32	1.69	44	----	''	''
14.00	63.41	0.335	0.5	16	22	1.75	42	----	''	''
14.50	32.31	0.356	1.1	11	15	1.81	38	----	Silty SAND to Sandy SILT	110-120
15.00	23.39	0.554	2.4	9	13	1.87	----	2.99	Sandy SILT to Clayey SILT	120-130
15.50	29.62	0.689	2.3	12	16	1.93	----	3.82	''	''
16.00	27.80	0.811	2.9	14	18	2.00	----	3.57	Clayey SILT to Silty CLAY	130-140
16.50	27.12	1.204	4.4	18	23	2.07	----	3.48	Silty CLAY to CLAY	''
17.00	32.68	1.718	5.3	33	42	2.13	----	4.21	CLAY	''
17.50	69.53	2.085	3.0	28	35	2.20	----	9.12	Sandy SILT to Clayey SILT	''
18.00	140.96	1.313	0.9	28	35	2.27	45	----	SAND	120-130
18.50	141.58	1.006	0.7	28	35	2.33	45	----	''	''
19.00	151.59	1.074	0.7	30	37	2.39	45	----	''	''
19.50	153.38	0.637	0.4	31	37	2.45	45	----	''	''
20.00	184.16	0.954	0.5	37	44	2.52	46	----	''	''
20.50	195.06	0.998	0.5	39	46	2.58	46	----	''	''
21.00	198.09	1.056	0.5	40	46	2.64	46	----	''	''
21.50	179.59	0.828	0.5	36	41	2.70	45	----	''	''
22.00	205.14	1.046	0.5	41	46	2.77	46	----	''	''
22.50	234.17	0.700	0.3	47	52	2.83	46	----	''	''
23.00	267.08	0.899	0.3	53	59	2.89	47	----	''	''
23.50	272.85	0.895	0.3	55	60	2.95	47	----	''	''
24.00	280.10	0.768	0.3	56	61	3.02	47	----	''	''
24.50	289.84	0.708	0.2	58	62	3.08	47	----	''	''
25.00	312.27	0.692	0.2	62	66	3.14	47	----	''	''
25.50	306.25	0.562	0.2	61	65	3.20	47	----	''	''
26.00	236.14	0.963	0.4	47	49	3.27	46	----	''	''
26.50	205.47	0.886	0.4	41	43	3.33	45	----	''	''
27.00	172.00	0.822	0.5	34	35	3.39	44	----	''	''
27.50	204.26	1.045	0.5	41	42	3.45	45	----	''	''
28.00	231.01	0.660	0.3	46	47	3.52	45	----	''	''
28.50	229.99	1.378	0.6	46	46	3.58	45	----	''	''
29.00	248.36	1.110	0.4	50	50	3.64	46	----	''	''
29.50	280.16	1.183	0.4	56	56	3.70	46	----	''	''
30.00	325.93	2.160	0.7	65	65	3.77	46	----	''	''
30.50	313.34	2.302	0.7	63	63	3.83	46	----	''	''
31.00	302.31	1.846	0.6	60	60	3.89	46	----	''	''
31.50	278.48	1.557	0.6	56	56	3.95	46	----	''	''
32.00	199.31	1.188	0.6	40	40	4.02	44	----	''	''

John Sarmiento & Associates
Cone Penetration Testing Service

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01(EGO-14)

CPT NO.: CPT-13
DATE : 03-12-1999
Groundwater measured at 3.0 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	10.08	0.523	5.2	10	16	0.06	----	1.34	CLAY	''
1.00	8.45	0.610	7.2	8	14	0.12	----	1.68	''	''
1.50	9.19	0.476	5.2	9	15	0.18	----	1.21	''	110-120
2.00	9.01	0.559	6.2	9	14	0.24	----	1.19	''	120-130
2.50	7.89	0.661	8.4	8	13	0.30	----	1.55	''	''
3.00	6.55	0.570	8.7	7	10	0.36	----	1.27	''	110-120
3.50	7.23	0.394	5.5	7	12	0.42	----	1.40	''	''
4.00	8.16	0.549	6.7	8	13	0.48	----	1.58	''	''
4.50	8.11	0.561	6.9	8	13	0.53	----	1.57	''	''
5.00	4.97	0.404	8.1	5	8	0.59	----	0.94	Organic Material	100-110
5.50	4.16	0.351	8.4	4	7	0.64	----	0.77	''	''
6.00	2.97	0.281	9.5	3	5	0.69	----	0.53	''	90-100
6.50	2.86	0.207	7.2	3	5	0.74	----	0.50	''	''
7.00	2.34	0.169	7.2	2	4	0.79	----	0.39	''	''
7.50	9.57	0.136	1.4	5	8	0.83	----	1.22	Clayey SILT to Silty CLAY	''
8.00	7.30	0.155	2.1	5	8	0.88	----	0.91	Silty CLAY to CLAY	100-110
8.50	21.21	0.124	0.6	8	14	0.94	----	2.77	Sandy SILT to Clayey SILT	''
9.00	14.70	0.138	0.9	6	9	0.99	----	1.89	''	''
9.50	13.87	0.327	2.4	7	11	1.05	----	1.78	Clayey SILT to Silty CLAY	110-120
10.00	29.58	0.982	3.3	15	24	1.11	----	3.87	''	130-140
10.50	45.89	1.597	3.5	23	37	1.18	----	6.04	''	''
11.00	46.69	1.635	3.5	23	37	1.25	----	6.14	''	''
11.50	72.52	1.494	2.1	24	39	1.31	44	----	Silty SAND to Sandy SILT	''
12.00	12.11	0.767	6.3	12	19	1.38	----	1.52	CLAY	120-130
12.50	7.66	0.435	5.7	8	12	1.44	----	1.39	''	110-120
13.00	11.69	0.566	4.8	12	18	1.50	----	1.46	''	120-130
13.50	9.72	0.706	7.3	10	15	1.56	----	1.19	''	''
14.00	9.75	0.689	7.1	10	14	1.62	----	1.19	''	''
14.50	10.34	0.640	6.2	10	15	1.69	----	1.27	''	''
15.00	11.71	0.747	6.4	12	17	1.75	----	1.44	''	''
15.50	11.86	0.733	6.2	12	17	1.81	----	1.46	''	''
16.00	13.93	0.835	6.0	14	19	1.87	----	1.73	''	''
16.50	14.41	0.899	6.2	14	20	1.94	----	1.79	''	''
17.00	13.73	0.875	6.4	14	18	2.00	----	1.70	''	''
17.50	13.72	0.803	5.9	14	18	2.06	----	1.69	''	''
18.00	17.60	0.802	4.6	18	23	2.12	----	2.21	''	''
18.50	27.32	0.998	3.7	14	18	2.19	----	3.50	Clayey SILT to Silty CLAY	130-140
19.00	118.74	0.482	0.4	30	38	2.25	44	----	SAND to Silty SAND	120-130
19.50	111.08	0.442	0.4	28	35	2.32	44	----	''	''
20.00	108.64	0.406	0.4	27	34	2.38	44	----	''	''
20.50	113.70	0.524	0.5	28	35	2.44	44	----	''	''
21.00	106.07	1.133	1.1	27	32	2.50	44	----	''	''
21.50	97.40	0.517	0.5	24	29	2.57	43	----	''	''
22.00	107.15	0.520	0.5	27	32	2.63	43	----	''	''
22.50	104.78	0.674	0.6	26	31	2.69	43	----	''	''
23.00	130.39	0.395	0.3	26	30	2.75	44	----	SAND	''
23.50	140.26	0.540	0.4	28	32	2.82	44	----	''	''
24.00	151.41	0.630	0.4	30	34	2.88	44	----	''	''
24.50	141.65	0.561	0.4	28	32	2.94	44	----	''	''
25.00	149.33	0.711	0.5	30	33	3.00	44	----	''	''
25.50	177.11	0.723	0.4	35	39	3.07	45	----	''	''
26.00	217.43	0.789	0.4	43	47	3.13	46	----	''	''

DEPTH = Sampling interval (2 inches)
Qc = Tip bearing resistance
Fs = Sleeve friction resistance
Rf = Tip/Sleeve ratio
SPT = Equivalent Standard Penetration Test*
TotStr = Total Stress using est. density**
Phi = Soil friction angle*
Su = Undrained Soil Strength* (Nk=10 for Qc<=9 tsf)
(Nk=15 for Qc>9 tsf)

References: * Robertson and Campanella, 1988
** Olsen, 1989

John Sarmiento & Associates
Cone Penetration Testing Service

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01(EGO-14)

CPT NO.: CPT-14
DATE : 03-12-1999
Groundwater estimated at 3.0 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	10.05	0.486	4.8	10	16	0.06	----	1.34	CLAY	110-120
1.00	12.37	0.330	2.7	6	10	0.12	----	1.64	Clayey SILT to Silty CLAY	''
1.50	96.29	0.562	0.6	24	39	0.18	>48	----	SAND to Silty SAND	120-130
2.00	74.85	0.623	0.8	19	30	0.24	>48	----	''	''
2.50	65.75	0.406	0.6	16	26	0.30	48	----	''	''
3.00	50.29	0.097	0.2	17	27	0.36	46	----	Silty SAND to Sandy SILT	''
3.50	55.74	0.168	0.3	19	30	0.42	46	----	''	''
4.00	55.43	0.159	0.3	18	30	0.49	46	----	''	''
4.50	60.87	0.161	0.3	15	24	0.55	46	----	SAND to Silty SAND	''
5.00	66.11	0.154	0.2	17	26	0.61	46	----	''	''
5.50	74.66	0.198	0.3	19	30	0.67	46	----	''	''
6.00	75.84	0.182	0.2	19	30	0.74	46	----	''	''
6.50	67.46	0.136	0.2	17	27	0.80	45	----	''	''
7.00	70.09	0.167	0.2	18	28	0.86	45	----	''	''
7.50	66.11	0.171	0.3	17	26	0.92	45	----	''	''
8.00	65.68	0.206	0.3	16	26	0.99	45	----	''	''
8.50	64.29	0.221	0.3	16	26	1.05	44	----	''	''
9.00	64.52	0.337	0.5	16	26	1.11	44	----	''	''
9.50	61.66	0.240	0.4	15	25	1.17	44	----	''	''
10.00	70.33	0.242	0.3	18	28	1.24	44	----	''	''
10.50	74.00	0.292	0.4	19	29	1.30	44	----	''	''
11.00	79.92	0.303	0.4	20	31	1.36	44	----	''	''
11.50	86.52	0.349	0.4	22	33	1.42	44	----	''	''
12.00	92.20	0.372	0.4	23	34	1.49	45	----	''	''
12.50	100.51	0.403	0.4	25	37	1.55	45	----	''	''
13.00	96.35	0.271	0.3	24	35	1.61	44	----	''	''
13.50	96.96	0.302	0.3	24	34	1.67	44	----	''	''
14.00	91.42	0.314	0.3	23	32	1.74	44	----	''	''
14.50	92.01	0.302	0.3	23	31	1.80	44	----	''	''
15.00	91.77	0.297	0.3	23	31	1.86	44	----	''	''
15.50	109.61	0.316	0.3	27	37	1.92	44	----	''	''
16.00	111.69	0.276	0.2	28	37	1.99	44	----	''	''
16.50	100.93	0.292	0.3	25	33	2.05	44	----	''	''
17.00	106.44	0.348	0.3	27	34	2.11	44	----	''	''
17.50	108.27	0.344	0.3	27	34	2.17	44	----	''	''
18.00	129.71	0.414	0.3	26	33	2.24	45	----	SAND	''
18.50	153.98	0.433	0.3	31	38	2.30	45	----	''	''
19.00	132.95	0.388	0.3	27	33	2.36	44	----	''	''
19.50	174.81	0.403	0.2	35	42	2.42	46	----	''	''
20.00	203.20	0.584	0.3	41	49	2.49	46	----	''	''
20.50	198.46	0.581	0.3	40	47	2.55	46	----	''	''
21.00	193.14	0.516	0.3	39	45	2.61	46	----	''	''
21.50	192.77	0.772	0.4	39	44	2.67	46	----	''	''
22.00	199.80	0.710	0.4	40	46	2.74	46	----	''	''
22.50	188.54	0.941	0.5	38	43	2.80	45	----	''	''
23.00	198.74	1.085	0.5	40	44	2.86	46	----	''	''

DEPTH = Sampling interval (2 inches)
Qc = Tip bearing resistance
Fs = Sleeve friction resistance
Rf = Tip/Sleeve ratio
SPT = Equivalent Standard Penetration Test*
TotStr = Total Stress using est. density**
Phi = Soil friction angle*
Su = Undrained Soil Strength* (Nk=10 for Qc<=9 tsf)
(Nk=15 for Qc>9 tsf)

References: * Robertson and Campanella, 1988
** Olsen, 1989

John Sarmiento & Associates
Cone Penetration Testing Service

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01(EGO-14)

CPT NO.: CPT-15
DATE : 03-12-1999
Groundwater measured at 2.3 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	20.24	0.059	0.3	8	13	0.06	----	2.69	Sandy SILT to Clayey SILT	100-110
1.00	142.86	0.490	0.3	29	46	0.12	>48	----	SAND	120-130
1.50	136.09	0.547	0.4	27	44	0.18	>48	----	''	''
2.00	104.19	0.308	0.3	26	42	0.24	>48	----	SAND to Silty SAND	''
2.50	77.15	0.133	0.2	19	31	0.31	>48	----	''	''
3.00	64.19	0.128	0.2	16	26	0.37	48	----	''	''
3.50	59.05	0.162	0.3	15	24	0.43	47	----	''	''
4.00	54.77	0.162	0.3	18	29	0.49	46	----	Silty SAND to Sandy SILT	''
4.50	56.25	0.162	0.3	19	30	0.56	46	----	''	''
5.00	56.99	0.172	0.3	19	30	0.62	46	----	''	''
5.50	57.95	0.176	0.3	19	31	0.68	46	----	''	''
6.00	55.01	0.132	0.2	18	29	0.74	45	----	''	''
6.50	57.17	0.162	0.3	19	30	0.81	45	----	''	''
7.00	47.38	0.136	0.3	16	25	0.87	44	----	''	110-120
7.50	37.24	0.109	0.3	12	20	0.92	43	----	''	''
8.00	45.49	0.064	0.1	15	24	0.98	43	----	''	''
8.50	61.49	0.117	0.2	15	25	1.04	44	----	SAND to Silty SAND	120-130
9.00	78.90	0.108	0.1	20	32	1.11	45	----	''	''
9.50	70.65	0.086	0.1	18	28	1.17	45	----	''	''
10.00	84.89	0.135	0.2	21	34	1.23	45	----	''	''
10.50	71.46	0.113	0.2	18	29	1.29	44	----	''	''
11.00	61.92	0.105	0.2	15	25	1.36	44	----	''	''
11.50	62.92	0.146	0.2	16	25	1.42	43	----	''	''
12.00	58.81	0.114	0.2	20	30	1.48	43	----	Silty SAND to Sandy SILT	''
12.50	69.26	0.138	0.2	17	26	1.54	44	----	SAND to Silty SAND	''
13.00	91.55	0.213	0.2	23	34	1.61	44	----	''	''
13.50	116.04	0.307	0.3	29	42	1.67	45	----	''	''
14.00	131.71	0.359	0.3	26	37	1.73	46	----	SAND	''
14.50	129.95	0.375	0.3	26	36	1.79	46	----	''	''
15.00	130.00	0.388	0.3	26	36	1.86	46	----	''	''
15.50	143.59	0.411	0.3	29	39	1.92	46	----	''	''
16.00	137.97	0.341	0.2	28	37	1.98	46	----	''	''
16.50	115.80	0.262	0.2	29	38	2.04	45	----	SAND to Silty SAND	''
17.00	94.86	0.219	0.2	24	31	2.11	44	----	''	''
17.50	106.22	0.369	0.3	27	34	2.17	44	----	''	''
18.00	108.12	0.333	0.3	27	35	2.23	44	----	''	''
18.50	99.32	0.208	0.2	25	31	2.29	44	----	''	''
19.00	118.07	0.336	0.3	30	37	2.36	44	----	''	''
19.50	132.55	0.194	0.1	27	33	2.42	45	----	SAND	''
20.00	116.60	0.346	0.3	29	36	2.48	44	----	SAND to Silty SAND	''
20.50	129.50	0.402	0.3	26	31	2.54	44	----	SAND	''
21.00	143.43	0.367	0.3	29	34	2.61	45	----	''	''
21.50	147.34	0.370	0.3	29	35	2.67	45	----	''	''
22.00	140.62	0.373	0.3	28	33	2.73	44	----	''	''
22.50	130.23	0.414	0.3	26	30	2.79	44	----	''	''
23.00	120.15	0.362	0.3	30	34	2.86	44	----	SAND to Silty SAND	''
23.50	108.69	0.352	0.3	27	30	2.92	43	----	''	''
24.00	121.61	0.515	0.4	30	34	2.98	43	----	''	''
24.50	156.68	1.686	1.1	31	34	3.04	44	----	SAND	''
25.00	206.15	0.678	0.3	41	45	3.11	46	----	''	''
25.50	180.61	2.279	1.3	36	39	3.17	45	----	''	130-140
26.00	133.36	4.154	3.1	53	57	3.24	----	17.57	Sandy SILT to Clayey SILT	''
26.50	72.07	2.685	3.7	36	38	3.31	----	9.39	Clayey SILT to Silty CLAY	''
27.00	56.61	2.290	4.0	28	30	3.37	----	7.32	''	''
27.50	156.32	2.007	1.3	31	32	3.44	44	----	SAND	''
28.00	168.66	2.722	1.6	42	43	3.51	44	----	SAND to Silty SAND	''
28.50	212.71	1.306	0.6	43	43	3.57	45	----	SAND	120-130
29.00	234.95	1.075	0.5	47	48	3.63	45	----	''	''
29.50	251.75	1.374	0.5	50	51	3.70	46	----	''	''
30.00	247.29	1.806	0.7	49	49	3.76	46	----	''	''
30.50	106.46	1.616	1.5	27	27	3.82	41	----	SAND to Silty SAND	130-140
31.00	50.49	1.746	3.5	25	25	3.89	----	6.47	Clayey SILT to Silty CLAY	''
31.50	47.63	1.783	3.7	24	24	3.96	----	6.09	''	''

LOCATION: CONTRA COSTA COUNTY   DATE : 03-12-1999
PROJ. NO.: 4603.002.01(EGO-14)   Groundwater measured at 2.3 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
32.00	84.05	1.763	2.1	28	28	4.03	40	----	Silty SAND to Sandy SILT	''
32.50	95.66	3.781	4.0	48	48	4.09	----	12.48	Clayey SILT to Silty CLAY	''
33.00	82.53	2.952	3.6	33	33	4.16	----	10.73	Sandy SILT to Clayey SILT	''
33.50	114.97	2.966	2.6	38	38	4.23	41	----	Silty SAND to Sandy SILT	''
34.00	80.33	2.063	2.6	32	32	4.30	----	10.42	Sandy SILT to Clayey SILT	''

DEPTH = Sampling interval (2 inches)
Qc = Tip bearing resistance   TotStr = Total Stress using est. density**
Fs = Sleeve friction resistance   Phi = Soil friction angle*
Rf = Tip/Sleeve ratio   Su = Undrained Soil Strength* (Nk=10 for Qc<=9 tsf)
SPT = Equivalent Standard Penetration Test*   (Nk=15 for Qc>9 tsf)

References: * Robertson and Campanella, 1988
** Olsen, 1989

John Sarmiento & Associates
Cone Penetration Testing Service

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01(EGO-14)

CPT NO.: CPT-16
DATE : 03-12-1999
Groundwater estimated at 3.0 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	401.73	2.968	0.7	80	129	0.06	>48	----	SAND	120-130
1.00	170.67	1.602	0.9	34	55	0.12	>48	----	''	''
1.50	35.32	0.889	2.5	14	23	0.19	----	4.70	Sandy SILT to Clayey SILT	130-140
2.00	11.68	0.418	3.6	8	12	0.25	----	1.54	Silty CLAY to CLAY	110-120
2.50	9.46	0.269	2.8	6	10	0.30	----	1.24	''	''
3.00	7.16	0.183	2.6	5	8	0.36	----	0.93	''	100-110
3.50	5.81	0.122	2.1	4	6	0.40	----	0.75	''	90-100
4.00	4.40	0.062	1.4	2	4	0.45	----	0.84	Sensitive Fine Grained	85-90
4.50	4.55	0.097	2.1	5	7	0.50	----	0.86	CLAY	90-100
5.00	3.61	0.055	1.5	2	3	0.54	----	0.67	Sensitive Fine Grained	85-90
5.50	3.38	0.037	1.1	2	3	0.59	----	0.62	''	''
6.00	4.02	0.085	2.1	4	6	0.63	----	0.74	CLAY	90-100
6.50	3.75	0.064	1.7	2	3	0.68	----	0.68	Sensitive Fine Grained	85-90
7.00	2.59	0.036	1.4	1	2	0.72	----	0.45	''	''
7.50	3.02	0.036	1.2	2	2	0.76	----	0.53	''	''
8.00	2.22	0.023	1.0	1	2	0.81	----	0.36	''	''
8.50	7.13	0.101	1.4	4	6	0.85	----	0.89	Clayey SILT to Silty CLAY	90-100
9.00	10.80	0.194	1.8	5	9	0.90	----	1.38	''	100-110
9.50	18.06	0.356	2.0	7	12	0.96	----	2.34	Sandy SILT to Clayey SILT	120-130
10.00	27.33	0.674	2.5	11	17	1.02	----	3.58	''	''
10.50	13.74	0.198	1.4	5	9	1.08	----	1.76	''	100-110
11.00	15.10	0.433	2.9	8	12	1.13	----	1.94	Clayey SILT to Silty CLAY	120-130
11.50	35.39	0.803	2.3	14	23	1.20	----	4.64	Sandy SILT to Clayey SILT	130-140
12.00	41.13	0.924	2.2	16	26	1.27	----	5.40	''	''
12.50	41.25	0.681	1.7	14	22	1.33	42	----	Silty SAND to Sandy SILT	120-130
13.00	9.62	0.212	2.2	5	8	1.39	----	1.19	Clayey SILT to Silty CLAY	100-110
13.50	9.74	0.251	2.6	6	10	1.44	----	1.20	Silty CLAY to CLAY	''
14.00	9.87	0.523	5.3	10	16	1.50	----	1.22	CLAY	120-130
14.50	23.91	0.483	2.0	10	15	1.56	----	3.08	Sandy SILT to Clayey SILT	''
15.00	47.60	0.181	0.4	16	25	1.62	42	----	Silty SAND to Sandy SILT	110-120
15.50	69.66	0.290	0.4	17	26	1.68	44	----	SAND to Silty SAND	120-130
16.00	67.58	0.267	0.4	17	25	1.75	43	----	''	''
16.50	69.23	0.300	0.4	17	25	1.81	43	----	''	''
17.00	88.41	0.367	0.4	22	31	1.87	44	----	''	''
17.50	79.18	0.382	0.5	20	28	1.93	44	----	''	''
18.00	90.61	0.325	0.4	23	31	2.00	44	----	''	''
18.50	92.56	0.350	0.4	23	32	2.06	44	----	''	''
19.00	99.04	0.275	0.3	25	33	2.12	44	----	''	''
19.50	108.99	0.383	0.4	27	36	2.18	44	----	''	''
20.00	96.10	0.449	0.5	24	32	2.25	44	----	''	''
20.50	88.96	1.111	1.2	22	29	2.31	43	----	''	''
21.00	87.92	0.293	0.3	22	28	2.37	43	----	''	''
21.50	91.58	0.243	0.3	23	29	2.43	43	----	''	''
22.00	89.39	0.250	0.3	22	28	2.50	43	----	''	''
22.50	85.84	0.154	0.2	21	27	2.56	43	----	''	''
23.00	99.10	0.206	0.2	25	30	2.62	43	----	''	''
23.50	111.32	0.336	0.3	28	34	2.68	44	----	''	''
24.00	125.30	0.425	0.3	31	37	2.75	44	----	''	''
24.50	145.15	0.491	0.3	29	34	2.81	45	----	SAND	''
25.00	165.43	0.633	0.4	33	38	2.87	45	----	''	''
25.50	155.11	0.840	0.5	31	36	2.93	45	----	''	''
26.00	34.47	1.245	3.6	17	20	3.00	----	4.40	Clayey SILT to Silty CLAY	130-140
26.50	29.71	1.168	3.9	20	22	3.07	----	3.76	Silty CLAY to CLAY	''
27.00	76.25	1.595	2.1	25	28	3.13	41	----	Silty SAND to Sandy SILT	''
27.50	184.06	1.054	0.6	37	40	3.20	45	----	SAND	120-130
28.00	157.75	1.671	1.1	32	34	3.26	44	----	''	''
28.50	104.65	2.213	2.1	35	37	3.33	42	----	Silty SAND to Sandy SILT	130-140
29.00	179.01	0.771	0.4	36	38	3.39	45	----	SAND	120-130
29.50	176.49	0.784	0.4	35	37	3.45	44	----	''	''
30.00	173.98	2.115	1.2	35	36	3.52	44	----	''	130-140
30.50	208.13	1.088	0.5	42	43	3.58	45	----	''	120-130
31.00	209.94	0.970	0.5	42	43	3.64	45	----	''	''
31.50	162.09	0.583	0.4	32	33	3.70	44	----	''	''

John Sarmiento & Associates
Cone Penetration Testing Service

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01(EGO-14)

CPT NO.: CPT-16
DATE : 03-12-1999
Groundwater estimated at 3.0 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
32.00	115.73	0.399	0.3	29	29	3.77	42	----	SAND to Silty SAND	''
32.50	84.74	0.543	0.6	21	21	3.83	41	----	''	''
33.00	28.92	0.826	2.9	14	14	3.89	----	3.60	Clayey SILT to Silty CLAY	130-140
33.50	29.47	0.622	2.1	12	12	3.96	----	3.67	Sandy SILT to Clayey SILT	120-130
34.00	28.19	0.858	3.0	14	14	4.02	----	3.49	Clayey SILT to Silty CLAY	130-140
34.50	74.31	1.930	2.6	30	30	4.09	----	9.63	Sandy SILT to Clayey SILT	''
35.00	138.45	2.200	1.6	35	35	4.15	43	----	SAND to Silty SAND	''
35.50	51.33	1.808	3.5	26	26	4.22	----	6.56	Clayey SILT to Silty CLAY	''
36.00	38.94	0.813	2.1	16	16	4.29	----	4.91	Sandy SILT to Clayey SILT	''
36.50	24.82	0.566	2.3	10	10	4.35	----	3.02	''	120-130
37.00	27.02	0.724	2.7	14	13	4.42	----	3.31	Clayey SILT to Silty CLAY	130-140
37.50	25.31	0.683	2.7	13	13	4.48	----	3.08	''	120-130
38.00	19.24	0.492	2.6	10	10	4.54	----	2.26	''	''
38.50	16.00	0.347	2.2	8	8	4.60	----	1.83	''	110-120
39.00	15.71	0.296	1.9	8	8	4.66	----	1.78	''	''
39.50	18.53	0.317	1.7	7	7	4.71	----	2.16	Sandy SILT to Clayey SILT	''
40.00	18.28	0.351	1.9	7	7	4.78	----	2.12	''	120-130
40.50	27.15	0.680	2.5	11	11	4.84	----	3.30	''	''
41.00	59.94	1.282	2.1	20	20	4.91	37	----	Silty SAND to Sandy SILT	130-140
41.50	193.16	0.903	0.5	39	38	4.97	43	----	SAND	120-130
42.00	233.62	0.984	0.4	47	45	5.03	44	----	''	''
42.50	240.95	1.116	0.5	48	46	5.09	44	----	''	''

DEPTH = Sampling interval (2 inches)
Qc = Tip bearing resistance
Fs = Sleeve friction resistance
Rf = Tip/Sleeve ratio
SPT = Equivalent Standard Penetration Test*

TotStr = Total Stress using est. density**
Phi = Soil friction angle*
Su = Undrained Soil Strength* (Nk=10 for Qc<=9 tsf)
(Nk=15 for Qc>9 tsf)

References: * Robertson and Campanella, 1988
** Olsen, 1989

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01(EGO-14)

CPT NO.: CPT-17
DATE : 03-12-1999
Groundwater estimated at 3.0 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	26.74	1.069	4.0	18	29	0.06	----	3.56	Silty CLAY to CLAY	130-140
1.00	17.83	0.612	3.4	12	19	0.12	----	2.37	''	120-130
1.50	10.07	0.366	3.6	10	16	0.18	----	1.33	CLAY	110-120
2.00	6.11	0.239	3.9	6	10	0.24	----	1.20	''	100-110
2.50	6.72	0.290	4.3	7	11	0.29	----	1.32	''	''
3.00	11.43	0.290	2.5	6	9	0.35	----	1.50	Clayey SILT to Silty CLAY	110-120
3.50	9.52	0.221	2.3	5	8	0.40	----	1.24	''	100-110
4.00	19.66	0.049	0.3	8	13	0.45	----	2.59	Sandy SILT to Clayey SILT	''
4.50	27.78	0.030	0.1	9	15	0.51	43	----	Silty SAND to Sandy SILT	110-120
5.00	52.03	0.138	0.3	17	28	0.57	45	----	''	120-130
5.50	77.62	0.225	0.3	19	31	0.63	47	----	SAND to Silty SAND	''
6.00	51.48	0.132	0.3	17	27	0.69	45	----	Silty SAND to Sandy SILT	''
6.50	36.14	0.325	0.9	12	19	0.75	43	----	''	110-120
7.00	39.14	0.142	0.4	13	21	0.81	43	----	''	''
7.50	40.73	0.189	0.5	14	22	0.86	43	----	''	''
8.00	44.03	0.238	0.5	15	23	0.92	43	----	''	''
8.50	42.44	0.026	0.1	14	23	0.98	43	----	''	''
9.00	38.71	0.050	0.1	13	21	1.04	42	----	''	''
9.50	32.54	0.028	0.1	11	17	1.09	41	----	''	''
10.00	39.75	0.051	0.1	13	21	1.15	42	----	''	''
10.50	50.86	0.165	0.3	17	27	1.21	43	----	''	120-130
11.00	50.44	1.344	2.7	20	32	1.28	----	6.64	Sandy SILT to Clayey SILT	130-140
11.50	56.11	2.690	4.8	37	60	1.34	----	7.39	Silty CLAY to CLAY	''
12.00	56.61	2.656	4.7	38	59	1.41	----	7.45	''	''
12.50	63.45	1.236	1.9	21	33	1.48	43	----	Silty SAND to Sandy SILT	''
13.00	69.74	0.465	0.7	17	26	1.54	44	----	SAND to Silty SAND	120-130
13.50	71.39	0.166	0.2	18	26	1.60	43	----	''	''
14.00	63.21	0.191	0.3	16	23	1.67	43	----	''	''
14.50	69.50	0.270	0.4	17	25	1.73	43	----	''	''
15.00	81.34	0.354	0.4	20	28	1.79	44	----	''	''
15.50	87.57	0.320	0.4	22	30	1.85	44	----	''	''
16.00	98.57	0.460	0.5	25	33	1.92	44	----	''	''
16.50	129.28	0.745	0.6	26	35	1.98	45	----	SAND	''
17.00	124.91	1.011	0.8	31	41	2.04	45	----	SAND to Silty SAND	''
17.50	107.62	1.305	1.2	27	35	2.10	44	----	''	''
18.00	128.37	0.498	0.4	26	33	2.17	45	----	SAND	''
18.50	136.38	0.620	0.5	27	35	2.23	45	----	''	''
19.00	164.23	0.782	0.5	33	41	2.29	46	----	''	''
19.50	161.59	0.763	0.5	32	40	2.35	46	----	''	''
20.00	174.18	0.886	0.5	35	43	2.42	46	----	''	''
20.50	86.47	3.398	3.9	43	52	2.48	----	11.36	Clayey SILT to Silty CLAY	130-140
21.00	90.20	1.890	2.1	30	36	2.55	43	----	Silty SAND to Sandy SILT	''
21.50	105.84	1.018	1.0	26	31	2.62	43	----	SAND to Silty SAND	120-130
22.00	133.50	1.098	0.8	27	31	2.68	44	----	SAND	''
22.50	146.09	1.072	0.7	29	34	2.74	44	----	''	''
23.00	155.80	0.981	0.6	31	35	2.80	45	----	''	''
23.50	142.67	1.167	0.8	29	32	2.87	44	----	''	''
24.00	79.15	2.070	2.6	32	35	2.93	----	10.36	Sandy SILT to Clayey SILT	130-140
24.50	128.18	1.402	1.1	32	35	3.00	44	----	SAND to Silty SAND	120-130
25.00	222.07	1.684	0.8	44	48	3.06	46	----	SAND	''
25.50	214.19	1.569	0.7	43	46	3.12	46	----	''	''
26.00	176.43	1.043	0.6	35	38	3.19	45	----	''	''
26.50	112.98	1.331	1.2	28	30	3.25	43	----	SAND to Silty SAND	''
27.00	34.50	0.875	2.5	14	14	3.31	----	4.38	Sandy SILT to Clayey SILT	130-140
27.50	32.54	1.190	3.7	16	17	3.38	----	4.11	Clayey SILT to Silty CLAY	''
28.00	30.17	1.235	4.1	20	21	3.45	----	3.79	Silty CLAY to CLAY	''
28.50	27.96	1.145	4.1	19	19	3.52	----	3.49	''	''
29.00	27.72	0.984	3.6	14	14	3.58	----	3.46	Clayey SILT to Silty CLAY	''
29.50	28.21	1.084	3.8	14	14	3.65	----	3.52	''	''
30.00	27.72	1.214	4.4	18	18	3.72	----	3.45	Silty CLAY to CLAY	''
30.50	26.49	1.122	4.2	18	18	3.79	----	3.28	''	''
31.00	28.76	1.029	3.6	14	14	3.85	----	3.58	Clayey SILT to Silty CLAY	''
31.50	31.44	1.168	3.7	16	16	3.92	----	3.93	''	''

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01(EGO-14)

CPT NO.: CPT-17
DATE : 03-12-1999
Groundwater estimated at 3.0 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
32.00	27.53	0.914	3.3	14	14	3.99	----	3.40	''	''
32.50	40.48	1.442	3.6	20	20	4.06	----	5.13	''	''
33.00	43.22	1.726	4.0	22	22	4.12	----	5.49	''	''
33.50	39.02	1.095	2.8	16	16	4.19	----	4.92	Sandy SILT to Clayey SILT	''
34.00	40.01	1.102	2.8	16	16	4.26	----	5.05	''	''
34.50	40.25	1.415	3.5	20	20	4.33	----	5.08	Clayey SILT to Silty CLAY	''
35.00	35.10	1.183	3.4	18	17	4.39	----	4.39	''	''
35.50	34.19	1.076	3.1	17	17	4.46	----	4.26	''	''
36.00	36.26	1.179	3.3	18	18	4.53	----	4.53	''	''
36.50	37.79	1.193	3.2	19	19	4.60	----	4.73	''	''
37.00	53.43	1.776	3.3	27	26	4.66	----	6.81	''	''
37.50	40.72	1.475	3.6	20	20	4.73	----	5.11	''	''
38.00	39.38	1.214	3.1	20	19	4.80	----	4.93	''	''
38.50	28.45	0.717	2.5	11	11	4.87	----	3.47	Sandy SILT to Clayey SILT	''
39.00	31.87	0.626	2.0	13	12	4.93	----	3.92	''	120-130
39.50	28.58	0.462	1.6	11	11	4.99	----	3.48	''	''
40.00	25.21	0.419	1.7	10	9	5.05	----	3.02	''	''
40.50	24.79	0.447	1.8	10	9	5.12	----	2.96	''	''
41.00	24.48	0.474	1.9	10	9	5.18	----	2.92	''	''
41.50	21.91	0.411	1.9	9	8	5.24	----	2.57	''	''
42.00	21.86	0.444	2.0	9	8	5.30	----	2.56	''	''
42.50	26.62	0.676	2.5	11	9	5.37	----	3.19	''	''
43.00	26.68	0.609	2.3	11	9	5.43	----	3.20	''	''
43.50	27.41	0.840	3.1	14	12	5.50	----	3.29	Clayey SILT to Silty CLAY	130-140
44.00	28.33	0.911	3.2	14	12	5.56	----	3.41	''	''
44.50	27.29	0.848	3.1	14	11	5.63	----	3.26	''	''
45.00	27.53	0.627	2.3	11	9	5.70	----	3.29	Sandy SILT to Clayey SILT	120-130
45.50	27.72	0.595	2.1	11	9	5.76	----	3.31	''	''
46.00	31.63	0.718	2.3	13	10	5.82	----	3.83	''	130-140
46.50	29.79	0.662	2.2	12	10	5.88	----	3.58	''	120-130
47.00	84.83	2.629	3.1	34	27	5.95	----	10.91	''	130-140
47.50	39.81	1.319	3.3	20	16	6.02	----	4.91	Clayey SILT to Silty CLAY	''
48.00	27.96	0.502	1.8	11	9	6.08	----	3.32	Sandy SILT to Clayey SILT	120-130
48.50	27.60	0.523	1.9	11	9	6.15	----	3.27	''	''
49.00	28.82	0.377	1.3	12	9	6.21	----	3.43	''	''
49.50	25.40	0.362	1.4	10	8	6.27	----	2.97	''	''
50.00	24.73	0.359	1.5	10	8	6.33	----	2.88	''	''
50.50	27.35	0.788	2.9	14	11	6.39	----	3.22	Clayey SILT to Silty CLAY	130-140
51.00	25.27	0.682	2.7	13	10	6.46	----	2.94	''	120-130
51.50	28.82	0.714	2.5	12	9	6.52	----	3.41	Sandy SILT to Clayey SILT	130-140
52.00	28.82	1.067	3.7	14	11	6.59	----	3.40	Clayey SILT to Silty CLAY	''

DEPTH = Sampling interval (2 inches)
Qc = Tip bearing resistance
Fs = Sleeve friction resistance
Rf = Tip/Sleeve ratio
SPT = Equivalent Standard Penetration Test*
TotStr = Total Stress using est. density**
Phi = Soil friction angle*
Su = Undrained Soil Strength* (Nk=10 for Qc<=9 tsf) (Nk=15 for Qc>9 tsf)

References: * Robertson and Campanella, 1988
** Olsen, 1989

John Sarmiento & Associates
Cone Penetration Testing Service

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01(EGO-14)

CPT NO.: CPT-18
DATE : 03-12-1999
Groundwater measured at 2.2 feet

DEPTH (feet)	Qc (tsf)	Fs (tsf)	Rf (%)	SPT (N)	SPT (N')	TotHzStr (ksf)	PHI (deg.)	SU (ksf)	SOIL BEHAVIOR TYPE	DENSITY RANGE (pcf)
0.50	9.73	0.519	5.3	10	16	0.06	----	1.29	CLAY	120-130
1.00	16.96	1.005	5.9	17	27	0.12	----	2.25	''	130-140
1.50	11.39	0.670	5.9	11	18	0.18	----	1.51	''	120-130
2.00	8.42	0.484	5.7	8	13	0.24	----	1.66	''	110-120
2.50	7.32	0.468	6.4	7	12	0.30	----	1.43	''	''
3.00	3.81	0.145	3.8	4	6	0.35	----	0.73	''	90-100
3.50	1.53	0.065	4.2	2	2	0.39	----	0.27	''	85-90
4.00	1.60	0.046	2.9	2	3	0.44	----	0.28	''	''
4.50	1.29	0.019	1.5	1	1	0.48	----	0.21	Sensitive Fine Grained	80-85
5.00	5.83	0.248	4.3	6	9	0.53	----	1.11	CLAY	100-110
5.50	22.87	0.620	2.7	11	18	0.59	----	3.01	Clayey SILT to Silty CLAY	120-130
6.00	27.27	0.371	1.4	11	17	0.65	----	3.59	Sandy SILT to Clayey SILT	''
6.50	33.01	0.287	0.9	11	18	0.71	43	----	Silty SAND to Sandy SILT	110-120
7.00	35.09	0.384	1.1	12	19	0.77	43	----	''	''
7.50	23.42	0.424	1.8	9	15	0.83	----	3.07	Sandy SILT to Clayey SILT	120-130
8.00	32.40	0.934	2.9	16	26	0.89	----	4.26	Clayey SILT to Silty CLAY	130-140
8.50	32.71	0.835	2.6	13	21	0.96	----	4.30	Sandy SILT to Clayey SILT	''
9.00	26.54	0.734	2.8	13	21	1.03	----	3.47	Clayey SILT to Silty CLAY	''
9.50	21.23	0.574	2.7	11	17	1.09	----	2.76	''	120-130
10.00	23.79	0.193	0.8	10	15	1.15	----	3.09	Sandy SILT to Clayey SILT	100-110
10.50	24.34	0.134	0.6	8	13	1.21	39	----	Silty SAND to Sandy SILT	''
11.00	21.34	0.168	0.8	9	14	1.26	----	2.76	Sandy SILT to Clayey SILT	''
11.50	33.01	0.154	0.5	11	18	1.32	41	----	Silty SAND to Sandy SILT	110-120
12.00	55.06	0.249	0.5	18	29	1.38	43	----	''	120-130
12.50	79.99	0.261	0.3	20	32	1.44	45	----	SAND to Silty SAND	''
13.00	54.15	0.123	0.2	18	29	1.51	43	----	Silty SAND to Sandy SILT	''
13.50	41.20	0.257	0.6	14	21	1.56	41	----	''	110-120
14.00	63.55	0.200	0.3	16	24	1.62	43	----	SAND to Silty SAND	120-130
14.50	80.11	0.321	0.4	20	30	1.69	44	----	''	''
15.00	91.41	0.388	0.4	23	33	1.75	44	----	''	''
15.50	100.14	0.387	0.4	25	36	1.81	45	----	''	''
16.00	95.50	0.247	0.3	24	33	1.87	44	----	''	''
16.50	104.49	0.299	0.3	26	36	1.94	45	----	''	''
17.00	96.00	0.278	0.3	24	33	2.00	44	----	''	''
17.50	124.28	0.357	0.3	31	42	2.06	45	----	''	''
18.00	105.27	0.536	0.5	26	35	2.12	44	----	''	''
18.50	126.90	0.636	0.5	32	42	2.19	45	----	''	''
19.00	73.58	2.403	3.3	29	38	2.25	----	9.66	Sandy SILT to Clayey SILT	130-140
19.50	152.25	2.426	1.6	38	49	2.32	46	----	SAND to Silty SAND	''
20.00	137.97	1.221	0.9	28	35	2.39	45	----	SAND	120-130
20.50	84.58	2.504	3.0	34	42	2.45	----	11.11	Sandy SILT to Clayey SILT	130-140
21.00	103.51	1.702	1.6	35	42	2.52	44	----	Silty SAND to Sandy SILT	''
21.50	148.47	0.830	0.6	30	36	2.58	45	----	SAND	120-130
22.00	171.08	0.989	0.6	34	41	2.64	45	----	''	''
22.50	155.86	0.539	0.3	31	37	2.71	45	----	''	''
23.00	145.00	0.594	0.4	29	34	2.77	44	----	''	''
23.50	164.51	0.852	0.5	33	38	2.83	45	----	''	''
24.00	167.93	0.868	0.5	34	38	2.89	45	----	''	''
24.50	94.46	2.207	2.3	31	36	2.96	42	----	Silty SAND to Sandy SILT	130-140
25.00	57.13	2.180	3.8	29	32	3.03	----	7.42	Clayey SILT to Silty CLAY	''
25.50	113.96	4.113	3.6	46	50	3.09	----	14.99	Sandy SILT to Clayey SILT	''
26.00	54.57	1.399	2.6	22	24	3.16	----	7.07	''	''
26.50	26.66	0.901	3.4	13	14	3.23	----	3.34	Clayey SILT to Silty CLAY	''
27.00	37.16	1.329	3.6	19	20	3.30	----	4.73	''	''
27.50	47.13	1.595	3.4	24	25	3.36	----	6.06	''	''
28.00	42.47	1.469	3.5	21	22	3.43	----	5.43	''	''
28.50	44.79	1.538	3.4	22	23	3.50	----	5.74	''	''
29.00	34.65	1.241	3.6	17	18	3.57	----	4.38	''	''
29.50	33.31	1.350	4.1	22	23	3.63	----	4.20	Silty CLAY to CLAY	''
30.00	34.04	1.480	4.3	23	23	3.70	----	4.29	''	''
30.50	34.66	1.488	4.3	23	23	3.77	----	4.37	''	''
31.00	30.14	1.293	4.3	20	20	3.84	----	3.76	''	''
31.50	32.16	1.313	4.1	21	21	3.90	----	4.03	''	''
32.00	32.59	1.372	4.2	22	22	3.97	----	4.08	''	''
32.50	29.89	1.047	3.5	15	15	4.04	----	3.72	Clayey SILT to Silty CLAY	''

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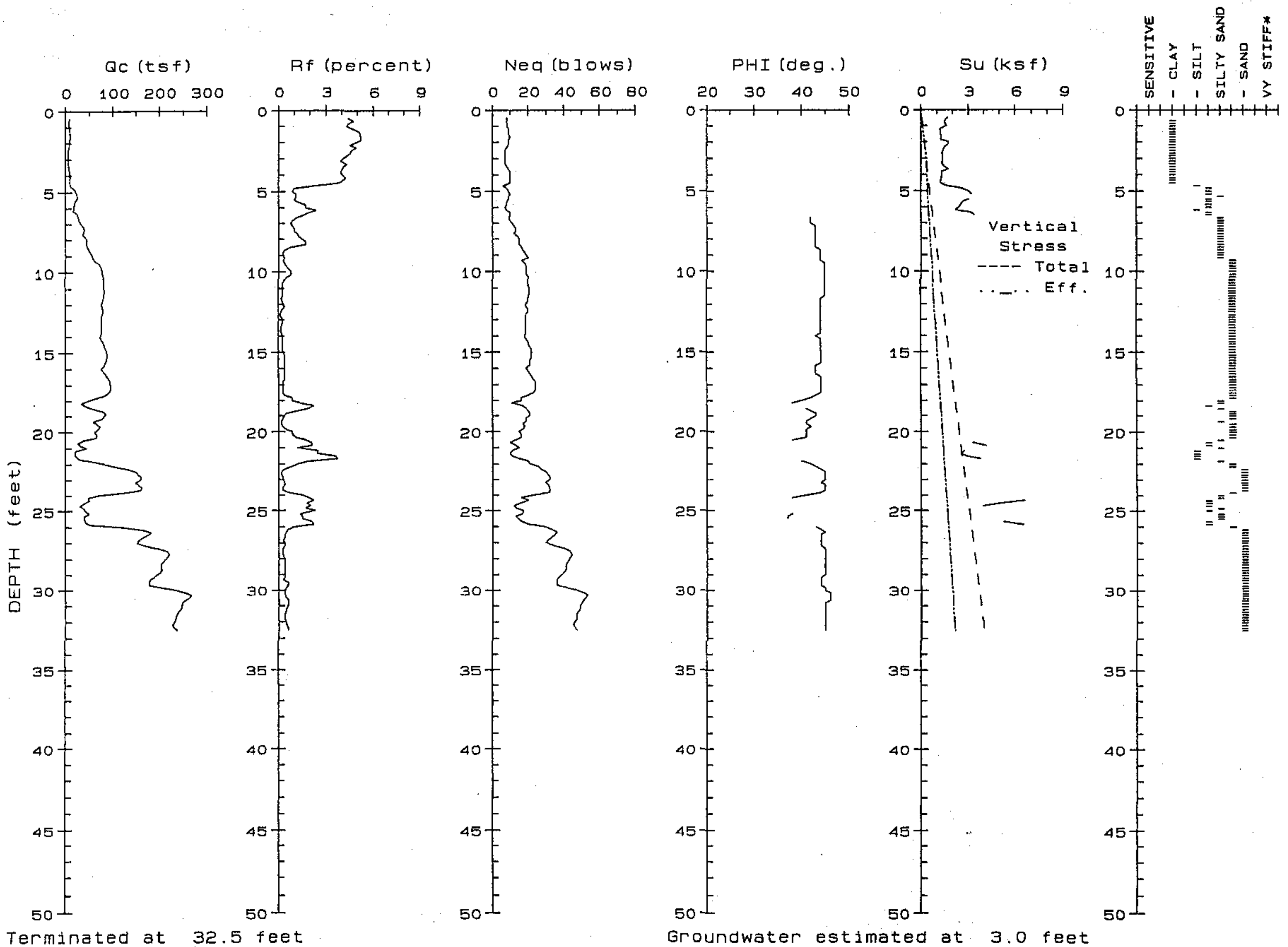

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-1
DATE : 03-11-1999

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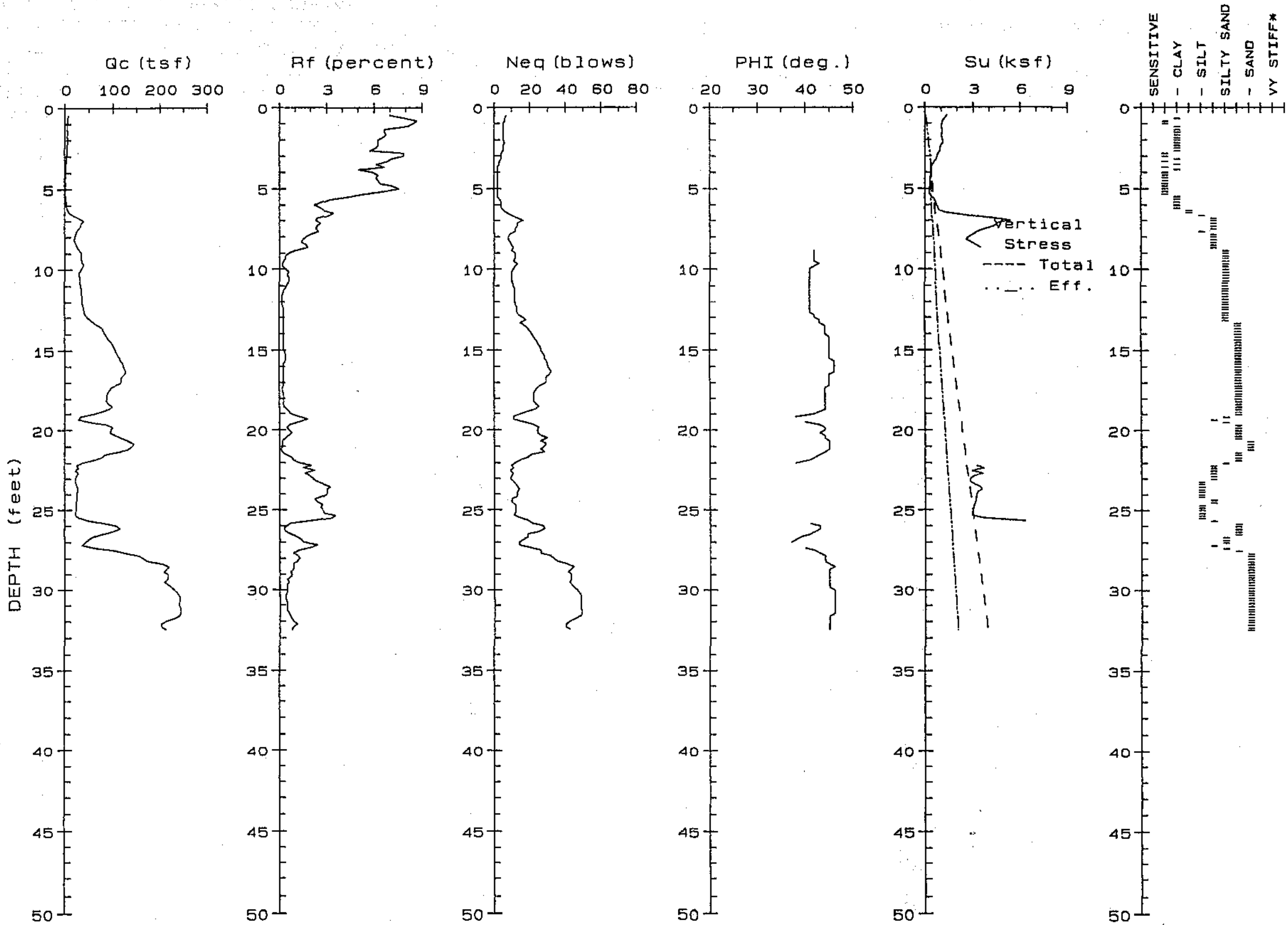


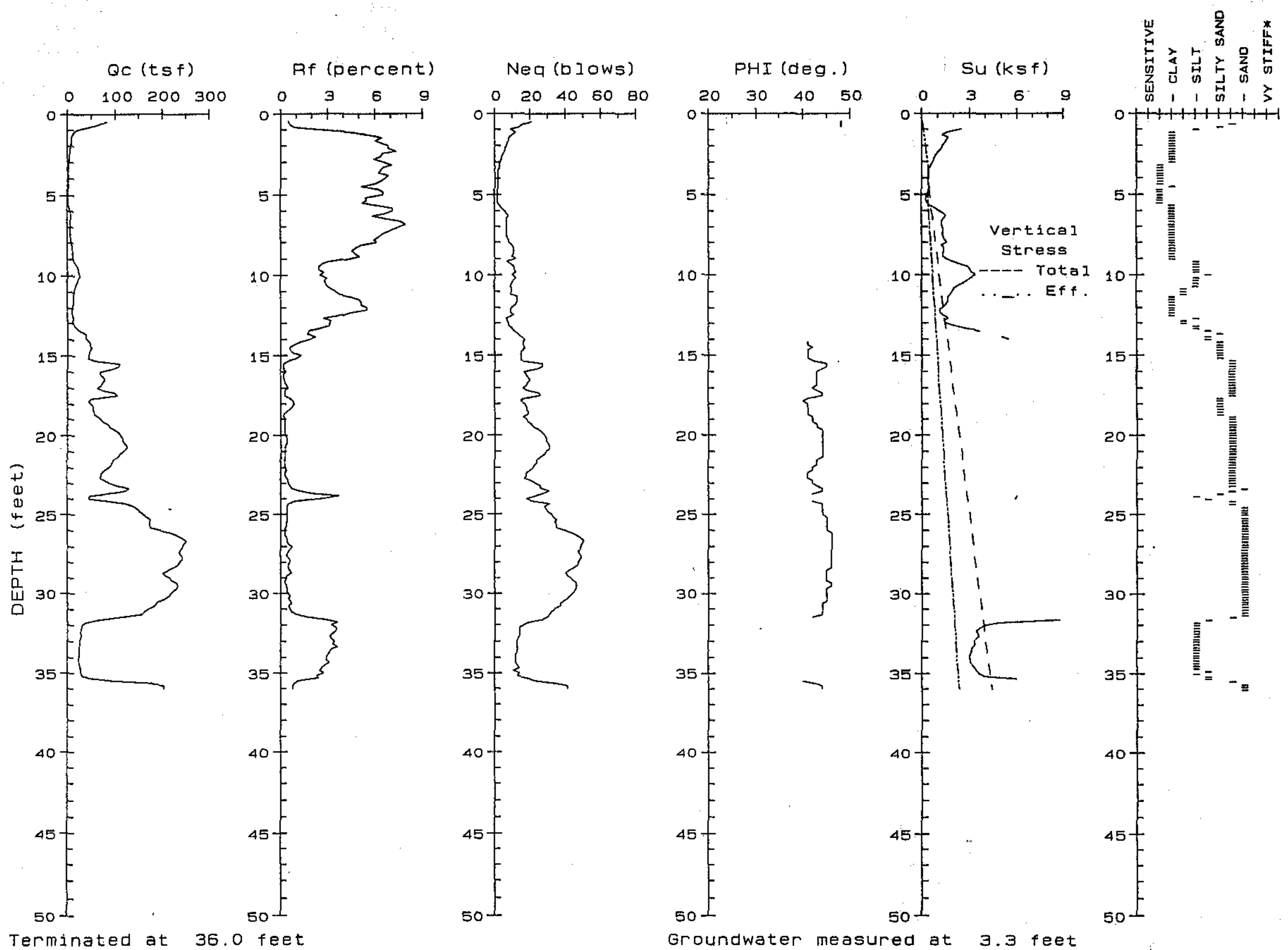
Terminated at 32.5 feet

Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-2
DATE : 03-11-1999

John Sarmiento & Associates
Cone Penetration Testing Service

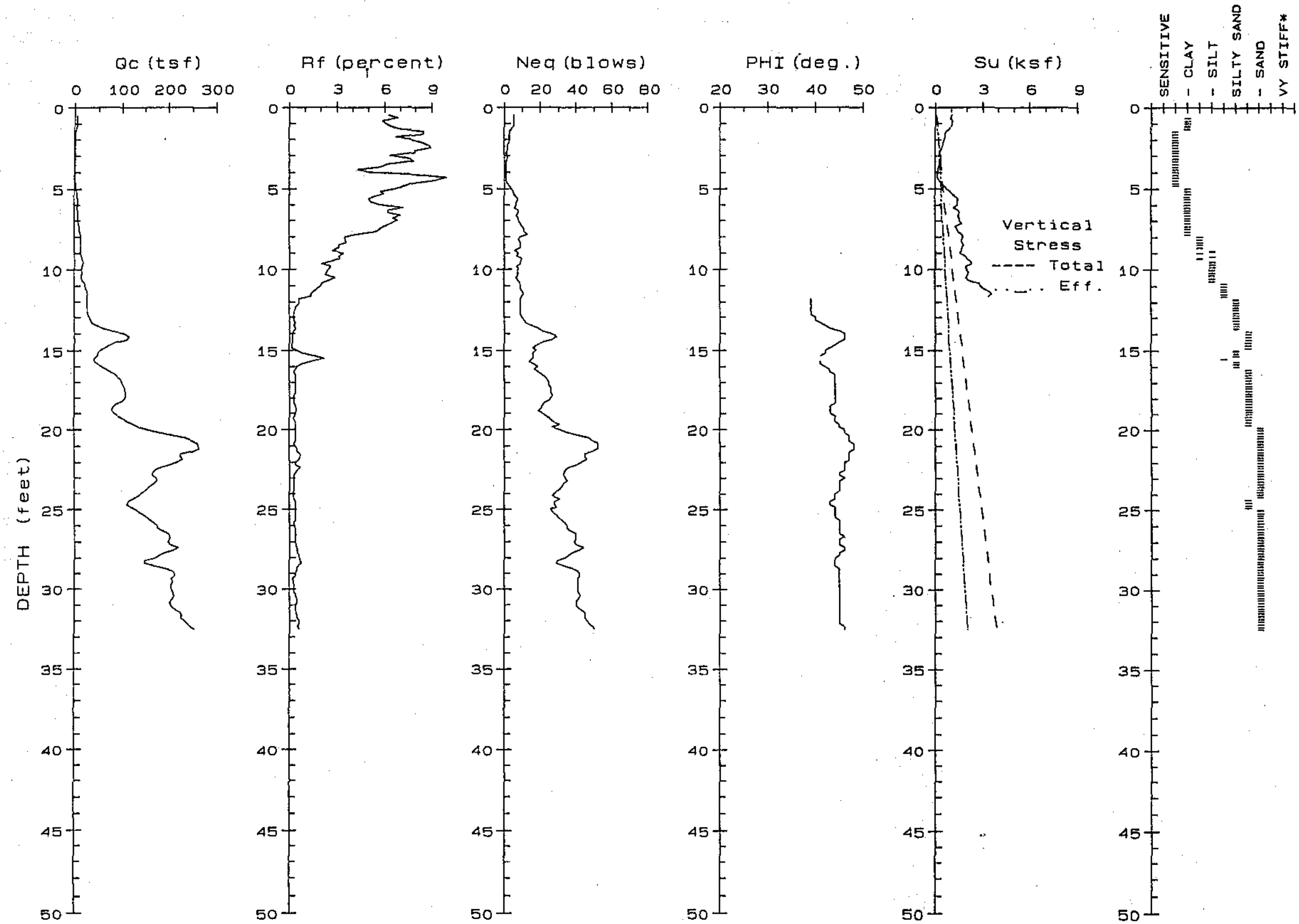


PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-3
DATE : 03-11-1999

John Sarmiento & Associates

Cone Penetration Testing Service



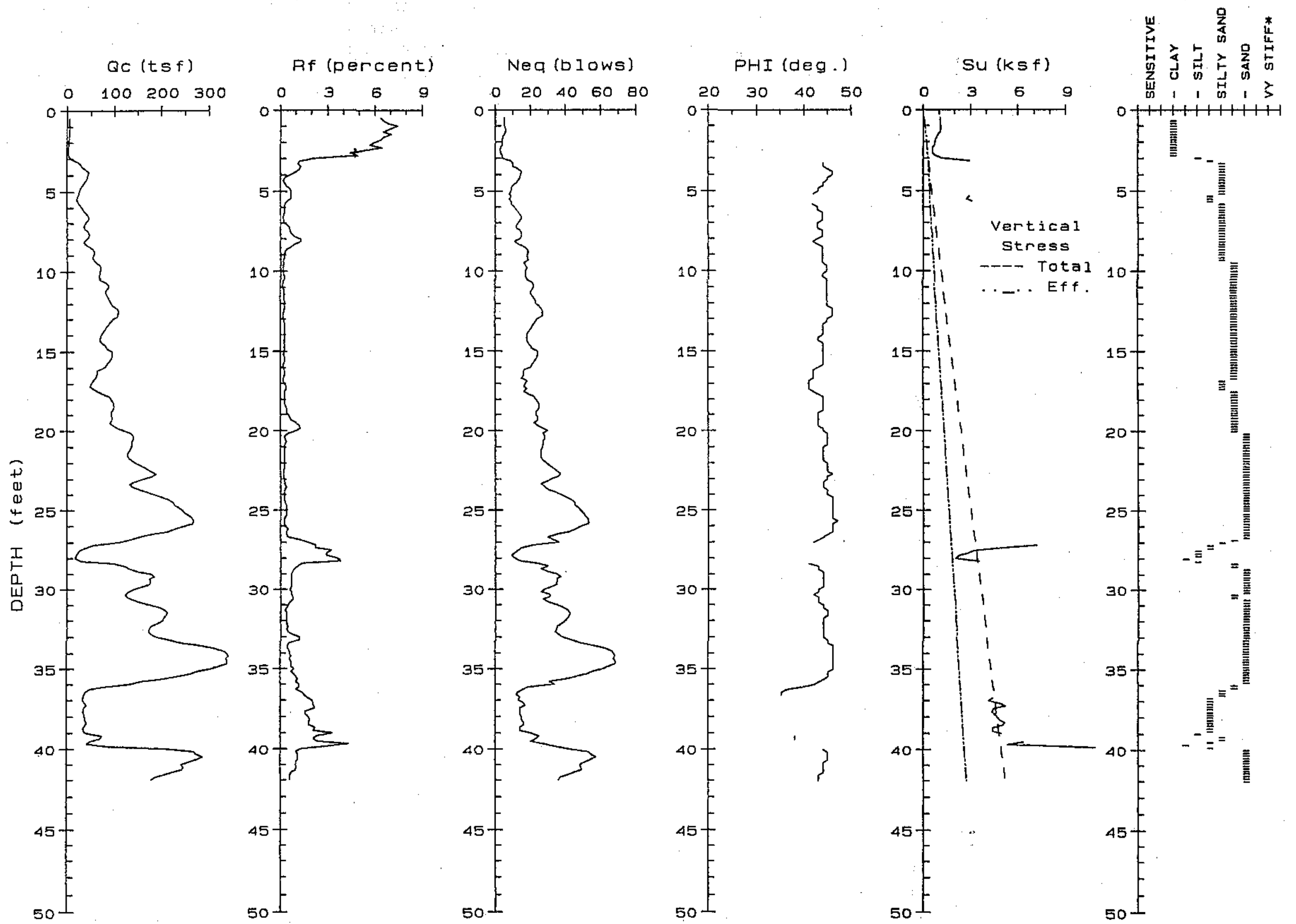
Terminated at 32.5 feet

Groundwater measured at 2.7 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-4
DATE : 03-11-1999

John Sarmiento & Associates
Cone Penetration Testing Service



Terminated at 42.0 feet

Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA

LOCATION: CONTRA COSTA COUNTY

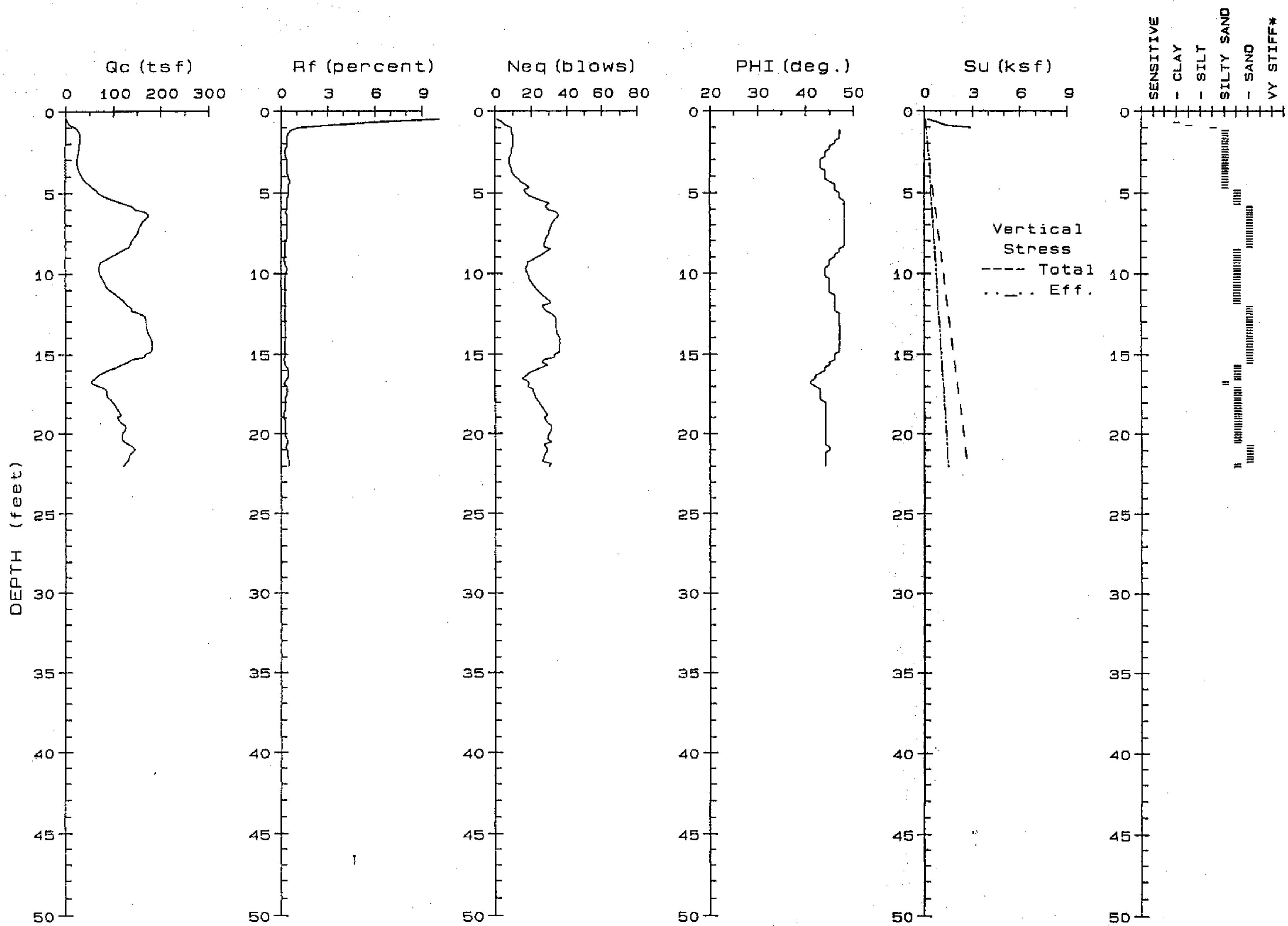
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-5

DATE : 03-11-1999

John Sarmiento & Associates

Cone Penetration Testing Service



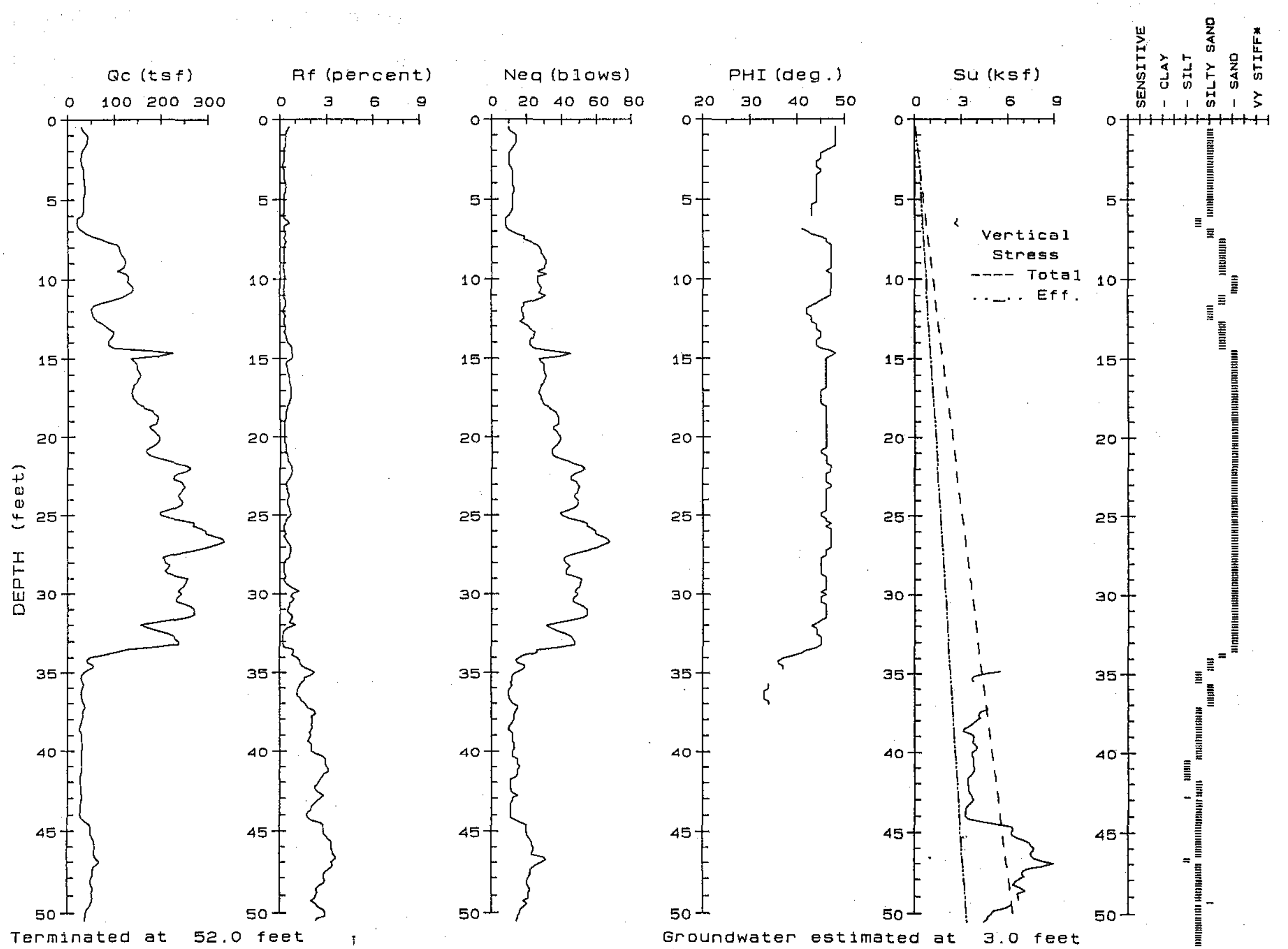
Terminated at 22.0 feet

Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-6
DATE : 03-11-1999

John Sarmiento & Associates
Cone Penetration Testing Service



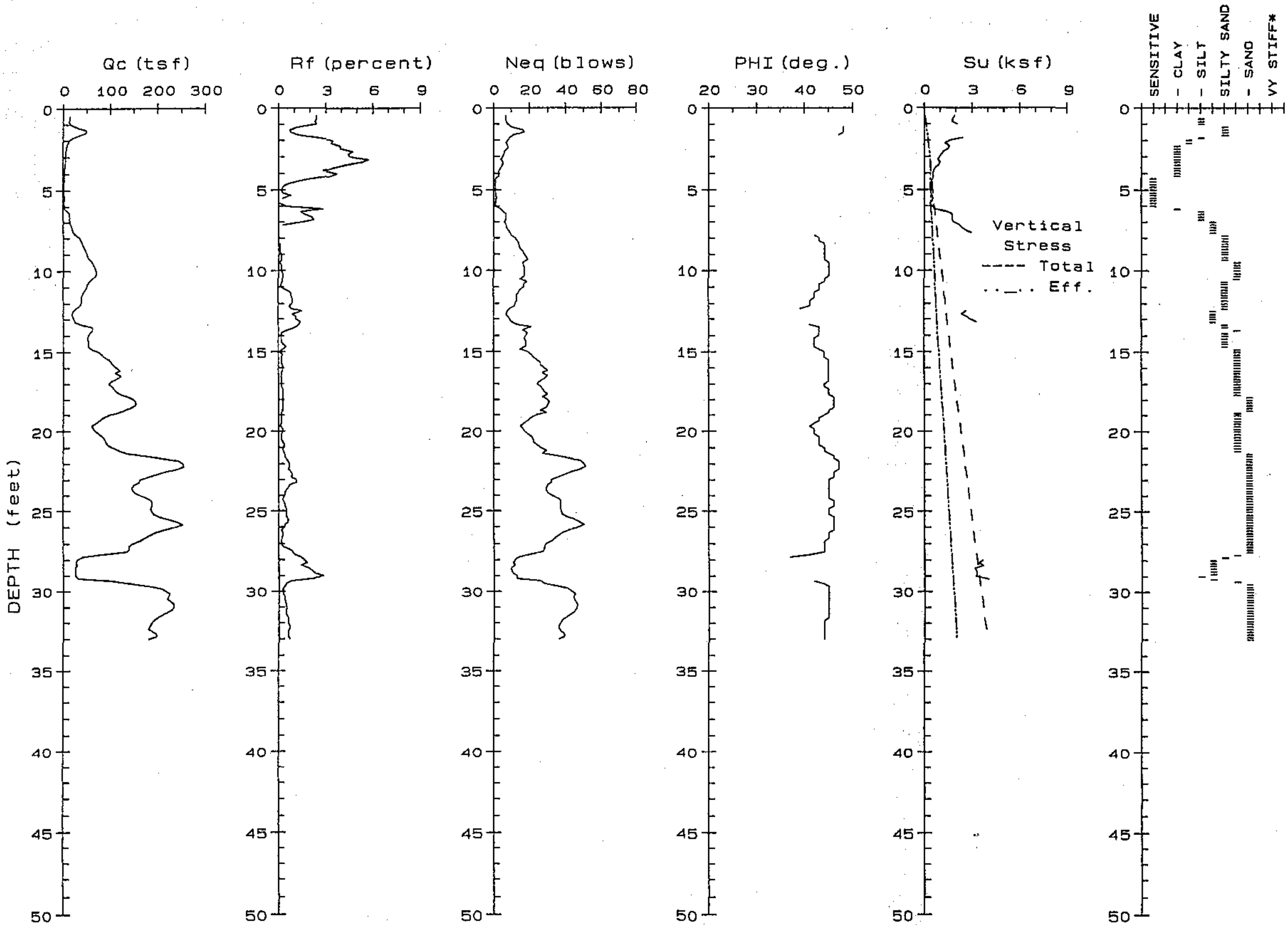
Terminated at 52.0 feet

Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-7
DATE : 03-11-1999

John Sarmiento & Associates
Cone Penetration Testing Service



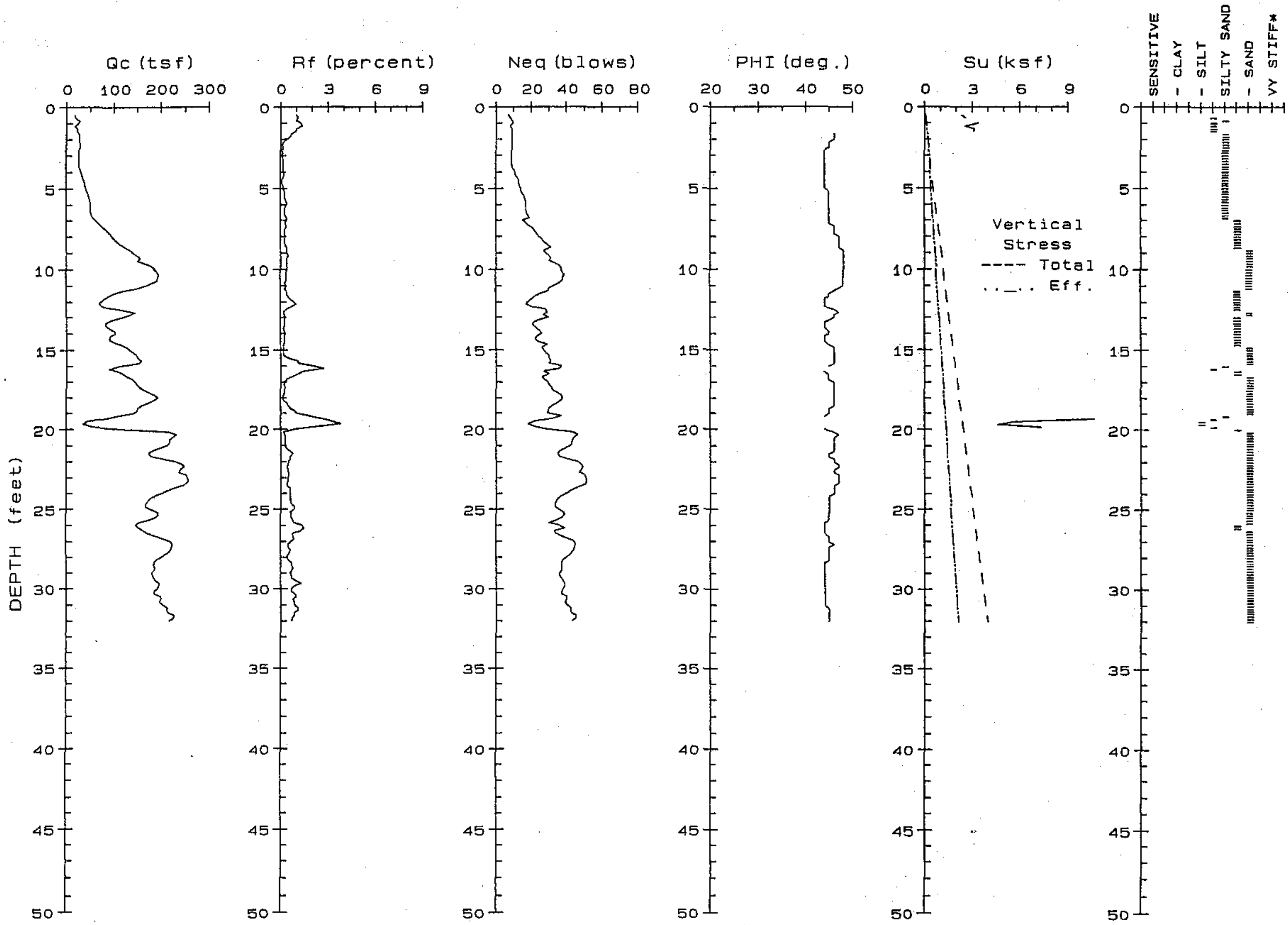
Terminated at 33.0 feet

Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-8
DATE : 03-12-1999

John Sarmiento & Associates
Cone Penetration Testing Service



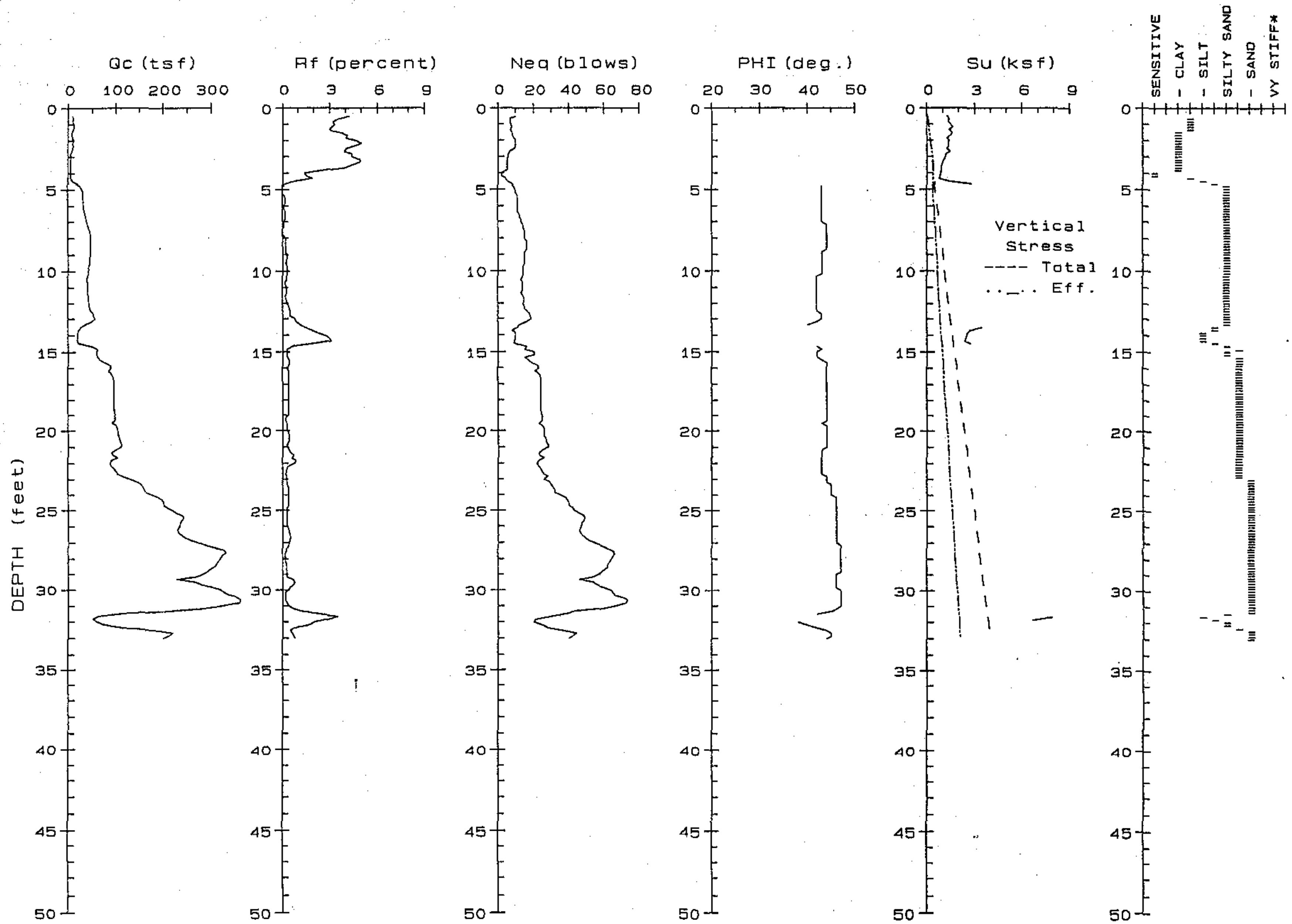
Terminated at 32.0 feet

Groundwater measured at 2.7 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-9
DATE : 03-12-1999

John Sarmiento & Associates
Cone Penetration Testing Service



Terminated at 33.0 feet

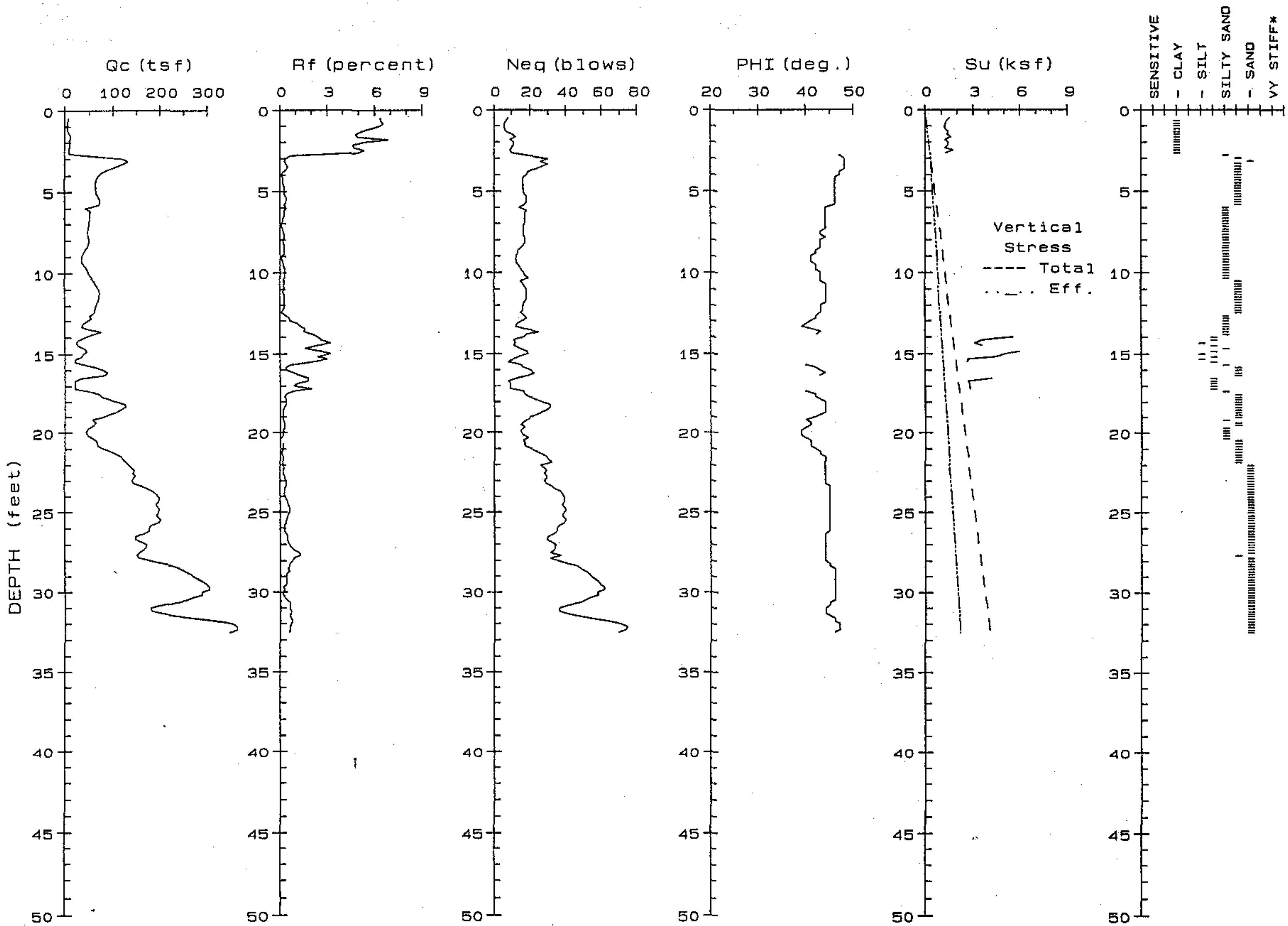
Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-10
DATE : 03-12-1999

John Sarmiento & Associates

Cone Penetration Testing Service



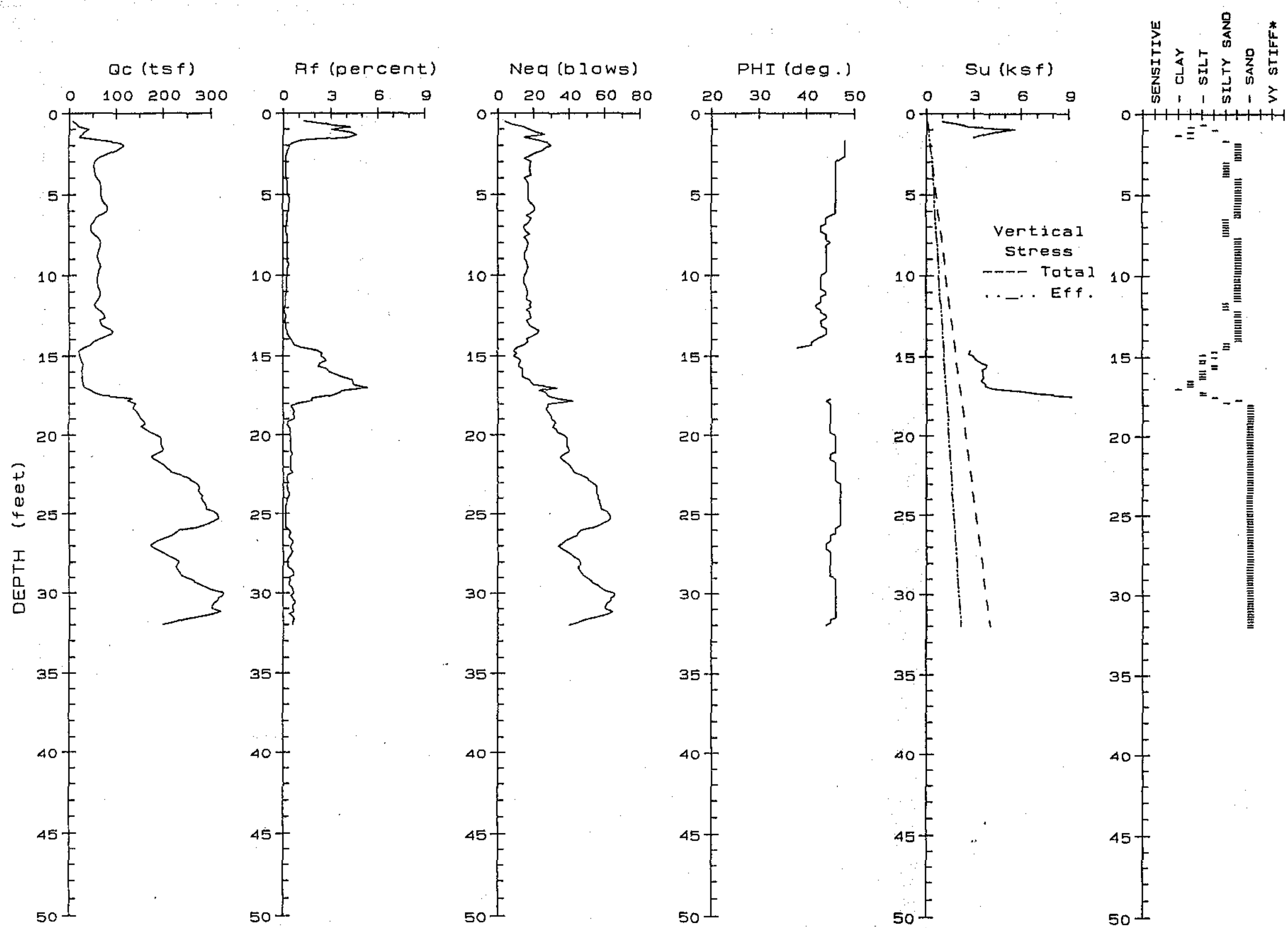
Terminated at 32.5 feet

Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-11
DATE : 03-12-1999

John Sarmiento & Associates
Cone Penetration Testing Service



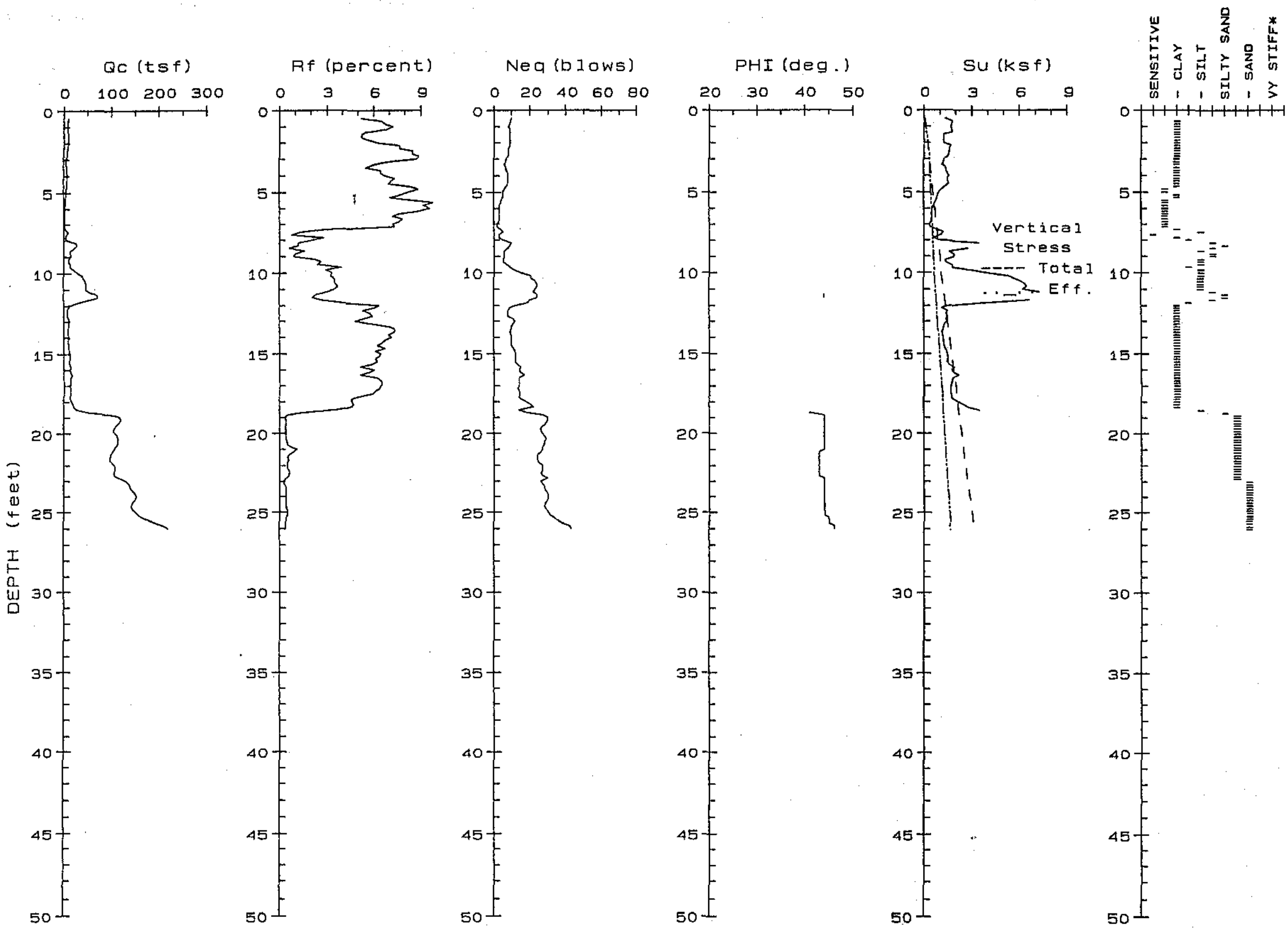
Terminated at 32.0 feet

Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-12
DATE : 03-12-1999

John Sarmiento & Associates
Cone Penetration Testing Service



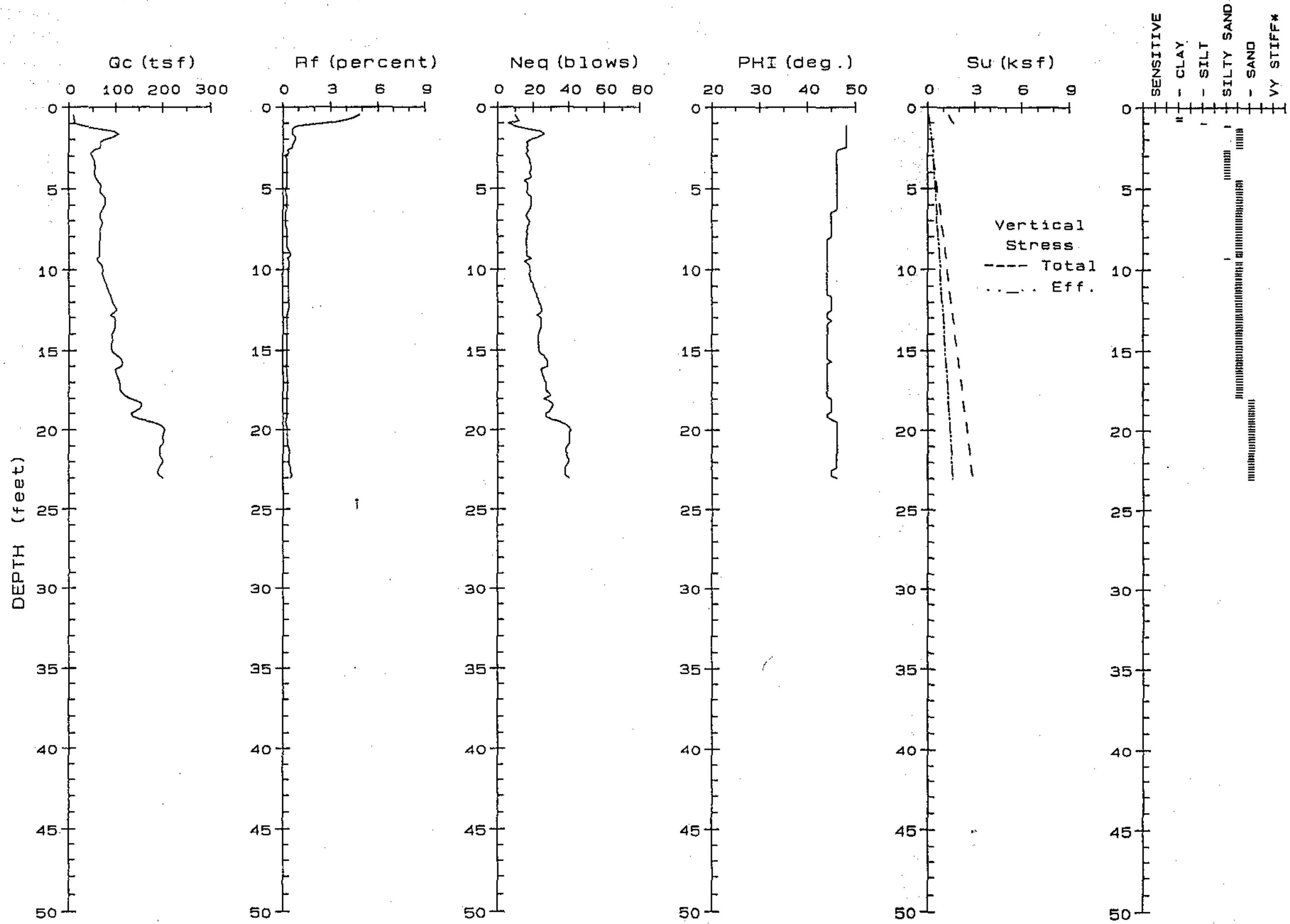
Terminated at 26.0 feet

Groundwater measured at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-13
DATE : 03-12-1999

John Sarmiento & Associates
Cone Penetration Testing Service



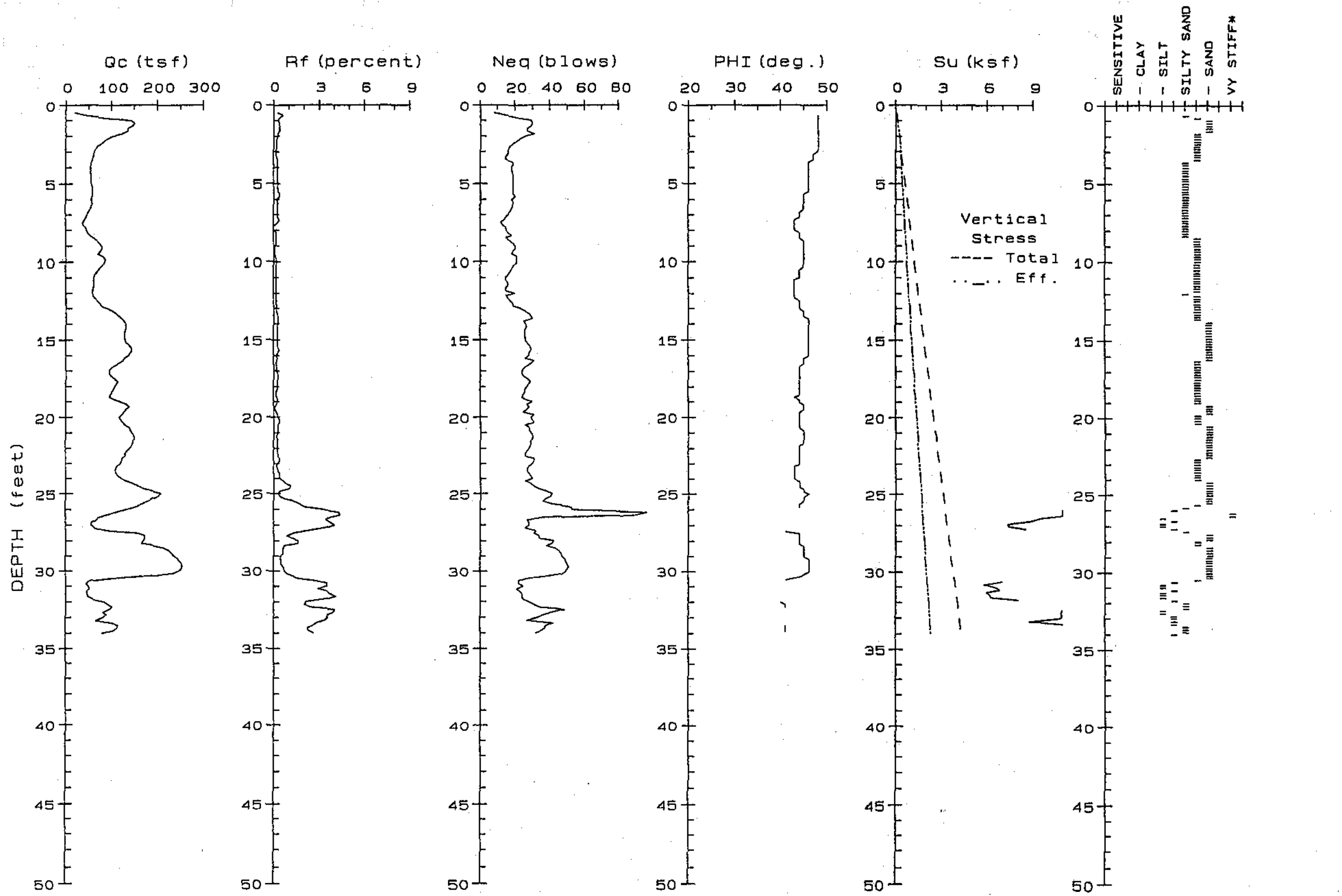
Terminated at 23.0 feet

Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-14
DATE : 03-12-1999

John Sarmiento & Associates
Cone Penetration Testing Service



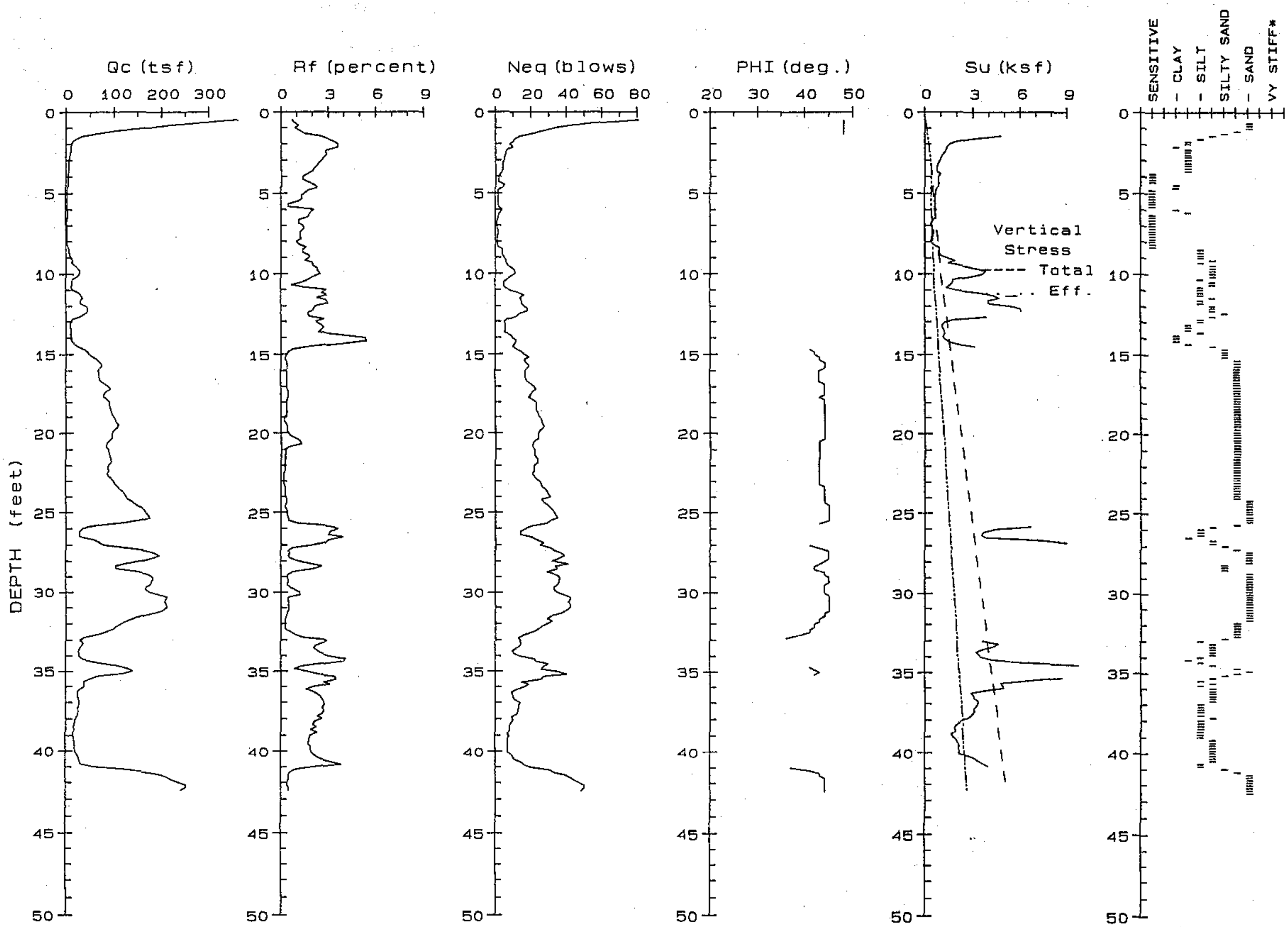
Terminated at 34.0 feet

Groundwater measured at 2.3 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-15
DATE : 03-12-1999

John Sarmiento & Associates
Cone Penetration Testing Service



Terminated at 42.5 feet

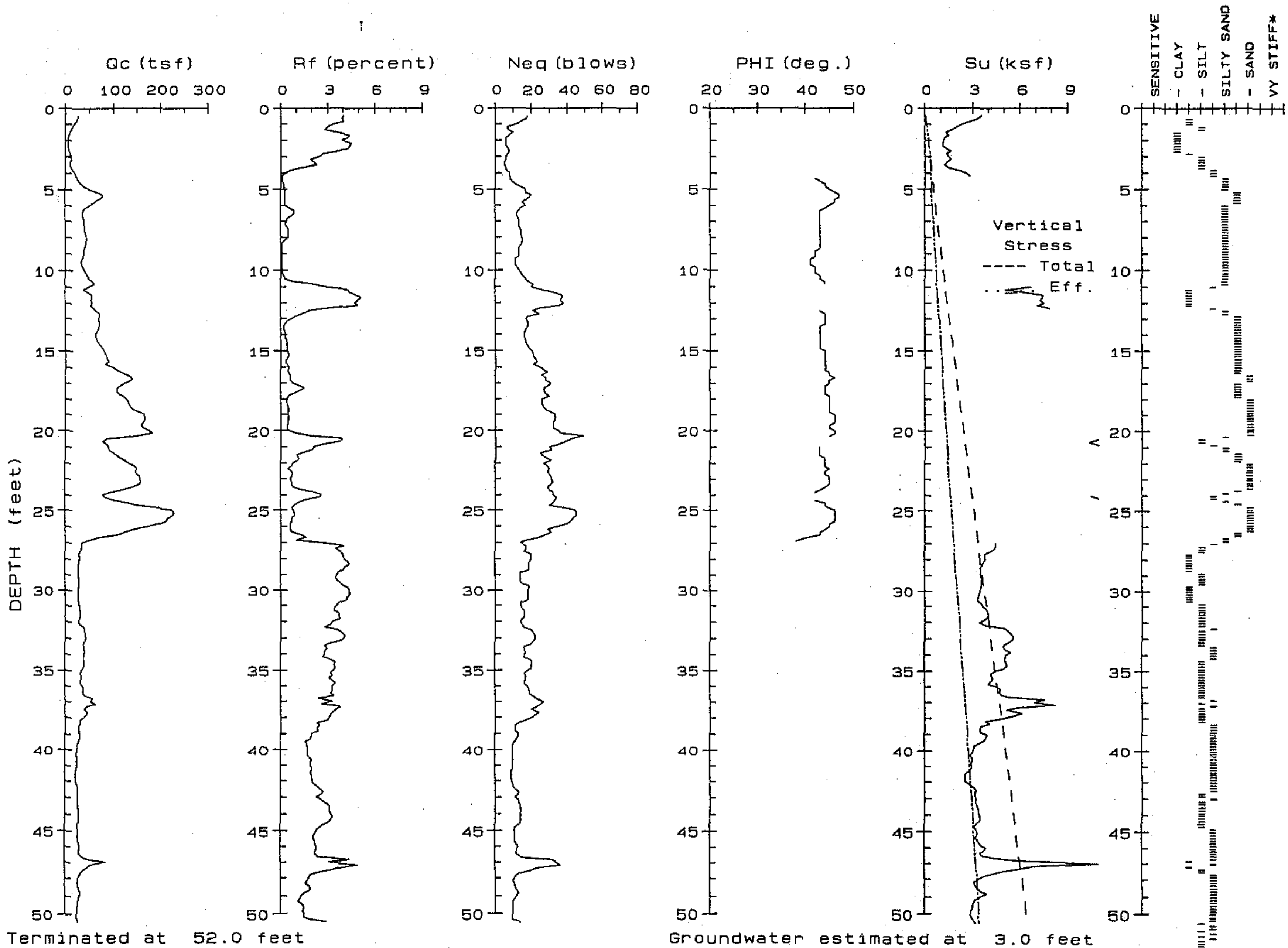
Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-16
DATE : 03-12-1999

John Sarmiento & Associates

Cone Penetration Testing Service



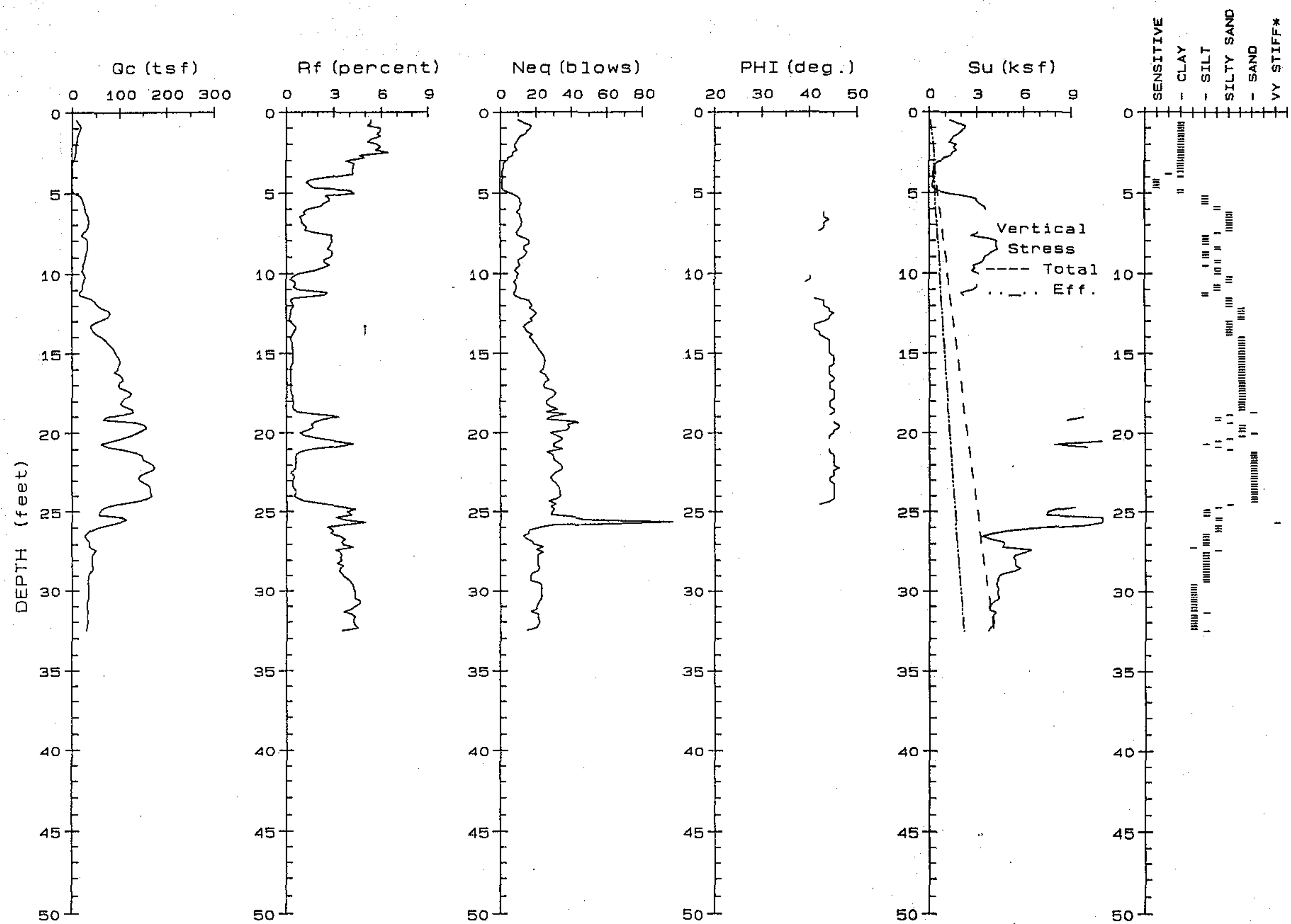
Terminated at 52.0 feet

Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01(EGO-14)

CPT NO.: CPT-17
DATE : 03-12-1999

John Sarmiento & Associates
Cone Penetration Testing Service



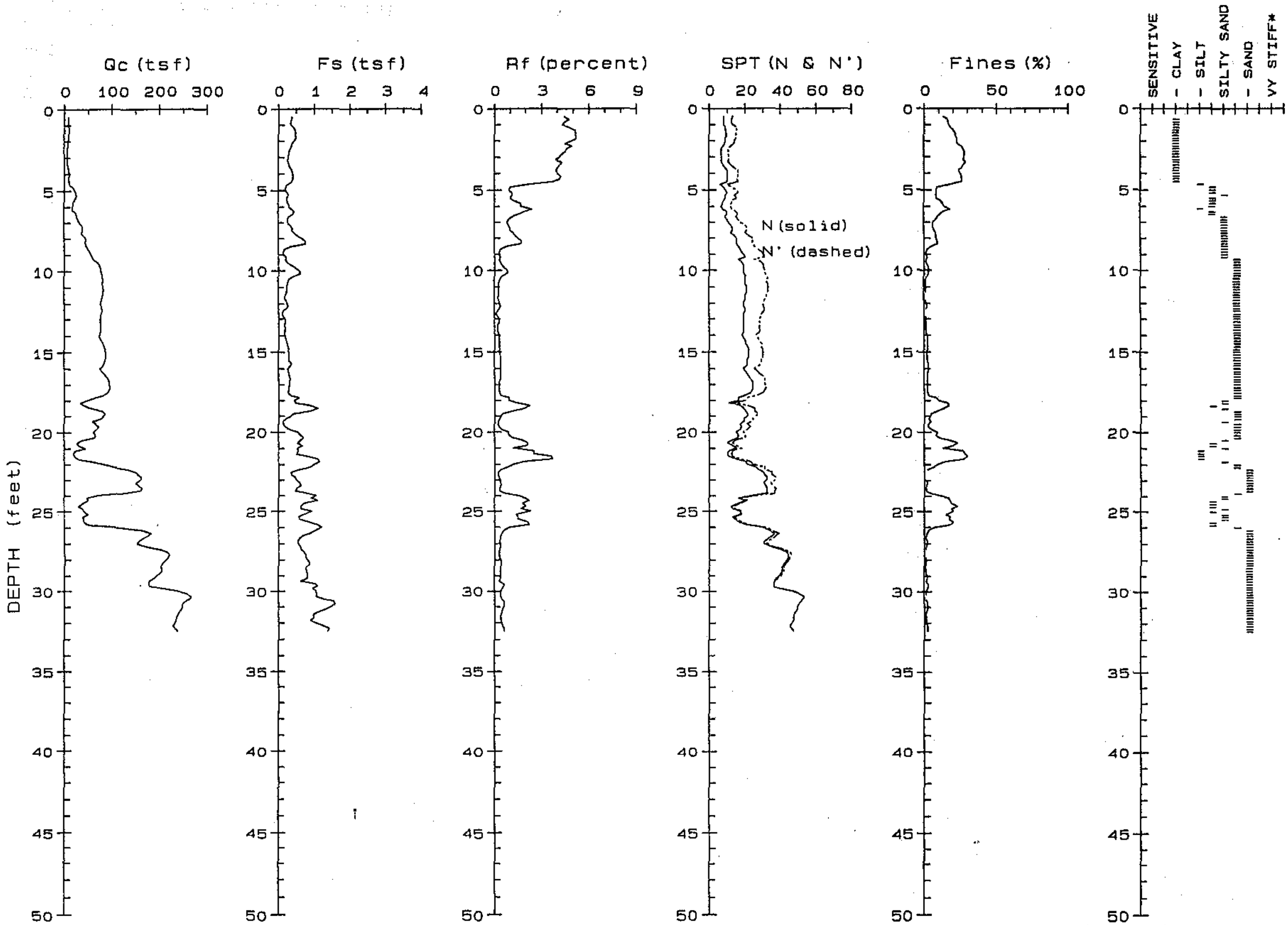
Terminated at 32.5 feet

Groundwater measured at 2.2 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-18
DATE : 03-12-1999

John Sarmiento & Associates
Cone Penetration Testing Service



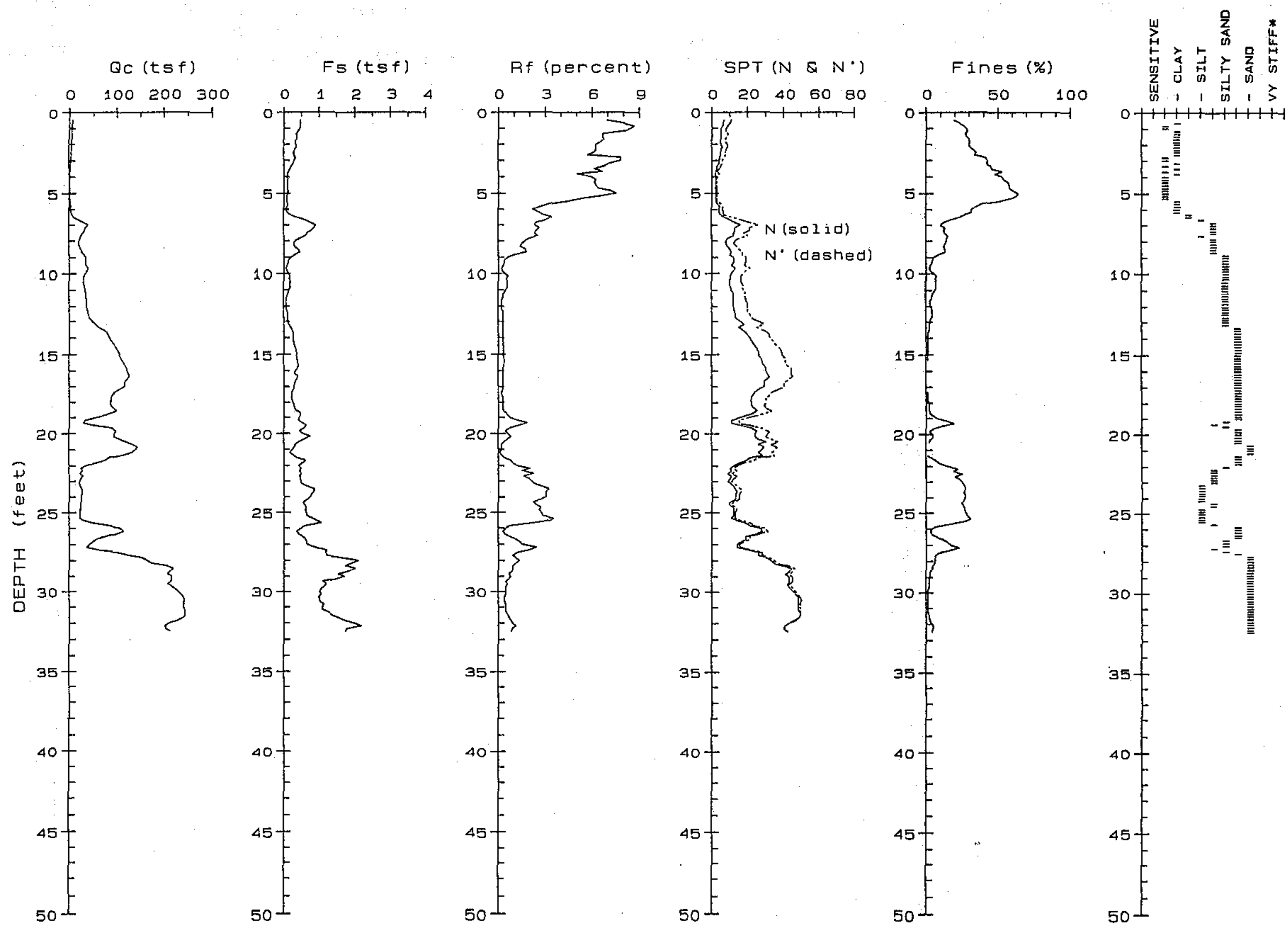
Terminated at 32.5 feet

Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-1
DATE : 03-11-1999

John Sarmiento & Associates
Cone Penetration Testing Service



Terminated at 32.5 feet

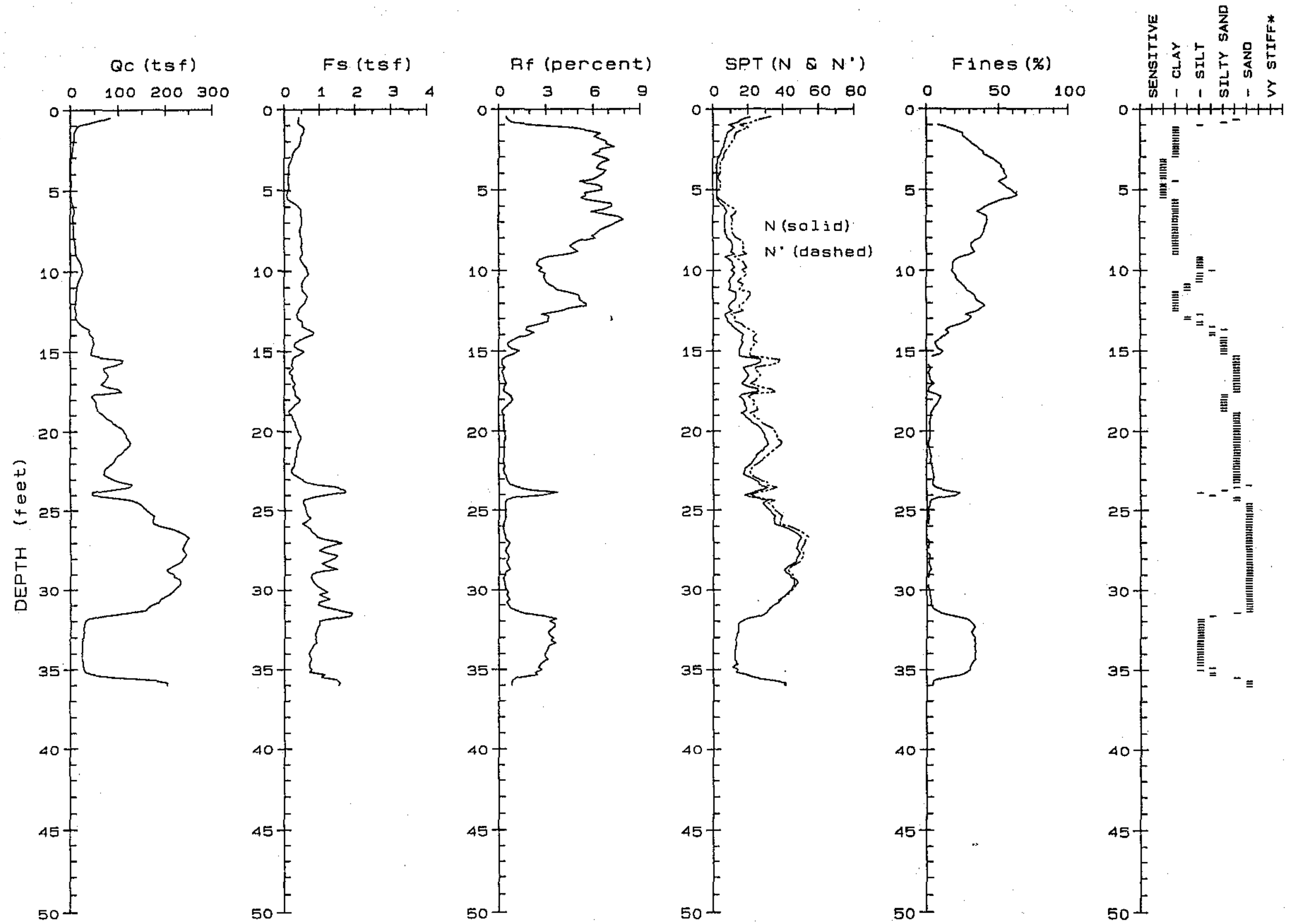
Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-2
DATE : 03-11-1999

John Sarmiento & Associates

Cone Penetration Testing Service



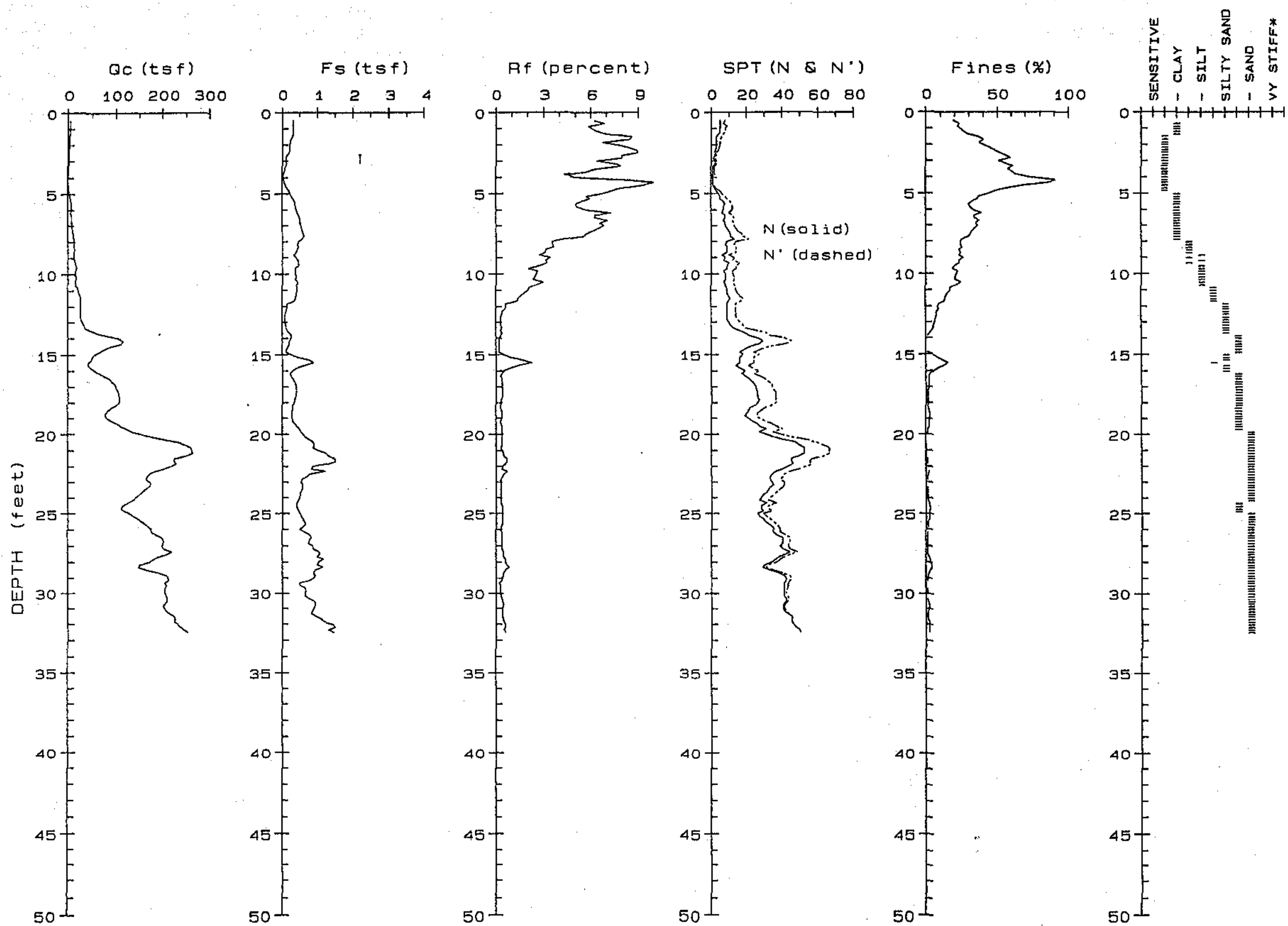
Terminated at 36.0 feet

Groundwater measured at 3.3 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-3
DATE : 03-11-1999

John Sarmiento & Associates
Cone Penetration Testing Service



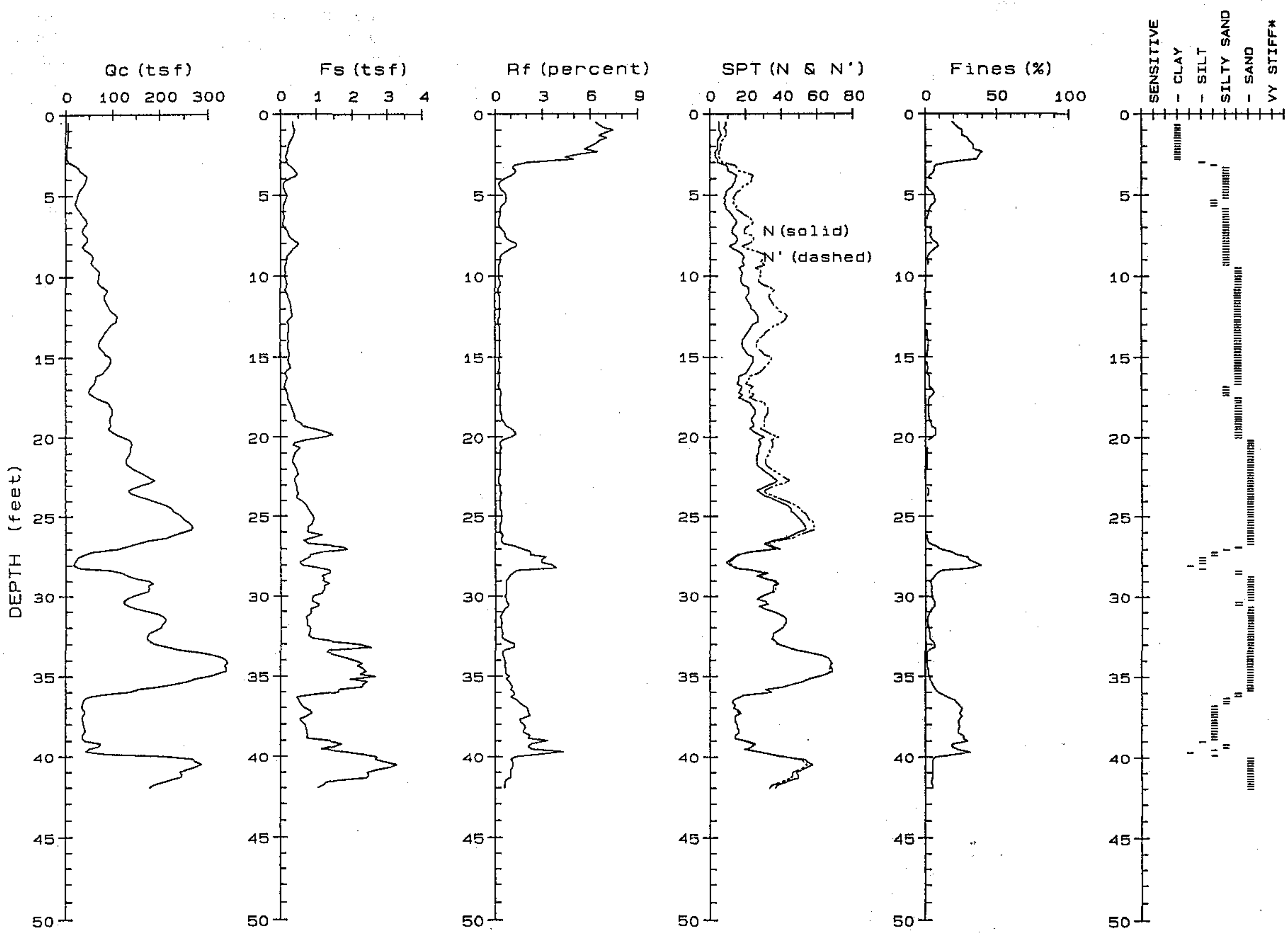
Terminated at 32.5 feet

Groundwater measured at 2.7 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-4
DATE : 03-11-1999

John Sarmiento & Associates
Cone Penetration Testing Service



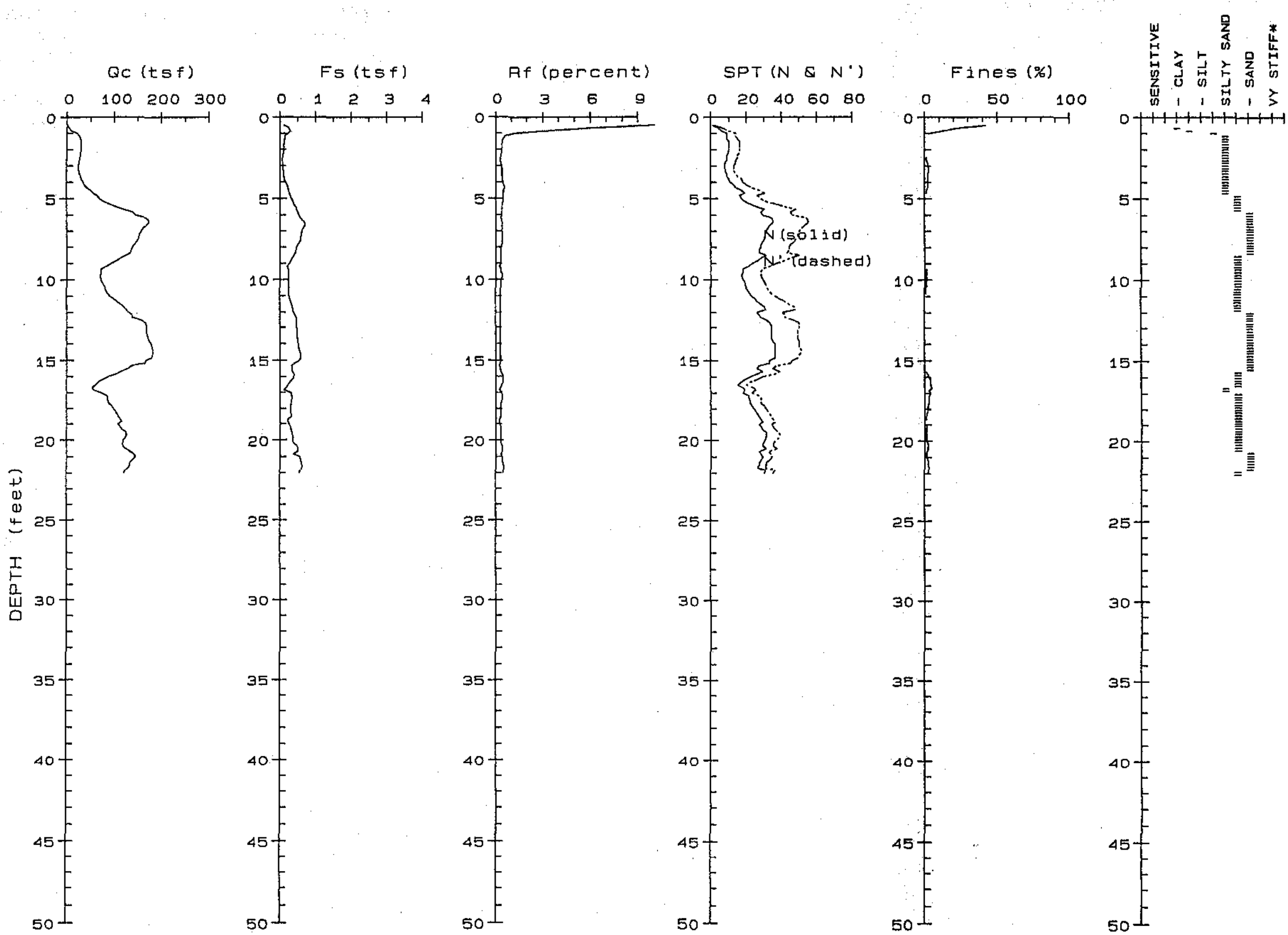
Terminated at 42.0 feet

Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-5
DATE : 03-11-1999

John Sarmiento & Associates
Cone Penetration Testing Service



Terminated at 22.0 feet

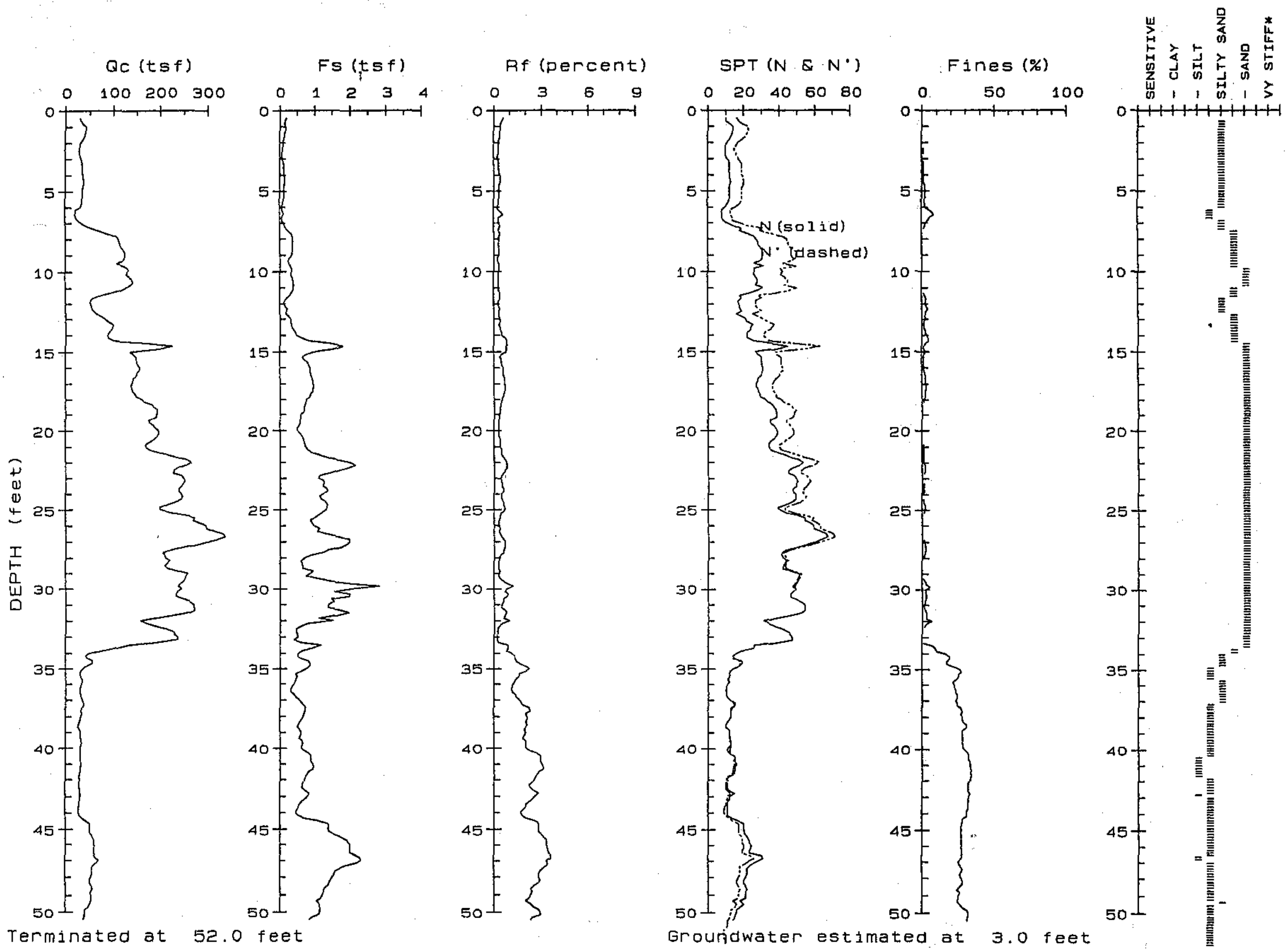
Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-6
DATE : 03-11-1999

John Sarmiento & Associates

Cone Penetration Testing Service



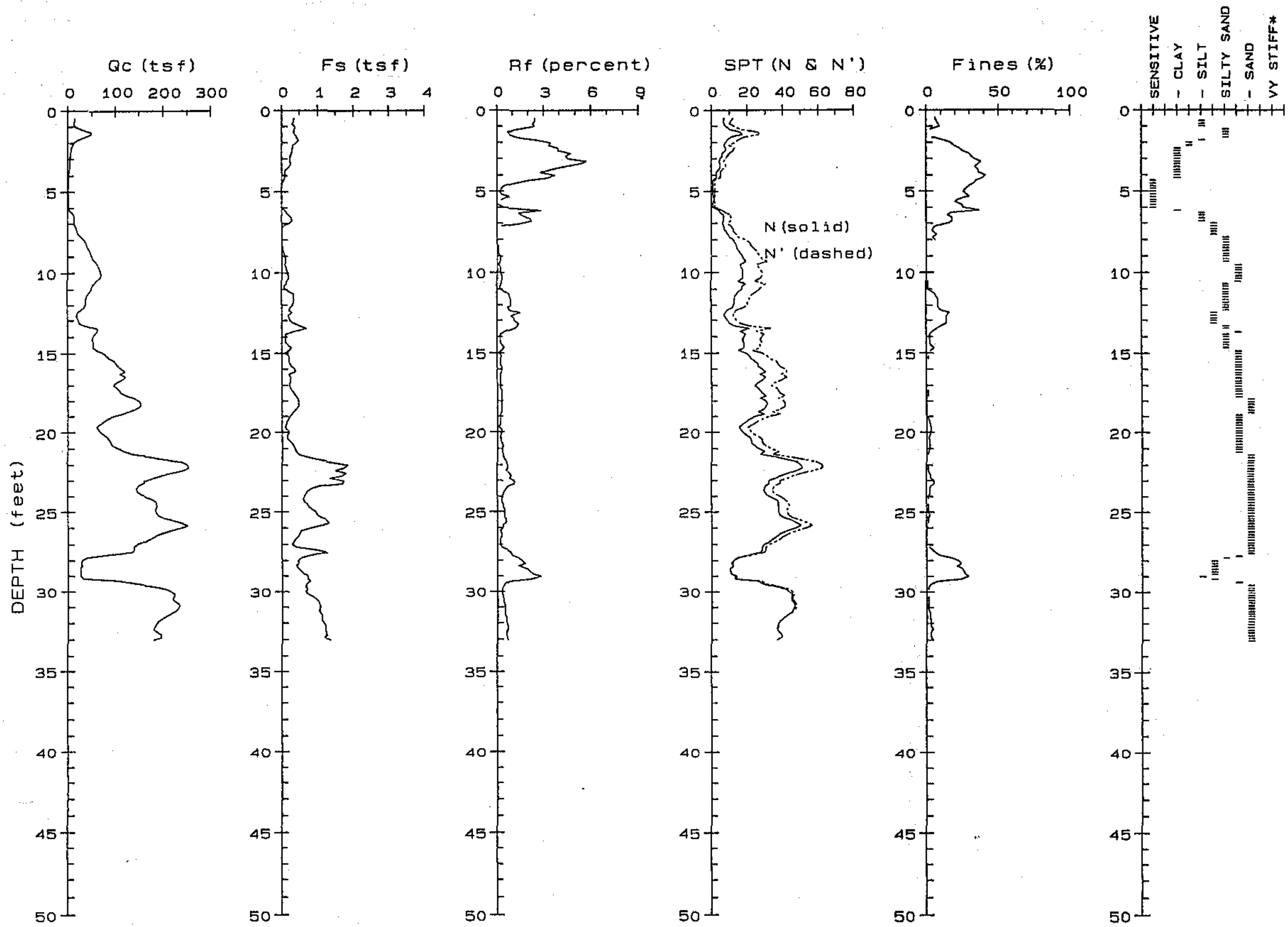
Terminated at 52.0 feet

Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-7
DATE : 03-11-1999

John Sarmiento & Associates
Cone Penetration Testing Service



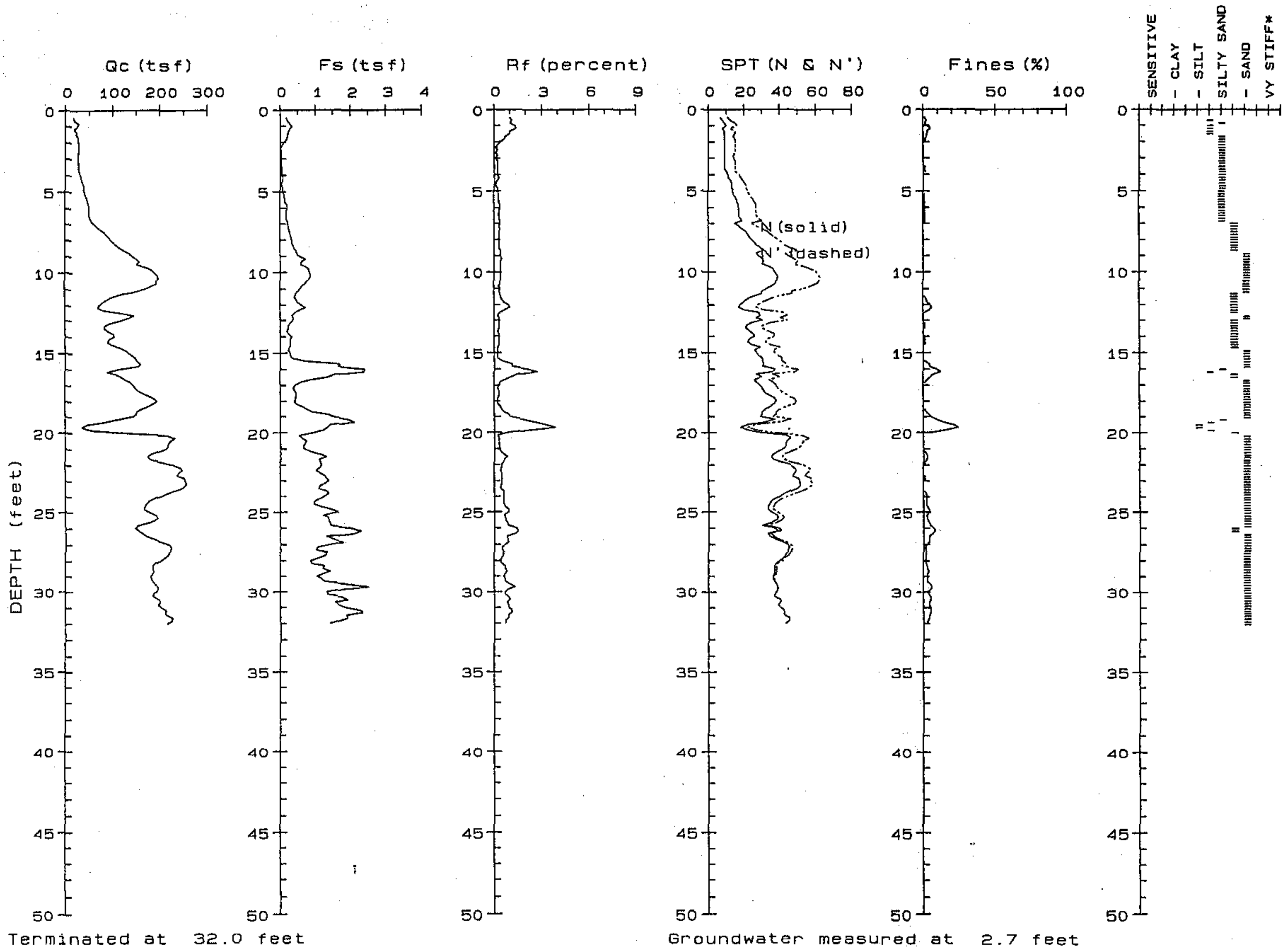
Terminated at 33.0 feet

Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-8
DATE : 03-12-1999

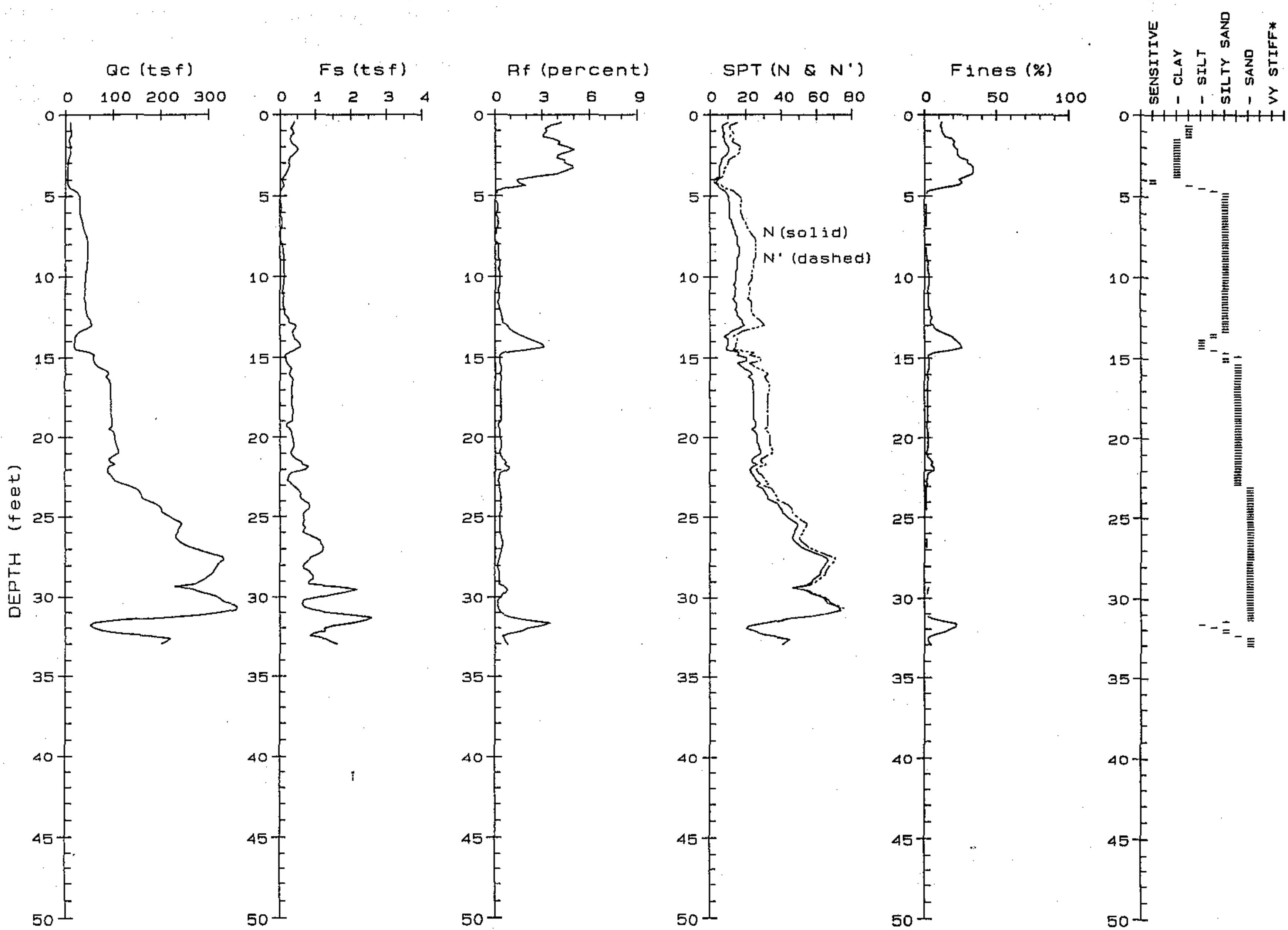
John Sarmiento & Associates
Cone Penetration Testing Service



PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-9
DATE : 03-12-1999

John Sarmiento & Associates
Cone Penetration Testing Service



Terminated at 33.0 feet

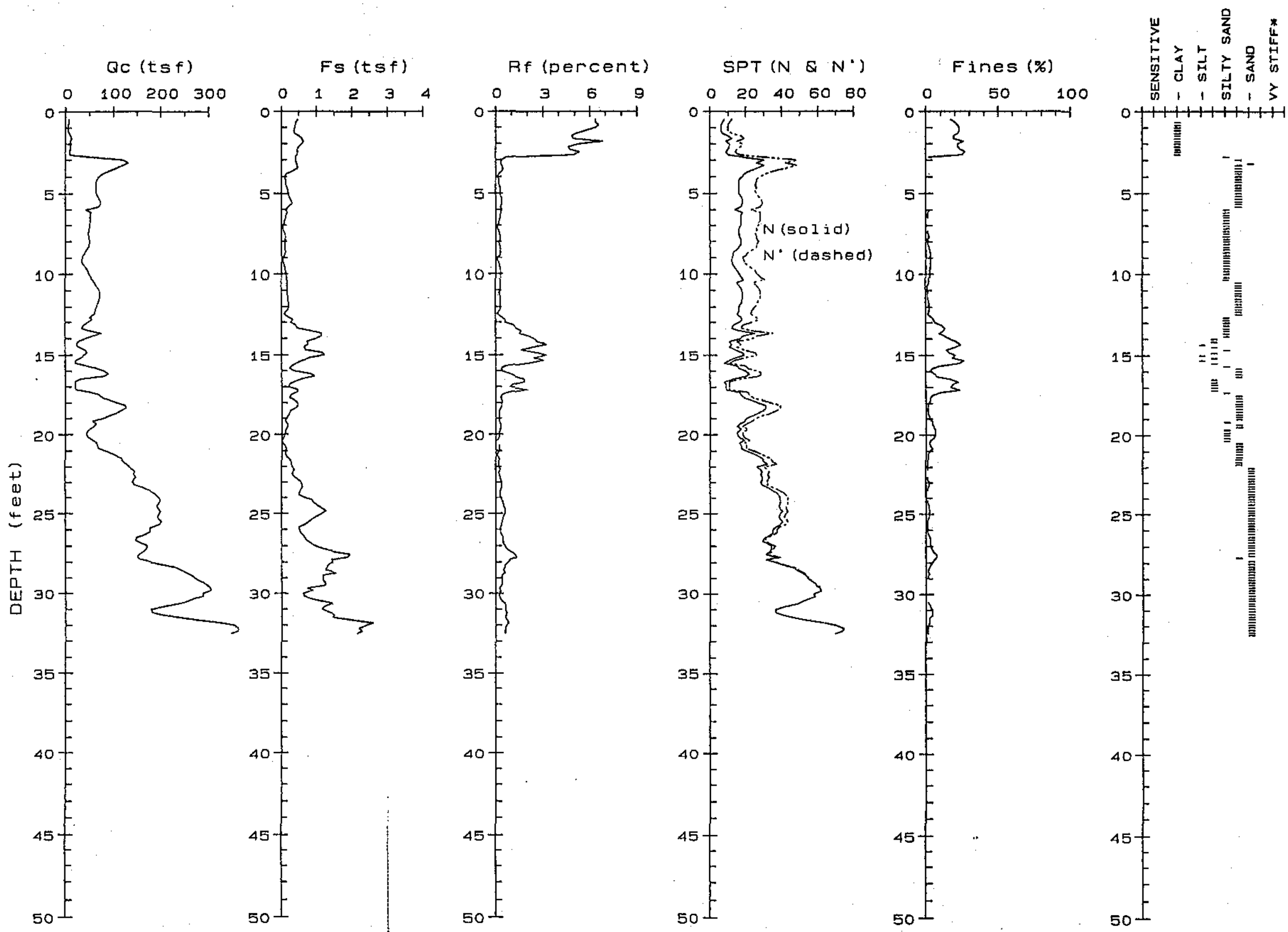
Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-10
DATE : 03-12-1999

John Sarmiento & Associates

Cone Penetration Testing Service



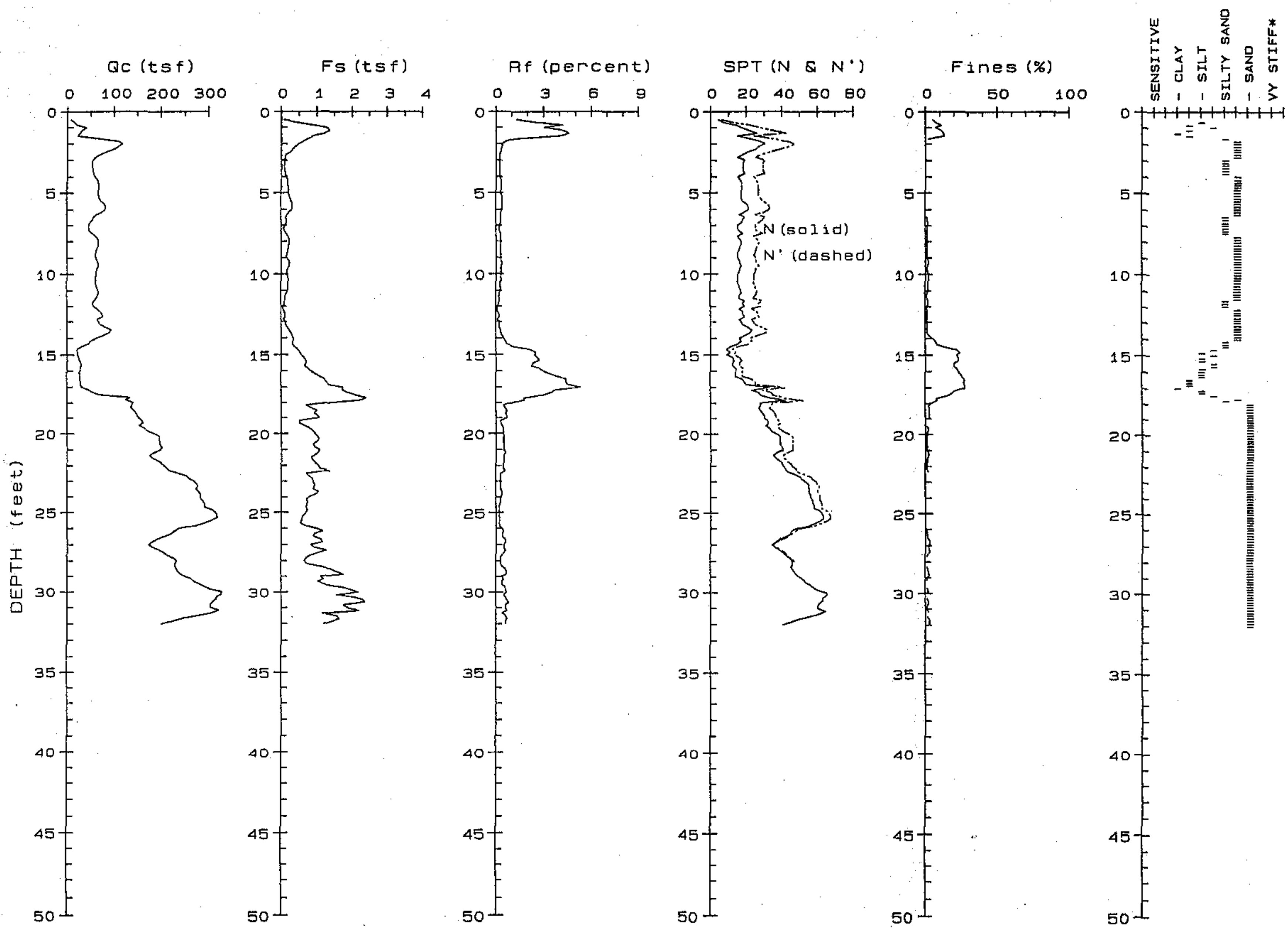
Terminated at 32.5 feet

Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-11
DATE : 03-12-1999

John Sarmiento & Associates
Cone Penetration Testing Service



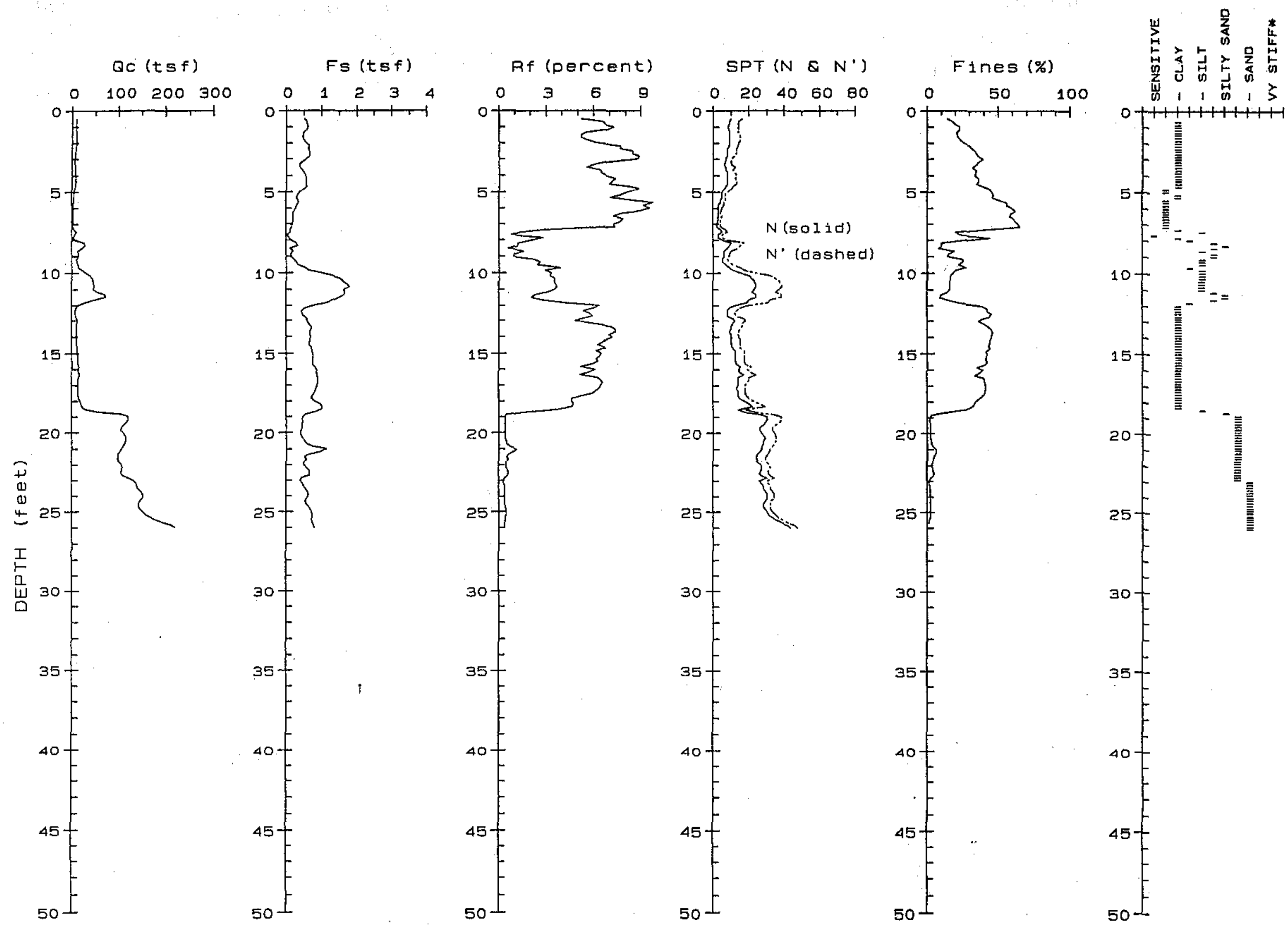
Terminated at 32.0 feet

Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-12
DATE : 03-12-1999

John Sarmiento & Associates
Cone Penetration Testing Service



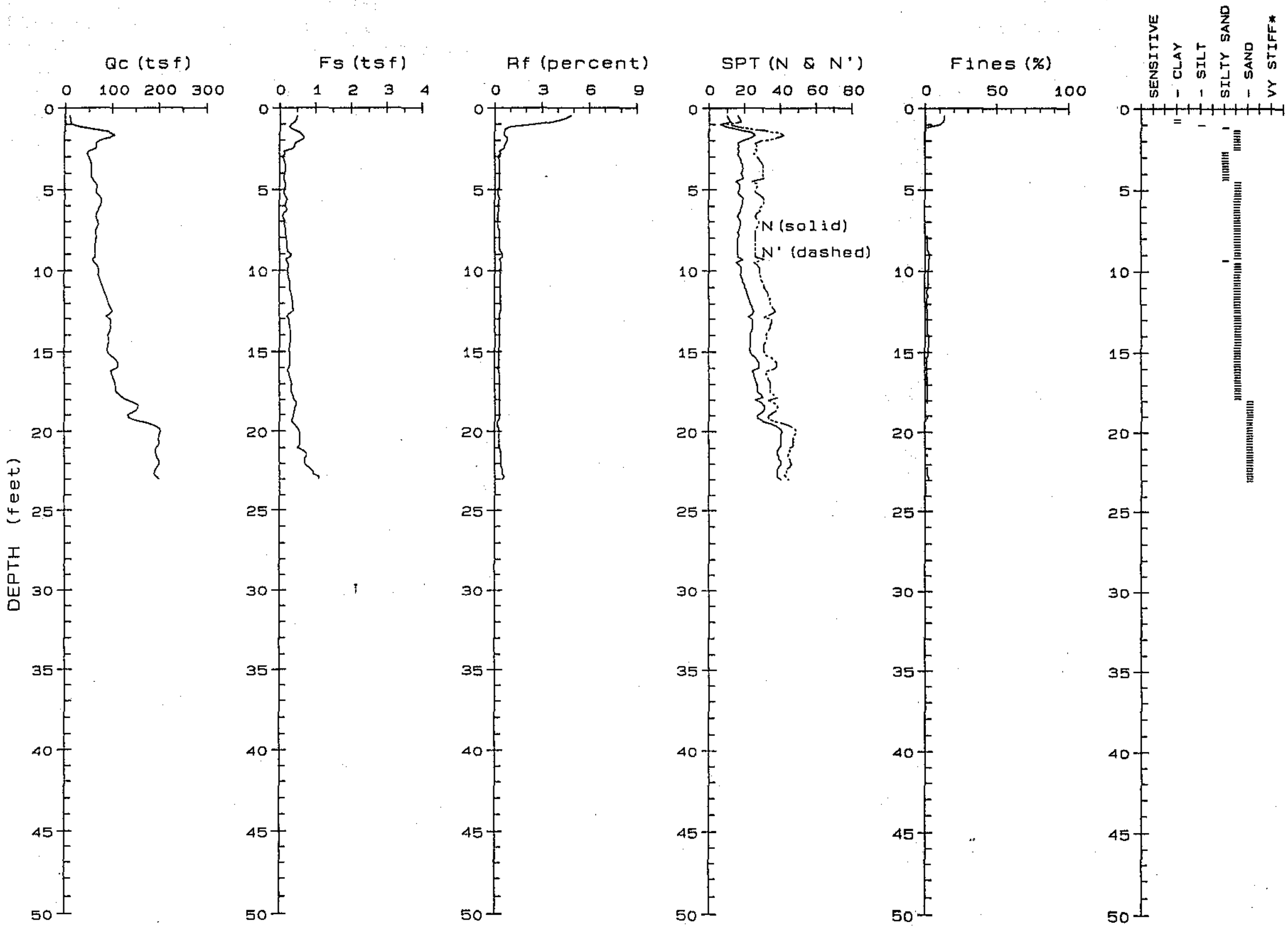
Terminated at 26.0 feet

Groundwater measured at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-13
DATE : 03-12-1999

John Sarmiento & Associates
Cone Penetration Testing Service



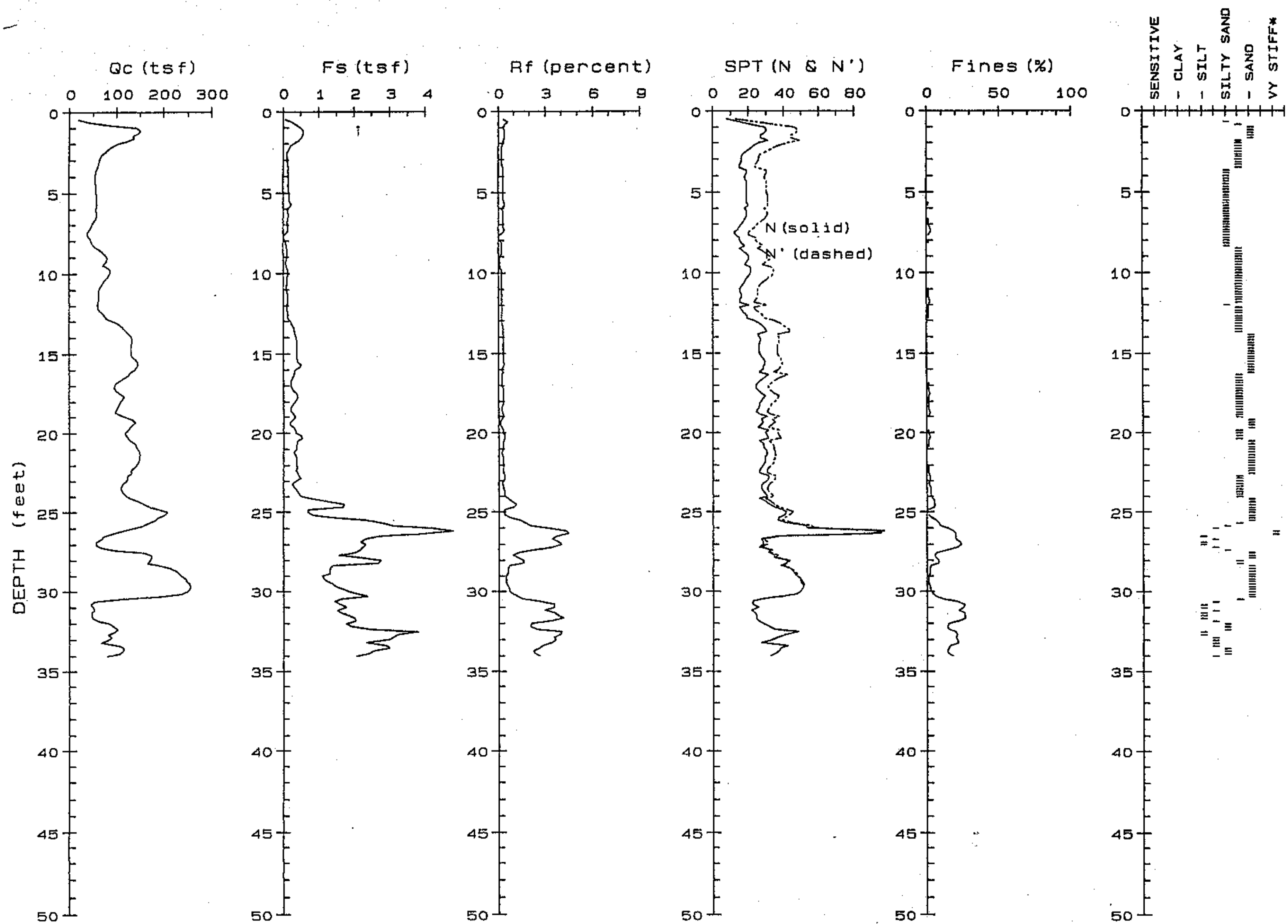
Terminated at 23.0 feet

Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-14
DATE : 03-12-1999

John Sarmiento & Associates
Cone Penetration Testing Service



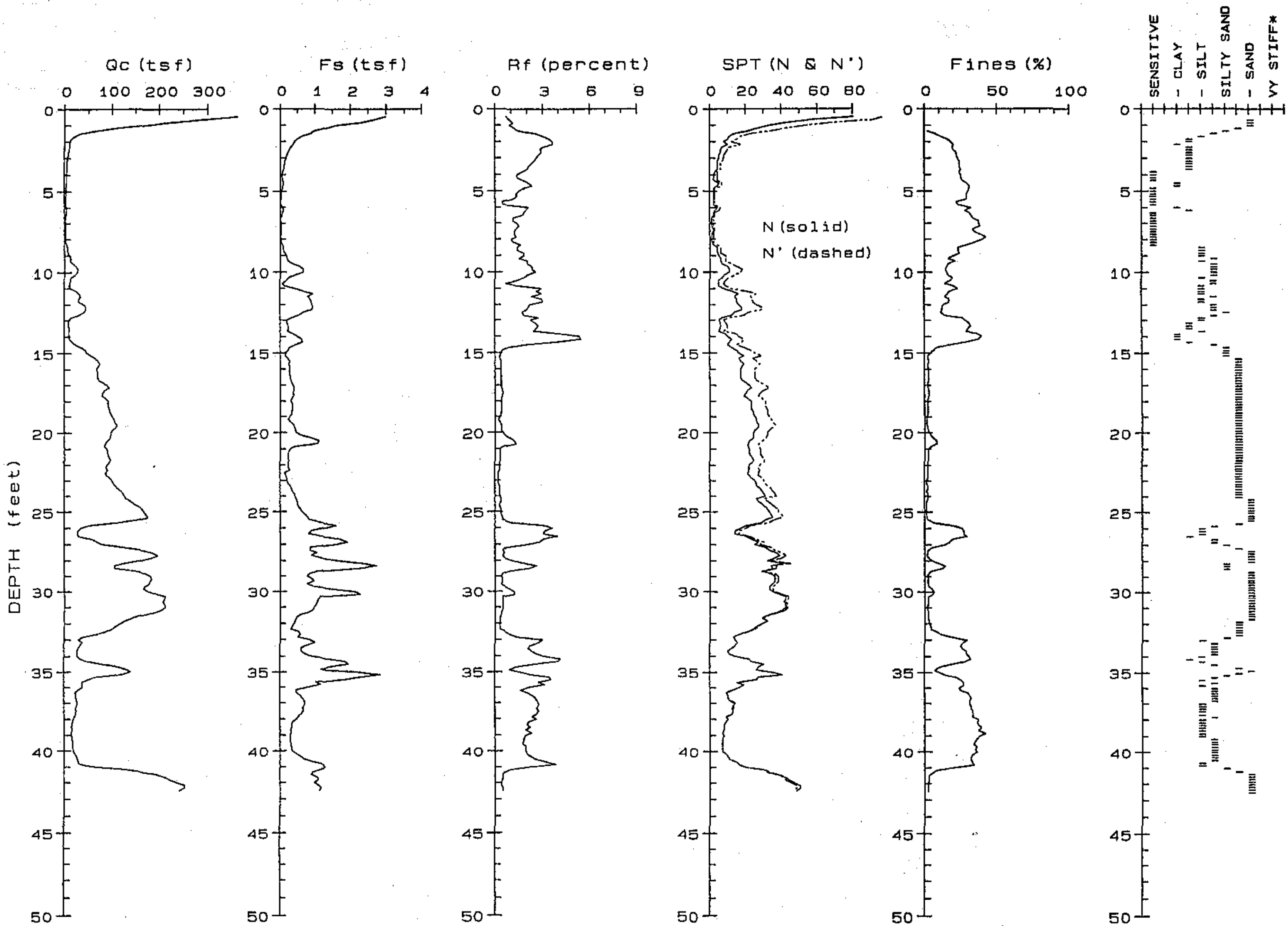
Terminated at 34.0 feet

Groundwater measured at 2.3 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-15
DATE : 03-12-1999

John Sarmiento & Associates
Cone Penetration Testing Service



Terminated at 42.5 feet

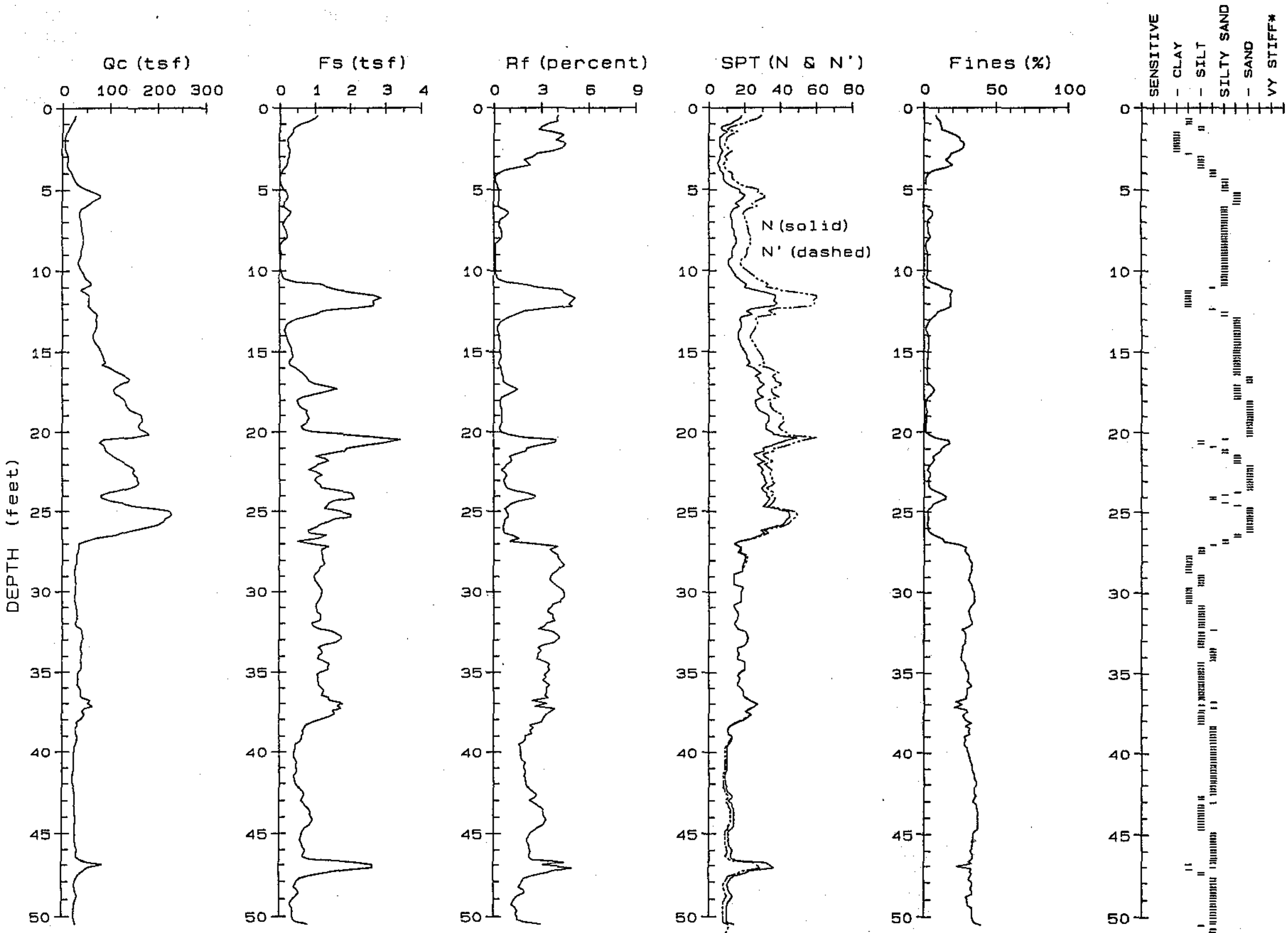
Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-16
DATE : 03-12-1999

John Sarmiento & Associates

Cone Penetration Testing Service



Terminated at 52.0 feet

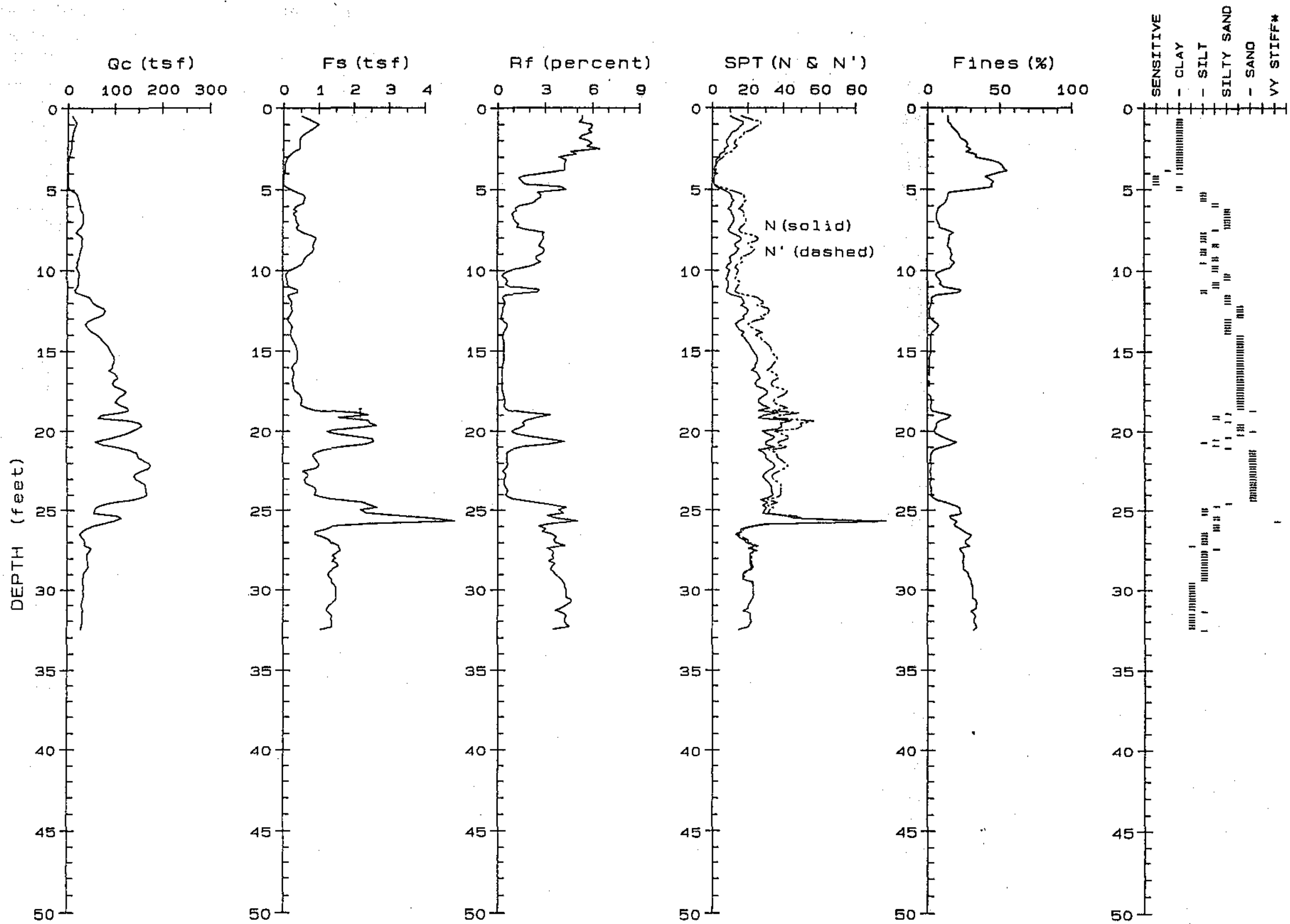
Groundwater estimated at 3.0 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-17
DATE : 03-12-1999

John Sarmiento & Associates

Cone Penetration Testing Service



Terminated at 32.5 feet

Groundwater measured at 2.2 feet

PROJECT: CYPRESS CORRIDOR PLANNING AREA
LOCATION: CONTRA COSTA COUNTY
PROJ. NO.: 4603.002.01 (EGO-14)

CPT NO.: CPT-18
DATE : 03-12-1999

John Sarmiento & Associates
Cone Penetration Testing Service

EXHIBIT F

PRELIMINARY TRAFFIC ANALYSIS FOR POTENTIAL DEVELOPMENT IN THE OAKLEY CYPRESS ROAD CORRIDOR

MARCH, 1999

GEORGE W. NICKELSON, P.E.
TRAFFIC ENGINEERING/TRANSPORTATION PLANNING

George W. Nickelson, P.E.

Traffic Engineering • Transportation Planning

March 5, 1999

Mr. Dave Carlson
Carlson, Barbee & Gibson
2000 Crow Canyon Place, Suite 250
San Ramon, CA 94583

Subject: ***Preliminary Traffic Analysis for Potential Development in the Oakley Cypress Road Corridor Area***

Dear Mr. Carlson:

The attached report addresses traffic issues relative to potential development on several large study parcels on the north side of Cypress Road in the east Oakley area. The report's analyses address the development's relationship to other areawide transportation planning, planned roadway improvements and likely traffic fees and the relative effects of the project on traffic conditions.

This report provides preliminary input to development planning for the study properties. Please let me know if further analyses and input are needed as the planning process proceeds.

Sincerely,

George W. Nickelson

George W. Nickelson, P.E.

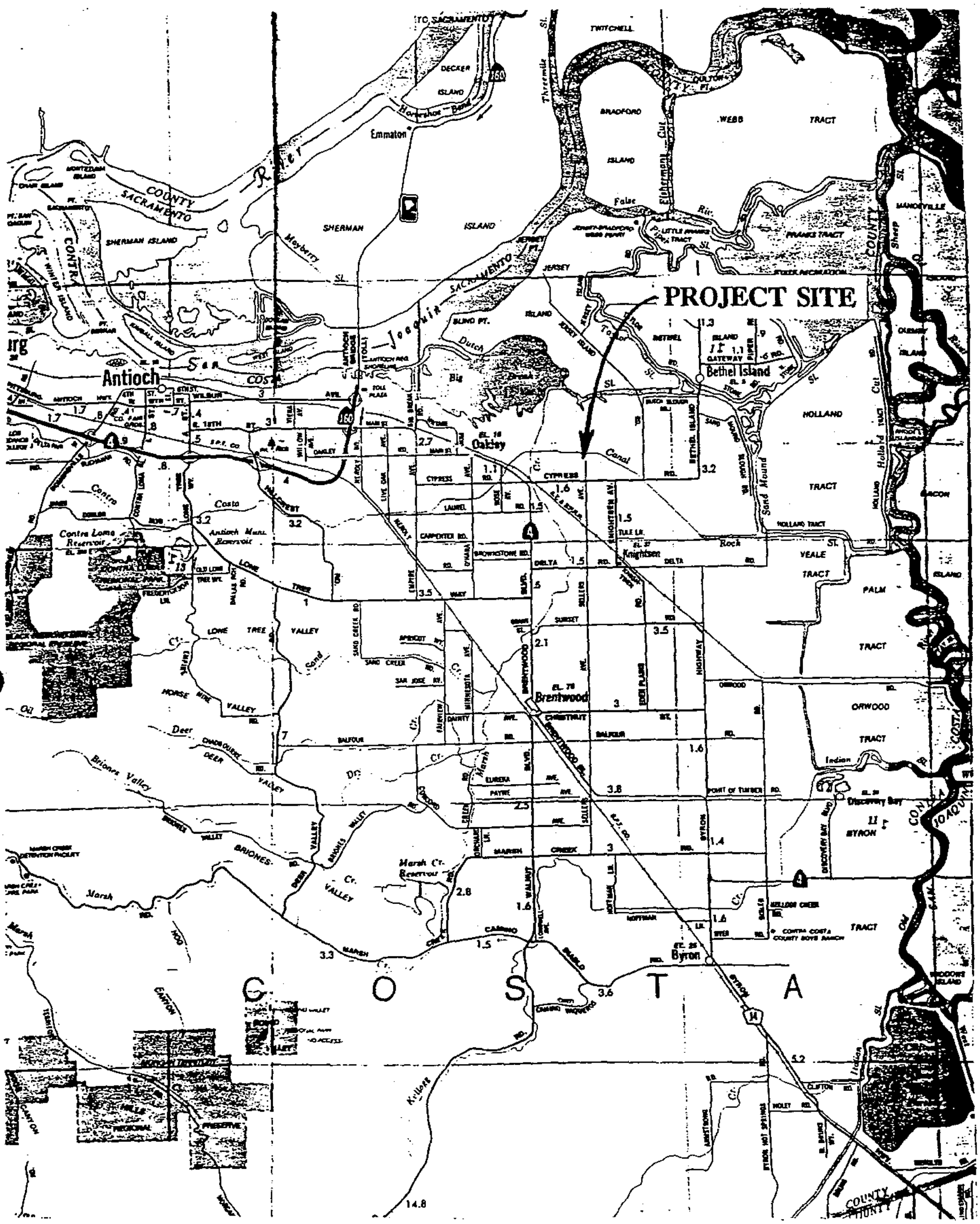
[illegible] Suite 120 • Walnut Creek, CA 94596 • (925) 935-5014 • FAX (925) 935-2247

1. INTRODUCTION

This report summarizes preliminary traffic analyses conducted for several large properties east of Oakley in Contra Costa County. As shown in Figure 1, the properties are located north of Cypress Road, on the east side of the Town of Oakley. With the recent voter approval of incorporation, the properties would actually be within the new Town of Oakley limits.

The analyses provide information on opportunities and constraints relative to traffic flow conditions, access, traffic fees and design standards. The chapters of this report include the following:

- the properties' relationship to areawide traffic planning;
- expected traffic improvements and County traffic improvement fees;
- traffic flow conditions and roadway needs associated with potential development on the properties.



SITE LOCATION MAP

figure 1

2. RELATIONSHIP OF STUDY PROPERTIES TO AREAWIDE PLANNING

a. Contra Costa County General Plan Land Uses

The General Plan land uses for the study properties are specifically outlined as a part of a special area.[1] Entitled the "Mixed Use-Oakley Community Center" (M8)", this area contains the subject properties' 1,540 acres. The General Plan states that "The purpose of this mixed-use designation is to provide for the integrated development of these three properties through a comprehensive planning process which will be completed prior to actual development of any of the three properties.".

The land uses anticipated by the General Plan are listed in Table 1.

b. Inclusion of the Study Properties in Areawide Traffic Projections

The study parcels have been included in recent areawide traffic planning for the east County area. In these planning efforts, the overall east County area is divided into "traffic analysis zones" (TAZ) for the purpose of projecting future traffic volumes. For each TAZ, the existing and future land uses are determined on the basis of data provided by cities and counties and compiled by the Association of Bay Area Governments (ABAG). These future land uses are input to a computerized traffic simulation model and the model provides projections of future traffic volumes/flow conditions on east County roadways.

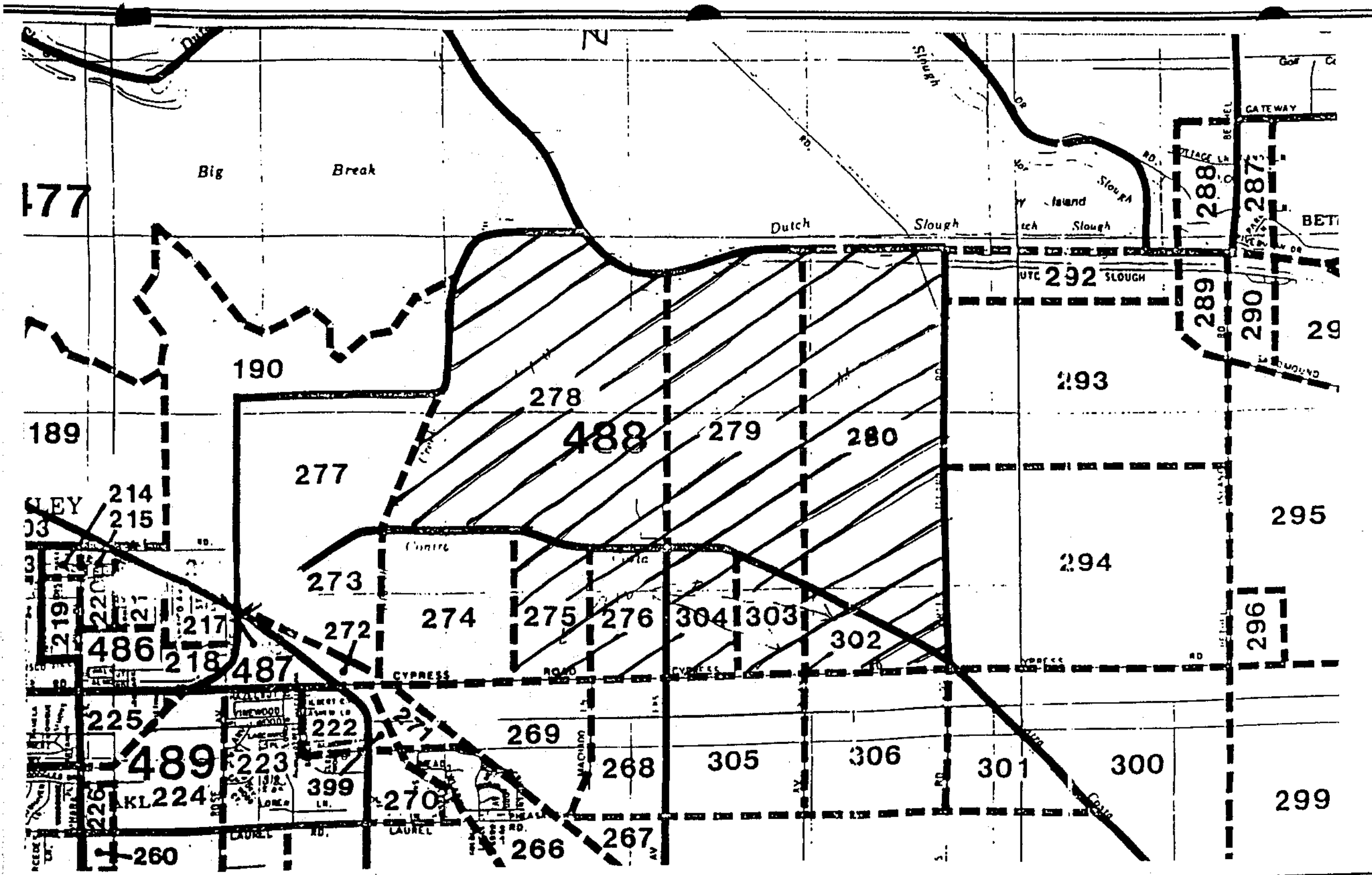
The parcels included in this preliminary analysis represent eight distinct TAZ's in the traffic simulation models. As shown in Figure 2, TAZs 275, 276, 278-280 and 302-304 include the properties which are the focus of this analysis.

Future traffic projections to the years 2000 and 2010 were prepared for the *Eastern Contra Costa County Travel Demand Model.*[2] Traffic projections to the year 2015 were produced for the *Route 4 East Major Investment Study.*[3] The most recent detailed traffic projections were completed as a part of the *Cowell Ranch Project Draft EIR.*[4] The projections from the Cowell Ranch EIR have been deemed the most complete in terms of identifying future traffic flows on roadways in the Brentwood-Oakley area.[5] These projections (and the assumed land uses contained in these projections) should be considered a basis for comparison with trip generation of development on the Cypress Road properties.

The Cowell Ranch traffic projections included a total of 995 dwelling units (D.U.) in the year 2010 on the three Cypress Road properties being evaluated. In the year 2025, a total of 6,790 D.U. are expected. Although the traffic model process does not specifically define the types of D.U. expected, the household size data indicates a mix of single family and multi-family development. In addition, the 2025 projections include commercial development with a total of 520 retail employees and 780 service/other employees. These employment figures can be

Table 1
General Plan Land Uses on Study Properties

- Single Family Residential 1,035 - 1,330 acres
- Multi-Family Residential 100 - 150 acres
- Commercial 15 - 20 acres
- Office 30 - 40 acres
- Commercial Recreation 20 - 30 acres
- Parks and recreation 100 - 150 acres
- Public and Semi-Public 25 - 35 acres



TRAFFIC ANALYSIS ZONES

omni•means

figure 2

Table 2
Buildout Trip Generation of the Study Properties
Based on Areawide Traffic Model Assumptions[1]

AM Peak Hour Trips

Land Use Component	AM Peak Trip Rate	External %	AM Peak Trips
• 2,519 single family D.U.	0.75/D.U.	100%	1,889
• 4,271 multi-family D.U.	0.66/D.U.	100%	2,819
• 211,000 sq.ft. office[2]	2.00/1,000[3]	50%[4]	211
• 260,000 sq.ft. retail[5]	ITE equation[6]	25%[7]	71
			4,990

PM Peak Hour Trips

Land Use Component	PM Peak Trip Rate	External %	PM Peak Trips
• 2,519 single family D.U.	1.01/D.U.	100%	2,544
• 4,271 multi-family D.U.	0.83/D.U.	100%	3,545
• 211,000 sq.ft. office[2]	2.58/1,000[3]	50%[4]	272
• 260,000 sq.ft. retail[5]	ITE equation[6]	25%[7]	295
			6,656

(1) ITE, *Trip Generation 6th Edition*, 1997. (Note that the trip calculations for the multi-family D.U. are based on ITE rates for "Low-Rise Residential Condominiums/Townhouses".)
(2) The areawide traffic model assumed a total of 780 service/other employees and it has been assumed that this space could include mixed general office and medical office uses. At an average employee density of 3.69 employees/1,000 sq.ft. (as per ITE standards for general office and medical office), a total of 211,000 sq.ft. of office space could be built.
(3) The listed rate is the average of ITE rates for general office and medical/dental office.
(4) It is assumed that the 6,790 residential units would generate 50% of the peak hour office trips - the remaining 50% of the trips would be external.
(5) The areawide traffic model assumed a total of 520 retail employees. With a typical density of 2.0 employees/1,000 sq.ft. (as per ITE standards), a total of 260,000 sq.ft. of retail space could be built.
(6) The ITE equations for "shopping center" trips was used.
(7) It is assumed that the 6,790 residential units would generate 75% of the peak hour retail trips - the remaining 25% of the trips would be external.

3. PLANNED ROADWAY IMPROVEMENTS/TRAFFIC FEES

a. Planned Roadway Improvements

There are a number of roadway improvement projects which are planned for the Oakley area.[7] Some of these projects have been funded and programmed for completion over the next 5-7 years. Other projects are part of the Contra Costa County General Plan but have not had been funded and are therefore not programmed for construction in a specific time period.

Programmed roadway projects most relevant to the study area are listed in Table 3 and highlighted on Figure 3. Although not currently programmed, a connection between Laurel Road and Cypress Road (east of Route 4) is a part of the County General Plan.

The Laurel Road extension has had an alignment adopted but no specific plans have been prepared.[8] However, County staff have indicated that the cost of this roadway extension (including the railroad overcrossing) would be included as a part of the traffic impact fees collected in the area.

b. Traffic Impact Fees

Traffic impact fees in the study area have been set by Contra Costa County.[9] These fees include the Oakley-North Brentwood (ONB) Traffic fee for arterial streets in the study area, the East Contra Costa (ECC) fee for major areawide improvements (including the Route 4 Bypass) and the Oakley Median Island fee to cover the costa of median island construction in arterial streets. The ONB, ECC and Median Island fees are \$6,232, \$4,903 and \$262 per peak hour trip, respectively. These peak hour amounts equate to specific land use fees as outlined in Table 4.

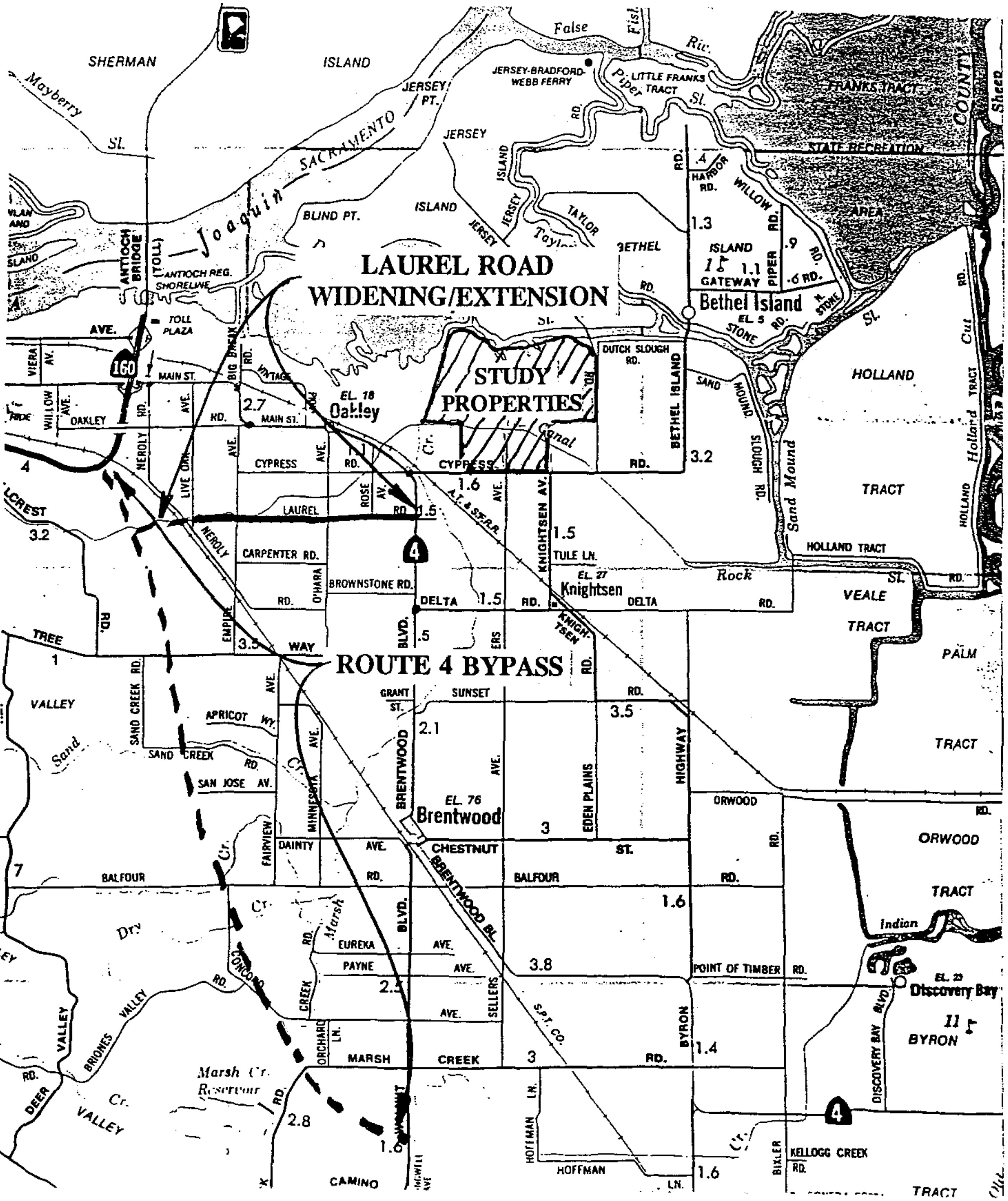
It is noted that these traffic improvement fees have been set by the County and the study area will be within the City of Oakley. However, it is likely that these fees would be maintained for at least one year after City incorporation.

Table 3
Planned Roadway Improvements in the Study Area[1][2]

Project Description	Project Timing
• Route 4 Bypass, 4 lanes, Highway 160 to Lone Tree Way	2000-2005 construction
• Route 4 Bypass, 2 lanes, Lone Tree Way to Balfour Road	1999 construction
• Route 4 Bypass, 2 lanes, Balfour Road to Vasco Road	2005-2010 construction
• Eden Plains Road widening, Sunset Road to Marshall Lane	2003 construction
• Knightsen Ave. frontage improvements, Delta Rd. to "A" St.	1999 construction
• Laurel Road/Empire Avenue traffic signal	2002 construction
• Laurel Road widening, Brown Road to Empire Avenue	2002 construction
• Laurel Road widening, Empire Avenue to Neroly Road	2001 construction
• Laurel Road widening, Rose Avenue to Route 4	2004 construction
• Laurel Road extension, Neroly Road to Route 4 Bypass	2004 construction

(1) Contra Costa County, information produced by the "State Route 4 Bypass Authority".

(2) Listing of "Proposed Capital Road Improvement Projects" provided by Mr. Brian Balbas, Contra Costa County Public Works Department, November 25, 1998.



PROGRAMMED ROADWAY IMPROVEMENTS

figure 3

Table 4
Traffic Improvement Fee Schedule for the Study Area[1]

Fee Program	Fee for Each Potential Land Use Category			
	Single Fam	Multi-Fam	Office	Commercial
Oakley/North Brentwood Fee	$6,232/D.U.	$4,986/D.U.	[2]	$3.19/sq.ft.
East Contra Costa Fee	$4,903/D.U.	$3,923/D.U.	$.57/sq.ft.	$.55/sq.ft.
Oakley Median Islands	$262/D.U.	$210/D.U.	$.44/sq.ft.	$.51/sq.ft.

(1) Fee schedule as of November 21, 1998. The fees for land uses not listed are based on per trip costs of $6,232, $4,903 and $262 for the three fee programs.

(2) The office development costs for the Oakley/North Brentwood fee program are based on a specific calculation of trips at a fee of $6,232 per trip.

4. TRIP GENERATION AND LIKELY TRAFFIC FEES FOR THE PROPOSED DEVELOPMENT ON THE CYPRESS ROAD PROPERTIES

a. Trip Generation

The peak hour trip generation of the proposed development has been calculated primarily on the bases of trip rates established by the Institute of Transportation Engineers (ITE).[10] In addition, actual traffic count data was obtained for the existing "Sun City" retirement community.[11] The trip generation calculations have focused on the peak commute hour rates since this peak hour trips generation is linked with traffic flow conditions and the need for traffic improvements. The peak hour trips generation would also be the basis for calculating traffic impact fees for the development.

As detailed in Table 5, the proposed development would generate 932 new trips during the AM peak commute hour and 1,310 new trips during the PM peak commute hour. These trip totals are substantially lower than the trips that would have been generated by the land uses designated in the General Plan and included in prior areawide traffic analyses (see Table 2). The development's peak hour trips would be 81% lower in the AM peak commute hour and 80% lower in the PM peak commute hour.

b. Traffic Fees

Because the proposed retirement community residences are not specifically designated in the traffic fee schedule, it would be appropriate that traffic fees for these units be based on their trip generation as a proportion of the trip rate for single family dwelling units. During the PM peak commute hour, the retirement residences would generate 0.27 trips per dwelling unit, about 27% of the PM peak hour rate for a single family dwelling unit. Applying this ratio to the fees listed in Table 4 would yield the following fees:

- Oakley/North Brentwood Fee = $1,683/D.U.
- East Contra Costa Fee = $1,324/D.U.
- Oakley Median Islands = $71/D.U.

It is noted that in the City of Roseville, the "Sun City" retirement community dwelling units pay a fee which is about 27-28% of the City's traffic fees for single family residential units. This ratio is consistent with the fees listed above.

The office and retail commercial land uses within the development would be charged the appropriate fees as outlined in Table 4.

Table 5
Peak Hour Trip Generation of the Proposed Development Plan[1]

AM Peak Hour Trips

Land Use Component	AM Peak Trip Rate	External %	AM Peak Trips
• 3325 retirement D.U.	0.23/D.U.[2]	100%[3]	765
20 acre commercial/ office parcel x .30 FAR x 25% office/75% retail=			
• 65,000 sq.ft. office	2.00/1,000[4]	50%[5]	65
• 195,000 sq.ft. retail	ITE equation[6]	25%[7]	60
• 40 acre community park	1.4/acre[8]	75%[9]	42
			932

PM Peak Hour Trips

Land Use Component	PM Peak Trip Rate	External %	PM Peak Trips
• 3325 retirement D.U.	0.27/D.U.	100%[3]	898
• 65,000 sq.ft. office	2.58/1,000[4]	50%[5]	84
• 195,000 sq.ft. retail	ITE equation[6]	25%[7]	244
• 40 acre community park	2.8/acre[8]	75%[9]	84
			1,310

(1) ITE, *Trip Generation 6th Edition*, 1997.
(2) City of Roseville, traffic counts at the "Sun City" development.
(3) The ITE rates for retirement communities reflect on-site amenities which already reflect internal trips. Thus the ITE rates only include external trips.
(4) The listed rate is the average of ITE rates for general office and medical/dental office.
(5) It is assumed that the 3,325 residential units would generate 50% of the peak hour office trips - the remaining 50% of the trips would be external.
(6) The ITE equations for "shopping center" trips was used.
(7) It is assumed that the 3,325 residential units would generate 75% of the peak hour retail trips - the remaining 25% of the trips would be external.
(8) San Diego Association of Governments, *San Diego Traffic Generators*, December 1996.
(9) It is assumed that the 3,325 residential units would generate 25% of the peak hour community park trips - the remaining 75% of the trips would be external.

5. FUTURE TRAFFIC FLOW CONDITIONS AND ROADWAY NEEDS

Because the proposed development plan would generate substantially lower trip generation than previously predicted for these properties, the traffic impacts and roadway needs could also be substantially reduced, particularly in the immediate development area.

The most recent long range traffic studies do not provide detailed information on traffic operations in the development area. However, the 1994 east County model projections do indicate very satisfactory traffic flows in the area with Level of Service (LOS) "A" operations at the Cypress Road/Route 4 intersection. (LOS definitions are attached as appendices). These projections (which include the easterly Laurel Road extension to Cypress Road) also show satisfactory operations on the Cypress Road and Laurel Road street segments.

Roadway construction associated with the development would include the internal streets with those streets being built as per County standards. In addition, a portion of the eventual Cypress Road-Laurel Road improvements would be the responsibility of the eventual developers of adjacent properties. Specifically, the County requires the adjacent property to pay for the curb, gutter, sidewalk and first 20 feet of roadway (an 8 foot parking lane and the first 12 foot travel lane).[12] All other lanes/medians along an arterial street are funded by the areawide traffic fee program.

REFERENCES

(1) *Contra Costa County General Plan,*

(2) DKS Associates, *Eastern Contra Costa County Travel Demand Model Final Report*, November 1994.

(3) CCS Engineers, *Route 4 East Major Investment Study - Administrative Draft #3*, June 1998.

(4) Wagstaff Associates, *Cowell Ranch Project Draft EIR*, 1996.

(5) Meeting with Mr. Steven Goetz, Contra Costa County Community Development Department, December, 11, 1998.

(6) Institute of Transportation Engineers (ITE), *Trip Generation 6th Edition*, 1997.

(7) Mr. Brian Balbas, Contra Costa County Public Works Department, November 25, 1998.

(8) Mr. Martin Lysons, Contra Costa County Public Works Department, March 5, 1999.

(9) Mr. Joe Yee, Contra Costa County Public Works Department, December 17, 1998.

(10) ITE, *Trip Generation...*, Ibid.

(11) Mr. Scott Gandler, Traffic Engineer, City of Roseville, February 19, 1999.

(12) Mr. Martin Lysons, Contra Costa County Public Works Department, March 8, 1999.

Letter 16

Contra Costa County
FLOOD CONTROL
& Water Conservation District

Maurice M. Shiu
ex officio Chief Engineer

255 Glacier Drive, Martinez, CA 94553-4825
Telephone: (925) 313-2000
FAX (925) 313-2333

October 30, 2002

Mr. Barry Hand
Community Development Director
City of Oakley
P.O. Box 6
3639 Main St.
Oakley, CA 94561

RECEIVED
NOV 04 2002
CITY OF OAKLEY

File: 97-29C, 29D, 29E, 29H
30A, 30B 30C, 52D, 56, 74
Oakley 2020 General Plan

Dear Mr. Hand:

We have reviewed the City of Oakley's 2020 General Plan Public Draft Review and the accompanying September 2002 Draft Environmental Impact Report (DEIR), which our office received on September 23, 2002. We also reviewed Santina & Thompson's August 2002 Public Facilities Background Report and August 2002 Conceptual Drainage Master Plan Report for the City of Oakley. These reports were prepared to provide background information for the General Plan. We provide the following comments:

1) The Oakley General Plan covers nine formed Drainage Areas (29C, 29D, 29E, 29H, 30A, 30B, 30C, 52D, and 56) and two unformed drainage areas (29 and 74). As mentioned in the General Plan, the areas of the City southwest of the BNSF railroad tracks are generally within formed CCCFCWCD drainage areas. The areas northeast of the railroad tracks are generally in unformed drainage areas. A

2) We agree with Santina & Thompson's Background Report, which mentions that areas to the northeast of the railroad will require significant drainage infrastructure as much of this area is in the 100-year flood zone. This area has not been studied by the District and therefore lacks an adopted master drainage plan. We agree with the General Plan statement that the areas in these unformed drainage areas will require separate drainage facilities discharging into Dutch Slough, which are not currently in place. B

3) The City's Sphere of Influence (SOI) includes the areas identified in General Plan Figure 2-3 as the "Cypress Corridor Areas" and the "Cypress Corridor Expansion Areas". These Areas lie to the east of the BNSF Railroad and Marsh Creek and are not part of a formed drainage area. The General Plan should state that these Areas should not drain to Marsh Creek. C

4) We compared Contra Costa County's 1995-2010 General Plan Land Use Maps with Oakley's Preferred 2020 General Plan, and Alternate A – Lower Density Plan and Alternate C – Higher Density Plan as shown in the DEIR. The land use assumptions in the District's hydrology calculations are generally based on the previous County General Plan. The City's land use designations for the areas located southwest of BSNF railroad, are comparable with the District's hydrology assumptions except for the following instance: **D**

   The Preferred Plan, Alternate A, and Alternate C show a higher land use density compared with our assumptions near Neroly Road and Empire Avenue. The Preferred Plan and Alternates show this area to be commercial while our DA 30C Hydrology Land Use Map (November 29, 2000) shows this area to be R-4 (single family high). The General Plan and EIR should address how the increased runoff from this higher land use will be mitigated.

5) The General Plan should include a specific policy that requires the City or developers in the Cypress Corridor Area and Expansion Area to draft their own regional drainage master plan. A drainage master plan should be completed prior to considering development proposals in these areas. The following paragraph on Page 19 of Santina & Thompson's Conceptual Drainage Master Plan should be added as a General Plan Policy under Drainage Facilities on Page 4-10: **E**

   A Drainage Master Plan must be developed and approved prior to allowing development in the Cypress Corridor Area and the Cypress Expansion Area. The Drainage Master Plan shall include detailed hydrologic modeling of the watershed that considers land use, existing facilities, soil, and topographic data. The Drainage Master Plan shall result in a plan with descriptions of proposed flood control facilities (which typically include basins, channels and storm drains), compliance with discharge requirements, cost estimates, and schedule.

   Also, the following paragraph from the Conceptual Drainage Master Plan should be included if Oakley's SOI is incorporated:

   The Drainage Master Plan shall include an organization chart that details which agency will be responsible for Design, Planning, Hydrogeology, Current Development Review, Clean Water Program compliance, and Maintenance.

6) The following paragraph from Page 3 Section 1.4 of Santina & Thompson's Conceptual Drainage Master Plan should be incorporated as a General Plan policy: **F**

   The unincorporated area within Oakley's SOI is currently under the control of the County. Should Oakley incorporate this area, Oakley shall develop their own flood control plans and identify discharge points. Oakley will be responsible for insuring the flood control implementation is performed correctly and the ongoing maintenance is perpetual.

7) In addition, the General Plan policies should be specifically modified as follows:
   a. Page 4-11, Program 4.10.A Implement and update, as necessary, the Contra Costa County Drainage Plan *for formed drainage areas* within the City of Oakley. **G**
   b. Page 4-11, Program 4.10.D Develop and adopt a Specific Drainage Plan for areas north and east ~~of the Contra Costa Canal~~ *BNSF Railroad, which includes the Cypress Corridor Area and Expansion Area.*

8) The DEIR should be amended as follows:
   - Page 3-106, Paragraph 3 –The current plan for the Planning Area is based upon the CFCWCD plan *only in the formed drainage areas where the Flood Control plan exists.* **H**

We appreciate the opportunity to review the Oakley 2020 General Plan public review draft and the accompanying DEIR. We look forward to receiving a copy of the Final General Plan and EIR, which include our comments. If you have any questions, or would like to meet to discuss our comments, please call me at (925) 313-2394 or Hannah Wong at (925) 313-2381.

Very truly yours,

Paul R. Detjens

Paul R. Detjens
Associate Civil Engineer
Flood Control Engineering

PRD:HSW:gpp
G:\GrpData\FldCtl\CurDev\CITIES\Oakley\2020 General Plan\DEIR 2020 General Plan.doc

Cc: E. Whan, Flood Control
S. Matsumoto, Flood Control
J. Vogan, City of Oakley
P. Roche, CDD

Letter 17

IRONHOUSE SANITARY DISTRICT

FAX
(925) 625-0169

450 Walnut Meadows Drive • P.O. Box 1105 • Oakley, CA 94561

Telephone
(925) 625-2279

October 31, 2002

Barry Hand
Community Development Director
3633 Main Street
Oakley, CA 94561

RE: COMMENTS ON THE OAKLEY 2020 GENERAL PLAN
DRAFT ENVIRONMENTAL IMPACT REPORT

Dear Mr. Hand:

On behalf of Ironhouse Sanitary District, thank you for the opportunity to comment on the Oakley 2020 General Plan Draft Environmental Impact Report. I present the District's comments by referencing the pages in the Draft document. We would be happy to provide these comments in digital form. Please do not hesitate to contact me if you have any questions.

PAGE 3-100 Under Railroad, in the second paragraph -- Please add this additional sentence: "Encouraging the installation grated crossing where none exist now is also an effective strategy to avoid collision and possible derailments." A

PAGE 3-120 Under Wastewater Services -- The Wastewater Services Section of this DEIR belongs in Section 3.6 Public Utilities and not in Section 3.8, Hydrology and Water Quality. Please relocate this section. B

2nd paragraph -- For the sake of technical accuracy, please replace this paragraph with the following: "Ironhouse Sanitary District resulted from the governmental reorganization of the former Contra Costa County Sanitation District No. 15 and the Oakley-Bethel Island Wastewater Management Authority into the Oakley Sanitary District, renamed the Ironhouse Sanitary District, which was completed on January 31, 1992." C

5th paragraph – Include "Dutch Slough and" prior to the word "Sandmound". D

PAGE 3-121 Change "Effluent Disposal" to "Effluent Recycling" in the heading and throughout this paragraph. E

In the third sentence, "4.0 MGD" should be changed to "3.0MGD". F

Change "Sludge Disposal" to "Solid Sludge Reuse" in the heading and throughout this paragraph. G

Under Effluent Disposal - the fourth sentence should be changed to read, " ISD has the ability to increase its ultimate effluent disposal capacity from 3.0 MGD to 8 MGD due to the acquisition of additional land". H

PAGE 3-127 Impact 3.8-C -- This entire section needs to also follow the above request for Page 3-120 and be moved to Section 3.6 of the DEIR - Public Utilities. I

Under Discussion and Conclusion -- Fifth sentence, the word "No" should be removed. J

PAGE 3-128	**The last sentence of the fourth paragraph should be changed to read, "The most significant change will be the need for a larger trunkline, and to extend the trunkline all the way to the treatment plant headworks".**	**K**
PAGE 3-129	**Fourth bullet, second sentence – Replace "<u>determine</u>" with "assure itself". Third sentence, replace "appropriate sewer service agency" with "Ironhouse Sanitary District".**	**L**
	Fifth Bullet -- Replace "<u>sewer service</u>" with "Ironhouse Sanitary District".	**M**
PAGE 4-17	**4.3-11 Utilities and Services – This section is completely void of any discussion on ISD's wastewater collection, treatment and reclamation impacts by the different alternatives. This section must be revised to include all relevant discussion of the impacts of each alternative on ISD's facilities.**	**N**
APPENDIX B	**Page 15, Item 4.9D – Revise to reflect changes noted above for Page 3-129.**	**O**
	Page 17, Item 5.1F, second sentence -- Revise "<u>impact fees</u>" to "City impact fees".	**P**
	Page 18, Item 5.5.A, first bullet -- as the City does not operate the water or wastewater facilities, sharing of those agencies plans and studies should not occur via the City as the City may misrepresent the intent, or conclusions of these documents. All information on these agencies' facilities must come directly from Ironhouse Sanitary District and Diablo Water District.	**Q**

Thank you again for the opportunity to comment on the Oakley 2020 General Plan Environmental Impact Report and please do not hesitate to call me if you have any questions.

Sincerely,

Tom Williams

Thomas Williams
Acting District Manager
IRONHOUSE SANITARY DISTRICT

TW:jt\wp8
tom\odeir.02

cc: Ironhouse Sanitary District Board
chron. file

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY GRAY DAVIS, Governor

DEPARTMENT OF TRANSPORTATION
P. O. BOX 23660
OAKLAND, CA 94623-0660
(510) 286-4444
(510) 286-4454 TDD

Flex your power! Be energy efficient!

November 21, 2002

CC-General
CC-000201
SCH2002042134

Mr. Barry Hand
City of Oakley
Community Development Department
3633 Main Street
Oakley, CA 94561

Dear Mr. Hand:

OAKLEY 2020 GENERAL PLAN - DRAFT ENVIRONMENTAL IMPACT REPORT/ DRAFT LONG-RANGE CIRCULATION PLAN

Thank you for continuing to include the California Department of Transportation (Department) in the environmental review process for the Oakley 2020 General Plan Update. The following comments are based on our review of both the Draft Environmental Impact Report (DEIR) and Draft Long-Range Circulation Plan, which are dated September 2002 and October 2002 respectively.

California Environmental Quality Act Compliance

The Department once again recommends that the City of Oakley recirculate the DEIR once the discussion of project-related traffic impacts from the Draft Long-Range Circulation Plan has been incorporated. As indicated in our previous correspondence dated October 30, 2002 (enclosed), omitting the discussion of project-related traffic impacts from the DEIR precludes full public disclosure of project impacts as required by the California Environmental Quality Act (CEQA). While the Department understands that additional traffic information will be provided in the Final EIR, the anticipated ten-day circulation of this document does not provide sufficient time for public review and comment per CEQA Section 15203. A

Comments on the Circulation Plan are presented below. These are submitted after close of the public review period because the Circulation Plan was not submitted to the Department until October 23, 2002, after more than a month of the public review period had already elapsed. B

Mitigation Requirements

While build-out of the General Plan would result in potentially significant impacts to transportation, the feasibility, financing, scheduling, implementation responsibilities and lead agency monitoring for proposed mitigation measures have not been identified in the DEIR. Because the only identified mitigation consists of a list of policies, the DEIR should be revised to include feasible and verifiable mitigation. Potentially significant impacts to transportation include: C

- Project-related traffic that exceeds level of service (LOS) standards for roadway segments and intersections, and
- Cumulative impacts to traffic, transit, pedestrian and bicycle facilities.

Improvement Assumptions
The text and LOS calculations in the Circulation Plan should be revised to reflect the following:

1. The four lane improvement along the State Route 4 (SR 4) Bypass cited in the first bullet on page 13 of the Circulation Plan is unlikely to occur by the year 2010 as stated in the 2nd paragraph of page 12. The SR 4 Bypass project that is scheduled for completion by Fall, 2006 will be four lanes between the SR 160 and Lone Tree Way interchanges only, then two lanes rather than the four cited in the Circulation Plan heading east to Balfour Road. Interchanges will be constructed at Laurel Road and Lone Tree Way. D

2. SR 4 Freeway widening to eight lanes from Bailey Road to the SR 4 Bypass is unlikely to be completed by 2010 as stated in the 3rd bullet of Page 13 in the Circulation Plan.

3. The Circulation Plan should clarify whether widening SR 4 to four lanes through the City will be needed once the SR 4 Bypass is completed.

Traffic
1. The Circulation Plan should clarify how capacity is derived from the 2000 Highway Capacity Manual (Table 3, Page 5). E

2. The 4D Road Type designation for the segment of Main Street (SR 4) east of Empire Avenue should be verified (Table 3, Page 5). F

3. Clarify whether right-turns-on-red (RTOR) are permitted in the eight-phase traffic signal cycle at Main Street (SR 4)/Laurel Road intersection, and if not, the RTOR volume should be adjusted accordingly. G

Agency Coordination
The City should coordinate with Contra Costa Transportation Authority and the SR 4 Bypass Authority in preparation of the General Plan. H

If you have any questions regarding this letter, please feel free to call or email Patricia Maurice of my staff at (510) 622-1644 or patricia_maurice@dot.ca.gov at any time.

Sincerely,

Timothy C. Sable

TIMOTHY C. SABLE
District Branch Chief
IGR/CEQA

c: Gregoria Garcia (State Clearinghouse)

4.0 RESPONSES TO COMMENTS

CHAPTER FOUR
RESPONSES TO COMMENTS

This section summarizes each of the written comments received on the Draft EIR during the public review period. Following each comment is a response intended to either supplement, clarify, or amend information provided in the Draft EIR, or refer the commentor to the appropriate place in the Draft EIR where the requested information is found. Letters of comment are presented verbatim in Chapter Three, and each letter and comment is numbered for reference.

In preparing responses to the comments received on the Draft General Plan and Draft EIR, City staff concluded that readers of the General Plan and the EIR would benefit from some clarifications regarding proposed commercial development and related impacts, particularly those related to circulation. Additions to the Land Use and Circulation Elements, which are included as Appendix C of this document, do not provide new information not previously contained in the General Plan and Draft EIR, including the Long Range Roadway Plan prepared by Fehr and Peers Associates, which is included as Appendix B of this document and referred to in the General Plan (page 3-8) and Draft EIR (page 3-31) as the Long Range Circulation Report or Plan. Instead, these additions clarify information presented in those documents, but provide additional discussion to directly address issues in which readers may be interested, but that were not previously addressed directly.

LETTER 1 Terry Roberts, Senior Planner, Governor's Office of Planning and Research, State Clearinghouse

Comment 1A: The State Clearinghouse submitted the Draft EIR to selected state agencies for review. On the enclosed Document Details Report, the Clearinghouse has listed the state agencies that reviewed the document. The review period closed on October 30, 2002, and the comments from the responding agency are enclosed. Please note that Section 21104(c) of the California Public Resources Code states that:

> A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation.

These comments are forwarded for use in preparing the Final EIR. This letter acknowledges that the City has complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act.

Response: Comment noted. No response is required.

LETTER 2 Roger L. Wilson, Director of Facilities and Planning, Liberty Union High School District

Comment 2A: The District requests to be referenced in Section 4.3-6, Public Services, similar to the Oakley Union School District. Also reference should be made that at all levels of density, the high school will be directly impacted.

Response: The first paragraph of Section 4.3-6 (page 4-12) is hereby modified to read as follows (new text is <u>underlined</u>):

> The four elementary schools in the Oakley Union School District are over capacity limits, and future growth will further impact these schools. The two middle schools are not impacted at this time. <u>Additionally, the Liberty Union High School District is projected to reach capacity in the 2003-2004 school year and will be adversely impacted by population growth at all levels of density.</u> However, impacts on schools of all levels would be directly related to population increase, with some benefit to compact development.

Comment 2B: In Table 4.4-1, Analysis of Alternatives, the commentor requests that under High Density/Schools the aforementioned impact would show up as a plus sign rather than a zero.

Response: Further discussion with the District determined that the table should reflect that the effect of the High Density Alternative would be adverse. The placing of a zero in that location does depict an adverse effect, instead of a positive effect. No modifications to the table are necessary.

LETTER 3 Barbara J. Cook, Chief, Northern California Cleanup Operations Branch, Department of Toxic Substances Control, State of California

Comment 3A: Much of the land in the Plan Area has historically been used for agricultural purposes and may contain harmful levels of pesticides. In addition, at least one parcel zoned for residential use is known to contain high levels of lead. The following should be added to the Goals, Policies and Programs of the General Plan:

- That an environmental assessment be required prior to any new construction, in order to verify the environmental suitability of the land for its intended use.
- That land with contamination at levels unsafe for currently zoned land uses, be rezoned to allow only those land uses considered safe.

Response: The suggested policies are overly broad in requiring an environmental assessment prior to <u>any</u> new construction, and requiring unknown numbers of rezonings. Discretionary projects for which an EIR is prepared will normally include an assessment of hazards. Phase I environmental site assessments are also commonly conducted for private parties in real estate transactions for other than single family residences. These actions should provide adequate protection to the public from contaminated sites. With regard to the specific property referenced in the comment, this parcel is under the control of DTSC. The surface is sealed, and the perimeter is surrounded by groundwater monitoring wells. This parcel has no potential for residential development under the proposed General Plan.

LETTER 4 Brian Wiese, Interagency Planning, East Bay Regional Park District

Comment 4A: The Draft EIR identifies existing regional trails within the City (page 3-66). It would be useful if the text more specifically identified the Big Break Regional Shoreline as an area for Delta shoreline access and recreational opportunities, contiguous with the City's planned habitat restoration and recreational development at Dutch Slough, immediately to the east. The District suggests adding to the sentence on page 3-68: "The East Bay Regional Park District (EBRPD) also manages regional parks and recreation facilities within the City of Oakley and for the eastern Contra Costa County region" the following phrase: "...including the Big Break Regional Shoreline, located along Oakley's northern city boundary on the San Joaquin River Delta, and to the west of the Cypress Corridor/Dutch Slough area."

Response: The first full paragraph of page 3-68 in Section 3.5-1 is hereby modified to read as follows (new text is underlined):

> The East Bay Regional Park District (EBRPD) also manages regional parks and recreation facilities within the City of Oakley and the far eastern Contra Costa County region, <u>including the Big Break Regional Shoreline, located along Oakley's northern city boundary on the San Joaquin River Delta, and to the west of the Cypress Corridor/Dutch Slough area</u>. EBRPD manages over 12,000 acres including under water or tidal marshlands, shoreline and areas around Mt. Diablo and the hills south of Antioch and Pittsburg.

Comment 4B: It would be helpful to if the Land Use and Open Space and Conservation sections of the Draft EIR reproduced relevant figures contained in the General Plan in order to illustrate the City policies which are discussed as mitigations. The Land Use Diagram (General Plan Figure 2-2) should be included as the Preferred Alternative, along with the High Density, Low Density and existing Contra Costa General Plan (Sections 4.2-1 through 4.2-3 of the Draft EIR) to show the land uses proposed in the Plan. Maps of Vegetation Types (General Plan Figure 6-1) and Biological Sensitivity (Figure 6-2) should be included in the Biological Resources section of the Draft EIR to illustrate the location of resources and compare with the Land Use Diagram.

Response: The maps referenced in the comment are included in Appendix A of this document.

Comment 4C: The General Plan and the EIR should address potential land-use incompatibilities between the proposed commercial development adjacent to the Big Break Marina and the surrounding Delta Recreational Lands, including the Big Break Shoreline. Buffers or other ways to mitigate land use conflicts should be considered.

Response: The City of Oakley is very concerned about potential land use incompatibilities surrounding the existing open space resources in and around Oakley, including those mentioned by the District. The Draft General Plan includes a goal (Goal 6.6) to encourage preservation and enhancement of existing open space resources in and around Oakley and balance open space and urban areas to meet the social, environmental, and economic needs of the City now and for the future, and several Policies and Programs to address that goal. Policy 6.6.2 calls for establishing buffers from adjoining land uses to protect the natural open space resources in the City, and Program 6.6.A. provides for adopting land use controls that prevent incompatible uses for parcels adjacent to existing open space resources. Policy 2.1.5 calls for preserving open space areas of varying scales and uses, both within development projects and at the City's boundary. Policy 2.1.8 provides for discouraging development that results in land use incompatibility, and requiring buffers between uses. The Parks Master Plan and the Parks and Recreation and Open Space and Conservation Elements of the General Plan were prepared concurrently and in conjunction, as pointed out on page 3-64 of the Draft EIR. Therefore, the General Plan Goals, Policies and Programs provide more general guidance for the steps the City will take to create a meaningful open space system, which will be specifically defined in the Parks Master Plan.

See Response to Comment 4F regarding the mechanisms that the City will use to finance parkland acquisition and development, as well as the preservation of open space.

Comment 4D: A number of the General Plan policies offered as mitigations appear to be only partially reflected in the Land Use Diagram. OSCE Policy 6.3.1, "Preserve important ecological and biological resources as open space" [changed now to read "Encourage preservation of important ecological and biological resources as open space"], and OSCE Policy 6.6.4, "Where feasible and desirable, major open space components shall be combined and linked to form a visual and physical system in the City." Major resource areas along Dutch Slough area and irrigated farmlands in the Future Expansion Area are preserved outright or partially through low-density zoning; however, outside of these areas, biological and agricultural resources (vineyards and orchards) shown in General Plan Figures 6-1 and 6-2 are not called out for preservation in the General Plan, as reflected in the Land Use Diagram. Thus it appears that much of the proposed land use pattern is not linked to any geographic resource analysis. If resource-conservation policies are to be used as mitigation measures, they should be linked to a geographic analysis which would include natural features such as Marsh Creek, sloughs off of Dutch Slough and view preservation. Without a comprehensive resource analysis, reflected in the Land Use Diagram, open space dedications associated with new development risk being ad-hoc and not linked to a meaningful open space system. Implementation policies in the General Plan should incorporate provisions for open space fees in lieu of dedication, under the Quimby Act, along with transfer of development rights or density credits.

Response: The Draft General Plan states that the City strives to be "recognized by 2007 as a model of civic participation and a vibrant Delta community ..." and is enabling that future by preparing a public input driven Parks and Recreation Master Plan. The General Plan's Parks and Recreation Element provides the overall policy statement for Oakley's parks and recreation facilities, but the Master Plan will provide the day-to-day guidance and standards for planning for future parks and recreation facilities. The Master Plan will provide a meaningful open space system.

The Open Space and Conservation Element addresses the following resources: agricultural resources, air quality, biological resources, cultural resources, historic resources, open space resources, and scenic resources. The analysis of these resources is contained in the Setting section of the Open Space and Conservation Element of the Draft General Plan. This analysis served as the basis for the formulation of the Element's goals, policies and programs. However, documenting existing resources does not translate into preservation of all existing resources in the context of an urbanizing area, much of which was designated for development under the existing Contra Costa General Plan. For example, as stated under "Agricultural Resources," "While the City recognizes the historic role of agriculture within the Oakley community and supports continued agriculture, the transition from agriculture to urban uses limits the potential for large-scale commercial agriculture within Oakley." One of the outcomes of the General Plan process is the identification of the most critical and important resources that merit preservation through the policies of the General Plan, and prevention of premature conversion of open space lands, which this Plan will accomplish.

Comment 4E: OSCE Program 6.1.B states: "Encourage consolidated development, with appropriate land use buffers of parks, open space and trails, for proposed major subdivisions of prime agricultural lands" [changed now to read "for proposed major subdivisions adjacent to prime agricultural lands."] Much of the Future Expansion Area (Sphere of Influence) is in irrigated fields and/or seasonal wetland. Both wetlands and prime agricultural lands and other resources should be mapped as a part of the EIR so that these policies can be implemented. The Plan proposes an Agricultural Limited land use designation for some of this land, which includes a wide density range (0.1 – 1 du/ac.) and single-family low and medium density on the remainder. Do these densities include or exclude wetlands?

Response: Included in the Draft General Plan Programs is the City's commitment to identify and map those properties that include prime productive agricultural soils for use in the review of development applications (Program 6.1.A). The City also displays its intent to protect and preserve important ecological and biological resources, including wetlands, by committing to a Program, as funding becomes available, to prepare a detailed inventory of ecological resource areas, along with detailed maps showing the location of significant resources, that would include wetland areas (Program 6.3.E). The purpose of the EIR is to analyze the environmental impacts of the General Plan. The analysis assumes full implementation of the General Plan, which would include the aforementioned identification and mapping programs.

General Plan densities are gross densities, and thus include wetlands.

Comment 4F: The General Plan shows no proposed public parks in the Future Expansion Area. In implementing the above policy, it would be useful to consider how to "encourage consolidated development." One way to mitigate development impacts would be by providing clustering or development rights transfer in order to consolidate development and preserve contiguous habitat, resource and agricultural areas. Such a transfer could facilitate an eastward extension of the Dutch Slough preserve, for example, or a buffer between it and proposed residential development.

Response: The General Plan shows no public parks in the Expansion Areas because the location of parks is not yet known. Park siting, type and design will be determined as development projects are submitted and approved. New development will be required to provide a minimum of 5 acres of parkland per 1,000 residents (or pay equivalent in-lieu fees), in accordance with the policies of the Parks and Recreation Element (Policy 7.1.1, Programs 7.1.A and 7.1.B). The Park and Recreation Element also requires subdivision developers to provide full improvement of required parkland (Program 7.1.A). The Park and Recreation Element also provides for development of some parks on property outside the subdivision if that would result in a larger and more usable parksite or create linkages (Program 7.1.B).

LETTER 5 James W. Cutler, Planning, Mediation, and Environmental Services, Lesher Trust Representative

Comment 5A: Page 1-2, second paragraph of the Draft EIR states that an additional purpose of the Draft EIR is intended to assist the Contra Costa County Local Agency Formation Commission (LAFCo) in making decisions about changes to the Oakley city limits and Sphere of Influence (SOI) in the future. Beyond this one sentence of intent in this document and two paragraphs on page 2-11, there is no discussion of the LAFCO policies on modifying the City SOI to include areas within the Oakley Planning Area. The Draft EIR does not, in any way, reference or discuss LAFCO "factors of consideration" in making the SOI changes that would allow for annexation of outlying areas.

Response: Section 2.6, under the heading of Local Agency Formation Commission, is hereby modified to read as follows (new text is underlined, deleted text is in ~~strikeout~~):

> The Local Agency Formation Commission (LAFCo) has authority over governmental organizations that affect ~~land use decisions affecting~~ local agency boundaries, including city limit and its sphere of influence (SOI) ~~boundary lines~~. The City of Oakley would be required to submit any proposed changes to the City's limit lines or its SOI ~~sphere of influence lines~~ to ~~the~~ LAFCo for approval.
>
> Oakley's proposed Sphere of Influence Expansion Areas are located directly to the east of the City boundary lines. They include a 154-acre area just southeast of the Sellers and Cypress intersection and a 2,547-acre area east of Jersey Island Road, north of Contra Costa Canal, ~~east~~ south of ~~the Delta~~ Dutch Slough, and south of the Delta. Annexation of these areas into the City of Oakley would require LAFCo review and approval. Likewise, any changes to the Sphere of Influence ~~boundary lines~~ would require LAFCo review and approval. Oakley would only be capable of expanding its boundaries to the east, as the west and south are bordered by Antioch and Brentwood, and the north is bordered by the Delta.

The Draft EIR describes LAFCo's role in approving Sphere of Influence amendments and annexations (see pages 1-2, 1-6, 2-1, 2-11 and 2-13) and indicates Oakley's interest in expanding its Sphere of Influence (see pages 1-5 and 2-1). The Public Review Draft of the General Plan also notes the City's interest in expanding the Sphere of Influence and annexing areas within the expanded Sphere (see pages 1-3, 2-2 and 2-28).

Sphere of Influence. In accordance with the Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 ("Act"), Contra Costa County's Local Agency Formation Commission (LAFCo) is responsible for reviewing and acting upon requests for sphere of influence amendments and annexations to cities. The purpose of the Act is to encourage planned, efficient urban development patterns with appropriate consideration of preserving open space and prime agricultural lands, to discourage urban sprawl, and to encourage efficient extension of governmental services based upon local conditions and circumstances (Government Code Sections 56001 and 56301; all citations in this response are to the Government Code unless otherwise noted.)

The Act further recognizes that providing housing at all income levels is an important factor in promoting orderly development. The Act prefers additional growth within, or through the expansion of, the boundaries of those local agencies which can provide necessary governmental services and housing for all incomes (Section 56001.)

The Act requires city and county representatives to meet prior to a city submitting an application to LAFCo for a sphere of influence amendment in an effort to reach agreement on boundaries, development standards and zoning within the proposed sphere to ensure that development occurs in a manner that reflects the concerns of the city, and is accomplished in a manner that promotes the logical and orderly development of areas within the sphere. LAFCo may adopt a sphere consistent with any such agreement reached or, if no agreement is reached, may consider a city's application. In determining a sphere, LAFCo shall consider the following:

(1) the present and planned land uses in the area, including agricultural and open space lands;
(2) the present and probable need for public facilities and services in the area;
(3) the present capacity of public facilities and adequacy of public services that the city provides; and
(4) the existence of any social or economic communities of interest in the area if LAFCo determines that they are relevant to the city. (Section 56425(e).)

The first three factors are CEQA considerations. The fourth factor is not a CEQA issue. In addition, LAFCo must conduct a review of municipal services and make certain determinations specified in Section 56430(a), some of which would require CEQA analysis.

LAFCo will be the lead agency when acting on a city request to amend its sphere. This EIR is intended to be used by LAFCo in analyzing the environmental impacts of a future City application to expand its Sphere of Influence. LAFCo will be required to update Oakley's sphere at least every five years, pursuant to the Act (Section 56425(f)), if it has not acted on a request from the City.

Annexation. LAFCos have the specific authority to review annexations to cities. The Act requires that annexation areas be prezoned, and provides for annexation approvals consistent with the planned and probable use of the property based on the General Plan and prezoning designations (Sections 56375(a), (e).) Annexation requests are reviewed for consistency with adopted spheres of influence (Sections 56375.5, 56668), and for guiding development toward non-prime agricultural lands (as defined in Section 56016), unless such development would not be orderly or efficient (Section 56377.)

Additionally, the Act sets forth a lengthy list of factors to be considered by LAFCo when acting on an annexation request (Section 56668.) The factors include, but are not limited to, land use and policy considerations such as population, density, land uses, growth projections for a ten-year period and fair share housing needs; social and economic interests; the physical and economic integrity of agricultural land; consistency with applicable general and specific plans and spheres of influence. The factors also include environmental considerations such as topography, drainage basins, and public services and facilities, including timely availability of water supplies. Any further annexation application to LAFCo must address all of the listed factors, including those that involve potential environmental impacts.

As part of an application to LAFCo to annex lands, the City will determine the adequacy of this EIR for such application, and will prepare any additional environmental documentation necessary to comply with CEQA. LAFCo will be a responsible agency when acting on an annexation proposal. Prezoning will be required prior to an application for annexation.

Comment 5B: On page 2-11 the Draft EIR references the Delta Protection Commission. This section should be augmented to point out that the Cypress Corridor Expansion Area is also located within the secondary zone of the Delta and is not subject to the requirements of the Delta Protection Commission's plan. The boundaries established for the Commission's jurisdictional areas within Contra Costa County were largely based upon County-adopted Urban Limits Line.

Response: See Response to Comment 6A.

Comment 5C: The Cypress Corridor Expansion Area was not included in the list of major growth areas in Oakley presented on page 3-128 of the Draft EIR.

Response: The list on page 3-128 in Section 3.8, Hydrology and Water Quality is hereby modified to read as follows (new text is <u>underlined</u>):

> There are a few major <u>potential</u> growth areas in Oakley:
>
> - DuPont property in northwest (industrial/ commercial uses);
> - Cypress Corridor (mostly residential with some commercial);
> - South Oakley on Neroly west of High School (commercial and residential); and
> - <u>Cypress Corridor Expansion Area (commercial and residential)</u>.

Comment 5D: The proposed project is identified as the environmentally superior alternative on page 4-22 of the Draft EIR. The commentor concurs in that assessment.

Response: Comments noted. No response is required.

LETTER 6 Margit Aramburu, Executive Director, Delta Protection Commission

Comment 6A: Portions of water-covered areas in the City limits are in the Primary Zone of the Delta. The City limits lie 200 feet waterward of the mean high tide line. The Draft EIR does not acknowledge this, or the fact that local government actions in the Primary Zone of the Delta can be appealed to the Delta Protection Commission. The Draft EIR should show the actual shoreline, the City Limits, and the boundary of the Primary Zone of the Delta. In addition, the Draft EIR should describe the Commission's law and plan and how they pertain to the City's planning process. The City's General Plan must be consistent with the Commission's adopted Plan and will have to be submitted to the Commission for a formal finding of consistency.

The Commission's Plan supports development of public access and recreation along the shoreline, a concept that is reflected in the proposed General Plan.

The Draft EIR should delineate the boundary of the Primary Zone of the Delta and describe the relationship between the City and the Delta Protection Commission. The Draft EIR should also acknowledge that the City will have to submit its adopted General Plan to the Commission to ensure it is consistent with the Commission's Plan.

Response: The following narrative hereby replaces the paragraph on the Delta Protection Commission found on page 2-11 of the Draft EIR (new text is <u>underlined</u>):

> **<u>Delta Protection Commission</u>**
>
> <u>The northern boundary of the City of Oakley is located along the western edge of the San Joaquin Delta, and the City's boundary extends approximately 200 feet into the area defined as the Primary Zone of the Delta. This area is subject to the jurisdiction of the Delta Protection Commission, and that body will review the Oakley 2020 General Plan and determine whether the General Plan is consistent with the Land Use and Resource Management Plan for the Primary Zone of the Delta.</u>
>
> <u>Once the Delta Protection Commission has found the Oakley General Plan consistent with their Land Use and Resource Management Plan, the City will be responsible for ensuring that the City of Oakley land uses within the Primary Zone are consistent with the adopted Oakley General Plan. If outside parties believe the City's actions related to the Primary Zone are not consistent with the adopted General Plan or the provisions of the Delta Land Use and Resource Management Plan, then such parties may appeal the City's actions to the Delta Protection Commission.</u>

The City of Oakley has consulted with staff of the Delta Protection Commission to ensure that the Oakley 2020 General Plan is consistent with the provisions of the Delta Land Use and Resource Management Plan.

Table 2-1 of the Draft EIR has been revised to more fully describe the role of the Delta Protection Commission. The revised Table 2-1 is presented at the end of this chapter. A map showing the Primary and Secondary Zones of the Delta is included in Appendix A of this Final EIR.

LETTER 7 William C. Norton, CEO/Executive Secretary, Bay Area Air Quality Management District

Comment 7A: District staff believe that implementation of the General Plan could have potentially significant impacts upon air quality in the region, and are not convinced that implementation of the programs and policies listed in Air Quality Section 3.4 will be sufficient to reduce the impacts to a less than significant level. The Bay Area is currently a non-attainment area for federal and state ambient air quality standards for ground level ozone, and state standards for particulate matter. The air quality standards are set at levels to protect public health and welfare. The major source of air pollution in the Bay Area is motor vehicles.

Response: The City concurs with the District's conclusion. In Impact 3.4-A, the last paragraph of the "Discussion and Conclusion" is revised to read as follows (new text is underlined, deleted text in ~~strikeout~~):

> The General Plan Policies and Programs presented here and proposed to be implemented demonstrate an effort on the part of the City of Oakley to implement all feasible measures to mitigate this impact. ~~Therefore, the effects of this impact will be reduced to the level of less than significant and need no further mitigation measures.~~
>
> The Bay Area Air Quality Management District has suggested additional mitigation measures; however, the City has determined those measures to be infeasible. The District has not identified new significant environmental impacts of the General Plan; its comments agree with the impacts identified in the Draft EIR. The District has, however, suggested that the level of the identified impacts of the General Plan would be substantially greater than addressed unless the City adopted additional mitigation measures. The City does not believe that the suggested mitigation measures would be feasible.
>
> As additional mitigation, the District has suggested that the General Plan increase residential densities near transit nodes, downtown, and other activity centers. However, the downtown is already built out, and the Commercial Downtown designation, as well as the Oakley Redevelopment Area Planned Unit District regulations, accommodate mixed uses. Moreover, the General Plan provides for most major intersections and commercial areas to be surrounded by the Single

Family High land use designation, with some nearby multi-family housing. Although the density could be increased, the District does not provide any evidence that more multi-family housing would be viable in the City of Oakley, since as indicated in both the General Plan (page 3-15) and Draft EIR (page 3-27), the percentage of people who drive alone has remained constant for the past ten years.

The District has also suggested that the General Plan increase the density of commercial development near current and future transit facilities. The District does not appear to account adequately for the likely increase in the number of vehicle trips that would be generated by denser commercial development, which proved to be the case for the Business Park designations located in the northwest portion of the City. It is not reasonable to assume that all, or even necessarily a majority of, new trips would be by transit.

The District has further suggested that the predominance of low-density residential land uses and the lack of mixed-use designations will not support alternative modes of transportation, which is inconsistent with proposed General Plan policies. Again, almost all of the residential areas near major roadways and commercial areas is Single Family High, which the City has determined is the highest density that Oakley can support in large areas, and policies in the General Plan preclude mixed-use development in areas designated for commercial development.

The District has also suggested that the General Plan include "stronger language" demonstrating the City's commitment to improving regional air quality with "unambiguous mitigation measures," including transportation demand management and "smart growth." These suggestions are vague and undefined, and no evidence is provided by the District regarding how they would improve air quality.

The District has also suggested that the General Plan provide specific transit-oriented development opportunities that might exist near the proposed Oakley eBART station or other current or future transit nodes in the City. The commercial land use designation at the Neroly/Empire intersection is intended to accommodate the proposed station, and the City is planning for eBART to the extent possible, given the preliminary nature of that project. Finally, the District states that the General Plan lacks adequate detail about location-specific programs and policies to encourage less single-occupancy automobile usage. Given that the City of Oakley is surrounded by other cities and urban or urbanizing areas, and that regional traffic passes through Oakley, the General Plan has incorporated all feasible policies/mitigation measures to address air quality in the context of the region. Further, many of the District's suggestions for additional mitigation are vague, and no evidence is provided that they are more likely to reduce the significance of impacts of regional air quality, particularly given the fact that the region is a non-attainment area for certain pollutants.

For the reasons identified above, the City does not believe that any of the District's suggested additional mitigation measures are feasible. Its review of the District's comments further leads the City to conclude that, even if fully implemented, its proposed mitigation measures will not reduce this impact to a less than significant level. Therefore, this impact is considered significant and unavoidable.

Mitigation Measures

~~No mitigation measures are necessary~~ No additional mitigation measures are feasible.

Significance after Implementation: Even after implementation of the proposed General Plan ~~would reduce this impact to a less than significant level~~, this impact will remain significant and unavoidable.

Impact 3.4-F is revised to read as follows (new text is underlined, deleted text in ~~strikeout~~):

Mitigation Measures

~~No mitigation measures are necessary~~ No additional mitigation measures are feasible.

Significance after Implementation: Even after implementation of the proposed General Plan ~~would reduce this impact to a less than significant level~~, this impact will remain significant and cumulative.

All other references to this impact in the Draft EIR are hereby revised to reflect the determination that this impact is significant, unavoidable and cumulative, including Table ES.2-1 "Summary of Impacts and Mitigation, Oakley 2020 General Plan Draft EIR, Significance After Implementation," Section 5.1, Significant Unavoidable Environmental Impacts, and Section 5.4, Cumulative Impacts. In Table ES.2-1, the entries in the column "Significance after Implementation" for Impacts 3.4-A and 3.4-F are changed from "Less Than Significant" to "Significant and Unavoidable" and "Significant and Cumulative," respectively. Sections 5.1 and 5.4 are revised to read as follows (new text is underlined, deleted text in ~~strikeout~~):

5.1 SIGNIFICANT UNAVOIDABLE ENVIRONMENTAL IMPACTS

The potential environmental impacts that would result from implementation of the proposed Oakley General Plan are summarized in Table ES.2-1 in the Executive Summary of this EIR. While this EIR identifies some potentially significant impacts, incorporation of the goals, policies and programs proposed in the

General Plan would reduce ~~all~~ such impacts to levels that are less than significant, with the exception of Impact 3.4-A ("New stationary and mobile sources of air pollutants caused by build-out of the proposed General Plan Land Use Map may cause emissions of ROG, NOx, and PM10."), which would remain significant and unavoidable.

The second paragraph of Section 5.4, Cumulative Impacts (page 5-3) is revised to read as follows (new text is underlined):

> The potentially significant cumulative impacts identified under each respective subject area in Chapter Three of this EIR are summarized below. This EIR concludes that all significant cumulative impacts, with the exception of air quality, will be reduced to a level of insignificance through implementation of the proposed General Plan policies and programs.

The last paragraph of Impact 3.4-F, "Discussion and Conclusion" is revised to read as follows (new text is underlined, deleted text in ~~strikeout~~):

> The City has included many policies and programs and that set and implement standards and actions that attempt to achieve this goal. These are throughout the Policies and Programs of the General Plan. Included by reference are all the Policies and Programs presented in the Discussions and Conclusions on the impacts presented in the Circulation/Transportation section of this EIR (Section 3.3). Other examples of Policies and Programs for improving air quality are listed in Impact 3.4-A of this EIR, along with an analysis of the feasibility of additional mitigation measures suggested by the BAAQMD. The General Plan Policies and Programs presented here and proposed to be implemented demonstrate an effort on the part of the City of Oakley to implement all feasible measures to mitigate this impact. ~~Therefore, the effects of this impact will be reduced to the level of less than significant and no additional mitigation measures are necessary.~~ However, due to the regional non-attainment status for certain pollutants, this impact is considered significant and cumulative.

Comment 7B: The District supports the intent of the air quality policies discussed in the General Plan Draft EIR, but believes the City needs to increase the residential densities and redesign the mixture of land uses in order to promote realistic alternatives to driving alone. Decisions made by the City of Oakley can directly influence motor vehicle usage both in the City's jurisdiction and in the greater Bay Area. It is important that the City view its General Plan as an opportunity to move transportation and land use policy in a direction that minimizes vehicle trips and reduces the rate of growth in vehicle miles traveled, thereby improving local and regional air quality.

Response: See Response to Comment 7A.

Comment 7C: The District is concerned about the General Plan's land use composition, especially regarding the proposed densities of residential uses and their ability to support alternative modes of transportation. While the densities of residential land use designations range between 1.0 and 16.7 dwelling units per [gross] acre (du/ac), the majority of the residential acreage is devoted to single-family homes at densities of 5.5 du/ac or less, figures that are too low to support transit service. With such low densities, residents will be more likely to travel via single-occupancy vehicles. The City should rework the residential densities, especially near transit nodes, downtown, and other activity centers to increase the residential densities to at least 10 du/ac, a density commonly regarded as able to support transit service as well as improve the bike/walkability of neighborhoods. In addition, the District urges the City to consider planning for higher density commercial development near current and future transit facilities than is currently being proposed in the General Plan.

Response: See Response to Comment 7A.

Comment 7D: Both the air quality and transportation sections of the Draft EIR mention City policies and programs designed to achieve the goals of reducing automobile travel demand and promoting alternatives to the single-occupancy vehicle. While the District is pleased that some of the District's recommended Transportation Control Measures for City General Plans (TCMs 9, 16, & 19) are addressed in the Draft EIR, the City needs to do more. Specifically, it is recommended that the City revise the land use designations to match the General Plan policies that promote use of alternative modes of transportation. General Plan policies mentioned in the Draft EIR state that the City will "ensure that the density and mixture of future land uses encourage transit usage, walking, and bicycling" (CE Policy #3.7.2) and "encourage site planning that promotes all modes of transportation, and that minimizes vehicular trips between different land uses" (CE Policy #3.7.7). However, the Land Use Diagram (Figure 2-2) in the General Plan does not clearly reflect these goals. Instead, the City of Oakley in 2020 appears to have predominantly single-family residential uses with commercial uses primarily lining major arterial roadways. Low-density residential land uses and the lack of mixed-use designations will result in a build-out of Oakley which is not supportive of alternative modes of transportation.

Response: See Response to Comment 7A.

Comment 7E: The District recommends that the City of Oakley reconsider the land use mixture and densities to better promote transportation alternatives including bicycle and pedestrian accessibility, public safety and access to services. In the Draft EIR's determination of consistency with the 2000 Clean Air Plan (CAP), the City identifies General Plan policies which implement some of the transportation control measures identified in the CAP. While the District supports the identified policies, they also recommend stronger language that clearly defines Oakley's commitment to improving regional air quality with unambiguous mitigation measures, including those aimed at current and future residential and commercial development in Oakley. Without appropriate mitigation measures in place, future development could lead to a long-term cumulative increase in motor vehicle traffic that will impair attainment of air quality standards and prolong residents' exposure to unhealthy air. The District strongly urges the City to consider not only implementing transportation demand management measures, but also focusing on a smart growth model of development.

Response: See Response to Comment 7A.

Comment 7F: The District is aware of the City of Oakley's participation in the current Contra Costa County "Shaping Our future" smart growth planning process. Decisions from this process will help to guide a number of growth-related issues throughout the county including more efficient use of land, the reduction of traffic congestion and better transit service. The District was disappointed to see no mention of this process in the Draft EIR, and strongly recommends that the City's General Plan reflect the goals and intent of "Shaping Our Future" as well as provide policies and programs that will implement the smart growth strategies that come out of that county-wide planning process.

Response: The City of Oakley is a participant in the "Shaping the Future of the Nine-County Bay Area/Smart Growth Strategy/Regional Livability Footprint Project." One of the purposes of the project - which involves the general public and the private sector as well as local and regional governmental institutions - is the selection of a preferred smart growth alternative that will be tailored to local communities. Because of the nature of the region, in which Oakley is surrounded by the urbanized communities of Brentwood and Antioch, the City of Oakley participates in this process because the solutions to air quality, traffic, and general livability lie in the collective decisions and approaches taken by the region. The City believes that the proposed General Plan is consistent with Alternative 3 ("Smarter Suburbs) developed by the "Shaping the Future" process, which is described as follows:

> Compact, walkable, mixed-use and mixed-income development in many of the same places as Alternatives 1 and 2, but at still lower densities. Additional growth at the region's edges at higher densities and with a better balance of jobs and housing than has been typical.

Comment 7G: The City of Oakley General Plan Draft EIR did not include an adequate analysis of the General Plan's consistency with the most recently adopted regional air quality plans, the 2000 Bay Area Clean Air Plan (CAP) and the 2001 Ozone Attainment Plan. In order to evaluate the General Plan's consistency with the air quality plans, the City should not only consider the extent to which the General Plan implements transportation control measures from the air quality plans but also the General Plan's consistency with the air quality plans' population and vehicle use projections, as well as whether the General Plan provides buffer zones around sources of odors, dust and toxics. For more details, it is recommended that the City refer to the BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans (1999) for guidance on best practices for assessing and mitigating air quality impacts related to plan consistency, as well as for construction emissions, land use/design measures, project operations, motor vehicles, nuisance impacts and more.

Response: Impact 3.4-C of the Draft EIR (pages 3-58 through 3-60) addresses consistency of the Draft General Plan with the 2000 Bay Area Clean Air Plan. As explained in the "Discussion and Conclusion" for Impact 3.4-C, the Draft EIR considers not only the extent to which the General Plan implements transportation control measures from the air quality plans, but also the General

Plan's consistency with the air quality plans' population and vehicle use projections. The discussion under the subheading "Population Growth" states as follows:

> Implementation of the proposed General Plan would cause a decrease in future population compared to the future population that could be accommodated under the City-adopted County General Plan. Under the City-adopted County General Plan, the future population of the Plan area at build-out was anticipated to be 74,917. This means that the future potential population in Oakley would be reduced by implementation of the proposed General Plan. Consequently, when compared to the results of not implementing the Proposed Project, attainment of the state-level ambient air quality standards would not be delayed, therefore there is a less than significant air quality impact [with regard to consistency with the 2000 Bay Area Clean Air Plan.]

The subheading which follows this paragraph, "Travel Growth and Transportation Control," includes an analysis of the extent to which the General Plan implements transportation control measures from the air quality plans.

It should be noted that the BAAQMD Clean Air Plan would have been based on the County General Plan. Since the buildout population for the proposed Oakley General Plan (68,371) is lower than the County General Plan for the Oakley area, implementation of the proposed General Plan should not delay attainment of the State ambient air quality standards, therefore resulting in a less than significant impact.

The BAAQMD 2001 Ozone Attainment Plan is referenced in Section 3.4.1.3 of the Draft EIR, under the subheading "Federal Air Quality Programs" (page 3-51). Similar to the analysis of consistency of the proposed General Plan with the 2000 Bay Area Clean Air Plan, it can be concluded that implementation of the proposed General Plan would cause a decrease in future population compared to the future population that could be accommodated under the City-adopted County General Plan. Under the City-adopted General Plan, the future population of the Plan Area at build-out was anticipated to be 74,917. This means that the future potential population in Oakley would be reduced by implementation of the proposed General Plan. Consequently, when compared to the results of not implementing the Proposed Project, attainment of the state- and federal-level ambient ozone standards would not be delayed.

Impact 3.4-E (pages 3-61 through 3-63) addresses the impact of potential placement of sensitive land uses near potential sources of objectionable odors, dust, or toxic air contaminants. The "Discussion and Conclusion" includes the following analysis:

> Odors, dust, or toxic air contaminants can be emitted by stationary or area sources throughout the Planning Area. The occurrence and severity of potential odor impacts depend on numerous factors. The nature, frequency, and intensity of the source, the wind speeds and direction, and the sensitivity of the receiving location each contribute to the intensity of the impact.

While offensive odors rarely cause any physical harm, they can be unpleasant and cause distress among the public and generate citizen complaints. Managing sources of odors is accomplished by regulatory requirements and appropriate land use planning. Sources that generate odors, which travel into adjacent properties, are regulated by the provisions of BAAQMD Regulation 7, Odorous Substances.

Dust can be a common byproduct of agricultural activities. As with odors, potential impacts from agricultural dust depend on the frequency and intensity of the source, wind speeds and directions, and the sensitivity of the receiving location. In order to minimize distress among the public and citizen complaints, land use planning strategies should aim to protect residents from sources of agricultural dust. BAAQMD Regulation 6 addresses control of visible emissions.

Trace quantities of toxic air contaminants would be expected to occur with natural gas combustion related to build-out as per the proposed Land Use Map. Additionally, diesel particulate emissions, known as TAC, could be emitted during operation of motor vehicles. To address these emissions, statewide programs and regulations are presently being developed by the CARB that will lead to reduced risks from diesel exhaust. In light of the available information, the effects of the toxic emissions from existing and future vehicle operations in the Planning Area are not expected to be substantial.

The City has included Policies and Programs that set and implement standards and actions that attempt to separate potential sources of odors and toxics and the potential sensitive receptors. These are throughout the Policies and Programs of the General Plan.

The discussion goes on to list those Policies and Programs. The discussion concludes that with implementation of these Policies and Programs, impacts will be less than significant.

The "Discussion and Conclusion" for Impact 3.4-C (pages 3-58 and 3-59) makes reference to the BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans (1999), which were used in this Draft EIR for guidance on best practices for assessing and mitigating air quality impacts related to plan consistency, as well as for construction emissions, land use/design measures, project operations, motor vehicles, nuisance impacts, etc.

Comment 7H: The Draft EIR also lacks any reference to specific transit-oriented development opportunities that might exist near the proposed Oakley eBART station or other current or future transit nodes in the City. The eBART project is a current proposal to run a single track diesel motorized train along existing railroad tracks to connect the Pittsburg BART station with the East Contra Costa County communities of Antioch, Byron, Oakley and Brentwood. The District is generally supportive of infill development that is of a moderate to high density, has a variety of compatible land uses and encourages alternative modes of transportation. Such development patterns have been strongly supported by Contra Costa County residents at "Shaping Our Future" workshops. These projects are generally much less automobile-dependent, especially if there is a compatible mixture of uses including needed services. Such projects generate less air pollution than conventional sprawl development by promoting transit usage as well as walking and cycling.

Response: See Responses to Comments 7A and 7F. The City of Oakley is currently participating with the cities of Antioch and Brentwood in researching options for planning a three-city transit-oriented development village at the location of the proposed eBART station. However, that research is in a very preliminary stage and is not adequately formulated for inclusion in the General Plan at this time.

Comment 7I: The District urges the City to develop a more comprehensive air quality section or element in the General Plan. The current Draft Air Quality Section of the Open Space and Conservation Element makes mention of the relationship between reducing automobile travel and the benefits to air quality but lacks adequate detail about location-specific City programs or policies to encourage less single-occupancy automobile usage. By including a more thorough air quality section or element, the City can link specific land use and transportation policies to Oakley's commitment towards clean air.

Response: Inclusion of an air quality section or element in a General Plan is optional. The City has demonstrated the importance of air quality to Oakley residents by including this air quality section. The City has further demonstrated its commitment to improving air quality by participating in the "Shaping the Future" program and researching options associated with the proposed eBART station, as described above. Air quality is a regional issue, with solutions best pursued through regional efforts rather than the General Plans of individual jurisdictions.

LETTER 8 Anne Olson, P.E., Water Resources Control Engineer, California Regional Water Quality Control Board

Comment 8A: With the exception of the Alternatives Analysis section, there are no maps or graphics to illustrate existing and proposed land uses, streets, or infrastructure improvements. It is therefore not possible to conceptualize the proposed development plan.

Response: Refer to Appendix A of this document for General Plan maps. As stated on page 3-1 of the Draft EIR:

> Much of the setting summaries in this Chapter are excerpted from the *Oakley 2020 Draft General Plan* (September 2002) and the *Oakley 2020 General Plan Background Report* (September 2001). In addition, many tables and figures referred to in this Chapter are not repeated and can be found in the two previously mentioned documents. These reports are available for review at the City of Oakley Community Development Department, 3639 Main Street, Oakley, California.

Comment 8B: Table 2-1 of the Draft EIR identifies the Regional Water Quality Control Board as a key agency "... responsible for evaluating appropriate uses of water and responsible for issuing waste discharge permits to protect water quality. This agency will act as a Responsible Agency to evaluate project consistency with the City's existing National Pollutant Discharge Elimination System (NPDES) permit." The Regional Board does not evaluate appropriate uses of water. Through the Basin Planning process, the Regional Board determines the existing and future beneficial uses of surface waters and groundwater. The beneficial uses are then used to determine applicable Water Quality Objectives.

Response: Table 2-1 has been revised to incorporate the information in this comment. The revised Table 2-1 is presented at the end of this chapter.

Comment 8C: The Regional Board's mission is to protect the quality of surface water and groundwater quality through regulation of waste discharges to land and surface water. The primary mechanism by which these discharges are regulated is adoption of Waste Discharge Requirements (WDRs) for individual dischargers. The Regional Board is also the implementing agency for the federal NPDES program and issues NPDES permits for point source discharges to surface water and storm water dischargers.

Response: See Response to Comment 8B and revised Table 2-1.

Comment 8D: Regional Board staff is unaware of any NPDES permit issued for the City of Oakley other than the MS4 storm water permit. The reference should be more specific.

Response: See Response to Comment 8B and revised Table 2-1.

Comment 8E: Section 3.8.1, Surface Water Resources, should be revised to reflect that the Central Valley Regional Water Quality Control Board is responsible for protecting water quality in the Sacramento-San Joaquin Delta, which is the receiving water for discharges originating in the Oakley area. The Water Quality Control Plan (Basin Plan) for the Sacramento River Basin and the San Joaquin River Basin sets forth the existing and potential beneficial uses, water quality objectives, an implementation plan, and survey and monitoring plan for the basin.

Response: The third paragraph in Section 3.8.1, Surface Water Resources (page 3-117) is hereby replaced by the following text to read as follows (new text underlined):

> <u>The Central Valley Regional Water Quality Control Board is responsible for protecting water quality in the Sacramento-San Joaquin Delta, which is the receiving water for discharges originating in the Oakley area. The Water Quality Control Plan (Basin Plan) for the Sacramento River Basin and the San Joaquin River Basin sets forth the existing and potential beneficial uses, water quality objectives, an implementation plan, and survey and monitoring plan for the basin.</u>

Comment 8F: Section 3.8.1, Wastewater Services, should be revised to address the following comment. The current WDRs for the Ironhouse Sanitary District (ISD) Wastewater Treatment Facility state that the current treatment capacity is 3.0 mgd (note that this is not the same as disposal capacity). The current permitted effluent disposal capacity is 2.0 mgd until ISD completes additional effluent disposal areas on Jersey Island. This limit determines the allowable influent flow rate.

Response: Section 3.8.1, Wastewater Services, Current System (page 3-120) is hereby revised to read as follows (new text is underlined, deleted text is in ~~strikeout~~):

> The wastewater system is composed of collection, treatment, and disposal. The collection and treatment facilities will be expanded to meet future requirements. The disposal system has been sized to meet build-out capacity. The current daily flow is 2.1 million gallons per day (MGD) and as of 2002, the ~~disposal system capacity was~~ current treatment capacity is 3.0 MGD and has the potential to be expanded to meet future requirements. However, the current permitted effluent disposal capacity is 2.0 MGD until ISD completes additional effluent disposal areas on Jersey Island. This limit determines the allowable influent flow rate. The facilities include the collection system, wastewater treatment, and liquid and sludge disposal. The majority of liquid effluent goes to Jersey Island for land disposal. The District is currently seeking a new permit to allow land application of its bio-solids on Jersey Island.

The foregoing clarification of the analysis in the Draft EIR does not indicate that the analysis in Section 3.8.1 was inadequate, nor change the ultimate conclusion that adequate disposal capacity exists or will be constructed to serve the General Plan Planning Area, and that the potentially significant impact will be reduced to a less than significant level.

Comment 8G: It should be noted that the long-term viability of ISD's current effluent disposal program is not certain. The Regional Board and Contra Costa Water District are concerned about the potential for impacts to groundwater and surface water quality. The current WDRs (copy enclosed) set forth a plan and schedule for evaluation of groundwater quality and implementation of source control measures as needed, and the Regional Board understands that ISD is currently updating its Master Plan.

Response: Section 3.8.1, Wastewater Services, Effluent Disposal (page 3-121) is hereby revised to read as follows (new text is underlined, deleted text is in ~~strikeout~~):

> Effluent disposal is through land application of the treated effluent on irrigated pasture and agricultural crops. Currently the disposal is split between the mainland property and Jersey Island. Currently ISD is permitted to apply its reclaimed water on 260 acres of its mainland property and 350 acres on its Jersey Island property. This provides enough capacity to accommodate the current plant treatment capacity of ~~4.0~~ 3.0 MGD and effluent disposal capacity of 2.0 MGD. ISD has increased its ultimate potential effluent disposal capacity ~~from 4.0 MGD~~ to 8.0 MGD by the acquisition of additional land. The land application of 8.0 MGD requires approximately 1,600 acres. However, 3,500 acres has been obtained on Jersey Island. ~~While not all of the 3,500 acres will be feasible for disposal use, enough should be available to allow adequate flexibility to rotate the~~

~~disposal areas over time~~. The Regional Water Quality Control Board has noted that the long-term viability of ISD's current effluent disposal program is not certain. The Regional Board and Contra Costa Water District are concerned about the potential for impacts to groundwater and surface water quality. The current waste discharge requirements (WDRs) set forth a plan and schedule for evaluation of groundwater quality and implementation of source control measures as needed.

The foregoing clarification of the analysis in the Draft EIR does not indicate that the analysis in Section 3.8.1 was inadequate, nor change the ultimate conclusion that adequate disposal capacity exists or will be constructed to serve the General Plan Planning Area, and that the potentially significant impact will be reduced to a less than significant level.

Comment 8H: Based on the discussion presented in the Draft EIR, Impact 3.8-A, it appears that this impact analysis is intended to address four different potential sources of water quality impacts: storm water impacts associated with construction (short-term); storm water impacts associated with changed land uses (long-term); potential groundwater impacts and/or increased seepage of pollutants into the Contra Costa Canal; and groundwater level fluctuations. However, the discussion seems to be limited to storm water discharges during and after construction. These should be identified and analyzed as separate potential impacts.

Response: Section 3.8.3, Analysis of Impacts, of Section 3.8, Hydrology and Water Quality (pages 3-122 through 3-129 of the Draft EIR) has been revised and reorganized to respond to comments 8H, 8I, 8J, 8K, and 8M. The discussion of potential groundwater impacts and groundwater level fluctuations is directly related to the discussion of potential long-term impacts of General Plan land uses on the Contra Costa Canal, a surface water feature. Therefore, that discussion has not been identified as a separate impact. The revised Section 3.8.3 is presented at the end of this chapter.

Comment 8I: The discussion of storm water impacts associated with construction should be moved to Impact 3.8-B.

Response: See Response to Comment 8H. The discussion of storm water impacts associated with construction has been moved to Impact 3.8-B.

Comment 8J: The conclusion states that the City of Oakley has adopted policies and programs to "...protect the citizens of Oakley from the dangers of flooding." This is not consistent with the impact topics.

Response: See Response to Comment 8H. The comment is correct, and this reference has been deleted. Impacts related to flooding are addressed in Section 3.7, Public Safety/Hazards of the Draft EIR, Impact 3.7-A.

Comment 8K: Many of the policies and programs listed are not relevant to avoiding or mitigating water quality impacts associated with any of the identified sources. They should be deleted.

Response: See Response to Comment 8H. Policies and Programs that are not relevant to avoiding or mitigating water quality impacts have been deleted.

Comment 8L: Many of the policies and programs cited as mitigation focus on encouraging, discouraging, coordinating, and consulting, but appear to lack specific means to ensure appropriate implementation of those policies and programs.

Response: Specific means to ensure appropriate implementation of the policies and programs which function as mitigation measures are presented in the Mitigation Monitoring and Reporting Program, which has been prepared separately from the Draft EIR and is included in this Final EIR at the end of this chapter.

Comment 8M: Impact 3.8-B is confusing: the impact statement states that the subject is construction-related erosion and sedimentation, but the mitigation measures include several policies and programs related to flood control and drainage improvements. The mitigation measures should be directly tied to the impact, and drainage and flooding issues should be identified and analyzed as separate impacts.

Response: See Response to Comment 8H. Impacts related to flooding are addressed in Section 3.7, Public Safety/Hazards of the Draft EIR, Impact 3.7-A. Policies and Programs related to flood control and drainage improvements have been deleted from Impact 3.8-B.

Comment 8N: The following (or similar language) should be included in Impact 3.8-B as a mitigation measure for construction-related water quality impacts: "For development projects encompassing disturbance of 5 acres or more, issue grading permits only upon receipt of documents verifying that the applicant has applied for coverage under the State Water Resources Control Board's General Permit for discharge of Storm Water Associated with Construction Activities."

Response: The suggested mitigation measure is currently a requirement of State law and is already implemented by the City of Oakley. Therefore, it does not need to be included as a mitigation measure in the General Plan EIR.

Comment 8O: Impact 3.8-C should be separated into two separate impacts: impacts to the treatment and disposal capacity of the ISD wastewater treatment facility (which belongs in Section 3.6, Public Services) and potential water quality impacts associated with increased discharge of treated effluent at the facility. The analysis of impacts under Public Facilities should include sewer hydraulic capacity, and the ISD facility hydraulic, treatment, and disposal capacities. Even at the Program EIR level, it should be possible to identify portions of the existing wastewater conveyance system whose capacity will be impacted by the proposed development plan. Unless some future CEQA document(s) will address these impacts, they must be disclosed and analyzed in the Final EIR.

Response: While the Regional Board suggests one way the impacts could be organized, the organization of impacts in the Draft EIR is not incorrect or in error. Further, since the Draft EIR has already been circulated, reorganization of the document at this point would serve no particular public purpose. Language has been added to the "Discussion and Conclusion" section of Impact 3.8-C to expand the discussion of water quality. With regard to impacts associated with future ISD facility hydraulic, treatment and disposal capacity, that information is summarized in the Public Facilities Background Report, Section 1.2, Wastewater Services, prepared for the General Plan by Santina & Thompson. The Background Report is referenced at the beginning of Section 3.8 of the Draft EIR as the source for a more detailed environmental setting discussion regarding hydrology and water quality. The ISD will be the lead agency for environmental review of future expansion of the wastewater treatment plant and effluent and biosolids disposal. It is anticipated that ISD will be required to analyze these impacts in future CEQA documents for which they are the lead agency.

LETTER 9 Steve Shaffer, Director, Ag & Environmental Policy, State of California, Department of Food and Agriculture

Comment 9A: The Department recommends that the Final EIR be amended to include the following additional information concerning project impacts on agricultural land. First, the Department requests that the Final EIR clearly set forth in narrative, maps and tables the existing categories and acreage of agricultural land in the planning area. Also, the categories and acreage of agricultural land that would be converted under each alternative should be set forth. Information on farmland categories and acreage can be obtained from the California Department of Conservation's Important Farmland Series maps and reports.

Response: Section 6.0, Open Space and Conservation, Setting, Agricultural Resources of the Draft General Plan (pages 6-8 through 6-13) includes the requested information for existing conditions and the proposed General Plan. The Draft General Plan is referenced at the beginning of Section 3.5 of the Draft EIR as the source for a more detailed environmental setting discussion regarding agriculture. Table 6-1, Agricultural Lands in the Plan Area, page 6-13 of the Draft General Plan presents the acreage of existing agricultural lands within the City limits and within the Expansion Areas. This section of the General Plan also includes a narrative and map (Figure 6-1). Section 2.0 of the Draft General Plan, the Land Use Element, provides acreage figures for the two proposed land use designations that will continue to allow agricultural uses: Agriculture Limited (AL) and Delta Recreation (DR), for both the City limits and the Expansion Areas. Additionally, lands owned by the Ironhouse Sanitation District that are designated as Public/Semi Public are actively farmed, and this use would not be modified under the proposed General Plan. The existing and future acreages for agricultural land at buildout are combined in the following table for the proposed General Plan (the Preferred Alternative):

Agricultural Acreage

	Existing Conditions	Oakley 2020 General Plan
Oakley General Plan Planning Area	3,538	2,255
Low Density Alternative	3,538	2,641
High Density Alternative	3,538	1,379

The State of California Department of Conservation Farmland Mapping and Monitoring Program has been reviewed to evaluate agricultural lands within the Oakley General Plan Planning Area. The following generalized discussion is based upon the Contra Costa County 2000 Farmland Maps.

The Farmland Maps depict the Oakley Planning Area as a mosaic of developed land and various classifications of agricultural lands. While approximately 1,650 acres of Farmland of Statewide Importance are located in the western and southern areas inside the existing Oakley City limits, these lands have become substantially constrained for commercial agriculture due to historic low density development and small parcel size. Agriculture in these areas includes vineyards near Freedom High School, adjacent to Laurel Road, and in the vicinity of SR 4/Main Street and Oakley Road; relatively small blocks of orchards; and blocks of ruderal or fallow land that is not cultivated.

Within the eastern portions of the City of Oakley, the Farmland Map identifies significant areas of Prime, Statewide Significant, and Unique Farmland. However, vegetation mapping conducted for this area for the Oakley General Plan process identified only 85 acres of orchards, 26 acres of vineyards, and irrigated pasture adjacent to and north of the Contra Costa Canal. The predominant agricultural lands in this area are located north of the Contra Costa Canal, an area designated Delta Recreation under the proposed General Plan for which agriculture is a compatible use. The limited amount of active agriculture within these areas reflects the constraints of historic development and economic factors that have significantly impacted the viability of commercial agriculture. Refer to Comment 15H for comments from property owners north of the Canal regarding limited uses of land.

The proposed Expansion Areas located to the east of Oakley are identified as a combination of predominantly Prime and Statewide Significant Farmland and Other Land (a designation for land that does not fit other Farmland Mapping categories). It is significant to note that a substantial portion of the main City-proposed Expansion Area is occupied by the County-approved Cypress Lakes project, a development project that will not only convert agricultural lands, but will also impact surrounding lands and will further decrease agricultural viability in this area.

It is significant to note that the Contra Costa County General Plan 1995-2010 identifies "Important Agricultural Areas." The entire Oakley Planning Area is excluded from this designation, presumably in recognition of the reduced viability of commercial agriculture due to generally small parcel sizes, historic urbanization and County-planned urban development.

Comment 9B: The Draft EIR notes that the Dutch Slough area will either host the development of approximately 4,000 residential dwelling units, or be set aside in a CALFED Ecosystem Restoration acquisition. The Department recommends that the Final EIR reflect the current status of the Dutch Slough area and, if the Slough is to be preserved for the purposes of CALFED, how the 4,000 dwelling units will be accommodated in the planning area. Particularly, the Draft EIR should address the growth-inducing impacts on agricultural land if the ecosystem restoration alternative use of Dutch Slough redirects the urban growth slated under the referenced development agreement onto other lands.

Response: The status of the Dutch Slough area is still being finalized. In the fall of 2001, the property owners submitted an application to CALFED proposing to sell substantially all of their property north of the Contra Costa Canal (approximately 1,166 acres) for the purpose of creating the Dutch Slough Restoration Project, an eco-system restoration project for scientific study and habitat preservation of the Bay-Delta. This application was also submitted by the California Coastal Conservancy, the Natural Heritage Institute, and the Conservation Fund, in association with the property owners. If the Project is approved as proposed, the property owners may either initially convey most of the property to one of these co-applicants ("interim CALFED purchaser"), which would then convey the property to another agency for long-term ownership and management; or convey most of the property directly to a final long-term landowner (expected to be the California Department of Water Resources [DWR]). On April 11, 2002, CALFED placed the project into a "Directed Action" category, requesting a resubmittal for which funding could be made available if scientific questions were addressed and the City agreed to support the project. The City expressed conditional support for the project to CALFED on May 6, 2002. The City's support is contingent on DWR agreeing to become the long-term landowner, and on the development of certain public amenities in association with the project. On July 29, 2002, the application was resubmitted to CALFED, revised to address requests for additional information. The project is currently awaiting a funding decision by CALFED. In September, 2002 the City of Oakley entered into three Memorandums of Understanding (MOUs) regarding the Dutch Slough Restoration Project: one with the Emerson, Burroughs, and Gilbert Families; one with the Natural Heritage Institute; and one with The Conservation Fund. The City and Coastal Conservancy have also now executed an MOU.

If the project is not funded and the acquisition does not occur, the existing Development Agreements remain in effect until 2007. If the Dutch Slough Restoration Project is funded and does proceed, the portion of the 4,000 dwelling units that would have been developed on the restoration site under the existing Development Agreement (approximately 2,800 dwelling units) are not proposed to be accommodated elsewhere in the Planning Area, under the Draft General Plan. All development under the proposed General Plan would occur within the identified Planning Area. There is no growth-inducing impact associated with the Dutch Slough Restoration Project. See Response to Comment 15H.

Comment 9C: The Draft EIR lists a number of policies to mitigate the loss of agricultural land from the projected City growth through 2020. The Department recommends that the mitigation measures that compensate for the loss of agricultural land through transfer of development rights and agricultural land conservation easements be quantified and related to the projected agricultural land conversion for each project alternative. In other words, the Department recommends a quantifiable mitigation target be set forth in the Draft EIR so that effectiveness of farmland conversion mitigation can be monitored.

Response: The Draft General Plan focuses on the protection of existing agricultural operations from encroachment and preserving the right to farm until such time as urban development occurs. The Draft General Plan does not directly propose mitigation measures that compensate for the loss of agricultural land through transfer of development rights or agricultural land conservation easements; however, General Plan Policy 6.1.1 of the Open Space and Conservation Element allows for participation in regional programs that promote the long-term viability of agricultural operations within the City, which could include participation in the Contra Costa County program described on page 6-8 of the Draft General Plan, which includes strategies such as voluntary conservation easements. Prior to its incorporation, the area that is now within the Oakley city limits was part of the 35 percent of Contra Costa County lands designated for development. Currently, agricultural resources are fragmented and commercial agriculture is substantially compromised based on existing urban development that was allowed to occur. The Draft General Plan accommodates agriculture, while providing for balanced needs of the City. It should be noted that under the County General Plan, virtually all land within the Expansion Areas is designated for agriculture. However, the majority of this land is also identified by the County as the "Off Island Bonus Area," an overlay designation that allows development at up to 3 dwelling units per acre. For example, the County approved the Cypress Lakes project, a 1,300 dwelling unit mixed use development, on a portion of this agricultural land.

Comment 9D: The Draft EIR contains two technical references that are in error and should be corrected in the Final EIR. First, on page 2-13 of the Project Description, the California Department of Food and Agriculture is listed as the agency responsible for agricultural preserves set up by local jurisdictions under the Williamson Act. Since the 1970's, the California Department of Conservation has been responsible for the statewide administration of the Williamson Act and its companion Open Space Subvention Entitlement Act.

Response: Table 2-1 has been revised to reflect this information. The revised Table 2-1 is presented at the end of this chapter.

Comment 9E: The first bullet at the top of page 3-77 of the Draft EIR has an outdated reference to the U.S. Soil Conservation Service. The former Soil Conservation Service remains an agency of the U.S. Department of Agriculture, but has been renamed as the Natural Resources Conservation Service.

Response: OSCE Program #6.1.F is hereby changed to read as follows (new text is underlined, deleted text is in ~~strikeout~~):

- Encourage agricultural landowners to work closely with the U.S. Natural Resources Conservation Service ~~Soil Conservation Service~~ and local Resource Conservation Districts to reduce soil erosion and to encourage soil restoration.

LETTER 10 Jerry Brown, Director of Planning, Contra Costa Water District

Comment 10A: Table 2-1, Key Public Agencies, pages 2-12 through 2-14 of the Draft EIR. The second sentence under the United States Fish and Wildlife Service (USFWS) Responsibility may be subject to misinterpretation. Revised language could be: This agency will act as a Responsible Agency pursuant to the Federal Endangered Species Act (Section 7 or Section 10 permits) and Migratory Birds Act.

Response: Table 2-1 has been revised to incorporate this information. The revised Table 2-1 is presented at the end of this chapter.

Comment 10B: In the Responsibility for Diablo Water District (DWD), please delete the first sentence. DWD obtains all of its surface water supplies from the Contra Costa Water District (CCWD).

Response: See Response to Comment 10A.

Comment 10C: In the Responsibility for Contra Costa Water District (CCWD), change "City of Oakley" to Diablo Water District.

Response: See Response to Comment 10A.

Comment 10D: Chapter 3.0, Environmental Setting, Impacts & Mitigation Measures, Roadway System, Bicycle and Pedestrian System, page 3-29. The last sentence includes the Delta de Anza Regional Trail along the Contra Costa Canal as a multi-use, paved trail "for hikers, horses, and bicycles." Please delete "horses" with reference to its facility, as CCWD does not permit horses in close proximity to its public water supply.

Response: Section 3.3.1, Bicycle and Pedestrian System, first paragraph is hereby revised to read as follows (new text underlined, deleted text in ~~strikeout~~):

> There are presently only limited bicycle facilities within Oakley. Bicycle lanes are provided on Cypress Road between Rose Avenue and Marsh Creek. Other streets with Class II bicycle lanes include Vintage Parkway from Main Street to Big Break Road and portions of Delta Road. The Contra Costa Countywide Transportation Plan designates Oakley Road/Empire Avenue/Cypress Road as a Regional Bicycle Route, providing a connection to the Marsh Creek Regional Trail. The Marsh Creek Regional Trail is a multi-use, paved trail for hikers, horses, and bicycles. ~~along with~~ The Delta de Anza Regional Trail (between Neroly Road and Cypress Road) ~~are~~ is a multi-use, paved trails for hikers~~, horses,~~ and bicycles.

Comment 10E: Section 3.5.1, Environmental Setting Summary, Trails, page 3-66. The Marsh Creek Regional Trail (according to the East Bay Regional Park District Master Plan) shows trail connections to the Los Vaqueros Watershed area and its 55-mile trail system. It may be appropriate to add "and the Los Vaqueros Reservoir and Watershed" at the end of the second sentence under Marsh Creek Regional Trail.

Response: The second sentence in Section 3.5.1, Trails (page 3-66), Marsh Creek Regional Trail is revised to read as follows (new text is <u>underlined</u>):

> When completed as planned, the trail will extend about 14 miles from the mouth of the creek at Big Break at the north through the cities of Oakley and Brentwood south to Round Valley Regional Preserve and the Morgan Territory Regional Preserve; with future connection to the Diablo Trail and the Mt. Diablo trail system <u>and the Los Vaqueros Reservoir and watershed</u>."

Consistent with Response to Comment 10D, the first sentence of the description of the Delta de Anza Trail is revised to read as follows (new text is <u>underlined</u>, deleted text is in ~~strikeout~~):

> Running from the Marsh Creek Trail along the Contra Costa Water District main canal through the City of Oakley and the EBMUD pipeline corridor to the west is a paved multi-use hiking~~,~~ <u>and</u> bicycling ~~and equestrian~~ trail.

Comment 10F: Open Space Resources, San Joaquin Delta, page 3-68. In the last paragraph, please add a third sentence for information on additional open space resources in the East County area: "CCWD manages approximately 18,000 acres, including trails, fishing access and marina facilities, resource protection areas and an interpretive center at the Los Vaqueros watershed south of Brentwood."

Response: Section 3.5.1, Open Space Resources, San Joaquin Delta, the last paragraph (page 3-68) is changed to read as follows (new text is <u>underlined</u>):

> The East Bay Regional Park District (EBRPD) also manages regional parks and recreation facilities within the City of Oakley and the far eastern Contra Costa County region, <u>including the Big Break Regional Shoreline located along Oakley's northern city boundary on the San Joaquin River Delta, and to the west of the Cypress Corridor/Dutch Slough areas.</u> EBRPD manages over 12,000 acres including under water or tidal marshlands, shoreline and areas around Mt. Diablo and the hills south of Antioch and Pittsburg. <u>CCWD manages approximately 18,000 acres, including trails, fishing access and marina facilities, resource protection areas and an interpretive center at the Los Vaqueros watershed south of Brentwood.</u>

Also see Response to Comment 4A.

Comment 10G: Section 3.8, Hydrology and Water Quality, Environmental Setting Summary, Surface Water Resources, page 3-118. The first sentence should be corrected to state that Marsh Creek originates off "Mt. Diablo," rather than "Marsh Creek Reservoir."

Response: Section 3.8, Hydrology and Water Quality, Surface Water Resources, sentence at the top of page 3-118 is revised to read as follows (new text is <u>underlined</u>, deleted text is in ~~strikeout~~):

> Marsh Creek is a small year-round creek that originates <u>off Mt. Diablo</u> ~~at Marsh Creek Reservoir~~ and travels north through Brentwood and Oakley before reaching its final destination at Big Break.

Comment 10H: Under Surface Water Hydrology and Quality, in the second paragraph, 4th sentence, it would be more accurate to use "flows" or "traverses" instead of "drains".

Response: Section 3.8, Hydrology and Water Quality, Surface Water Hydrology and Quality, the fourth sentence in the second paragraph (page 3-118) is revised to read as follows (new text is <u>underlined</u>, deleted text in ~~strikeout~~):

> The canal ~~drains~~ <u>flows</u> through Oakley from east to west starting at the southwestern corner of the primary SOI area and ending at the intersection of Live Oak Dr. and Neroly Rd. before heading into Antioch.

Comment 10I: Water Quality, Diablo Water District, page 3-119. It is not understood why "Diablo Water District" is included in this title since none of the discussion relates to DWD facilities or activities.

Response: The comment is correct. The heading is hereby revised to read as follows (deleted text in ~~strikeout~~):

> **Water Quality ~~– Diablo Water District~~**

Comment 10J: Section 3.8.3, Analysis of Impacts, Discussion and Conclusion, pages 3-123 through 3-125. In the second full paragraph (page 3-123), first sentence, add "levee" after "Contra Costa Canal". In the third paragraph, first sentence, change "cause damage" to "affect."

Response: Section 3.8.3, the first sentence of the third paragraph under Discussion and Conclusion for Impact 3.8-A on page 3-123 is revised to read as follows (new text is <u>underlined</u>, deleted text in ~~strikeout~~):

> Another concern raised by the CCWD is that water in this portion of the Canal may cause groundwater fluctuations, which could ~~cause damage to~~ <u>affect</u> adjacent properties.

The first sentence of the second paragraph currently reads as follows:

> A particular concern introduced by the Contra Costa Water District (CCWD) is that development in close proximity to the four-mile portion of the Contra Costa Canal that is earthen, and therefore unlined, may increase the potential to introduce pollutants into the water system via seepage.

The subject of the discussion is the earthen, unlined canal itself, and not the earthen levee. Therefore the sentence will remain unchanged.

Comment 10K: In the fourth paragraph, first sentence it is stated that the identified policies and programs were designed to "protect the citizens of Oakley from the dangers of flooding." The ensuing list of policies, however, does not appear to be related to flooding, or the actual mitigation of Impact 3.8-A, which is development associated discharges into surface waters, or other alteration of surface water quality. An examination of the bulleted policies indicates they are directly related to water supply or water service issues. In fact, the same listed policies appear once again on pages 3-156 and 3-157 under 3.11.3, Analysis of Impacts for water supplies (where they should be). It would appear that another set of policies was intended to apply to drainage impacts.

Response: See Response to Comment 8H and the revised and reorganized text for Impact 3.8-A. Impacts and mitigation measures related to flooding are addressed in Section 3.7, Public Safety/Hazards of the Draft EIR, Impact 3.7-A.

Comment 10L: Due to the absence of any existing policy or program relative to identified Impact 3.8-A, either a new set of policies needs to be identified, or mitigation needs to be identified and applied. CCWD is concerned that future development adjacent to and/or in proximity to the Contra Costa Canal could result in additional discharges into the canal that would affect the quality of a municipal water supply. As a result of this concern, CCWD recommended (comment letter dated October 4, 2002 to the City of Oakley on the Draft General Plan) that an additional policy be added to the General Plan. The recommended policy is 4.10.10 "Prevent drainage from entering the Contra Costa Canal and protect the canal levee system." CCWD also recommended two new programs in order to implement the new policy. If CCWD's recommended additional Policy 4.10.10 is not added to the General Plan, CCWD hereby requests that the two programs recommended to implement that policy be incorporated as mitigation for EIR Impact 3.8-A. The resulting two implementation measures recommended to mitigate this impact on canal water quality are:

> Mitigation Measure 3.8-A 1. Permanent structures and fill material placed within 1,000 feet of the Contra Costa Canal property shall be adequately designed to prevent seepage to the Canal, and to prevent any effects to the developed property caused by groundwater fluctuations due to water in the Canal. CCWD must be consulted prior to construction activities within 1,000 feet of the Canal property line.
>
> Mitigation Measure 3.8-A 2. Stormwater and sewer drainage cannot be routed to the Contra Costa Canal. Stormwater and sewer pipelines within 1,000 feet of the Canal property line must be designed consistent with CCWD design criteria;

detention ponds within 1,000 feet of the Canal property line shall be lined to prevent seepage.

Response: The City of Oakley consulted with CCWD in developing the policy that was added to the Draft General Plan in response to the letter received from CCWD on the NOP. As presented in Impact 3.8-A, the policy provides that "The Contra Costa Water District must be consulted prior to any construction activities within 1,000 feet of the Canal property line." In response to the District's request, that policy will be modified to read as follows (new text is <u>underlined</u>):

> The Contra Costa Water District must be consulted prior to any construction activities within 1,000 feet of the Canal property line <u>to ascertain the District's standards for each development project.</u>

As described in the "Discussion and Conclusion" for Impact 3.8-A, all development planned near the unlined portion of the Canal will be residential, either single family or multi-family. Provided that CCWD standards are met, the City determined that the quantity and types of runoff from residential development will not pose a significant environmental threat to water quality in the Contra Costa Canal.

Comment 10M: Section 3.9, Biological Resources, Environmental Setting Summary, page 3-131. Under Special Status Plants with a "High Potential" (last paragraph) to occur in the Planning Area, please consider adding "Antioch Dunes Evening Primrose." This plant species is shown to have an occurrence in the City of Oakley on the "Interim Service Area Listed Species Occurrences and Potential Habitat" map (June 2000) prepared by CCWD and the U.S. Bureau of Reclamation as a requirement contained in a Los Vaqueros Project biological opinion. The occurrence data used in the Interim Service Area Map is from the California Department of Fish and Game Natural Diversity Data Base (NDDB).

Response: The General Plan Background Report includes Section 8.0, Biological Resources prepared by Foothill Associates. It includes Table 1, Listed and Special Status Species Potentially Occurring within the Oakley Planning Area or in the Oakley Vicinity, and Table 2, Listed and Special-Status Species Potentially Occurring within the Planning Area or in the Planning Area Vicinity. Both tables include the Antioch Dunes Evening Primrose, which is identified as Federal Endangered, State Endangered, and California Native Plant Society "1B" (CNPS plants rare, threatened, or endangered in California or elsewhere). However, in Table 2, Foothill Associates has concluded that the potential for occurrence is "Unlikely: One record of this species is listed with the CNDDB within the plan area, however this area appears to be developed and the occurrence is therefore presumed extirpated." No evidence has been presented to cause Foothill Associates to change this conclusion.

Comment 10N: Section 3.11, Utilities and Service Systems, Water Services, pages 3-152 and 3-153. In the first paragraph under Water Supply, move the third through fifth sentences into the second paragraph following the third sentence. This information applies strictly to the CCWD/DWD Randall-Bold Treatment Plant agreement. In the last sentence of the first paragraph add the following qualification: "subject to drought or other restriction by the U.S. Bureau of Reclamation."

Response: Section 3.11, Utilities and Service Systems, Water Services, Water Supply, the first and second paragraphs (pages 3-152 and 3-153) are revised to read as follows (new text is underlined, deleted text in ~~strikeout~~):

> The Contra Costa Water District (CCWD), a public water agency, delivers water to 450,000 people in central and eastern Contra Costa County through the Contra Costa Canal, including the DWD. Currently, 100 percent of the DWD's raw water supply is surface water from the Contra Costa Canal, which obtains water from the Sacramento-San Joaquin Delta at the Rock Slough intake. ~~The initial allocation for DWD is 15 MGD with a future maximum allocation of 30 MGD. DWD's ultimate supply commitment from CCWD is 30 MGD. This commitment is for "normal" years and drought years can be less.~~ CCWD provides water for irrigation and industry with a full commitment from the Central Valley Project of 174 million gallons per day (MGD), subject to drought or other restriction by the U.S. Bureau of Reclamation.
>
> The Randall-Bold Water Treatment Plant (WTP) on Neroly Road treats the water before public consumption. The WTP is jointly owned by DWD and CCWD. The WTP has an initial capacity of 40 MGD with expansion capability to 80 MGD. Major operations include: connection to the Contra Costa Canal, grit basin, influent mixing basin, pre- and post-ozone contact basins, flocculation basin, deep bed filtration, treated water reservoir, and distribution pumping facilities. The initial allocation for DWD is 15 MGD with a future maximum allocation of 30 MGD. DWD's ultimate supply commitment from CCWD is 30 MGD. This commitment is for "normal" years and drought years can be less.

Comment 10O: Please change "1997" to "1999" in the first sentence of the first full paragraph on page 3-153. Technically, the quality (and possibly the reliability) of DWD's water supply was improved in 1997 due to diversion of Old River water; however, the Los Vaqueros Reservoir was not placed into service until after it was filled on January 28, 1999.

Response: The first sentence of the first full paragraph on page 3-153 is revised to read as follows (new text is underlined, deleted text in ~~strikeout~~):

> In ~~1997~~ 1999, the quality and reliability of the water being provided by the DWD was further improved when the Los Vaqueros Reservoir was placed into service.

Comment 10P: The third paragraph discussion on page 3-153 needs to be significantly augmented with additional information on the institutional processes and findings necessary in order to extend CVP and Los Vaqueros Project (LVP) water supplies into new areas. CCWD's May 29, 2002 response requested that this process be explained in the Draft EIR. While the NOP response (with appropriate attachments) is included in the Appendix, there is no summation or reference in the Draft EIR text to the Appendix in order to facilitate the information CCWD provided. The third paragraph could serve as a convenient introductory into the institutional processes because the areas "in the eastern portion of DWD's sphere of influence" discussed are largely outside CCWD's CVP contractual service area (about seven square miles) and the LVP planning area. In fact, about half of the present city boundaries are outside the CVP service area, including projects that are currently under City review (e.g., Cypress Grove). In addition, some areas (approximately 1,200 acres in three portions of the eastern part of the Planning Area) are also outside the CCWD and DWD service area boundaries. It is noted that all areas currently not serviced in the Planning Area are "anticipated" to "become part of the DWD's system with supply from Randall-Bold WTP". It is therefore recommended that additional sentences, or perhaps separate paragraphs, be added following this paragraph, in order to sequentially identify: (1) the local annexation process, and (2) the CVP inclusion process, as follows:

> For water services from the Randall-Bold Treatment Plant to be extended into the entire Planning Area, some areas will need to be annexed into both DWD and CCWD. A common procedure would be a reorganization application submitted by the City to the Contra Costa Local Agency Formation Commission (LAFCO) around the time of development approval. The reorganization would include annexations of the respective service agencies including DWD and CCWD.
>
> In order for CCWD to authorize DWD to extend CVP water supplies into most of theses areas (i.e., east of the AT&SF Railroad), the U.S. Bureau of Reclamation must first approve an inclusion application submitted by CCWD. CCWD's annexation regulations require a project proponent to submit environmental and other information along with required processing fees to CCWD for submission to Reclamation (see Appendix A, CCWD NOP Response). The environmental information must include evidence of compliance with federal laws and regulations, including the Endangered Species Act (ESA). In order to issue a Confirmation Letter to DWD to serve an inclusion applicant, CCWD must also find that the developed project, when combined with buildout in the current service area, will not compromise the water quality and reliability objectives of the Los Vaqueros Project.

Response: The requested paragraphs are hereby included as requested, following the third paragraph on page 3-153 (Section 3.11.1, Water Supply) of the Draft EIR (new text is <u>underlined</u>):

> <u>For water services from the Randall-Bold Treatment Plant to be extended into the entire Planning Area, some areas will need to be annexed into both DWD and CCWD. A common procedure would be a reorganization application submitted by the City to the Contra Costa Local Agency Formation Commission (LAFCO) around the time of development approval. The reorganization would include annexations to the respective service agencies, including DWD and CCWD.</u>
>
> <u>In order for CCWD to authorize DWD to extend CVP water supplies into most of theses areas (i.e., east of the AT&SF Railroad), the U.S. Bureau of Reclamation must first approve an inclusion application submitted by CCWD. CCWD's annexation regulations require a project proponent to submit environmental and other information along with required processing fees to CCWD for submittal to Reclamation (see Appendix A, CCWD NOP Response). The environmental</u>

information must include evidence of compliance with federal laws and regulations, including the Endangered Species Act (ESA). In order to issue a Confirmation Letter to DWD to serve an inclusion applicant, CCWD must also find that the developed project, when combined with buildout in the current service area, will not compromise the water quality and reliability objectives of the Los Vaqueros Project.

Comment 10Q: Section 3.11.3, Analysis of Impacts, pages 3-154 through 3-157. The Discussion and Conclusion does not provide a quantification of project water demands for analytical purposes. Impact 3.11-A recognizes that new development may exceed available supply or distribution capacity to the extent that it is identified as a *Potentially Significant Impact*, but does not provide the empirical evidence to support this statement. The EIR should include a quantified analysis of this project water demand in the context of CCWD's water supply planning, as requested in the NOP Response.

Response: The requested information can be found in Chapter 4 of the Draft EIR, Analysis of Alternatives. Under Section 4.3-11, Utilities and Services, the following average annual water need is presented for each alternative: 11.3 million gallons per day (mgd) for the proposed General Plan; 12.6 mgd for the No Project Alternative (the existing County General Plan); 14.0 mgd for the High Density Alternative; and 11.5 mgd for the Low Density Alternative. (It should be noted here that the analysis in Section 4.3-11 shows a water demand of 11.3 mgd for the Proposed Project and 11.5 mgd for the Low Density Alternative, yet concludes that the Low Density Alternative will result in the lowest demand. That conclusion is hereby corrected to show that the Proposed Project will result in the lowest demand.) The letter submitted by DWD in response to the NOP (included in Appendix A of the Draft EIR) states that the District "has ample water treatment plant capacity and supply to serve the City's General Plan Area and extended Sphere of Influence at build-out." It is clarified here that water demand from new development may exceed available supply in drought years.

It should be noted that CCWD is not asserting that the Draft EIR has misjudged the level of significance of impacts, or that DWD cannot provide adequate water to the City or the Expansion Areas. CCWD simply requests an analysis of the already-identified impact in the context of CCWD's Future Water Supply Study, and indirectly its ability to provide water to DWD. As indicated in the Water Services section of the proposed General Plan (pages 4-18 to 4-21), the City relied upon DWD's Water Master Plan and 1998 Facilities Plan Update to calculate demand generated by new development, and in gauging DWD's ability to provide water service to the General Plan Planning Area, including the Expansion Areas. The DWD Facilities Plan Update relied upon the then-current CCWD water supply studies, so indirectly the analysis in the General Plan and Draft EIR of water supply and demand are presented in the context of CCWD's own assessment of its ability to provide water to the General Plan Planning Area. Moreover, the City discussed water demand and supply issues with representatives of both agencies and received no information that would indicate that buildout of the General Plan Planning Area, including the Expansion Areas, would result in unmet demand for water. For additional information on methodology and conclusions, please refer to the Public Facilities Background Report prepared by Santina & Thompson (July 2001), pages 1-12. This Report, which is part of the comprehensive General Plan Background Report, is referenced at the beginning of Section

3.11, Utilities and Service Systems, of the Draft EIR as a source of more detailed information on the environmental setting for this section.

The foregoing comments simply clarify the relevant content of the Draft EIR and proposed General Plan, and do not represent the inclusion of new information. The analysis in the Draft EIR and proposed General Plan is adequate.

Comment 10R: GME Program #4.8.A, as stated on page 3-157, provides an excellent opportunity for the City to require new development to demonstrate that it has secured an "adequate water supply". The City's project analysis of an adequate supply should not be confined to DWD's ability to extend treated water services, but should be broad enough to provide assurances that CVP inclusion and LVP services are secured before final subdivision maps or final development plans are approved. GME Program #4.8.A should be expanded to incorporate the following language: "The City will send written requests to the water supplier for Water Supply Assessments or Water Supply Verifications, as required under recent Senate Bills 221 and 610."

Response: As stated in the language suggested by the comment, sending such written requests for applicable development projects is required by State law under Water Code Sections 10910 *et seq.*, and therefore does not need to be included as a General Plan program. See Response to Comment 10Q regarding water supply assurances provided by DWD and Response to Comment 10P regarding securing the inclusion of new development within the Central Valley Project Area and the provision of service from the Los Vaqueros Project.

Comment 10S: Note that the third and fourth bulleted GME Programs on page 3-157 are identical. One should be deleted.

Response: The fourth bulleted GME Program on page 3-157 should actually read as follows (new text is underlined):

> <u>Cooperate with other regulatory agencies to control point and non-point water pollution sources to protect adopted beneficial uses of water.</u> – *GME Program #4.8.C;*

LETTER 11 Mike Yeraka, P.E., General Manager, Diablo Water District

Comment 11A: Page ES-16, Impact 3.11-A, indicates that the increase in demand from new development may exceed supply (during drought years) or distribution capacity. While it is accurate that demand may exceed supply in drought years, the District's distribution system has been designed to accommodate the demands of new growth for all the project's alternatives.

Response: Comment noted. No response is required.

Comment 11B: Page 2-14, Local Agency Contra Costa Water District, indicates that CCWD has water treatment agreements with the City of Oakley. CCWD's water treatment contract is with the Diablo Water District.

Response: Table 2-1 has been revised to incorporate this information. The revised Table 2-1 is presented at the end of this chapter.

Comment IIC: Page 3-153, Interim Intertie with the City of Brentwood. There is only one intertie with the City of Brentwood and it will be in operation until 2007 unless the contract is extended by the District.

Response: Page 3-53, Interim Intertie with the City of Brentwood, the paragraph is revised to read as follows (new text is underlined, deleted text in ~~strikeout~~):

> There is an intertie with the City of Brentwood that became operational in 1997 ~~and a second intertie~~ <u>which</u> will be operational until 2007 <u>unless the contract is extended by DWD</u>. ~~These interties are~~ <u>This intertie is</u> designed to deliver treated water to Brentwood from the Randall-Bold WTP, providing 6 MGD for the maximum conditions.

Comment IID: Page 3-156, third bullet from the bottom. This bullet suggests that water wells shall be abandoned after connection to the District's water supply. The District encourages the City not to adopt such a policy in the General Plan. Even though a residence would be connected to the District's water supply, they could still use their well for outside watering which would reduce the demand on the District's supply and be of benefit to the District's conservation efforts.

Response: The referenced policy is GME Policy #4.8.9 (actually the fifth bullet from the bottom of page 3-156.) The City concurs with the District's conclusion that maintaining existing wells for irrigation purposes after connection to a municipal water service will assist in conserving the District's water supply. GME Policy #4.8.9 will be modified to read as follows (new text in <u>underline</u>, deleted text in ~~strikeout~~):

> Encourage rural residences currently served by well water to connect to municipal water service when it becomes available. Upon connection to municipal water service, ~~any~~ water well(s) ~~shall be abandoned consistent with Contra Costa County regulations~~ <u>may be maintained for landscape irrigation purposes only</u>.

Comment IIE: Page 4-17, Utilities and Services. This section compares average water need with ultimate storage capacity. The section goes on to say that the High Density Alternative would result in the highest water need of all the alternatives but still fall below 50 percent of the ultimate capacity of the provider. The reader of the Draft EIR may believe that the District has twice as much water as is needed for the High Density Alternative, which is not the case. The District suggests using language from page 8 of the City's Public Facilities Background Report. There is a discussion in that report with regard to how the District has the ability to serve at build-out given each alternative.

Response: The comment is correct, the paragraph confuses storage capacity with water supply. For clarification the paragraph is hereby revised to read as follows (new text is underlined, deleted text in ~~strikeout~~):

> **High Density Alternative**
>
> Build out of the ~~Proposed Project~~ High Density Alternative would result in an average annual water need of approximately 14.0 mgd, which is 49 percent of DWD's ultimate storage capacity. This alternative would result in the highest water need of all the alternatives but still fall below 50 percent of the ultimate storage capacity of the provider.

The language from page 8 of the Public Facilities Background Report is reprinted here for reference, although it does not appear to directly address the District's ability to serve each alternative at build-out.

> As part of the Oakley General Plan development, current estimates are being made for various demographic parameters important in determining water consumption. Generally, the land use classification areas used in the DWD Facilities Plan Update are similar to those in the expected Oakley General Plan. A comparison of the current demographic estimates for Oakley is shown in Table 2. Various parameters are compared between the DWD Facilities Plan Update and the current City General Plan basis. It can be seen that there are significant differences in dwelling units, people per dwelling unit, and population. The difference in 1998 dwelling units is due to the fact that there are many residences in the Oakley Area not connected to the District's water system. These residences have private wells as a water supply and were not included in the existing 1998 water demand calculations. Another difference is in the heavy industrial use classification. The DuPont plant was still in operation while the District's Facilities Plan Update was being prepared. The District chose to continue showing this area as heavy industrial since the light industrial/commercial redevelopment of this area will have approximately the same water use. The third difference is with regards to people per dwelling unit. The difference between these numbers is because the District used the Contra Costa County average of 2.5 people per dwelling unit.
>
> Table 3 is a comparison of selected demographic parameters for Oakley at build-out. This table also compares the Oakley General Plan and the DWD Facilities Plan Update. It is seen that there are significant differences in the population at build-out for Oakley. However, dwelling units are comparable. Also as noted above, the DuPont facility has been permanently shut down. The Facilities Plan Update made future water usage projections based upon consumption per dwelling unit derived from the current consumption data. Thus, using this parameter, the projected water use at build-out would be similar, irrespective of actual population.

Table 2 on page 9 of the Public Facilities Background Report presents current water use assumptions. Table 3 on page 10 presents demographic comparisons at buildout.

LETTER I2 **Patrick Roche, Principal Planner, Advance Planning Division, Contra Costa County Community Development Department**

Comment I2A: EIR Documentation is Lacking and Insufficient. It is stated on page ES-2 (ES.2 Summary of Project Impacts and Mitigation) that the proposed Oakley General Plan is "self-mitigating" because the General Plan policies are designed to avoid or minimize environmental impacts. The County notes that the mitigation measures for all the impacts identified in the document are essentially a listing of various policies and programs proposed in the General Plan. Although CEQA Guidelines (Section 15166) provides for combining the General Plan document with the EIR, it does not relieve the Lead Agency from presenting a meaningful analysis of impacts and mitigation measures in an environmental document. As presently drafted, the document is lacking in this regard because there is little or insufficient documentation about the degree of impact based on the threshold of significance or how the proposed General Plan policies and programs would actually mitigate the impacts.

Response: The introductory paragraphs to Chapter 3 (Page 3-1) explain how impacts and mitigation measures are analyzed in the Draft EIR. First, the environmental setting for each environmental impact area is described, and significance criteria are established, beyond which impacts are considered significant. It is noted that many policies in the Oakley 2020 General Plan are designed to reduce environmental impacts. In this way, the General Plan is self-mitigating. In the discussion of impacts, the policies in the Oakley 2020 General Plan that would reduce the impact are presented and discussed. Based on the CEQA Guidelines Environmental Checklist and the Initial Study, the General Plan process anticipated potential impacts and incorporated policies and programs designed to address and mitigate those impacts. It is explained that the environmental analysis assumes full implementation of the Oakley 2020 General Plan, new development projects, road and infrastructure improvements, and new community facilities and parks. It is further explained that this Draft EIR does not repeat tables, figures and setting summaries already included in the Draft General Plan and the General Plan Background Report.

Chapter 1, Section 1.4 of the Draft EIR further explains that this is a Program EIR, and evaluates environmental impacts resulting from implementation and buildout of the General Plan. While the Draft EIR identifies potentially significant impacts with full General Plan buildout, it does not preclude and, indeed, assumes that individual development project proposals submitted to the City of Oakley will necessitate independent environmental assessments in accordance with CEQA requirements. As explained further in Section 1.3, the General Plan EIR is intended to serve as a Tier I CEQA document (per Section 15152 of the CEQA Guidelines). Tier I documents are broad and general in scope and typically discuss broad environmental issues that affect a large geographic area. Subsequent environmental reviews are narrower in scope and address site-specific details. Tier I documents are appropriate for General Plan programs, while second and third tier reviews would typically address specific plans and subdivisions, respectively. These subsequent documents incorporate earlier EIRs by reference and add detailed analyses as necessary. The concept of tiering helps the lead agency "to focus on issues which are ripe for decisions and exclude from consideration issues already decided on or not yet ripe" (*Guidelines §15385(b)*). "Tiering is needed in order to provide increased efficiency in the CEQA process. It allows agencies to deal with broad environmental issues in EIRs at planning stages and then to provide more detailed examination of specific effects in EIRs on later development projects that are consistent with or implement the plans (*Guidelines §15385, "Discussion"*). The EIR provides a framework within which future and more detailed planning for the project may be reviewed, and identifies where additional environmental analysis may be required at subsequent stages of project implementation.

The Draft EIR complies with the requirements of CEQA and the CEQA Guidelines regarding consideration and discussion of significant environmental impacts (Guidelines §15126.2(a)) and consideration and discussion of mitigation measures proposed to minimize significant effects (Guidelines §15126.4(a)). The Draft EIR identifies and focuses on the significant effects of the proposed project. Direct and indirect significant effects of the project on the environment are clearly identified and described, giving due consideration to both the short-term and long-term effects. The discussion includes relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems, and changes induced in population distribution, population concentration, and human use of the land, health and safety problems caused by the physical changes, and other aspects of the resource base such as water, historical resources, scenic quality, and public services. The Draft EIR also analyzes any significant environmental effects the project might cause by bringing development and people into the area affected. The Draft EIR describes feasible measures which could minimize significant adverse impacts. All the measures are, by definition, feasible because they have been incorporated in the Draft General Plan. The discussion of mitigation measures identifies mitigation measures for each significant environmental effect identified in the Draft EIR.

An example of the Program EIR methodology used in the Draft EIR can be found in Chapter 3, Section 3.2, Aesthetic Resources (pages 3-21 through 3-26). Impact 3.2-A is "Development associated with the proposed General Plan may impact scenic vistas and visual natural resources within the Planning Area ***(Potentially Significant.)*** The "Discussion and Conclusion" explains that the Oakley 2020 General Plan has a goal of preserving scenic qualities of the Delta Waterway, Marsh Creek, and views of Mount Diablo. The discussion goes on to present the General Plan policies and programs designed to assure and implement this goal, and therefore reduce or avoid potentially significant impacts on scenic qualities of the Delta Waterway, Marsh Creek, and views of Mt. Diablo. The Discussion concludes that "It is clear that the City of Oakley intends that its scenic resources, which include the waterways of the Delta, Dutch Slough, Marsh Creek, habitat areas, open space land and views of Mount Diablo west of the City will be efficiently protected. The Plan's Goals, Policies and Programs mitigate any potential impacts on the aesthetic qualities inherent in the Planning Area. Therefore, this is a less than significant impact and no mitigation is required."

Comment I2B: This lack and/or insufficiency of documentation is perhaps best illustrated in the Draft EIR's review of traffic impacts. Beginning on page 3-36 and ending on page 3-37, Impact

3.3-A identifies the increase in traffic associated with the General Plan as exceeding Level of Service standards for roadway segments and signalized intersections as potentially significant. The analysis of impacts for Impact 3.3-A includes a summary discussion and conclusion about the traffic impact, a listing of the relevant General Plan policies and programs aimed at mitigating the impact, and a concluding statement that taken together the General Plan policies and programs would reduce this impact to a less than significant level and there is no need for further mitigation measures.

It has been the custom in this County that at a minimum the EIR traffic analysis for a General Plan, even though it is a program level EIR document, would include the following:

- map of the existing transportation (roadway) network,
- list or map of study intersections (signalized and unsignalized)
- discussion of the traffic analysis methodology,
- tables presenting the peak hour Level of Service for study intersections under existing conditions, conditions for the horizon year, and conditions under the proposed mitigation measures.

The County was surprised that the Draft EIR released by the City of Oakley does not include the basic level of documentation needed for a reviewer to understand the degree of traffic impacts today and in the horizon year under the proposed General Plan, and how the proposed mitigation measures based on General Plan policies and programs would reduce the impact to a level of insignificance. The Circulation Element in the proposed General Plan does present some baseline traffic data, which is apparently incorporated by reference to the Draft EIR. However, CEQA Guidelines Section 15147 advise that "the information contained in an EIR shall include summarized technical data, maps, plot plans, diagrams, and similar relevant information sufficient to permit full assessment of significant environmental impact by reviewing agencies and members of the public". The County is concerned that, as presently drafted, a full assessment of significant environment impacts identified in the EIR is not possible because the documentation is lacking and insufficient. This is particularly the case with the traffic analysis. It is not possible for the County to discern how the General Plan's traffic impacts would affect roadways that share service to the unincorporated communities of Bethel Island and Knightsen, or how traffic associated with the General Plan would affect key portions of the regional transportation network, State Highway 4 (freeway portion), the State Route 4 Bypass, etc.

Response: This is a very broad comment requesting additional documentation of the methodologies and results of the traffic analysis. The following narrative breaks this comment down into smaller sections to facilitate a complete response.

Existing Conditions. The comment requests a map of the existing transportation network and data on existing conditions. Please refer to pages 2 through 10 of the City's Draft Long Range Roadway Plan (LRRP), which is provided in Appendix B of this Final EIR. The LRRP is the same as the Long Range Circulation Plan (LRCP) referred to on page 3-8 of the General Plan and page 3-31 of the Draft EIR as providing more detail about the methodologies for determining circulation needs. At the time the Draft EIR was circulated for public review, the

Plan had not yet reached an administrative review draft form, but was available upon request. The City's consultant for preparing the LRRP has refined the LRRP/LRCP since circulation of the Draft EIR, but has not altered any of the information or conclusions regarding the future roadway conditions or methodologies which were used in preparing the General Plan and Draft EIR. Changes by the consultant have primarily focused on adding detail to the roadway classification map, which remains consistent with, but is now more detailed than, the Circulation Diagram in the General Plan. An administrative review draft of the Plan, which is included as Appendix B of this document, was submitted to City staff for review in October 2002. Thus, its inclusion in this Final EIR does not constitute the inclusion of significant new information. The appended LRRP provides a map of the current transportation network, discusses the concept of Level of Service (LOS), and reports the existing LOS on roadway segments and at 30 study intersections. Please note that LRRP Table 3 is an update to Table 3-2 in the Draft General Plan, and LRRP Table 4 updates Table 3-3 in the Draft General Plan.

Analysis Methodology. The comments requests discussion of the traffic analysis methodology. Please refer to pages 17 through 20 of the LRRP in Appendix B of this Final EIR. This section describes how the travel model was used to produce traffic forecasts, and it provides those forecasts in tabular and graphic form.

Impacts and Mitigation Measures. The comment requests more detailed documentation of the potential impacts of the Draft General Plan, and how the General Plan policies and programs mitigate those impacts. Table 9 of the LRRP presents recommended roadway widths and future LOS based on the analysis conducted for the Long Range Roadway Plan. Figure 4 of the LRRP presents recommended roadway classifications to support buildout of the Oakley General Plan. These roadway recommendations are based on the capacity thresholds to achieve LOS D, and other considerations such as the suitability of certain roadway types in the context of adjacent land uses. As shown in Table 9 of the LRRP, at the roadway sizes recommended, all of the road segments will operate at LOS D or better, except the segment of Main Street east of Empire Avenue. This segment of Main Street has a built-out frontage and cannot be substantially widened without physical impacts (widening would be infeasible). However, the need for widening this segment is partially dependent on the effectiveness of the proposed Laurel/Cypress connector and the Downtown Bypass; therefore, the capacity needs for this segment will be more fully investigated as more detailed plans for these additional projects are developed.

While it is difficult to accurately forecast intersection turning movement volumes under very long range conditions such as buildout of the General Plan, it is possible to identify intersection locations likely to require installation of traffic signals given the recommended roadway types. In order to safely accommodate the traffic volumes forecast in this analysis, it is recommended that traffic signals be installed at all intersections of four-lane streets, and at intersections of two-lane collectors with four-lane arterials.

The comment questions how the General Plan's traffic impacts would affect roadways that share service to Bethel Island and Knightsen, and how those impacts would affect key portions of the regional transportation network, the freeway portion of SR 4, and the SR 4 Bypass. It is unclear whether the comment addresses the impacts of development in the City on sections of roadways shared with those areas but located outside the City, or whether it addresses impacts of traffic from those areas on sections of shared roadways in the City. Based on the City's interpretation of the comment, this response addresses the former question. The LRRP focuses on roadways inside the City's Planning Area. The LRRP reports projected traffic volumes on Sellers Avenue, Cypress Road and Bethel Island Road in the Planning Area. Cumulative impacts were included in the traffic analysis of existing traffic volumes, as well as projections based on the County's General Plan, and these impacts were assessed in the Draft EIR (pages 3-36 through 3-43). The foregoing clarifies the analysis in the Draft EIR, and does not present new information or identify new significant environmental impacts of the General Plan.

As stated above, the LRRP focuses on roadways inside the City's Planning Area. Explicit discussion of impacts on roadways outside the City's Planning Area was not included because they are outside the City's jurisdiction and are subject to planning by regional authorities that will have to reassess the particular issues associated with the roadways after the City has adopted the General Plan. The LRRP, Draft General Plan and Draft EIR nevertheless consider the City's contribution to cumulative traffic impacts, to the extent feasible, and the included Goals, Policies, and Programs are used as mitigation measures to reduce those contributions to a less than cumulatively considerable level. In addition to TRANSPLAN, the City participates in two Joint Powers Authorities, the East Contra Costa County Regional Fee and Financing Authority, and the East County Transportation Improvement Authority, which exist to provide regional transportation facilities improvements. As a member of those JPAs, the City imposes traffic impact fees on new development to fund necessary regional transportation improvements. As a result of participation in the JPAs and the collection of fees, any impacts of the General Plan on portions of the regional transportation network outside the City limits should be mitigated to a less than significant cumulative level. Thus, the contribution of the General Plan to any cumulative impacts on the regional transportation network is less than significant. Moreover, current regional circulation planning in CCTA's CMP and GMP is based on the City-adopted County General Plan. The proposed General Plan will result in a lower population and increased local employment relative to the City-adopted County General Plan. As a result, the impacts of the proposed General Plan on the regional transportation network should be less than currently assumed by CCTA plans.

The text of Section 3.3, Circulation/Transportation, of the Draft EIR is revised to read as follows (new text is <u>underlined</u>, deleted text in ~~strikeout~~):

Measure C – 1998 Growth Management Program

The fourth paragraph on page 3-34 and the second paragraph on page 3-35 are revised to read as follows:

> As described earlier, each Contra Costa jurisdiction must adopt level of service standards for Basic Routes and implement actions and meet Transportation Service Objectives for *Routes of Regional Significance*. Oakley has adopted LOS D, or a volume-to-capacity (V/C) ratio of ~~0.89~~ <u>0.90</u>, as the threshold of acceptability for signalized intersections. Approval of a development proposal

that would result in a violation of LOS standards could result in a finding of non-compliance by CCTA, which would potentially jeopardize Oakley's annual allocation of return-to-source funding. The only Route of Regional Significance in Oakley, which is evaluated according to different criteria than Basic Routes, is Main Street (State Route 4).

The *East County Action Plan Final 2000 Update* specifies Transportation Service Objectives (TSOs) and actions for State Route 4 from State Route 160 to the San Joaquin County Line. The TSO for this segment of State Route 4 is LOS D or better at signalized intersections and LOS E or better at unsignalized intersections. ~~Two~~ Four unsignalized Oakley intersections do not currently meet this TSO: Main Street at Live Oak Avenue ~~(LOS F)~~, ~~and~~ Main Street at Delta Road ~~(LOS F)~~, Main Street at O'Hara Avenue, and Main Street at Rose Avenue.

Section 3.3.2, Thresholds of Significance, is modified to read as follows:

The City of Oakley has established a level of service standard for signalized intersections, as required by Contra Costa County's Measure C. Accordingly, all signalized intersections must operate at LOS D or better, as evaluated by CCTA's LOS methodology. Oakley's standard is consistent with the standards set in the *Action Plan for Routes of Regional Significance* prepared by TRANSPLAN, which identified the intersection TSO for the regional routes in Oakley as LOS D with a v/c ratio of ~~0.89~~ 0.90 or better. Significant traffic impacts ~~at signalized intersections~~ are defined to occur when the addition of project traffic causes:

- Signalized intersection operations to deteriorate from an acceptable level (LOS D or better with a v/c ratio equal to or less than ~~0.89~~ 0.90) to an unacceptable level (LOS D or worse with a v/c ratio greater than ~~0.89~~ 0.90) or improve from an unacceptable level to an acceptable level; or
- Volume-to-capacity ratio at ~~an~~ signalized intersection operating at an unacceptable level to increase by 0.01; or
- Average daily volumes on roadway segments exceed LOS D (as defined in the Highway Capacity Manual and shown in Table 2 of the Long Range Roadway Plan).

Other significance criteria used in this study for transportation impacts include:

- Conflicts with local or regional policies or programs supporting alternative transportation;
- Creating unsafe conditions for pedestrians or bicyclists;
- Causing a substantial delay to transit service, or increase demand for transit beyond existing capacities.

The first and second paragraphs of Impact 3.3-A, "Discussion and Conclusion," are revised to read as follows:

The City of Oakley, being responsible to the CMP (the most recent CMP referred to as the 2001 CMP Update) and the GMP (called for in Measure C-1998), must adopt level of service standards for *Basic Routes* and implement actions and meet Transportation Service Objectives for *Routes of Regional Significance*. Oakley has adopted LOS D, or a volume-to-capacity (V/C) ratio of ~~0.89~~ 0.90, as the threshold of acceptability for signalized intersections. The only Route of Regional Significance in Oakley, which is evaluated according to different criteria than Basic Routes, is Main Street (State Route 4).

Oakley also must comply with the GMP by continuing implementation of actions included in the *East County Action Plan Final 2000 Update*, which specifies TSOs and actions for State Route 4 from State Route 160 to the San Joaquin County Line. As mentioned above, ~~two~~ four unsignalized Oakley intersections do not currently meet this TSO: Main Street at Live Oak Avenue ~~(LOS F)~~, ~~and~~ Main Street at Delta Road ~~(LOS F)~~, Main Street at O'Hara Avenue, and Main Street at Rose Avenue.

Comment 12C: The traffic impacts and their mitigation measures are just one example, but the concern with documentation occurs throughout the Draft EIR. The County urges the City of Oakley to prepare an EIR that documents the degree of impact on the environment based on the thresholds of significance and then establish a more direct analytical link with how the mitigation measure (General Plan policies and programs) would reduce the impact to a less than significant level.

Response: See Response to Comment 12A.

Comment 12D: Adequacy of Mitigation Measures. CEQA Guidelines advise that to be considered adequate, mitigation measures should be specific, feasible actions that actually improve adverse environmental conditions. Mitigation measures should be measurable to allow monitoring their implementation. Effective mitigation measures involve clearly explaining its objectives – how it will be implemented, where it will be implemented, when will it be implemented, and who will be responsible to implement. While it is acknowledged that the activity being evaluated in this EIR is a General Plan, and the mitigation measures consist of policies and programs from the General Plan, many of these mitigation measures are not very specific as to how, when, where, and who will implement the measure. In several instances, the mitigation measures are deferred to some unspecified point in the future.

Response: See Response to Comment 8L.

Comment 12E: Water Supply Assessment – S.B. 610 and S.B. 221. It is unclear from reviewing the Draft EIR whether or not the required water supply assessment under the recently adopted Senate Bill 610 has been conducted. As the City may be aware, S.B. 610 requires a local jurisdiction to provide substantial evidence that there is a water supply and water delivery system sufficient to approve subsequent residential subdivision maps. The EIR should provide the reviewer with a discussion of how the water supply assessment will provide the basis for making future findings relative to another new law related to water, Senate Bill 221.

Response: See Response to Comment 10R. Also see the Public Facilities Background Report, Section 1.1 Water Service. The Background Report is referenced in Section 3.11, Utilities and Service Systems, for a more detailed environmental setting discussion regarding utilities and service systems. The Water Service section of the Background Report analyzes water supply. The preparers of the Background Report, Santina & Thompson, and the City of Oakley consulted extensively with Contra Costa Water District (CCWD) and Diablo Water District (DWD) in the preparation of this Report. The letter submitted by DWD in response to the NOP (included in Appendix A of the Draft EIR) states that the District "has ample water treatment plant capacity and supply to serve the City's General Plan Area and extended Sphere of Influence at build-out." According to the recently released, Draft Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001 (California Water Code Sections 10910 *et seq.*, California Department of Water Resources, September 2002) and consultation with DWR officials, SB 610 does not apply to General Plans. Future projects to which SB 610 and SB 221 do apply must comply with the requirements of those statutes.

Comment 12F: Cypress Corridor Expansion Area: Impact 3.7-A – Stormwater Drainage Plan. The Draft EIR under Impact 3.7-A acknowledges that the General Plan may result in absorption changes, drainage patterns, and the rate of and amount of surface runoff within the Planning Area, including the Cypress Corridor Expansion Area. The Contra Costa Flood Control and Water Conservation District has prepared drainage plans for the current incorporated Oakley city limits, however these plans do not cover the Cypress Corridor Expansion Area (generally east of Jersey Island Road).

A stormwater drainage plan needs to be developed for the Cypress Corridor prior to considering urban development in this area that would increase the amount of impervious surface. The City of Oakley should consider an additional mitigation measure (and General Plan policy) that the development of an areawide stormwater drainage plan, which identifies a collect and convey and discharge program for specific parcels within the Cypress Corridor Expansion Area, would occur prior to urban development.

Response: See Response to Comment 16E.

Comment 12G: The Draft EIR states that the City has limited bicycle facilities and calls out three areas with bike lanes. The EIR should include the bike lanes on Cypress Avenue from Rose Avenue to Empire Avenue, the bike lanes on Empire Avenue from Laurel Drive to Oakley Road, and the following bike paths: 1. Marsh Creek Regional Trail that goes from the levee at Big Break to Brentwood, 2. The trail along the Contra Costa Canal from Neroly Road to Cypress Road, and 3. The Big Break Trail complex. The EIR should reference the East Contra Costa Bikeways Plan developed by TRANSPLAN.

Response: The referenced text is located on page 3-29 of the Draft EIR. The first paragraph on page 3-29 is revised to read as follows (new text is underlined, deleted text in ~~strikeout~~):

> There are presently only limited bicycle facilities within Oakley. Bicycle lanes are provided on Cypress Road between Rose Avenue and Marsh Creek, on Cypress Road between Rose Avenue and Empire Avenue, and on Empire Avenue between Laurel Road and Oakley Road. Other streets with Class II bicycle lanes include Vintage Parkway from Main Street to Big Break Road and portions of Delta Road. The Contra Costa Countywide Transportation Plan designates Oakley Road/Empire Avenue/Cypress Road as a Regional Bicycle Route, providing a connection to the Marsh Creek Regional Trail. The Marsh Creek Regional Trail, along with the Delta de Anza Regional Trail (between Neroly Road and Cypress Road) are multi-use, paved trails for hikers, horses, and bicycles. The Marsh Creek Regional Trail also allows horses. Additional bike paths include the trail along the Contra Costa Canal from Neroly Road to Cypress Road, and the Big Break Trail complex. TRANSPLAN has developed a bikeway plan for the region that includes the Oakley Planning Area, entitled the East Contra Costa Bikeways Plan.

Refer to Response to Comment 10D for an explanation of additional revisions to this paragraph.

Comment 12H: Page 3-30, 3. Circulation/Transportation, Rail. The Draft EIR states, "There are no grade-separated rail crossings in Oakley." Vintage Road is grade-separated from the railroad.

Response: Section 3.3.1, Circulation/Transportation, Rail, the third sentence is revised to read as follows (new text is underlined; deleted text in ~~strikeout~~):

> There ~~are no~~ is only one grade-separated rail crossing~~s~~ in Oakley, on Vintage Parkway.

Comment 12I: Page 3-31, 3. Circulation/Transportation, Bicycles and Pedestrian Circulation. The DEIR states, "...and a capital improvement program to ensure adequate maintenance of bicycle and pedestrian facilities." Capital Improvement Programs typically are for new construction, not for maintenance of existing facilities.

Response: The comment is correct. Section 3.3.1, Circulation/Transportation, Bicycles and Pedestrian Circulation, the first sentence of the second paragraph (top of page 3-32) is revised to read as follows (new text is underlined; deleted text in ~~strikeout~~):

> To further the objectives of providing a safe and convenient bicycle and pedestrian circulation system, a Bicycle and Pedestrian Master Plan will be developed, including design standards for bicycle and pedestrian facilities, evaluation of current bicycle promotion programs, analysis of bicycle and pedestrian accidents, and a ~~capital improvement~~ funding program to ensure adequate maintenance of bicycle and pedestrian facilities.

Comment 12J: Page 3-32, 3. Circulation/Transportation, Bicycles and Pedestrian Circulation. The DEIR states, "A map of proposed bicycle lanes and bicycle/pedestrian trails is included in

Figure 7-3 in the Parks and Recreational Element." The County suggests that the map should also be included in the Circulation Element of the General Plan to show that the City is serious about the use of bicycles as a mode of transportation. If the map is in the Parks and Recreation Element it appears that the City considers bicycling as a recreation and not a mode of transportation.

Response: The City does not concur that locating Figure 7-3, Existing and Proposed Trails, in the Parks and Recreation Element demonstrates less commitment than including it in the Circulation Element. All elements of a General Plan must be internally consistent and are equally weighted. The Circulation Element also contains numerous policies and programs that address bicycle and pedestrian transportation (Goal 3.2, Policies 3.2.1 through 3.2.4, and Programs 3.2.A through 3.2.D).

Comment 12K: Page 3-41, under Impact 3.3-C, sixth bullet. The mitigation measure/General Plan policy states that the City will work to coordinate with the school districts to create a well designed, Routes to Schools map. The County suggests that the City of Oakley should be working with the school districts to create Safe Routes to School Plans to facilitate their applications for funding from the Safe Routes to School Grant Program.

Response: The City welcomes this suggestion from the County. Such an effort would naturally follow coordination with the Districts to create the Routes to Schools map.

LETTER 13 Timothy C. Sable, District Branch Chief, Department of Transportation

Comment 13A: California Environmental Quality Act Compliance. Specific project-related traffic impacts are not discussed in the Draft EIR as required by California Environmental Quality Act (CEQA) Section 15147 which states that project-related traffic impacts and mitigation must be discussed in sufficient detail "...to permit full assessment of significant environmental impacts by reviewing agencies and members of the public." Moreover, CEQA mandates full public disclosure of project impacts, preventing significant impacts through mitigation (CEQA Section 15002 (1) (2) (3) (4)), and that the review period allow adequate time for public review and comment on Draft EIRs (Section 15203).

Response: See Responses to Comments 12B and 13C through 13F.

Comment 13B: By transmittal dated May 29, 2002 [included as an attachment to Letter 13 in Chapter Three], the Department requested a detailed traffic study including project-related level of service (LOS) impacts to state roadway facilities. The Preliminary Draft Report for the Long-Range Circulation Plan, which is dated June 19, 2000, was faxed to their office on October 23, 2002, more than a month after the September 16, 2002 commencement of the review period. The Preliminary Draft Circulation Plan is currently being reviewed by Departmental staff; however, since this information was received late, their ability to assess project impacts to state roadways has been severely limited. Therefore, Caltrans requests a time extension of one month from the date they received the information, which would be November 23, to allow for the lawful period of project review required by CEQA Section 15105 (a) which states, "The public review period for a draft EIR should not be less than 30 days..."

Response: Any comments received by Caltrans by November 23, 2002 will be addressed in the Final EIR.

Comment 13C: Traffic/The study area should include intersections and mainline roadway segments along State Route 160 as well as State Route 4. Please see the Department's' "Guide for the Preparation of Traffic Impact Studies" at the following website for more information: http://www.dot.ca.gov.hq/traffops/developserv/operationalsystems/reports/tisguide.pdf.

Response: The comment requests analysis of intersections and mainline roadway segments along SR 160 and SR 4. Please note that, because the General Plan Circulation Element and the Long Range Roadway Plan (LRRP, reproduced in Appendix B of this Final EIR) focus on facilities within the City limits and the Planning Area, no analysis was conducted on the freeway mainlines of SR 160 or SR 4. The analysis presented in the LRRP does address the facilities at the SR 160/Main Street interchange. See Responses to Comments 12B and 13F for discussion of impacts on SR 160 and SR 4.

Comment 13D: The Association of Bay Area Government's (ABAG) Projection 2002 data set should be used for the long-range (2025) land use, population and employment projections rather than the data extrapolated from ABAG's 1998 data set of year 2020 projections. ABAG's Projection 2002 data set contains year 2025 projection data that is more appropriate for the East County Model.

Response: The comment requests that the regional land use forecasts be updated to ABAG's Projections 2002. The long range land use projections used in the LRRP analysis were taken from ABAG's Projections 2000 data series. This is the most recent land use data available in a form that is consistent with CCTA's travel demand models. ABAG's Projections 2002 is not yet available in the appropriate format from CCTA.

Comment 13E: Future improvement projects along the State Route 4 corridor, including those listed below, should be included in the analysis: Loveridge Interchange reconstruction and widening the eastbound onramp and new auxiliary lane at Hillcrest Avenue.

Response: The comment suggests that specific future improvement projects along SR 4 be included in the analysis. The planned improvements to SR 4 were included in the East County travel demand model applications that generated the traffic forecasts used in the LRRP, and are, therefore, already taken into consideration in quantifying the impact of the General Plan and developing the proposed General Plan Policies and Programs/mitigation measures that will reduce potentially significant impacts to a less than significant level.

Comment 13F: Specific mitigation measures for project impacts must be identified, as well as financing, scheduling, implementation responsibilities and lead agency monitoring. The project's fair share contribution toward project impact mitigation should also be identified. Additional comments will be forthcoming pending final staff review of the Preliminary Draft Circulation Plan.

Response: See Response to Comment 12B. The comment suggests more detail be provided regarding mitigation implementation and funding. It is not clear whether the comment is requesting additional detail regarding mitigation of impacts on local roadways or on regional roadways that intersect with or are affected by the General Plan, or both. As discussed below and in Response to Comment 12B, regional roadways are subject to planning by the CCTA and other regional bodies in which the City participates, in part by collecting impact fees for regional transportation facilities improvements. Implementation responsibility and lead agency monitoring resides with those agencies. Thus, the City cannot provide the level of detail requested. Regarding the mitigation of impacts to local roadways, the comments requests a level of detail that is not required by CEQA Guidelines Section 15126.4. Funding mechanisms are discussed below, and responsibility for implementation and monitoring obviously resides with the City for those roadways. The details of financing and scheduling of improvements is addressed in the City's capital improvement programs, funded by the fees discussed below, copies of which can be obtained from the City's Community Development Department.

The City of Oakley has strong programs for ensuring that infrastructure improvements are funded through traffic impact fees assessed on new development in the city. The City of Oakley is a member of two regional fee programs (the East Contra Costa Regional Fee and Finance Authority and the East County Transportation Improvement Authority) that support improvements to regional facilities, such as widening SR 4 and constructing the SR 4 Bypass. New development in Oakley is also assessed a fee to support local transportation improvements; the current program is the Oakley/North Brentwood Area of Benefit program, which will shortly be replaced by a City of Oakley traffic impact fee program. The Area of Benefit programs are constructed and updated regularly to assure that the City achieves the Level of Service standards established in the General Plan and described in the Draft EIR for local roadways, thereby reducing to a less than significant level any potentially significant impacts of the General Plan on the City's circulation system.

Comment 13G: Local Agency Authority/The State Route 4 Bypass Authority should be listed as a key public agency in Table 2-1 on Page 2-13.

Response: Table 2-1 has been revised to reflect this information. The revised Table 2-1 is presented at the end of this chapter.

LETTER 14 Robert D. Gromm, Secretary/Chairman, Reclamation District #799

Comment 14A: Reclamation District #799 was not notified of the Draft EIR and requests a copy and additional time to comment.

Response: A copy of the Draft EIR was not sent to Reclamation District #799 because the City was not aware that the District had jurisdiction over any areas within the Oakley Planning Area. However, the Draft EIR was circulated for public review, and a Notice of Availability was published that the Draft EIR was available for review. The District did not request a specific time period for extended review, but will be provided with a copy of the Final EIR prior to certification as required by CEQA.

Comment 14B: Reclamation District #799 is a special district that is responsible for the maintenance of the levee and drainage system on Hotchkiss Tract. It is their understanding that the Draft EIR discusses the inclusion of some or all of Hotchkiss Tract into the City's boundary.

Response: The Hotchkiss Tract is within the Oakley Planning Area.

Comment 14C: It is also their understanding that the Draft EIR does not discuss the jurisdiction or responsibilities of RD #799. Because most of the tract is below sea level, the District's role in providing flood protection and drainage is a critical function.

Response: Comment noted. See Response to Comment 14A.

LETTER 15 David A. Gold, Morrison & Foerster, LLP

Comment 15A: Cypress Corridor Studies: The property owners of Cypress Corridor have prepared the attached biological, geotechnical, and infrastructure studies and the attached wetland delineations related to Cypress Corridor. It is requested that these documents be included in the Draft EIR and specifically referenced as documents considered by the Final EIR. Section 2.B of the MOU provides that the City will include these studies in the EIR "to minimize, to the extent possible, the environmental analysis necessary for the development of the Southern Property [South Canal Land, as defined below]."

Response: Section 2.B of the Memorandum of Understanding (MOU) states the following:

> The Property Owners have conducted substantial biological, engineering, geotechnical, and other environmental studies of the Property that may be relevant to the City's current General Plan process. As long as doing so will not delay completion of the General Plan beyond the state mandated deadline of December 31, 2002, the Property Owners agree to share the studies referenced above, for City's appropriate inclusion in the environmental review analysis prepared in conjunction with the General Plan, including the General Plan Environmental Impact Report, to minimize, to the extent possible, the environmental analysis necessary for development of the Southern Property.

The MOU is dated September 23, 2002, one week before the end of the review period on the Draft EIR. Adequate time was not available to provide an objective peer review of the studies to allow for an analysis to be prepared. The Biological Assessment, Preliminary Wetlands Delineation and Preliminary Geotechnical Reconnaissance include summaries, which are included as attachments to Letter 15 in Chapter Three of this Final EIR. These are provided for informational purposes. The Preliminary Geotechnical Investigation and the traffic study do not include summaries. The full text of all the referenced studies are available for review at the offices of the City of Oakley Community Development Department.

Comment 15B: Definition of Dutch Slough: The commentor is concerned with the General Plan language that alternately defines Dutch Slough as (1) the actual slough waterways, and (2) the entire Cypress Corridor. It is requested that the GPU and Draft EIR be clarified such that the term "Dutch Slough" refers to the actual slough waterways and not to any surrounding land. It is suggested that the 1,257 acre portion of Cypress Corridor north of the Contra Costa Canal be referred to as the "Northern Canal Land," the 307 acre portion of Cypress Corridor south of the Contra Costa Canal and north of Cypress Road be referred to as the "South Canal Land," and the remaining portion of the "Cypress Corridor Planning Area" south of Cypress Road be referred to as the "South Cypress Land." It is respectfully requested that the Draft EIR and GPU assumption (see e.g., Draft EIR Page 3-68, GPU Page 2-21) that Cypress Corridor is currently an open space resource of the City be corrected to reflect the existing Urban Development Agreement M-8 General Plan designation.

Response: It is hereby clarified that, for purposes of the Draft General Plan and the Draft EIR, the following terminology will apply. The term "Dutch Slough" refers to the actual slough waterways. The "Dutch Slough Restoration Project" refers to the project north of the Contra Costa Canal outlined in the Memorandum of Understanding for the former M-8 area. The term "North Canal Land" will refer to the 1,257-acre portion of the Cypress Corridor Planning Area north of the Canal. The remaining area is a portion of the "Cypress Corridor Planning Area," of which both the North Canal Land and the 307-acre area south of the Canal are a part.

Page 3-68 of the Draft EIR contains no reference to Cypress Corridor as an open space resource of the City; therefore, the requested correction cannot be made. The City acknowledges the existing M-8 designation in the Contra Costa County General Plan and the existing development agreements.

Comment 15C: Cypress Corridor Acreage: The commentor is concerned that the Draft EIR and the GPU do not reflect the correct acreage of Cypress Corridor (see DEIR Pages 3-4 through 3-5, GPU Page 2-21). It is requested that these documents be corrected to show that Cypress Corridor *north* of the Contra Costa Canal contains 1,257 acres +/- and Cypress Corridor south of the Contra Costa Canal contains 307 acres +/-, as reflected in the most current surveys prepared by Carlson, Barbee, and Gibson. Please revise the third paragraph in the Cypress Corridor Planning Area – Description (see GPU Page 2-21) as follows:

> The Cypress Corridor Planning Area includes the North Canal Land, the South Canal Land and the South Cypress Land (the North Canal Land and the South Canal Land are subject to existing Development Agreements with Contra Costa County dated January 13, 1997 for urban mixed-use (M8) master-planned development covering both the North Canal Land and the South Canal Land). At the time of adoption of this General Plan, the City of Oakley had entered into a Memorandum of Understanding dated September 23, 2002, with the three landowners of the North Canal Land and the South Canal Land which contemplates possible CALFED funding for the acquisition of the North Canal Land for the creation of an eco-system restoration project referred to as the "Dutch Slough Restoration Project."

Response: The acreages in the General Plan have been corrected to correspond to those in Comment 15C. The requested text change is a comment on the General Plan, and not a comment on the Draft EIR.

Comment 15D: MOU: The City should also be concerned that the Draft EIR accurately identifies the development constraints related to the Cypress Corridor. The MOU contemplates numerous future City related amenities and improvements north of the Contra Costa Canal and the dedication of 27 acres south of the canal to the City (reference Sections 1-6 of the MOU in particular.) Also, please confirm that the first and second bullets in Section 3 of the MOU (i.e., 1,200 units on 271 acres at a density of 4.2 – 4.4 per gross acre and commercial development on 10-15 acres of the Cypress Corridor property, excluding the acres to be dedicated to the City) are consistent with the densities and units contemplated by the draft General Plan. It is called to the attention of City Staff and the City's consultants that the City Council approved MOU (Section 2A) conditions cash payments to City on whether the new General Plan meets these use and density terms for the South Canal Land.

Response: Comment noted. The City has confirmed that the land uses, densities and units contained in the MOU are consistent with the land uses, densities and units contemplated by the Draft General Plan. The MOU between the City of Oakley and the Gilbert, Burroughs and Emerson families (Property Owners) provides for "approximately 1,200 residential units on approximately 271 acres, resulting in a density of approximately 4.2 to 4.4 units per gross acre." The following table analyzes the development potential offered to the Property Owners under the proposed General Plan.

M-8 Area – Dwellings and Density Analysis

	Density	Acres	Dwellings
SFL	2.3	31.2	72
SFM	3.8	130.2	495
SFH	5.5	83.2	458
Sub-Total SF		244.6	1024
MFL	9.6	10.5	101
MFH	16.7	11.3	189
Sub-Total MF		21.8	290
Total SF + MF		**266.4**	**1,314**
Commercial		10.7	
Dedication to City		27	
Total Acres		**304.1**	

The above table has been adjusted to reflect changes anticipated to bring the Land Use Diagram into closer conformance with the MOU. The current Land Use Diagram varies from the MOU in two ways. First, the shape of the 50 acre park site located north of the Contra Costa Canal must be adjusted to more accurately reflect the MOU. Second, the Single Family High-designated land located at the eastern extent of land south of the Canal is intended to depict the land to be dedicated to the City. However, the Land Use Diagram shows this area as 39 acres, rather than the MOU's 27 acres. The Land Use Diagram will be refined to correct these two variations. As noted within the above table, the Land Use Diagram provides Property Owners with more than the MOU-negotiated 1,200 dwelling units. However, if development occurred at the maximum density as described above, the resulting gross density would be 4.93 dwelling units per acre. This density exceeds the approximate range included in the MOU. However, the Property Owners may pursue development at densities less than the maximum allowed, thereby constructing the referenced 1,200 dwelling units at an overall density of approximately 4.5 dwelling units per acre. It should be noted that the description of development constraints for the Cypress Corridor Planning Area in the proposed General Plan has been revised to read as follows (new text is underlined, deleted text in ~~strikeout~~):

Cypress Corridor Planning Area

Constraints

Development constraints within this Area are significant. While East Cypress Road and Sellers Avenue provide circulation access, both roads will require expansion to accommodate future traffic. Existing wastewater collection lines are adequate for current operation. Some trunk lines and pump stations will need to be upgraded and/or added to provide greater capacity as needed. ~~undersized and, in addition to replacing such lines, pump stations will be required to convey wastewater to treatment facilities.~~ Domestic water facilities also must be upgraded to provide greater capacity. While expansion of water and wastewater facilities are underway to serve the Delta Vista Middle School, further facility upgrades will be required to serve this Area. While the banks of the Contra Costa Canal provide some protection against Delta flooding, these levees were not designed for flood control purposes, are not certified by the Army Corps of Engineers, and, therefore, their integrity ~~is, therefore,~~ in question. The primary purpose of the Contra Costa Canal is for conveyance of drinking water supply for the customers of the Contra Costa Water District. Additionally, under 100 year flood conditions, it is anticipated that Marsh Creek would bank-up, resulting in localized flooding in the northwestern portion of this Area. Provision of adequate flood protection will likely require a combination of improvements of Marsh Creek banks and levees, as well as a pump facility to discharge water toward the Delta.

Comment I5E: It is requested that the Draft EIR and the GPU reference the recently approved MOU concerning the proposed CALFED restoration project. It is also requested that the Draft EIR and GPU clearly indicate that if the restoration project is not finalized, Cypress Corridor may be planned consistent with its existing Development Agreement or re-evaluated for future development potential as analyzed under the Draft EIR High-Density and No Project Alternatives.

Response: See Response to Comment 9B.

Comment 15F: Both the Draft EIR and the GPU inadvertently portray Cypress Corridor as currently valuable wildlife habitat. Cypress Corridor property owners have commissioned the Biological Assessment of the Emerson & Burroughs Properties, dated January 4, 1999 (the "Biological Assessment"), prepared by Sycamore Associates ("Sycamore"), which has been previously provided to the City and is attached as Exhibit A [Executive Summary included as an attachment to Letter 15 in Chapter Three]. The Biological Assessment indicates that Cypress Corridor consists predominately of disturbed lands from which the naturally occurring vegetation has been entirely removed by grading, filling, draining, irrigating and grazing. The Biological Assessment also indicates that no state or federally-listed Endangered, Threatened, Candidate species or species proposed for listing are considered to have a moderate or high potential to occur on Cypress Corridor. It is requested that the following references, to the extent they affect Cypress Corridor, be clarified to reflect the findings of the Biological Assessment:

Draft EIR, page 3-69/GPU Pages 2-17, 6-9 describe the "Delta Recreation (DR)" land use designation and state that the most appropriate uses for such land include wildlife preservation. Should the Dutch Slough Restoration Project not be finalized, the DR designation may not be appropriate since there is limited existing wildlife on the North Canal land.

Draft EIR, page 3-130 indicates that "Irrigated Pasture Land" is home to "weedy species tolerant of year round wet conditions" and support "foraging habitat for numerous avian and small mammal species."

Draft EIR, page 3-131 indicates that Cypress Corridor waterways are associated with riparian habitat that supports various wildlife species.

Draft EIR, pages 3-137 through 3-138 expand on the discussion of Irrigated Pasture lands and sloughs as suitable habitat for protected species.

Draft EIR, page 4-15 indicates that, under the No Project Alternative, Cypress Corridor would be developed north of the canal and, therefore, threaten potential "sensitive habitat."

Draft EIR, page 5-12 indicates that Cypress Corridor is "likely protected" by the California Fish and Game Code and "is considered sensitive habitat by CDFG."

Draft EIR, pages 6-17 through 6-19 indicate that Cypress Corridor contains a waterway of Oakley and that riparian vegetation is associated with this land. These pages also state that "numerous resident and migratory wildlife species utilize open water canal habitats for foraging and shelter opportunities" and list several species that may occur in this area.

GPU, Figure 6-2 indicates that Cypress Corridor is in an area of "medium biological sensitivity."

GPU, page 6-27 contains a significant description of Cypress Corridor and the proposed restoration project. The commentor is concerned, however, with several references to the assumed wildlife habitat value of Cypress Corridor in its existing condition.

Response: As noted above, the Executive Summary is included as an attachment to Letter 15 in Chapter Three of this Final EIR. As explained in Response to Comment 15A, because the Draft EIR was already in the public review period when the Memorandum of Understanding was executed, this information was not circulated with the Draft EIR. The City has not had an opportunity to conduct an independent evaluation or peer review of this information; however, it is incorporated in this Final EIR for informational purposes. The discussion and analysis of biological resources in the Draft EIR is based upon the discussion of sensitive habitats in the Biological Resources Background Report prepared for the General Plan by Foothill Associates.

In response to this comment, the "Delta Recreation" description on page 3-69 of the Draft EIR is changed to read as follows (new text is <u>underlined</u>):

> **Delta Recreation.** This land use designation encompasses the lowlands of the San Joaquin Delta at the City's northern edge, most of which is located within the 100-year flood plain. The most appropriate land uses in this designation include agriculture, low intensity recreation, and wildlife habitat. <u>Urban development of the Cypress Corridor Planning Area properties designated DR may be possible for the life of the existing development agreements.</u>

With regard to the references to pages 3-130, 3-131, 3-137 through 3-138, and 4-15 of the Draft EIR, it is unclear what changes are being requested. Because the biological assessment has not been independently evaluated or peer reviewed, the City is not in a position to make changes to the conclusions presented by Foothill Associates in the Background Report. The impact discussed on page 5-12 is a restatement of Impact 3.9-F from the Biological Resources section of Chapter 3, addressing the cumulative impact of development associated with the proposed General Plan on conversion and loss of plant and animal habitat. The conclusion is that this impact is less than significant. The City's review of the Sycamore Biological Assessment, within the time available to it for review, did not reveal any new information that contradicts that conclusion or that would require the City to revise its description of the area, beyond the changes noted above. The Biological Assessment is largely consistent with the conclusions in the Draft EIR and does not provide evidence of significant and previously unidentified environmental impacts. The remaining references are to text and graphics in the Draft General Plan, not the Draft EIR.

Comment 15G: Wetland Delineations/The Draft EIR, at pages 3-133 and 3-137, suggests that no formal wetland delineations have been prepared for Cypress Corridor. In fact, Sycamore prepared the Preliminary Wetlands Delineation of Jurisdictional Determination of the Emerson and Burroughs Properties, dated December 7, 1998, and the U.S. Army Corps of Engineers has produced the Wetlands Verification Letter of 43.2 Acres for Emerson & Burroughs Properties, dated December 30, 1998. Both of theses documents have previously been transmitted to the City and are attached as Exhibits B and C [Executive Summary of Exhibit B and Exhibit C are included as attachments to Letter 15 in Chapter Three]. It is requested that the Draft EIR and GPU be clarified to reflect these documents and their conclusions.

Response: The comment is correct, a Preliminary Wetlands Delineation was conducted for an area of approximately 1,100 acres within the Cypress Corridor. The findings, which were verified by the U.S. Army Corps of Engineers, indicated that 43.2 acres have been identified as jurisdictional wetlands. The last paragraph on page 3-133 of the Draft EIR is revised to read as follows (new text is <u>underlined</u>, deleted text in ~~strikeout~~):

> <u>Not all</u> ~~These~~ water features have ~~not~~ been delineated, and additional jurisdictional wetlands or Waters of the U.S. may occur within the Planning Area. Consequently, a wetland delineation must be conducted and verified by the Corps prior to the development of any project proposed within the Planning Area. <u>A preliminary wetland delineation has been conducted for an approximately 1,100 acre area in the Cypress Corridor which has been verified by the Corps. This delineation identified 43.2 acres of jurisdictional wetlands within the 1,100 acre site.</u> Encroachment into areas protected under Corps jurisdiction will require authorization from the Corps and may require Regional Water Quality Control Board (RWQCB) water quality certification and a CDFG Streambed Alteration Agreement.

Comment 15H: Agricultural Issues/The Draft EIR and GPU both inadvertently depict Cypress Corridor as viable agricultural land, the development of which will deplete the City's supply of the resource. It is requested that the Draft EIR and GPU both reflect that Cypress Corridor has been fully entitled for development of a mixed use, master planned community for at least a decade, that the County in its 1990-91 General Plan FEIR determined that Cypress Corridor is not prime agricultural land, and the Cypress Corridor is not suitable for high-production agricultural purposes, as reflected in the Biological Assessment. Furthermore, it is noted that in 1991, as part of its General Plan Update, the County analyzed the impacts that development of Cypress Corridor would have on state agricultural lands and determined that such impacts were less than significant. Only a small portion of Cypress Corridor has been used for dairy purposes, and it is anticipated that the dairy operations will cease operations in the near future. It is requested that the following passages, to the extent they affect Cypress Corridor, be clarified to indicate that Cypress Corridor is not a viable agricultural resource:

Draft EIR, pages 3-68 through 3-69 and GPU page 6-9 indicate that agricultural uses are appropriate within the Delta Recreation designation, including Cypress Corridor.

Draft EIR, pages 3-130 through 3-131 and GPU, pages 6-1 and 6-9 indicate that agricultural uses are appropriate within lands considered irrigated pasture, including Cypress Corridor.

Draft EIR, page 3-145 and GPU, page 6-26 mistakenly describe the Emerson and former Burroughs dairies as "farmsteads", thus suggesting they are situated on prime agricultural land.

Response: The Draft EIR (pages 3-68 and 3-69) does not identify any prime agricultural land in the City of Oakley. The Draft EIR also reports the difficulties of conducting commercial agricultural operations within Oakley. However, some soils classified as prime agricultural lands are located within the Expansion Areas of the Oakley Planning Area. The existence of the M-8 land use designation and the development agreements does not change that fact, or the City's obligation to disclose that fact in accordance with CEQA. The Draft EIR concludes that the conversion of farmland is a less than significant impact, with implementation of the policies and programs of the Draft General Plan. The definition of the Delta Recreation land use designation provides that agriculture, low intensity recreation, and wildlife habitat are appropriate land uses within areas with this designation. Should lands within these areas be developed to a different use (e.g., in accordance with the existing development agreements), Delta Recreation would no longer be the appropriate land use designation on these lands. The referenced text on pages 3-130 and 3-131 of the Draft EIR consists of a description of the existing biological communities within the Oakley Planning Area. The Irrigated Pasture habitat includes portions of the Cypress Corridor. The description does not state that "agricultural uses are appropriate within lands considered irrigated pasture," it simply describes the existing habitat within the majority of the northeastern portion of the Planning Area. Since under existing conditions portions of the Cypress Corridor are in irrigated pasture, there is no reason to change this description. The reference on page 3-145 of the Draft EIR is within Section 3.10, Historic and Cultural Resources. The statement is made in the context of historic resources (hence the somewhat archaic term "farmstead"), and is not intended to imply a classification of prime agricultural land.

Comment 151: Geotechnical Issues/The Draft EIR and GPU inaccurately depict Cypress Corridor as overly flood prone and susceptible to significant earthquake damage. The commentor is similarly concerned with statements in the Draft EIR and GPU suggesting that the levees surrounding Cypress Corridor cannot adequately protect the public from natural disasters as they exist or as they may be fortified in the future. Specifically, they are concerned with the following passages:

Draft EIR, page 3-69 describes the GPU's "Delta Recreation" land use designation and states that part of Cypress Corridor lies within the 100-year flood plain.

Draft EIR, pages 3-99, 3-105, and 5-8 indicate that most of the Cypress Corridor planning area, including Cypress Corridor, lies within the 100-year flood plain.

Draft EIR, page 4-13 indicates that buildout of the Project Alternative "preserves much of the land in flood-prone areas" including Cypress Corridor.

GPU Policy 4.10.3 refers to the "unique flooding constraints" of Cypress Corridor.

GPU Figure 8-1 indicates that the entire Cypress Corridor is susceptible to "high [earthquake] damage."

GPU Figure 8-2 indicates that a majority of Cypress Corridor is located in an area of "generally high" liquefaction potential.

GPU Figure 8-3 indicates that the entire Cypress Corridor north of the Contra Costa Canal is within the 100-year flood plain.

It is requested that these passages be clarified to reflect the determinations of the *Preliminary Geotechnical Reconnaissance,* dated January 4, 1999, and the *Preliminary Geotechnical Investigation*, dated April 26, 1999, prepared by Engeo Incorporated. These studies were previously made available to the City and are attached as Exhibits D and E [a Synopsis of Exhibit D is included as an attachment to Letter 15 in Chapter Three; Exhibit E does not include a Synopsis, but is available for review at the City of Oakley Community Development Department]. It is also requested that the Draft EIR and GPU indicate that these Engeo studies have determined that flood and earthquake hazards at Cypress Corridor are minimal and that existing levees can be reconstructed (or new levees constructed) in a manner that will adequately protect future development from flooding.

Response: As noted above, the Executive Summary of the Preliminary Geotechnical Reconnaissance is included as an attachment to Letter 15 in Chapter Three of this Final EIR. The Preliminary Geotechnical Investigation does not provide an Executive Summary. The full text of both documents can be reviewed at the offices of the City of Oakley Community Development Department. As explained in Response to Comment 15A, because the Draft EIR was already in the public review period when the Memorandum of Understanding was executed, this information was not circulated with the Draft EIR. The City has not had an opportunity to conduct an independent evaluation or peer review of this information; however, it is incorporated in this Final EIR for informational purposes. The discussion and analysis of geologic, seismic and flooding issues in the Draft EIR is based upon information contained in the Geology and Hydrology section of the General Plan Background Report (Section 9.0) and the Conceptual Drainage Master Plan prepared for the City of Oakley by Santina & Thompson. The City acknowledges that this information is generalized and not site-specific such as the referenced studies. The City's review of the commentor's geotechnical documents, within the time available to it for review, did not reveal any new information that contradicts the Draft EIR's conclusions regarding geologic, seismic, or flooding issues or that would require the City to revise its description of the area, beyond the changes noted in the response. The information in the geotechnical documents is largely consistent with the conclusions in the Draft EIR and does not provide evidence of significant and previously unidentified environmental impacts.

The referenced description of the Delta Recreation land use designation (page 3-69 of the Draft EIR) does not mention the Cypress Corridor. The referenced descriptions of flood hazards on pages 3-99, 3-105 and 5-8 of the Draft EIR do not state that most of the Cypress Corridor lies within the 100-year flood plain; they state that the majority of areas within the 100-year floodplain exists along the shorelines of the Delta, within the Cypress Corridor and Cypress Corridor Expansion Special Planning Areas, and along Marsh Creek, with pockets of flood areas scattered throughout the City. That statement is based upon FEMA maps. However, the City acknowledges that, with an adequate levee system and other flood control measures in place, the risks of flooding can be reduced. It is also important to keep in mind that levee systems designed to protect agricultural areas are generally not considered adequate protection for urbanized areas.

With regard to the analysis of public safety and hazards of the Proposed Project on pages 4-13 and 4-14 of the Draft EIR, that paragraph is changed to read as follows (new text is underlined, deleted text in ~~strikeout~~):

> This alternative has a significant portion of the land containing oil well activity dedicated to Delta Recreation but there are also some single-family residential. Peat areas are predominantly designated Public/Semi-Public or Delta Recreational. The build-out of this alternative preserves much of the land in ~~flood-prone area~~ the flood plain identified by FEMA as Delta Recreational. This alternative has little industrial activity.

It should be kept in mind that reducing flood risks is one of the reasons why the Proposed Project has been determined to be environmentally superior.

Pages 4-18 and 4-19 of the Draft EIR compare the geology, soils, and seismic hazards of the Proposed Project and alternatives. As noted above, this is based on generalized information presented in the General Plan Background Report, rather than site-specific studies. It does not preclude development on these lands. However, it should be kept in mind that reducing seismic and geologic risks is one of the reasons why the Proposed Project has been determined to be environmentally superior.

The comments on General Plan Policy 4.10.3 and Figures 8-1, 8-2 and 8-3 are comments on the Draft General Plan, not the Draft EIR.

Comment 15J: Natural Gas Wells/Draft EIR Page 3-101 and GPU Figure 8-4 indicate that several "active" oil and/or gas wells currently exist at Cypress Corridor. It is their understanding that of the eleven natural gas wells on or near Cypress Corridor, only one gas well remains active. Furthermore, there are no "oil" wells at Cypress Corridor. The current status of these wells should be clarified in the Draft EIR.

Response: The last paragraph on page 3-101 of the Draft EIR is revised to read as follows (new text is underlined, deleted text in ~~strikeout~~):

> There are several active gas and oil wells in the Planning Area, most of which are far from populated areas. ~~in the southeastern portion of~~ One active gas well and no oil wells are located in the Cypress Corridor Special Planning Area and the northwestern portion of the Cypress Corridor Expansion Special Planning Area. Figure 8-4 in the *Oakley 2020 General Plan* shows approximate location of wells. Although there is the risk of a well catching on fire, such incidents have been very few and the risk of such a fire causing a general disaster is remote. There is the possibility of increased public safety hazards if rural residential areas are permitted to encroach on the gas producing area.

Comment 15K: General Land Use Issues/Draft EIR, page 3-10 indicates that the General Plan Update anticipates a residential buildout potential that accommodates 6,500 persons less than the buildout potential of the same planning area under the Contra Costa County General Plan. Clarification is requested whether this numerical difference is due to the City's assumption that M8 will not be developed on the North Canal Land.

Response: This numerical difference is due to the City's assumption that M8 will not be developed on the North Canal Land.

Comment 15L: Draft EIR, page 3-123 indicates that "[a]ll development planned near the unlined portions of the [Contra Costa] Canal will be residential, either single-family or multi-family" in order to mitigate potential impact of development to local water supplies. Verification is requested that this mitigation measure does not apply to Cypress Corridor South Canal land and that commercial development will also be permitted near unlined portions of the Canal with adequate mitigation.

Response: This represents a new request. The Draft Land Use Diagram has been available for over a year showing commercial development located away from the unlined portions of the Canal, which served as the basis for the analysis in the Draft EIR. The City does not propose to consider a different land use configuration at this point; however, the General Plan states at page 2-12 that the Land Use Diagram is inexact, may be interpreted flexibly, and is subject to adjustment for individual development applications.

Comment 15M: Draft EIR, pages 4-2 through 4-4 describe the various project alternatives analyzed by the Draft EIR. The existing County entitlements for Cypress Corridor appear to be analyzed under both the No Project and High-Density Alternatives considered by the Draft EIR. It is requested that the Draft EIR clearly indicate in these Alternatives that Cypress Corridor is the subject of existing Development Agreements with Contra Costa County.

Response: The requested discussion is already provided on page 4-1 of the Draft EIR. It should be noted that upon incorporation, the City of Oakley succeeded the County as a party to the Development Agreements.

Comment 15N: GPU Figure 2-2; GPU Pages 2-21, 2-22 designate specific land uses within the 307 acre South Canal Land. The commentor agrees with the statement at GPU page 2-12 that the locations of land use designations on the Land Use Diagram are approximate and that the generalized depiction of the planning area will require some flexibility when interpreting the plan. Limited flexibility is requested to assure that the future general plan amendments will not necessarily be required within the 307 acre South Canal land, provided the development intensity contemplated by the MOU is not exceeded (specifically, a density of 1,200 units on the westernmost 271 acres of the South Canal Land at an overall residential density of 4.2-4.4 dwelling units per acre and 10-15 acres of commercial development). In the first paragraph of the GPU's "Development Vision" Section pertaining to the "Cypress Corridor Planning Area" (see GPU Page 2-21), the following insert is requested:

> Given that there are six (6) distinct land use designations within the 307 acre South Canal Land, it should be noted that the locations identified on Figure 2-2 are illustrative of one potential land use plan consistent with this General Plan. Future development proposals covering the South Canal Land may significantly vary from the illustrative land use pattern identified on Figure 2-2 without the need to amend this Land Use Element, provided (i) the land use density and intensity of use does not exceed the aggregate levels contemplated by Figure 2-2

and (ii) the intersection of East Cypress Road and Sellers Avenue substantially complies with this higher intensity development vision.

Response: This is a comment on the Draft General Plan, rather than the Draft EIR. The City believes that this passage from the "Development Vision" provides a reasonable level of flexibility. While there may be opportunities to approach development of the South Canal Lands in the manner requested at a future date, the requested change in the General Plan would undermine the application of land use designations, and therefore cannot be incorporated at this time.

Comment 15O: GPU, page 2-21: In the third paragraph of the Cypress Corridor Planning Area Constraints Section, it is requested that the following be inserted:

> The reader of this General Plan should be directed to inquire about the status of existing Development Agreement dated January 13, 1997 entered into between Contra Costa County covering the mixed-use (M8) master planned development of the North Canal Land and the South Canal Land, as well as the status of the Dutch Slough Restoration Project which was pending at the time of adoption of this General Plan.

Response: This is a comment on the Draft General Plan, rather than the Draft EIR. The referenced passage is added to read as follows (new text is <u>underlined</u>):

> <u>Portions of the property in the area are subject to development agreements between the City and the property owners. The agreements provide for specified development of the properties.</u>

Comment 15P: GPU Policy 2.3.13 states that City will "[r]equire that all commercial developments construct, and dedicate land to the City, *and* pay impact fees and other fees that represent their respective fair shares of necessary public services and facilities." Consistent with State law, it is requested that this policy be redrafted to require "... all commercial developments construct and dedicate land to the City, <u>*or*</u> pay impact fees ... "

Response: This is a comment on the Draft General Plan, not the Draft EIR. The City believes the current wording reflects the applicable law and takes better account of the range of possible mitigations that may be necessary to address the impacts of commercial development.

Comment 15Q: GPU, page 2-21 describes various "constraints" on development in the Cypress Corridor Planning Area including inadequate circulation access, undersized water delivery and wastewater collection lines, the need for pump stations, and uncertified existing levees. The commentor has submitted to the City the *Preliminary Traffic Analysis for Potential Development in the Oakley Cypress Road Corridor,* dated March 1999, prepared by George Nickelson Associates, and attached as Exhibit F [available for review at the City of Oakley Community Development Department]. It is requested that this study be included in the Draft EIR. Furthermore, it is requested that the Draft EIR clearly indicate that Cypress Road is planned as a four lane arterial and that Sellers Avenue provides access to the south. It is also requested that the Draft EIR indicate that plans are in place for the construction of a 24" force main under Cypress Road, a portion of which is already in place. The Draft EIR should also indicate that the Diablo Water Master Plan identifies necessary water main improvements that will be constructed concurrent with development of Cypress Corridor. Finally, it is noted that uncertified levees do not affect Cypress Corridor if such structures behind the levees are brought above elevation seven.

Response: See Response to Comment 15D with regard to revisions in the development constraints in the Cypress Corridor Planning Area. The City Engineer has reviewed the statements in this comment with regard to the 24" force main and the necessary water main improvements and found them to be accurate. However, with regard to the statement about levees and structure elevation, the City's Floodplain Ordinance requires one foot of freeboard between the base flood elevation (as determined by FEMA) and lowest floor elevation. Further, Section 914-10.012 of the City's Subdivision Ordinance requires that top of curbs shall not be lower than 9.5 feet if the property is not protected by a certified levee. As noted above, the Preliminary Traffic Analysis is available for review at the City of Oakley Community Development Department. Because the Draft EIR was already in the public review period when the Memorandum of Understanding was executed, this information was not circulated with the Draft EIR. The City has not had an opportunity to conduct an independent evaluation or peer review of this information; however, it is made available for review for informational purposes. See Responses to Comments 12B and Letter 13 for additional information about traffic. The City's review of the commentor's Preliminary Traffic Analysis, within the time available to it for review, did not reveal any new information that contradicts the Draft EIR's conclusions regarding traffic issues, or that would require the City to revise its description of the current conditions or necessary future roadway improvements. The information in the commentor's Preliminary Traffic Analysis is largely consistent with the conclusions in the Draft EIR and does not provide evidence of significant and previously unidentified environmental impacts.

Comment 15R: GPU Program 5.1.L indicates that the Cypress Corridor Planning Area is not targeted for "economic development". Please indicate whether this is a reference to redevelopment.

Response: This is a comment on the Draft General Plan, not the Draft EIR. In reviewing this policy, the referenced text (that the Cypress Corridor Planning Area is not targeted for economic development) could not be located. The cited section of the General Plan lists some areas identified as having unique opportunities for economic development; not all areas are in the Redevelopment Project Area. The Cypress Corridor Special Planning Area is not listed, but Figure 2.2 of the General Plan, the Land Use Diagram, shows potential nonresidential development in portions of the Area. See Figure 2-2 in Appendix A of this document. While the comment is correct that the Cypress Corridor is not specifically identified as a targeted location for economic development, such omission does not limit development of such uses or the City's participation in such development, if deemed appropriate.

Comment 15S: GPU Figure 7-1 and Figure 7-2 indicate that a 100 acre community park is proposed *south* of the Contra Costa Canal at Cypress Corridor. It is requested that these figures be amended to reflect the terms of the MOU and show that an approximately fifty (50) acre community park is planned *north* of the Contra Costa Canal.

Response: This is a comment on the Draft General Plan, not the Draft EIR. More recent versions of the Land Use Diagram (Figure 2-2 in Appendix A) show the proposed park in the general location identified in the comment. The location of the 50 acre park north of the Canal will be incorporated in the General Plan, and references to the 100 acre park have been eliminated.

Comment I5T: GPU Figure 7-3 indicates various existing and proposed trails at Cypress Corridor and a trail staging area north of the Contra Costa Canal. It is recommended that this figure be revised to reflect the terms of the MOU.

Response: This is a comment on the Draft General Plan, not the Draft EIR. Figure 7-3 of the Draft General Plan will be revised as requested.

Comment I5U: GPU, page 7-35 notes Dutch Slough water opportunities and a proposed 100 acre park at Cypress Corridor. It is requested that this description also include a reference to the MOU.

Response: This is a comment on the Draft General Plan, not the Draft EIR. The description will be revised to reflect the size of the park/civic center contained in the MOU; however, reference will not be made to the MOU.

Comment I5V: GPU, page 4-23 states that "[d]evelopment in the Cypress Corridor will require the installation of a new and larger [wastewater] main from Bethel Island Road west to the treatment plant." Although the commentor agrees with this statement, it is requested that the Draft EIR note that the size and alignment of this main have been determined by the Iron House Sanitary District and that construction will commence concurrent with development of Cypress Corridor.

Response: This is a comment on the Draft General Plan, not the Draft EIR. The description will be revised to incorporate the requested information.

Comment I5W: GPU, page 4-24 states that "[t]he Cypress Corridor Area and the Cypress Corridor Expansion Area currently have limited drainage infrastructure and little planning has been undertaken to consider the drainage requirements for future development." It is requested that this discussion be amplified with respect to Cypress Corridor so that it notes that necessary planning will take place concurrent with development applications and that projects will be required to adequately protect new residences from flooding and collect and convey normal drainage within the project.

Response: This is a comment on the Draft General Plan, not the Draft EIR. The discussion will be revised to incorporate the requested information.

Comment I5X: Miscellaneous Issues/Draft EIR, page 3-72 discusses how growth may impact availability of open space in the City's planning area and describes the CALFED project, M8, and the existing development agreement for Cypress Corridor. It is requested that the Draft EIR indicate that City's removal of existing urban land use designations was done subject to the existing Cypress Corridor Development Agreements and in contemplation of the pending CALFED funded acquisition for the Dutch Slough Restoration Plan.

Response: The fourth paragraph on page 3-72 of the Draft EIR is revised to read as follows (new text is underlined):

> The owners of the M-8 area properties have made an application to CALFED for funding to sell their properties north of the Canal to another public agency and to establish a substantial wetland restoration area within the Dutch Slough area. Based upon this application and presentations by the property owners' representative, the City has removed the urban land use designations from lands located north of the Contra Costa Canal within the Dutch Slough area. <u>This removal of existing urban land use designations was done subject to the existing Cypress Corridor development agreements and in contemplation of the pending CALFED-funded acquisition for the Dutch Slough Restoration Project.</u> This land has been designated as Delta Recreation by the City, a designation intended to preserve open space within the area, while providing the opportunity for enhancement of biological resources and development of passive and active recreational activities.

LETTER 16 Paul Detjens, Associate Civil Engineer, Flood Control Engineering, Contra Costa County Flood Control and Water Conservation District

Comment 16A: The Oakley General Plan covers nine formed Drainage Areas (29C, 29E, 29H, 30A, 30B, 30C, 52D, and 56) and two unformed drainage areas (29 and 74). As mentioned in the General Plan, the areas of the City southwest of the BNSF railroad tracks are generally within formed CCCFCWCD drainage areas. The areas northeast of the railroad tracks are generally in unformed drainage areas.

Response: Comment noted. No response is required because this information is already contained in the General Plan and the General Plan Background Reports.

Comment 16B: The District agrees with Santina & Thompson's Background Report, which mentions that areas to the northeast of the railroad will require significant drainage infrastructure as much of this area is in the 100-year flood zone. This area has not been studied by the District and therefore lacks an adopted master drainage plan. The District agrees with the General Plan statement that the areas in these unformed drainage areas will require separate drainage facilities discharging into Dutch Slough, which are not currently in place.

Response: Comment noted. No response is required.

Comment 16C: The City's Sphere of Influence (SOI) includes the areas identified in General Plan Figure 2-3 as the "Cypress Corridor Areas" and the "Cypress Corridor Expansion Areas". These areas lie to the east of the BNSF Railroad and Marsh Creek and are not part of a formed drainage area. The General Plan should state that these Areas should not drain to Marsh Creek.

Response: Areas east of Marsh Creek drain away from the creek. This is a comment on the General Plan, not the Draft EIR.

Comment 16D: The District compared Contra Costa County's 1995-2010 General Plan Land Use Maps with Oakley's Preferred 2020 General Plan, and Alternate A – Lower Density Plan and Alternate C – Higher Density Plan as shown in the DEIR. The land use assumptions in the District's hydrology calculations are generally based on the previous County General Plan. The City's land use designations for the areas located southwest of BSNF railroad, are comparable with the District's hydrology assumptions except for the following instance: The Preferred Plan, Alternate A, and Alternate C show a higher land use density compared with the District's assumptions near Neroly Road and Empire Avenue. The Preferred Plan and Alternates show this area to be commercial while their DA 30C Hydrology Land Use Map (November 29, 2000) shows this area to be R-4 (single family high). The General Plan and EIR should address how the increased runoff from this higher land use will be mitigated.

Response: The City is not necessarily convinced that the Commercial land use designations proposed in the General Plan and Alternatives A and C will result in increased runoff as compared to Single Family High. Maximum site coverage in the Commercial land use designation is 40 percent. General Plan policies for Drainage Facilities also provide for mitigation of drainage impacts through installation of necessary drainage facilities to serve new development, including detention basins, and master planning for drainage facilities. Finally, the District needs to look at the overall hydrological impacts of the proposed Oakley 2020 General Plan in comparison to the City-adopted County General Plan. Buildout of the City-adopted County General Plan ("No Project Alternative") would result in a population of approximately 75,000 in approximately 24,000 dwelling units. The proposed General Plan would result in a population of approximately 50,000 and 15,588 dwelling units within the same planning boundaries as the County General Plan (the city limits), and a total population of 68,371 and 21,561 dwelling units within the total planning area. Thus the population, number of dwelling units, and overall densities for the larger Oakley 2020 General Plan Planning Area will be lower than those for the County General Plan, upon which the District indicates its hydrology calculations are generally based. As described on pages 4-14 and 4-15 of the Draft EIR, all alternatives would result in reduced water percolation and increased runoff, with the High Density Alternative converting the most land to urban uses, therefore causing the most runoff effects.

Comment 16E: The General Plan should include a specific policy that requires the City or developers in the Cypress Corridor Area and Expansion Area to draft their own regional drainage master plan. A drainage master plan should be completed prior to considering development proposals in these areas. The following paragraph on Page 19 of Santina & Thompson's Conceptual Drainage Master Plan should be added as a General Plan Policy under Drainage Facilities on Page 4-10:

> A Drainage Master Plan must be developed and approved prior to allowing development in the Cypress Corridor Area and the Cypress Expansion Area. The Drainage Master Plan shall include detailed hydrologic modeling of the watershed that considers land use, existing facilities, soil, and topographic data. The Drainage Master Plan shall result in a plan with descriptions of proposed flood control facilities (which typically include basins, channels and storm drains), compliance with discharge requirements, cost estimates, and schedule.

Also, the following paragraph from the Conceptual Drainage Master Plan should be included if Oakley's SOI is incorporated:

> The Drainage Master Plan shall include an organization chart that details which agency will be responsible for Design, Planning, Hydrogeology, Current Development Review, Clean Water Program compliance, and Maintenance.

Response: A new General Plan Policy (GME Policy 4.10.10) is added to the Growth Management Element, Drainage Facilities, to read as follows (new text is <u>underlined</u>):

> <u>Develop and approve a Drainage Master Plan prior to allowing development in the Cypress Corridor Area and the Cypress Expansion Area.</u>

A new General Plan Program (GME Program 4.10.I) is added to read as follows (new text is <u>underlined</u>):

> <u>Include detailed hydrologic modeling of the watershed that considers land use, existing facilities, soil, and topographic data in the Drainage Master Plan. Develop a Drainage Master Plan which includes descriptions of proposed flood control facilities (which typically include basins, channels and storm drains), compliance with waste discharge requirements, cost estimates, schedule, and an organization chart that details which agency is responsible for design, planning, hydrogeology, current development review, Clean Water Program compliance, and maintenance.</u>

The foregoing new General Plan Policy and Program constitute additional mitigation measures and clarification of information provided in the Draft EIR. The comment does not assert that, absent the added mitigations, drainage and flood-related impacts of the General Plan will be more severe than previously identified. The City has added the Policy and Program/mitigation measures because it believes that they are reasonable and feasible, and that in conjunction with previously identified mitigation measures, they will reduce those impacts to a less than significant level.

It should be noted that the Santina & Thompson Public Facilities Background Report is a part of the General Plan Background Report, which was referenced at the beginning of Section 3.11, Utilities and Service Systems (page 3-152) of the Draft EIR. It is stated that this document should be consulted for a more detailed environmental setting discussion of utilities and service systems.

Comment 16F: The following paragraph from page 3, Section 1.4 of Santina and Thompson's Conceptual Drainage Master Plan should be incorporated as a General Plan policy:

> The unincorporated area within Oakley's SOI is currently under the control of the County. Should Oakley incorporate this area, Oakley shall develop their own flood control plans and identify discharge points. Oakley will be responsible for insuring the flood control implementation is performed correctly and the ongoing maintenance is perpetual.

Response: A new General Plan Policy (GME Policy 4.10.11) is added to the Growth Management Element, Drainage Facilities, to read as follows (new text is underlined):

> Develop flood control plans and identify discharge points for unincorporated areas annexed by the City of Oakley. Ensure that flood control implementation is performed correctly and that ongoing maintenance is perpetual.

The foregoing new General Plan Policy constitutes an additional mitigation measure and clarification of information provided in the Draft EIR. The comment does not assert that, absent the added mitigation, drainage and flood-related impacts of the General Plan will be more severe than previously identified. The City has added the policy/mitigation measure because it believes that it is reasonable and feasible, and that in conjunction with previously identified mitigation measures, it will reduce those impacts to a less than significant level.

It should be noted that the Santina & Thompson Public Facilities Background Report is a part of the General Plan Background Report, which was referenced at the beginning of Section 3.11, Utilities and Service Systems (page 3-152) of the Draft EIR. It is stated that this document should be consulted for a more detailed environmental setting discussion of utilities and service systems.

Comment 16G: In addition, the General Plan policies should be specifically modified as follows:

a. Page 4-11, Program 4.10.A "Implement and update, as necessary, the Contra Costa County Drainage Plan for formed drainage areas within the City of Oakley."
b. Page 4-11, Program 4.10.D "Develop and adopt a Specific Drainage Plan for areas north and east ~~of the Contra Costa Canal~~ BNSF Railroad, which includes the Cypress Corridor Area and Expansion Area."

Response: GME Program 4.10.A is modified to read as follows (new text is underlined):

> Implement and update, as necessary, the Contra Costa County Drainage Plan for formed drainage areas within the City of Oakley.

GME Program 4.10.D is modified to read as follows (new text is underlined, deleted text in ~~strikeout~~):

> Develop and adopt a Specific Drainage Plan for areas north and east of the ~~Contra Costa Canal~~ BNSF Railroad, which includes the Cypress Corridor Area and Expansion Area.

Comment 16H: The Draft EIR should be amended as follows: page 3-106, paragraph 3: "The current plan for the Planning Area is based upon the CFCWCD plan only in the formed drainage areas where the Flood Control plan exists."

Response: Section 3.7.3, Impact 3.7-A, Discussion and Conclusion, the third paragraph on page 3-106 is revised to read as follows (new text is underlined):

> Much of the overall concern about flooding is managed by providing an effective stormwater drainage system. The implementation of drainage facilities within the City of Oakley is accomplished by both the City or the County Flood Control and Water Conservation District (CFCWCD). CFCWCD has prepared and adopted plans that serve both Oakley and the County. Both groups generally use the same design criteria in sizing and evaluating drainage systems. The current plan for the Planning Area is based upon the CFCWCD plan only in the formed drainage areas to which the Flood Control plan applies.

LETTER 17 Tom Williams, Acting District Manager, Ironhouse Sanitary District

Comment 17A: Page 3-100. Under Railroad, in the second paragraph, please add this sentence: "Encouraging the installation of gated crossing where none exist now is also an effective strategy to avoid collision and possible derailments."

Response: Section 3.7.1, Railroad, the second paragraph (page 3-100) is revised to read as follows (new text is underlined):

> There is also a safety concern of pedestrians along the tracks and vehicles utilizing at grade crossings. The design and operation of at grade crossings allows the City some control over rail related hazards. Ensuring proper gate operation at the crossings is the most effective strategy to avoid collision and possible derailments. Encouraging the installation of gated crossings where none exist now is also an effective strategy to avoid collision and possible derailments.

Comment 17B: Page 3-120. Under Wastewater Services, the Wastewater Services section of the Draft EIR belongs in Section 3.6, Public Utilities and not in Section 3.6, Hydrology and Water Quality. Please relocate this section.

Response: See Response to Comment 8O.

Comment I7C: Page 3-120. Second paragraph, for the sake of technical accuracy, please replace this paragraph with the following: "Ironhouse Sanitary District resulted from the governmental reorganization of the former Contra Costa Sanitation District No. 15 and the Oakley-Bethel Island Wastewater Management Authority into the Oakley Sanitary District, renamed the Ironhouse Sanitary District, which was completed on January 31, 1992."

Response: Section 3.8.1, Wastewater Services, the second paragraph is revised to read as follows (new text is underlined; deleted text in ~~strikeout~~):

> ~~The former Contra Costa County Sanitation District No. 15 and the Oakley-Bethel Island Wastewater Management Authority reorganized into the ISD and were renamed on January 31, 1992.~~ Ironhouse Sanitary District resulted from the governmental reorganization of the former Contra Costa County Sanitation District No. 15 and the Oakley-Bethel Island Wastewater Management Authority into the Oakley Sanitary District, renamed the Ironhouse Sanitary District, which was completed on January 31, 1992. Much, but not all, of the existing District area is presently served by collection systems owned and operated by ISD. Septic systems treat other individuals' wastewater.

Comment I7D: Page 3-120. Fifth paragraph, include "Dutch Slough and" prior to the word "Sandmound".

Response: Section 3.8.1, Wastewater Services, Treatment Plant, the first paragraph (pages 3-120 and 3-121) is revised to read as follows (new text is underlined):

> ISD owns and operates a wastewater treatment plant in the northeast portion of Oakley. This plant currently provides wastewater treatment services for Oakley, Bethel Island, Dutch Slough and the Sandmound area. There are currently 50 acres of onsite storage for treated wastewater. Additional acreage for storage will be required as flows increase. The Central Valley Regional Water Quality Control Board (CVRWQCB) has established the waste discharge requirements for the plant. The plant with its existing treatment system has routinely produced effluent below the discharge requirements.

Comment I7E: Page 3-121. Change "Effluent Disposal" to "Effluent Recycling" in the heading throughout this paragraph.

Response: The heading and paragraph on page 3-121 are changed to read as follows (new text is underlined; deleted text in ~~strikeout~~):

> **Effluent ~~Disposal~~ Recycling**
>
> Effluent ~~disposal~~ recycling is through land application of the treated effluent on irrigated pasture and agricultural crops. Currently the ~~disposal~~ recycling is split between the mainland property and Jersey Island. Currently ISD is permitted to apply its reclaimed water on 260 acres of its mainland property and 350 acres on

its Jersey Island property. This provides enough capacity to accommodate the current plant treatment capacity of ~~4.0~~ 3.0 MGD and effluent recycling capacity of 2.0 MGD. ISD has increased its ultimate effluent ~~disposal~~ recycling capacity from 4.0 MGD to 8.0 MGD ~~by~~ due to the acquisition of additional land. The land application of 8.0 MGD requires approximately 1,600 acres. However, 3,500 acres has been obtained on Jersey Island~~. While not all of the 3,500 acres will be feasible for disposal use, enough should be available to allow adequate flexibility to rotate the disposal areas over time~~. The Regional Water Quality Control Board has noted that the long-term viability of ISD's current effluent recycling program is not certain. The Regional Board and Contra Costa Water District are concerned about the potential for impacts to groundwater and surface water quality. The current waste discharge requirements (WDRs) set forth a plan and schedule for evaluation of groundwater quality and implementation of source control measures as needed.

Also see Responses to Comment 8G and 17H for an explanation of the additional revisions.

Comment 17F: Page 3-121. In the third sentence, "4.0 MGD" should be changed to "3.0 MGD".

Response: See Response to Comment 17E.

Comment 17G: Page 3-121. Change "Sludge Disposal" to "Solid Sludge Reuse" in the heading throughout this paragraph.

Response: The heading and paragraph on page 3-121 are revised to read as follows (new text is underline; deleted text in ~~strikeout~~):

~~Sludge Disposal~~ Solid Sludge Reuse

Solid sludge production results from the treatment process. ISD has increased its ~~sludge disposal~~ solid sludge reuse capacity through the beneficial reuse of sludge by land application on ISD owned lands. ISD rotates the application of dewatered sludge and treated effluent both on the existing disposal areas on ISD property and on Jersey Island.

Comment 17H: Page 3-121. Under Effluent Disposal, the fourth sentence should be changed to read, "ISD has the ability to increase its ultimate effluent disposal capacity from 3.0 MGD to 8 MGD due to the acquisition of additional land."

Response: See Response to Comment 17E.

Comment 17I: Page 3-127. Impact 3.8-C, this entire section needs to also follow the above request for Page 3-120 and be moved to Section 3.6, Public Utilities of the Draft EIR.

Response: See Response to Comment 8O.

Comment I7J: Page 3-127. Under Discussion and Conclusion, fifth sentence, the word "No" should be removed.

Response: Impact 3.8-C, Discussion and Conclusion, the fourth sentence (fifth line) is revised to read as follows (deleted text in ~~strikeout~~):

> ~~No~~ New CVRWQCB approval will be required.

Comment I7K: Page 3-128. The last sentence of the fourth paragraph should be changed to read, "The most significant change will be the need for a larger trunkline, and to extend the trunkline all the way to the treatment plant head works".

Response: Impact 3.8-C, Discussion and Conclusion, the fourth paragraph (page 3-128) is revised to read as follows (new text is underlined; deleted text in ~~strikeout~~):

> The District has 27 pump stations. In many cases, changing the pump motor and possibly upgrading the pump impeller is enough to handle additional flow without affecting the line sizes. The main impact of the development proposed under this General Plan is on the trunk line in the area east of Marsh Creek. The most significant changes will be ~~for larger trunk lines~~ expanding the size of the trunkline, and extending the trunkline all the way to the treatment plant head works.

Comment I7L: Page 3-129. Fourth bullet, second sentence, replace "determine" with "assure itself". Third sentence, replace "appropriate sewer service agency" with "Ironhouse Sanitary District."

Response: GME Program #4.9.D is hereby changed to read as follows (new text is underlined, deleted text in ~~strikeout~~):

> At the project approval stage, require new development to demonstrate that wastewater treatment capacity can be provided. The City shall ~~determine~~ obtain assurance that ~~whether~~ 1) capacity exists within the wastewater treatment system if a development project is built within a set period of time, or 2) capacity will be provided by a funded program or other mechanism. This finding will be based on information furnished or made available to the City from consultations with ~~the appropriate sewer service agency~~ Ironhouse Sanitary District, the applicant, or other sources.

Comment I7M: Page 3-129. Fifth bullet, replace "sewer service" with "Ironhouse Sanitary District."

Response: GME Program #4.9.E is hereby changed to read as follows (new text is underlined, deleted text in ~~strikeout~~):

> Identify and develop opportunities, in cooperation with ~~sewer service~~ Ironhouse Sanitary District and water service agencies, for using reclaimed wastewater.

Comment 17N: Page 4-17. Section 4.3-11, Utilities and Services, this section is completely void of any discussion on ISD's wastewater collection, treatment and reclamation impacts by the different alternatives. This section must be revised to include all relevant discussion of the impacts of each alternative on ISD's facilities.

Response: The comment is correct, this section of the Draft EIR addresses only water supply and not wastewater collection, treatment and disposal/reclamation. Pages 4-21 to 4-23 of the General Plan contain information regarding ISD's ability to provide wastewater collection services in the City and Expansion Areas. The level of impacts on the ISD system would depend upon the total population, numbers of dwelling units, and commercial and industrial development allowed under each alternative, in comparison to existing conditions and the proposed General Plan. Buildout of the Planning Area for the proposed General Plan would result in a total population of 68,371 and 21,561 dwelling units, as well as 1,427 acres of commercial and industrial development. Buildout of the High Density Alternative would result in a total population of 83,589 and 26,702 dwelling units, as well as 1,503 acres of commercial and industrial development. Buildout of the Low Density Alternative would result in a total population of 63,983 and 20,262 dwelling units, as well as 1,329 acres of commercial and industrial development. Buildout of the existing County General Plan (the "No Project Alternative") would result in a total population of 74,918 and 23,942 dwelling units, as well as 1,308 acres of commercial and industrial development. Adoption of the Preferred Alternative (the proposed General Plan) would therefore result in a lower buildout population (68,371) than the existing County General Plan (74,918) (which the District would have served had the City of Oakley not incorporated), or the High Density Alternative (83,589). Furthermore, the County General Plan provided for 431 acres of heavy industrial uses, while the proposed General Plan does not include a heavy industrial designation (nor do the High and Low Density alternatives). Heavy industrial uses have a much greater potential for impacting the wastewater treatment process, both in terms of volume and loading of the effluent.

ISD's current capacity planning is based on the City-adopted County General Plan; since the proposed Oakley 2020 General Plan would, compared to the County Plan, result in a lower population and no heavy industrial uses, the proposed General Plan should have fewer and less severe wastewater collection, treatment, and reclamation impacts than the District has currently planned to accommodate.

The foregoing clarification is based on information contained throughout the General Plan and Draft EIR, and does not identify new, significant, or previously unanalyzed environmental impacts. The conclusion in Section 4.2-11 of the Draft EIR that the Proposed Project and Low Density Alternative will have the least impact on utilities and services, including wastewater collection, treatment, and reclamation, remains valid.

Comment 17O: Appendix B. Page 15, Item 4.9.D, revise to reflect changes noted above for page 3-129.

Response: See Response to Comment 17L.

Comment I7P: Appendix B. Page 17, Item 5.1.F, second sentence, revise "impact fees" to "City impact fees".

Response: Program 5.1.F. currently reads as follows:

> Identify development standards that the City would consider modifying to attract highly desirable businesses, possibly including on-site parking, building setbacks, building height, and lot coverage. Consider provisions for very unique circumstances where the City Council may consider adjustments to impact fees where it can be demonstrated that the development project will be provided with all necessary services and infrastructure improvements.

The City can only adjust its own impact fees; it has no authority to adjust impact fees imposed by other jurisdictions, including schools districts and special districts. The requested change is therefore unnecessary.

Comment I7Q: Appendix B. Page 18, Item 5.5.A, first bullet, as the City does not operate the water or wastewater facilities, sharing of those agencies' plans and studies should not occur via the City, as the City may misrepresent the intent or conclusions of these documents. All information on theses agencies' facilities must come directly from Ironhouse Sanitary District and Diablo Water District.

Response: Comment noted. The referenced program is actually Program 5.3.A. The City's intent is to facilitate expansion of existing businesses and establishment of new businesses by sharing copies of plans and studies provided by special districts and other agencies that provide services in the City of Oakley. It was never the City's intent to attempt to interpret these plans and studies on behalf of the agencies.

LETTER I8 Timothy C. Sable, District Branch Chief, Department of Transportation

Comment I8A: The Department once again recommends that the City of Oakley recirculate the Draft EIR once the discussion of project-related traffic impacts from the Draft Long-Range Circulation Plan has been incorporated. As indicated in their previous correspondence dated October 30, 2002 [Letter 13 in Chapter Three], omitting the discussion of project-related traffic impacts from the Draft EIR precludes full public disclosure of project impacts as required by the California Environmental Quality Act (CEQA). While the Department understands that additional traffic information will be provided in the Final EIR, the anticipated ten-day circulation of this document does not provide sufficient time for public review and comment per CEQA [Guidelines] Section 15203.

Response: The comment consists of a general recommendation that the City recirculate the Draft EIR and requests for clarifications of specific information provided in the Draft EIR and Long Range Roadway Plan (LRRP). The comment states that the City should recirculate the Draft EIR because the Draft EIR did not address "project-related traffic impacts" in sufficient detail to provide the public with a meaningful opportunity to comment. Please note that, contrary to the assertion in the comment, the October 30, 2002 letter from Caltrans (Letter 13) did not request recirculation of the Draft EIR.

Section 15088.5 of the CEQA Guidelines requires a lead agency to recirculate a Draft EIR when it adds significant new information to the EIR after the lead agency gives notice that the EIR is available for public review, but before certification of the Final EIR. New information is not "significant" unless it deprives the public of a meaningful opportunity to comment upon a substantial adverse environmental impact or a feasible way to mitigate such an impact. The eight specific requests for clarification are addressed below, in Responses to Comments 18C through 18H. They and the responses to Letter 13 are based on information available in the Draft General Plan, Draft EIR, and LRRP prepared by Fehr and Peers Associates, which is cited both in the Draft General Plan (page 3-8) and the Draft EIR (page 3-31) (see Response to Comment 12B for a discussion of the relationship between the LRRP and the Long Range Circulation Plan, which was the name for the document at the time the Draft General Plan and Draft EIR were circulated for public review.)

The City believes that neither Caltrans' comments nor the responses contained in this Final EIR contain significant new information, because the responses are based on and are merely clarifications of information contained in the Draft General Plan, the Draft EIR, and the LRRP. The CEQA Guidelines support the City's decision to include general information about circulation impacts of the General Plan, and to incorporate the details contained in the LRRP by reference, rather than to include all of the detailed information about the proposed General Plan's impacts within the Draft EIR and General Plan themselves. CEQA Guidelines Section 15146 states that the level of detail required for an EIR is different from the level required for a specific construction project. Section 15147 additionally recommends that the information in an EIR should include "summarized technical data," and that "placement of highly technical and specialized analysis and data in the body of an EIR should be avoided." Finally, Section 15150(a) allows a lead agency to incorporate by reference a document that is a matter of public record or generally available to the public. As previously stated, the LRRP is referenced in both the Draft General Plan and Draft EIR, and a copy was provided to Caltrans within the required review period for the Draft EIR. Caltrans was allowed additional time to comment, as requested in Letter 13. Moreover, the City believes that the information contained in the Draft General Plan, Draft EIR, and LRRP addresses all of Caltrans' specific requests for clarification.

Because, as shown below, all of the specific comments can be addressed with information contained in the Draft General Plan, Draft EIR, and LRRP; because the LRRP is incorporated in the other documents by reference; and because all of the documents were available to the public for review, the City believes that the impacts of the General Plan were identified in sufficient detail for the public to have a meaningful opportunity to comment on the impacts on traffic of the General Plan. No new significant information is contained in the comment or in the responses provided in this Final EIR. All of the comments can be addressed with clarifications of information contained in the Draft General Plan, Draft EIR, and LRRP. Therefore, CEQA does not require recirculation, and the City does not believe that any public benefit would be derived from doing so.

Nonetheless, City staff and consultants have discussed traffic issues with Caltrans representatives, and additional provisions have been included in the Mitigation Monitoring and Reporting Program contained in this Final EIR (at the end of this Chapter) to ensure that, as individual development projects occur in the City consistent with the General Plan, the City and Caltrans work together to identify all impacts on affected roadways, and to mitigate all such impacts as provided for in the General Plan, Final EIR, and LRRP. The City is committed to full implementation of those and all other mitigation measures identified in the Final EIR.

Comment 18B: Comments on the Circulation Plan are presented below. These are submitted after close of the public review period because the Circulation Plan was not submitted to the Department until October 23, 2002, after more than a month of the public review period had already elapsed.

Response: See Response to Comment 18A.

Comment 18C: Mitigation Requirements. While buildout of the General Plan would result in potentially significant impacts to transportation, the feasibility, financing, scheduling, implementation responsibilities and lead agency monitoring for proposed mitigation measures have not been identified in the Draft EIR. Because the only identified mitigation consists of a list of policies, the Draft EIR should be revised to include feasible and verifiable mitigation. Potentially significant impacts to transportation include:

- Project-related traffic that exceeds level of service (LOS) standards for roadway segments and intersections, and
- Cumulative impacts to traffic, transit, pedestrian and bicycle facilities.

Response: See Response to Comment 8L, and the Mitigation Monitoring and Reporting Program included at the end of this Chapter.

Comment 18D: Improvement Assumptions. The text and LOS calculations in the Circulation Plan should be revised to reflect the following:

1. The four lane improvement along the SR 4 Bypass cited in the first bullet on page 13 of the Circulation Plan is unlikely to occur by the year 2010 as stated in the second paragraph of page 12. The SR 4 Bypass project that is scheduled for completion by Fall 2006 will be four lanes between the SR 160 and Lone Tree Way interchanges only, then two lanes rather than the four cited in the Circulation Plan heading east to Balfour Road. Interchanges will be constructed at Laurel Road and Lone Tree Way.

2. SR 4 Freeway widening to eight lanes from Bailey Road to the SR 4 Bypass is unlikely to be completed by 2010 as stated in the third bullet of page 13 in the Circulation Plan.

3. The Circulation Plan should clarify whether widening SR 4 to four lanes through the City will be needed once the SR 4 Bypass is completed.

Response: With regard to (1) the timing of regional roadway improvements along the SR 4 Bypass, the LRRP reports the roadway action items identified in The Action Plan for Routes of Regional Significance in Eastern Contra Costa County (TRANSPLAN, June 2000). As noted in the comment, the construction of the SR 4 Bypass as a four-lane facility between SR 160 and Lone Tree Way is currently expected to be completed in 2006; the Bypass south of Lone Tree Way will be a 2-lane facility at that point, until future upgrades are constructed. The segment between SR 160 and Lone Tree Way and the associated Laurel Road interchange are of most importance for the City of Oakley, and these improvements will be complete before 2010.

With regard to (2) the timing of regional roadway improvements along SR 4, the LRRP reports the roadway action items identified in The Action Plan for Routes of Regional Significance in eastern Contra Costa County. The widening of the SR 4 freeway between Bailey Road and the SR 4 Bypass is partially complete, and construction is continuing. The analysis conducted for the LRRP focused on buildout of the proposed General Plan. That land use scenario will correspond to a timeframe well beyond the year 2010; therefore, it is reasonable to assume that all improvements will be completed by the time buildout is achieved, even if they are not completed by 2010, and therefore it is reasonable to include the full widening of the SR 4 freeway in the analysis of this long-range growth scenario.

With regard to (3) requesting clarification of the proposed width of SR 4 through Oakley, the LRRP analyzes a long-range growth scenario (buildout of the proposed General Plan), and assumes completion of the SR 4 Bypass. As shown in Figure 4 of the LRRP, the analysis finds that widening of Main Street (current SR 4) through Oakley is needed to accommodate the growth that is anticipated in Oakley and surrounding communities.

Comment I8E: The Circulation Plan should clarify how capacity is derived from the 2000 Highway Capacity Manual (Table 3, page 5).

Response: The daily roadway capacities used in the LRRP were derived from the hourly capacities for various roadway types presented in the 2000 Highway Capacity Manual, Chapter 10. The directional peak hour capacities in the Manual were multiplied by 10 to calculate daily capacities, then multiplied by 2 to result in bi-directional daily capacities.

Comment I8F: The 4D Road Type designation for the segment of Main Street (SR 4) east of Empire Avenue should be verified (Table 3, page 5).

Response: As noted in the LRRP, the need for widening this segment of Main Street beyond a 4-lane cross-section depends on the effectiveness of the proposed Laurel/Cypress connector and the Downtown Bypass. Therefore, the capacity needs for this segment will be more fully investigated as more detailed plans for these additional projects are developed.

Comment I8G: Clarify whether right-turns-on-red (RTOR) are permitted in the eight-phase traffic signal cycle at Main Street (SR 4)/Laurel Road intersection, and it not, the RTOR volume should be adjusted accordingly.

Response: In the analysis of the Main/Laurel intersection presented in the Existing Conditions section of the LRRP, the eastbound right-turn movement was adjusted for right-turn-on-red, because that approach has an exclusive right turn lane.

Comment 18H: Agency Coordination. The City should coordinate with Contra Costa Transportation Authority and the SR 4 Bypass Authority in preparation of the General Plan.

Response: The City has and continues to coordinate with Contra Costa Transportation Authority and the SR 4 Bypass Authority in preparation of the General Plan. The City is a member of both agencies.

Mitigation Monitoring and Reporting Program

As stated in Chapter 1.0 of the Draft General Plan, "From the outset, it was the City's intention to create a self-mitigating Plan. This strategy required the City to consider potential impacts and incorporate policies and programs within the General Plan that would reduce potential impacts to a level of less than significant." Chapter 1.0 of the Draft General Plan also addresses subsequent actions, as follows (page 1-4):

> While adoption of the General Plan represents a major milestone for the City of Oakley, additional concurrent and future planning efforts will be required. As noted above, the City is currently engaged in numerous planning efforts that are anticipated for adoption following the General Plan. Additionally, the City must amend the City adopted County Zoning Ordinance and Zoning Map to achieve consistency with this General Plan. The amendment and adoption of a Zoning Code and Zoning Map prepared specifically for Oakley will be a substantial and important undertaking that will clearly identify specific uses and standards for development within Oakley.

The mitigation measures incorporated in the proposed project to reduce or avoid identified significant impacts are Policies and Programs included in the Draft General Plan. Section 15126.4(2) of the CEQA Guidelines requires that mitigation measures must be fully enforceable through permit conditions, agreements, or other legally-binding instruments. In the case of the adoption of a plan, policy, regulation, or other public project, mitigation measures can be incorporated into the plan, policy, regulation, or project design. That is what the City of Oakley has done. With adoption of the General Plan, the Policies and Programs (mitigation measures) are fully enforceable. CEQA requires that the General Plan Policies and Programs reflect the mitigation measures identified in the Plan's EIR. Pursuant to §65103 of the California Government Code, the planning agency of the City of Oakley must perform the following functions with respect to implementation of the General Plan (as excerpted from the State of California General Plan Guidelines, 1998):

- Implement the General Plan through actions including, but not limited to, the administration of specific plans and zoning and subdivision ordinances.
- Annually review the capital improvement program of the city and the local public works projects of other local agencies for their consistency with the General Plan, pursuant to Article 7 (commencing with §65400).
- After the City Council has adopted all or part of a General Plan, §65400 requires the City planning agency to do both of the following:
  - Investigate and make recommendations to the City Council regarding reasonable and practical means for implementing the General Plan or element of the General Plan, so that it will serve as an effective guide for orderly growth and development, preservation and conservation of open space land and natural resources, and efficient expenditure of public funds relating to the subjects addressed in the General Plan.

- Provide to the City Council an annual report on the status of the General Plan and progress of its implementation

In addition, for Policies, Programs and transportation improvements included in the Circulation Element of the General Plan, the Mitigation Monitoring and Reporting Program provides that the City will comply with the following Mitigation Monitoring and Reporting Plan requirements per California Department of Transportation (Caltrans) Draft Guidelines:

- Providing to Caltrans the name, address and telephone number of the lead agency contact responsible for specific mitigation measures. For the General Plan as a whole, the City of Oakley is the lead agency and related questions may be addressed to the Community Development Department, 3633 Main Street, Oakley, CA 94561. Telephone inquiries may be made by calling (925)625-7000.

- Identifying for Caltrans the location and custodian of the documents and additional materials which constitute the record of proceeding upon which the lead agency's decision is based for individual development projects and related circulation mitigation measures. For the General Plan as a whole, the City of Oakley Community Development Department is the custodian of all records, which will be located at the address cited above.

- Providing assurances from the lead agency that Caltrans can obtain copies of the aforementioned documents and materials, if needed, to clarify details or resolve issues related to project mitigation. The City of Oakley hereby assures that, for the General Plan as a whole, all related documents will be made available to Caltrans upon request. The City will provide similar assurances for the circulation mitigation measures for individual development projects.

- Providing detailed information of the type of mitigation, specific location, and implementation schedule for each transportation impact mitigation measure included in the reporting or monitoring program. Information of this type for the General Plan as a whole is included in the City of Oakley Long Range Roadway Plan, included as Appendix B of the Final EIR, and will be supplemented on a project-by-project basis.

- Including a certification section, signed and dated by the lead agency and Caltrans, certifying that the mitigation measures have been implemented and all other requirements have been adhered to in accordance with Public Resources Code Section 21081.6. The City will provide such certification for the General Plan and for the implementation of mitigation measures for individual development projects, as the City and Caltrans consider necessary.

Table 2-1
Key Public Agencies (Revised) (New text is underlined; deleted text in ~~strikeout~~)

Federal Agency	Responsibility
United States Army Corps of Engineers (Corps)	Responsible for floodplain and wetland management services along waterways, such as Marsh Creek. This agency will act as a Responsible Agency in regulating the removal of wetland areas and overseeing the permit process for replacing wetlands.
United States Fish and Wildlife Service (USFWS)	Responsible for conserving and protecting, endangered species and their habitat for the benefit of the public at large. This agency will act as a Responsible Agency pursuant to ~~its Section 7 or Section 10 permits (~~Federal Endangered Species Act (Section 7 or Section 10 permits) and Migratory Bird Treaty Act~~)~~.
National Marine Fisheries Service (NMFS)	Responsible for the conservation and management of fishery resources within the U.S. Exclusive Economic Zone (EEZ) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act, Public Law 94-265, as amended.
Federal Emergency Management Agency (FEMA)	An independent agency of the federal government, reporting to the President established to reduce loss of life and property and protect our nation's critical infrastructure from all types of hazards through a comprehensive, risk-based, emergency management program of mitigation, preparedness, response and recovery.

State Agency	Responsibility
California Department of Fish and Game (DFG)	Responsible for the protection, conservation, propagation, and enhancement of California's wildlife and vegetation resources. This department enforces laws and regulations protecting sensitive biological resources and habitats. This agency will act as a Responsible Agency and has the authority to enter into agreements for alterations to any streambeds.
~~California~~ Central Valley Regional Water Quality Control Board (CVRWQCB)	Responsible for determining existing and future beneficial uses of surface water and ground water through the Basin planning process. Beneficial uses are then used to determine applicable Water Quality Objectives. Also responsible for protecting the quality of surface water and groundwater through regulation of waste discharges to land and surface water, primarily through adoption of ~~evaluating appropriate uses of water and responsible for issuing~~ Waste Discharge Requirements for individual dischargers. ~~permits to protect water quality. This agency will act as Responsible Agency to evaluate project consistency with the City's existing National Pollutant Discharge Elimination System (NPDES) permit.~~ The Regional Board is also the implementing agency for the federal National Pollutant Discharge Elimination System (NPDES) and issues NPDES permits for point source discharges to surface water and storm water dischargers.

State Agency	Responsibility
California Reclamation Board (CRB)	Responsible for delineation of flooding and regulation of encroachments into designated floodways.
California Department of ~~Food and Agriculture (CDFA)~~ Conservation	Responsible for ~~agricultural preserves set up by local jurisdictions under~~ statewide administration of the Williamson Act and the Open Space Subvention Entitlement Act.
California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR)	Responsible for regulating natural gas extraction throughout the Planning Area.
California Department of Transportation (Caltrans)	Responsible for approval of roadway improvements along state highways, including State Route 4.
California Environmental Protection Agency (CalEPA)	This agency is the primary state agency concerned with degradation of the environment and how it affects human health.
California Public Utilities Commission (CPUC)	The Public Utilities Commission regulates public utilities and would be responsible for approval of modification and improvements to railroad and major utility facilities.
Delta Protection Commission (DPC)	The entity that plans for and guides the conservation and enhancement of natural resources of the Delta. Responsible for General Plan consistency determination.

Local Agency	Responsibility
Contra Costa Local Agency Formation Commission (LAFCO)	Establishes policies regarding the organization and service delivery of cities and special districts, and approves boundary changes proposed by ~~any~~ governmental agencies.
City of Oakley	Lead Agency for the Oakley 2020 General Plan.
Contra Costa County, Antioch, and Brentwood	These jurisdictions will act as Interested Agencies with the proposed project because they are located directly adjacent to the City of Brentwood.
Bay Area Air Quality Management District (BAAQMD)	Serves as the regional agency dealing with air pollution in the San Francisco Bay area and has the responsibility for the implementation of the California Clean Air Act. This agency's authority extends throughout the nine-county San Francisco Bay Area, includes Contra Costa County.
Contra Costa Transportation Authority (CCTA)	Agency responsible for implementing Measure C provisions. Measure C established a one-half cent sales tax in Contra Costa County to fund a special set of transportation improvements. The Contra Costa Transportation Authority is also the designated Congestion Management Agency.
Diablo Water District (DWD)	~~Local surface water rights and water supply contracts serving the project area.~~ Domestic water provided for the Oakley Planning Area.

Local Agency	Responsibility
Contra Costa Water District (CCWD)	Has local surface water rights and water supply contracts including water treatment agreements with the ~~City of Oakley~~ Diablo Water District.
Contra Costa County Flood Control and Water Conservation District	Responsible for maintenance and operation of major flood control facilities and stream channels throughout Contra Costa County.
Ironhouse Sanitary District	Operates wastewater treatment facilities within Oakley and disposes of treated wastewater upon property in Oakley and on Jersey Island.
Oakley-Knightsen Fire Protection District	Provides fire protection service to a 40-square mile area that includes Oakley.
Liberty Union High School District, Oakley Union Elementary School District, and Contra Costa Community College District	Provide school services in the Oakley Planning Area.
Tri Delta Transit – Eastern Contra Costa County Transit Authority (ECCTA)	Provides Transit Service to Oakley Planning Area.
East Bay Regional Park District (EBRPD)	Maintains certain recreation trails in Oakley.
State Route 4 Bypass Authority	State Route 4 Bypass project. (Joint Powers Agreement)

3.8.2 THRESHOLDS OF SIGNIFICANCE

CEQA Guidelines Appendix G says a significant impact would occur with full implementation of the Oakley General Plan if it would result in:

- Violation of water quality standards;
- Alteration of existing drainage patterns of the site or area, including alternation of a course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site;
- Substantial increase of nonpoint-source pollution entering stormwater runoff and entering the regional storm drain system or surrounding water resources;
- Substantial increase of construction-related erosion and sedimentation into surface waters;
- Disruption of a creek or stream channel, as a result of structures built within 100 feet of the centerline of a creek or stream channel; or
- Inadequate storm drains, as a result of new development, to accommodate 100- to 500- year flood flows.

3.8.3 ANALYSIS OF IMPACTS (REVISED) (New text is <u>underlined</u>; deleted text in ~~strikeout~~):

Impact 3.8-A: *Future development associated with the proposed General Plan may result in additional discharge into surface waters or other alteration of surface water quality in violation of Regional Water Quality Control Board standards or waste discharge requirements.* ***(Potentially Significant)***

Discussion and Conclusion: Development of the proposed land uses and circulation improvements within the Planning Area would have the potential to degrade water quality. Short-term water quality impacts would occur during individual site construction, and long-term impacts would be experienced during the lifetime of development. <u>Short-term construction impacts are addressed in Impact 3.A-B.</u>

~~Short-term grading and construction activities may cause an increase in erosion leading to sedimentation of streams in the affected watershed. Pollutants may also be transported from construction areas to downstream locations due to improper handling practices. Solvents, fuels, lubricants, and chemical wastes may be spilled, dumped, or discarded on construction sites. These contaminants may be picked up in site runoff and ultimately enter downstream waterways.~~

~~The degree to which construction activities affect water quality is partly determined by the time of year during which construction occurs. Construction during the winter rainy season would result in an increased potential for erosion, sedimentation, and contaminant transport in surface runoff. Decreased water quality during individual project construction would be a potentially significant impact.~~

Long-term occupation of the proposed land uses would introduce non-point sources of pollution such as fertilizers, pesticides, household chemicals, and automobile products (including fuels and lubricants spilled, leaked, or dumped) within the Planning Area. These pollutants may be picked up by stormwater runoff and enter surface water bodies in or downstream from the Planning Area.

Runoff water quality is at its worst during the first storm following a prolonged dry period due to the first flush effect: the storm tends to remove pollutants that have accumulated over the preceding dry period. These pollutants include sediments, hydrocarbons, heavy metals, and bacterial contaminants that originate from urban sources like those identified above. Subsequent stormwater runoff is of generally better quality because exposed surfaces are typically less contaminated with pollutants.

A particular concern introduced by the Contra Costa Water District (CCWD) is that development in close proximity to the four-mile portion of the Contra Costa Canal that is earthen, and therefore unlined, may increase the potential to introduce pollutants into the water system via seepage. All development planned near the unlined portion of the Canal will be residential, either single-family or multi-family. Provided that CCWD standards are met, it is determined that the quantity and types of runoff from residential facilities will not pose a significant environmental threat to the quality of water in the Contra Costa Canal.

Another concern raised by the CCWD is that water in this portion of the Canal may cause groundwater fluctuations, which could ~~cause damage to~~ affect adjacent properties. This has been determined to be a potential environmental concern that can be diminished by adding the following wording to the Policies and Programs of the General Plan:

"The Contra Costa Water District must be consulted prior to any construction activities within 1,000 feet of the Canal property line."

The City ~~takes this responsibility seriously and~~ has included many Policies and Programs to ~~provide an efficient and safe water system to protect the citizens of Oakley from the dangers of flooding. These are:~~ protect surface water quality. These include:

- ~~Coordinate future development with all water agencies to ensure facilities are available for proper water supply. *Growth Management Element (GME) Policy #4.8.1;*~~
- ~~Encourage the development of locally controlled supplies to meet the growth needs of the City. *GME Policy #4.8.2;*~~
- ~~Encourage the conservation of water resources throughout the City. *GME Policy #4.8.3;*~~
- ~~Ensure that new development pays the costs related to the need for increased water system capacity. *GME Policy #4.8.4;*~~
- ~~Ensure that water service systems be required to meet regulatory standards for water delivery, water storage, and emergency water supplies. *GME Policy #4.8.5;*~~
- ~~Encourage water service agencies to establish service boundaries and to develop supplies and facilities to meet future water needs based on the growth policies contained in the General Plan. *GME Policy #4.8.6;*~~
- ~~Encourage urban development within the existing water Spheres of Influence adopted by the Local Agency Formation Commission; expansion into new areas within the Urban Limit~~

~~Line beyond the Spheres should be restricted to those areas where urban development can meet all growth management standards included in this General Plan. – *GME Policy #4.8.7;*~~

- ~~Discourage the development of rural residences or other uses that will be served by well water or an underground water supply, if a high nitrate concentration is found following County Health Services Department testing. – *GME Policy #4.8.8;*~~
- ~~Encourage rural residences currently served by well water to connect to municipal water service when it becomes available. Upon connection to municipal water service, any water well(s) shall be abandoned consistent with Contra Costa County regulations. – *GME Policy #4.8.9;*~~
- ~~Identify and develop opportunities, in cooperation with water service agencies, for use of non-potable water, including ground water, reclaimed water, and untreated surface water, for other than domestic use. – *GME Policy #4.8.10;*~~
- ~~Identify, monitor, and regulate land uses and activities that could result in contamination of groundwater supplies to minimize the risk of such contamination. – *GME Policy #4.8.11;*~~
- ~~Reduce the need for water system improvements by encouraging new development to incorporate water conservation measures to decrease peak water use. – *GME Policy #4.8.12;*~~
- ~~Encourage the use of reclaimed water as a supplement to existing water supplies. – *GME Policy #4.8.13;*~~
- Pursue and achieve compliance with all regional, State, and Federal regulations related to flood control, drainage, and water quality. – *GME Policy #4.10.2;*
- ~~At the project approval stage, the City shall require new development to demonstrate that adequate water quantity and quality can be provided. The City shall determine whether 1) capacity exists within the water system if a development project is built within a set period of time, or 2) capacity will be provided by a funded program or other mechanism. This finding will be based on information furnished or made available to the City from consultations with the appropriate water agency, the applicant, or other sources. – *GME Program #4.8.A;*~~
- Encourage water service agencies to meet all regulatory standards for water quality before approval of any new connections to that agency. – *GME Program #4.8.B;*
- ~~Encourage water service agencies to meet all regulatory standards for water quality prior to approval of any new connections to that agency. – *GME Program #4.8.C;*~~
- Cooperate with other regulatory agencies to control point and non-point water pollution sources to protect adopted beneficial uses of water. – *GME Program #4.8.C;*
- ~~Encourage water serving agencies to prepare written drought contingency plans and hold public hearings on these plans. These plans should identify the size of needed drought capacity reserves. In requests for capacity verification for new development, the City shall require that the serving agency exclude these reserves from its operating capacities for the purpose of the verification. – *GME Program #4.8.D;* and~~
- ~~Identify and develop opportunities, in cooperation with sewer service and water service agencies, for using reclaimed wastewater. – *GME Program #4.9.E.*~~

The General Plan Policies and Programs presented here and proposed to be implemented, demonstrate a strong effort on the part of the City of Oakley to implement all feasible measures to mitigate this impact. Therefore, the effects of this impact will be reduced to the level of less than significant and need no further mitigation measures.

Mitigation Measures

No additional mitigation measures are necessary.

Significance after Implementation: Implementation of the proposed General Plan would reduce this impact to a ***less than significant*** level.

Impact 3.8-B: *New development associated with the proposed General Plan may result in a substantial increase of construction-related erosion and sedimentation into surface waters.* ***(Potentially Significant)***

Discussion and Conclusion: Drainage systems and improvements are discussed in detail in Section 3.7 of the EIR in the discussion on flood protection and storm drainage. This section will discuss the unique attributes associated with construction activities.

<u>Short-term grading and construction activities may cause an increase in erosion leading to sedimentation of streams in the affected watershed.</u> New development may result in construction-related dust associated with grading activities and heavy equipment travel. Dust and dirt may be washed into surface waters as a result of surface runoff from watering down construction areas, or during rainfall. Murky or cloudy waters may result from sedimentation and surface runoff.

In addition, pollutants may be transported from construction areas to downstream locations due to improper handling practices. Solvents, fuels, lubricants, and chemical wastes may be spilled, dumped, or discarded on construction sites. These contaminants may be picked up in site runoff and ultimately enter downstream waterways.

The degree to which construction activities affect water quality is partly determined by the time of year during which construction occurs. Construction during the winter rainy season would result in an increased potential for erosion, sedimentation, and contaminant transport in surface runoff. Decreased water quality during individual project construction would be a potentially significant impact.

Stormwater pollution control is implemented through the use of NPDES permits, which are applied to industry, municipalities, and construction activities. Subsequent developments greater than five acres in area would be required to obtain construction NPDES permits. Violation of downstream receiving water quality standards or non-compliance with the NPDES program would be considered a significant impact. A Storm Water Pollution Prevention Plan (SWPPP) would have to be prepared, which would include an erosion and sedimentation control aspect. An SWPPP could be designed using concepts similar to those developed by the Association of Bay

Area Governments and the Best Management Practices for Storm Water Pollution Prevention developed by the Central Valley Regional Water Quality Control Board.

The City takes this problem seriously and has included many Policies and Programs to provide an efficient ~~water~~ and effective drainage system and a construction activities monitoring system to protect the citizens of Oakley from the dangers associated with construction-related water contamination. These are:

- Pursue and achieve compliance with all regional, State, and Federal regulations related to flood control, drainage, and water quality. – *Growth Management Element (GME) Policy #4.10.2;*
- ~~Pursue responsible and adequate financing for implementation of the Drainage Plan. – *GME Policy #4.10.4;*~~
- ~~Improve and expand the functionality of Marsh Creek as a major drainage corridor. – *GME Policy #4.10.5;*~~
- ~~Open bypass channels, detention basins, and all drainage facility rights of way should be developed as an asset to the development or adjacent neighborhood, e.g. as a secondary recreation use. – *GME Policy #4.10.9;*~~
- ~~Implement and update, as necessary, the Contra Costa County Drainage Plan for the City of Oakley. – *GME Program #4.10.A;*~~
- Actively participate in the Joint Municipal National Pollutant Discharge Elimination System (NPDES) program with the City of Antioch, City of Brentwood, and East Contra Costa County. – *GME Program #4.10.B;*
- ~~Develop and adopt a Specific Drainage Plan for areas north and east of the Contra Costa Canal. – *GME Program #4.10.D;*~~
- ~~Adopt and update, as necessary, development fees for drainage improvements for all new development in the City. – *GME Program #4.10.E;*~~
- ~~Pursue funding from public agencies and other grant sources to plan, design, and implement flood control improvements. – *GME Program #4.10.F;*~~
- ~~Require, upon development, the dedication of property or drainage easement adjacent to Marsh Creek to be used to increase width and capacity of the stream corridor. – *GME Program #4.10.G;*~~
- ~~Coordinate a study of Marsh Creek to determine appropriate strategies for improving, expanding and managing the stream corridor to enhance aesthetic, biological and recreational qualities, as well as providing drainage and flood control. – *GME Program #4.10.H;*~~
- Control dust and particulate matter by implementing the AQMD's fugitive dust control measures, including:
  - Restricting outdoor storage of fine particulate matter;
  - Requiring liners for truck beds and covering of loads;
  - Controlling construction activities and emissions from unpaved areas; and
  - Paving areas used for vehicle maneuvering. – *OSCE Program # 6.2.B;*

- Preserve and enhance the watershed, natural waterways, and areas important for the maintenance of natural vegetation and wildlife populations. – *OSCE Policy #6.6.2.*
- ~~Evaluate the feasibility of expanding drainage easements along waterways and modifying banks and/or levees to increase the width of stream corridors. – *Open Space and Conservation Element (OSCE) Program #6.3.G;*~~
- ~~Investigate and implement as appropriate City Zoning regulations requiring expanded setbacks, and land dedications along waterways to allow expansion and enhancement of waterways. *OSCE Program #6.3.H;*~~
- ~~Applications for development at urban or suburban densities in 100-year floodplain areas where there is a serious risk to life and property (see Figure 8-3) shall demonstrate appropriate solutions or be denied. – *Health and Safety Element (HSE) Policy #8.2.1;*~~
- ~~Development of lands subject to subsidence shall take into account and fully mitigate the potential impacts of flooding based on the best currently available techniques. *HSE Policy #8.2.9;*~~
- ~~Encourage the County Flood Control District to proceed with drainage improvements in areas subject to flooding from inadequate County flood control facilities. *HSE Program #8.2.A;* and~~
- ~~Draft and adopt a city drainage master plan to address localized areas affected by creeks, in accordance with the guidelines contained in the Health and Safety Element and the Open Space and Conservation Element of this General Plan. – *HSE Program #8.2.B.*~~

The General Plan Policies and Programs presented here and proposed to be implemented, demonstrate a strong effort on the part of the City of Oakley to implement all feasible measures to mitigate this impact. Therefore, the effects of this impact will be reduced to the level of less than significant and need no further mitigation measures.

Mitigation Measures

No additional mitigation measures are necessary.

Significance after Implementation: Implementation of the proposed General Plan would reduce this impact to a ***less than significant*** level.

Impact 3.8-C: *New development under the proposed General Plan may generate wastewater flows that exceed the collection and treatment capacity of the existing wastewater treatment plant.* ***(Potentially Significant)***

Discussion and Conclusion: New development will result in increased discharge of treated effluent, resulting in potential water quality impacts. ISD has estimated a future potential wastewater flow of 8.0 MGD within its Sphere of Influence area. To meet future wastewater service needs and projected effluent discharge water quality requirements, ISD is proposing to upgrade and increase both its wastewater treatment capacity and field disposal area. This increased capacity will be in steps until the ultimate build-out is reached. ~~No~~ New CVRWQCB approval will be required. In 1991, ISD prepared a *Wastewater Facilities Expansion Plan*

(Facilities Plan) that outlined the recommended treatment and disposal system projects necessary to meet the projected service demand. Since completion of the Facilities Plan, ISD has continued to refine future wastewater flow projections and proposed facilities plans. The development allowed under Oakley's 2020 General Plan will not exceed ISD's planned maximum capacity limits.

There are a few major growth areas in Oakley:

- DuPont property in northwest (industrial/ commercial uses);
- Cypress Corridor (mostly residential with some commercial); ~~and~~
- South Oakley on Neroly west of High School (commercial and residential); and
- Cypress Corridor Expansion Area (commercial and residential).

In addition, a County project, Cypress Lakes, has been discussed and proposed for east of Oakley. ISD is including this project in its plans. Development in the Cypress Corridor Expansion Area will require the installation of a new and larger main from Bethel Island Road west to the treatment plant. New lift stations, increased emergency storage pond capacity near Bethel Island, and a new crossing of Marsh Creek and the Contra Costa Canal will be required.

The District has 27 pump stations. In many cases, changing the pump motor and possibly upgrading the pump impeller is enough to handle additional flow without affecting the line sizes. The main impact of the development proposed under this General Plan is on the trunk line in the area east of Marsh Creek. The most significant change will be ~~for larger trunk lines~~ the need for a larger trunkline, and to extend the trunkline all the way to the treatment plant headworks.

Even though the provider of this service has assured that they will be able to meet future needs presented by this project with planned improvements, the City must plan for this impact and has therefore included Policies and Programs to ensure, to the extent that it can, that an effective wastewater disposal system that preserves water quality and meets waste discharge requirements, will be provided the citizens of Oakley. These are:

- Identify and develop opportunities, in cooperation with water service agencies, for use of non-potable water, including ground water, reclaimed water, and untreated surface water, for other than domestic use. – *Growth Management Element (GME) Policy #4.8.10;*
- Encourage the use of reclaimed water as a supplement to existing water supplies. – *GME Policy #4.8.13;*
- Coordinate future development with the Ironhouse Sanitary District to ensure facilities are available for proper wastewater disposal. – *GME Policy #4.9.1;*
- Wastewater treatment should preserve, and to the extent feasible, enhance water quality and the natural environment. – *GME Policy #4.9.2;*
- Encourage beneficial uses of treated wastewater, including marsh enhancement and agricultural irrigation. Such wastewater reclamation concepts shall be incorporated into resource management programs and land use planning. – *GME Policy #4.9.3;*

- Reduce the need for sewer system improvements by requiring new development to incorporate water conservation measures, which reduce flows into the sanitary sewer system. – *GME Policy #4.9.4;*
- Require new development to pay its fair share of the cost of on- and off-site infrastructure. This shall include installation of necessary public facilities, payment of impact fees, and participation in a Capital Improvement Program. – *GME Program #4.9.A;*
- Encourage sewer service agencies to establish service boundaries and develop treatment facilities to meet the future service needs based on the growth policies contained in the City of Oakley General Plan. – *GME Program #4.9.B;*
- Discourage development of rural residences served by septic tank and leach fields. – *GME Program #4.9.C;*
- At the project approval stage, require new development to demonstrate that wastewater treatment capacity can be provided. The City shall determine whether 1) capacity exists within the wastewater treatment system if a development project is built within a set period of time, or 2) capacity will be provided by a funded program or other mechanism. This finding will be based on information furnished or made available to the City from consultations with the appropriate sewer service agency, the applicant, or other sources. – *GME Program #4.9.D;*
- Identify and develop opportunities, in cooperation with sewer service and water service agencies, for using reclaimed wastewater. – *GME Program #4.9.E;* and
- Explore the feasibility of reclaimed water as a source of landscape irrigation within parks. – *Parks and Recreation Element (PRE) Program #7.1.P.*

The General Plan Policies and Programs presented here and proposed to be implemented, demonstrate a strong effort on the part of the City of Oakley to implement all feasible measures to mitigate this impact. Therefore, the effects of this impact will be reduced to the level of less than significant and need no further mitigation measures.

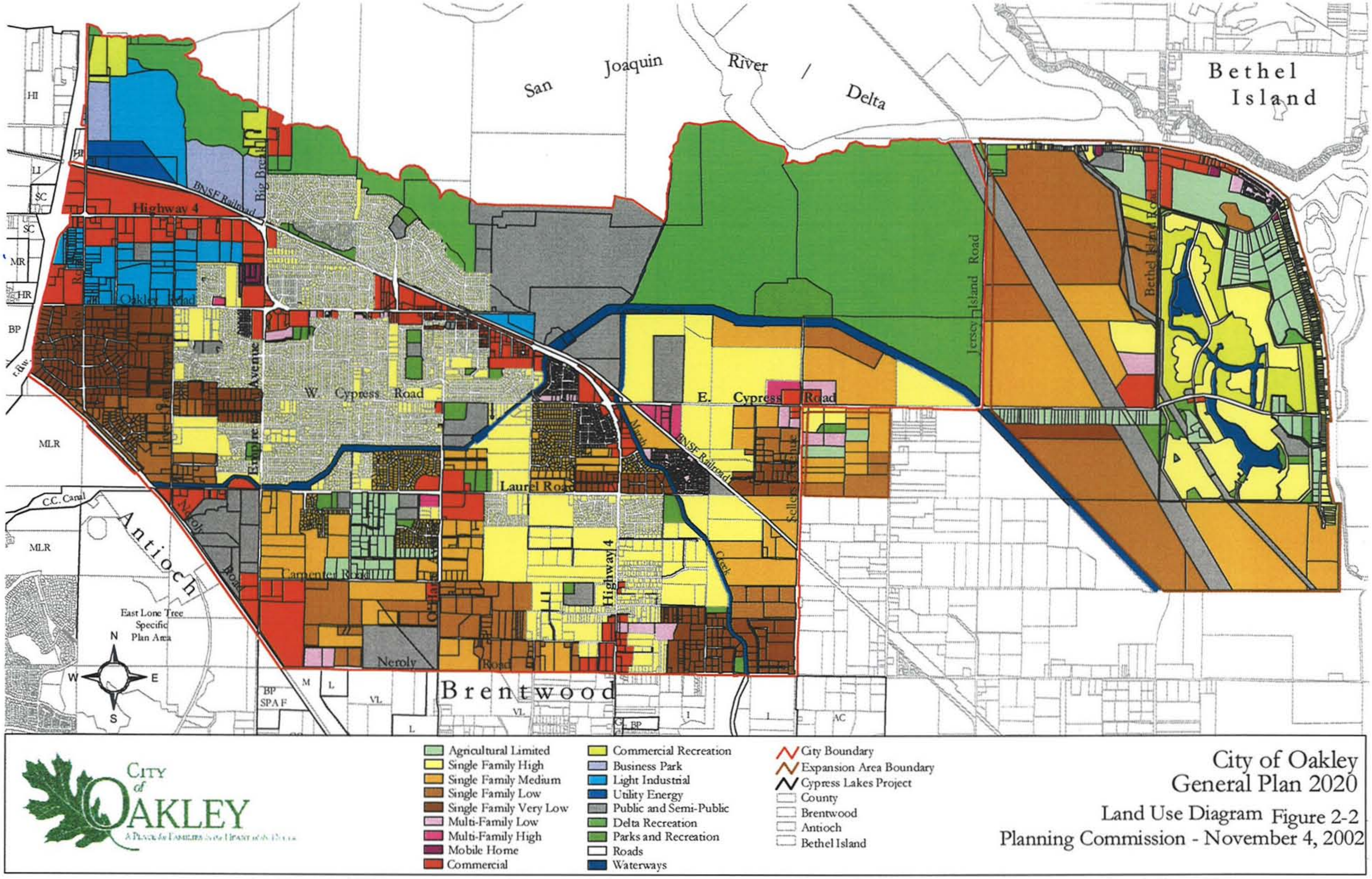
Mitigation Measures

No additional mitigation measures are necessary.

Significance after Implementation: Implementation of the proposed General Plan would reduce this impact to a ***less than significant*** level.

APPENDICES

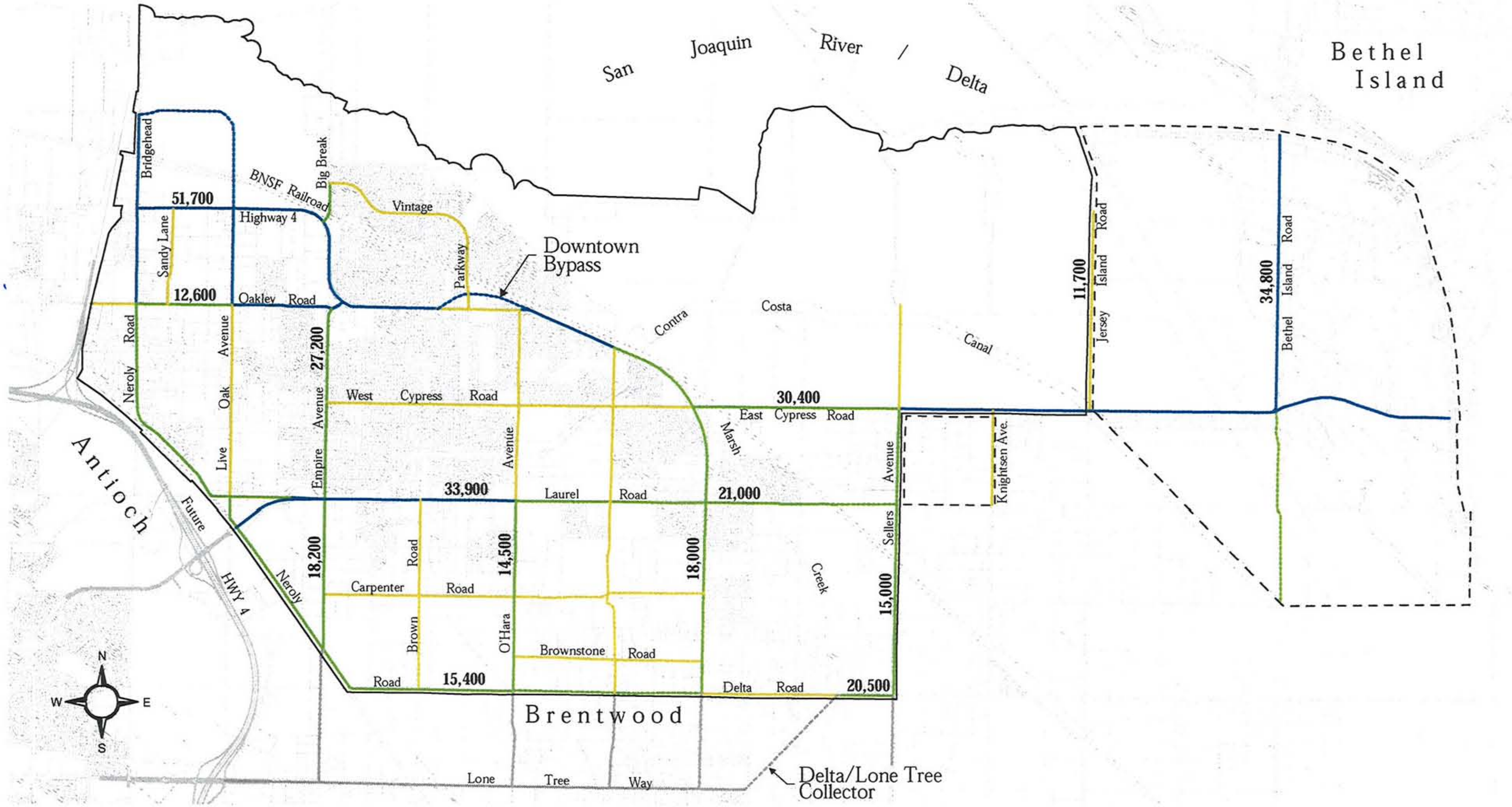
APPENDIX A



City of Oakley
General Plan 2020

Land Use Diagram Figure 2-2

Planning Commission - November 4, 2002



City of Oakley

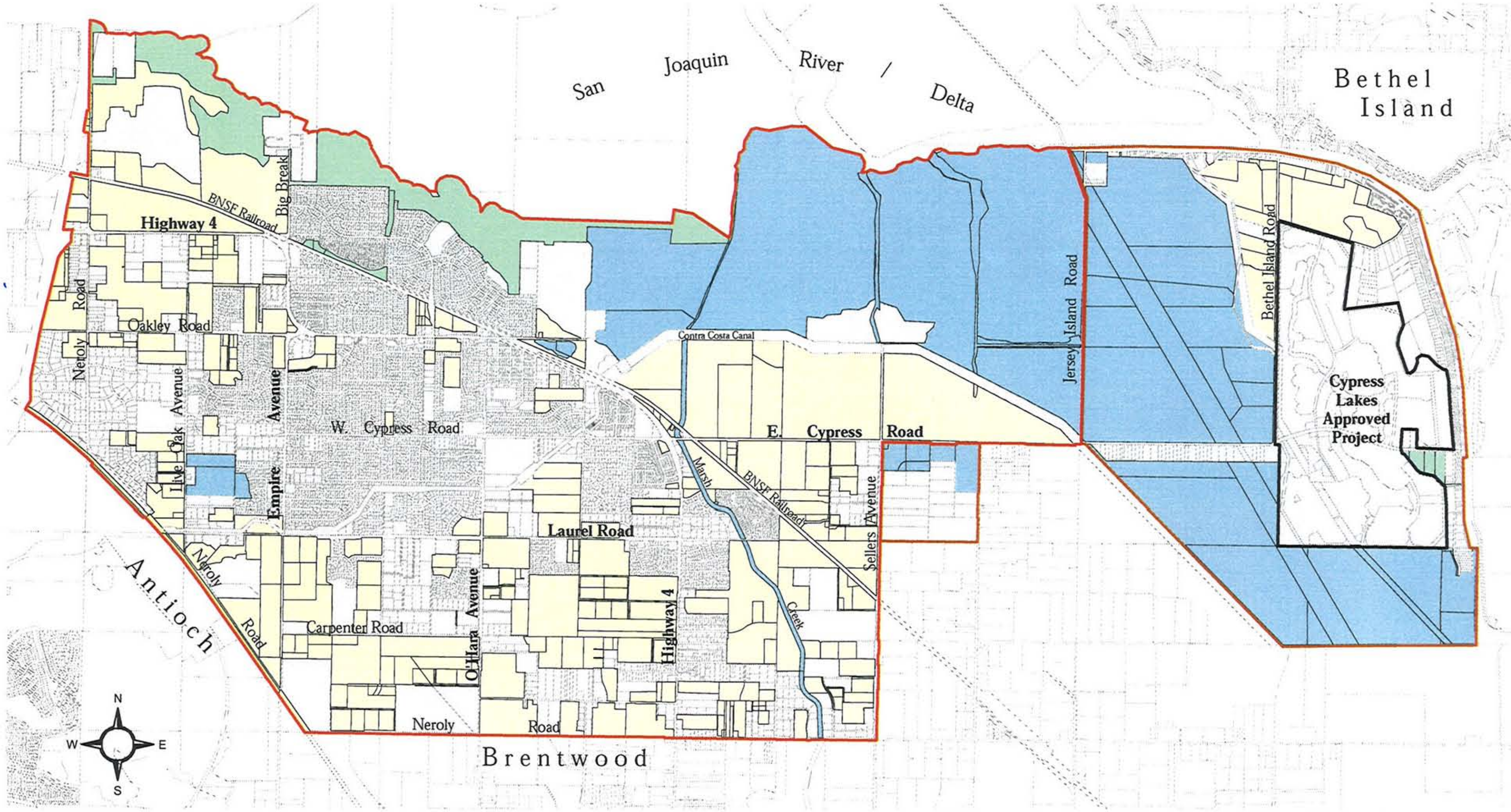
LEGEND

- Major Arterial
- Major Arterial-Proposed
- Minor Arterial
- Minor Arterial-Proposed
- Collector
- Collector-Proposed
- City Boundary
- Expansion Area Boundary
- 51,700 Average Daily Traffic Volumes at Build-Out

City of Oakley General Plan 2020

Figure 3-1
Circulation Diagram

Source: Fehr & Peers



LEGEND

- City Boundary
- Expansion Area Boundary
- Cypress Lakes Boundary
- High
- Medium
- Low
- Minimal

City of Oakley

City of Oakley
General Plan 2020

Figure 6-2
Biological Sensitivity

Source: Foothill & Associates

Legal Delta and Zones

Primary Zone

Secondary Zone

County Boundary

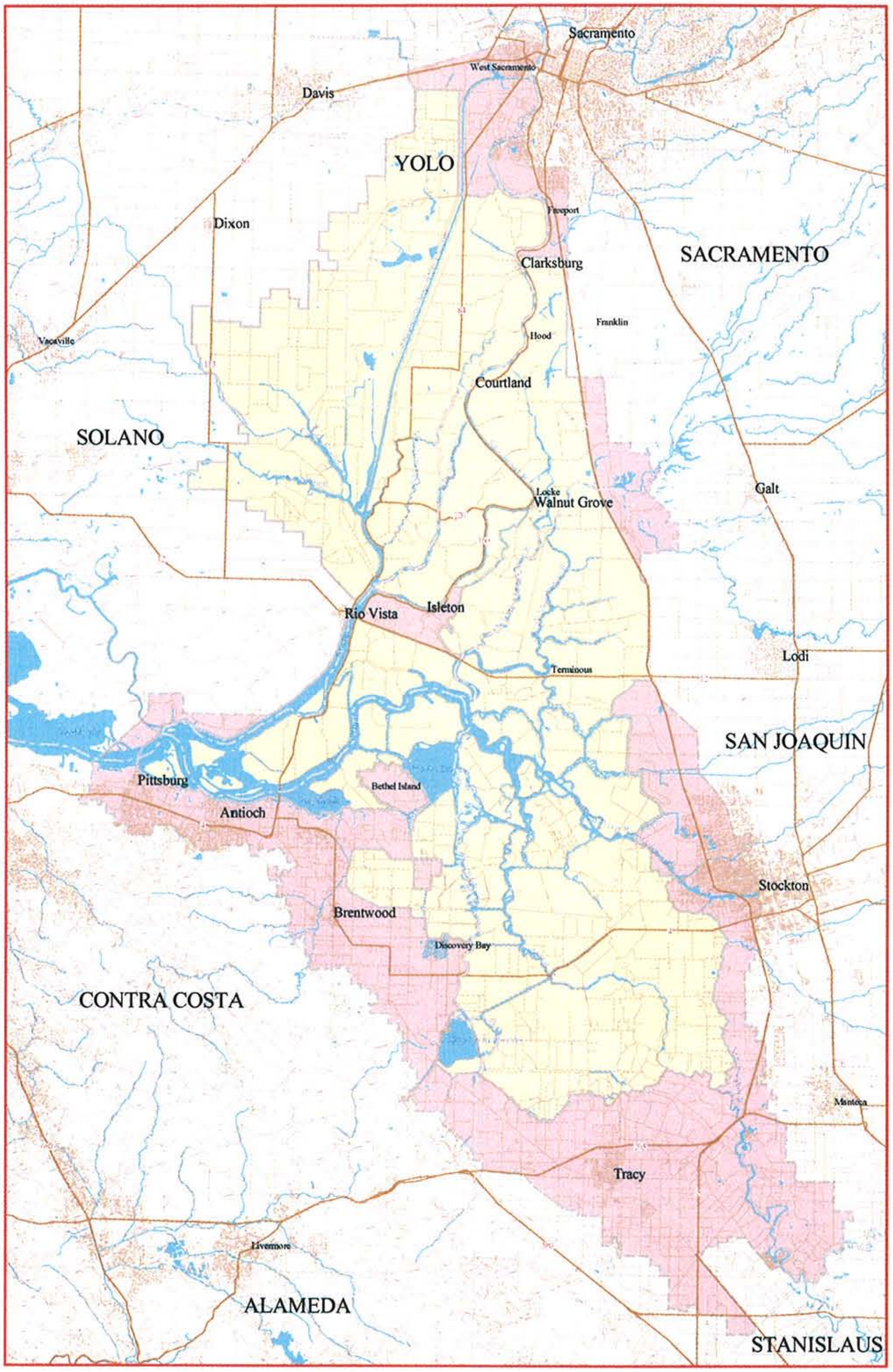
Surface Streets

Major Highways

Hydrography

Delta Primary Zone

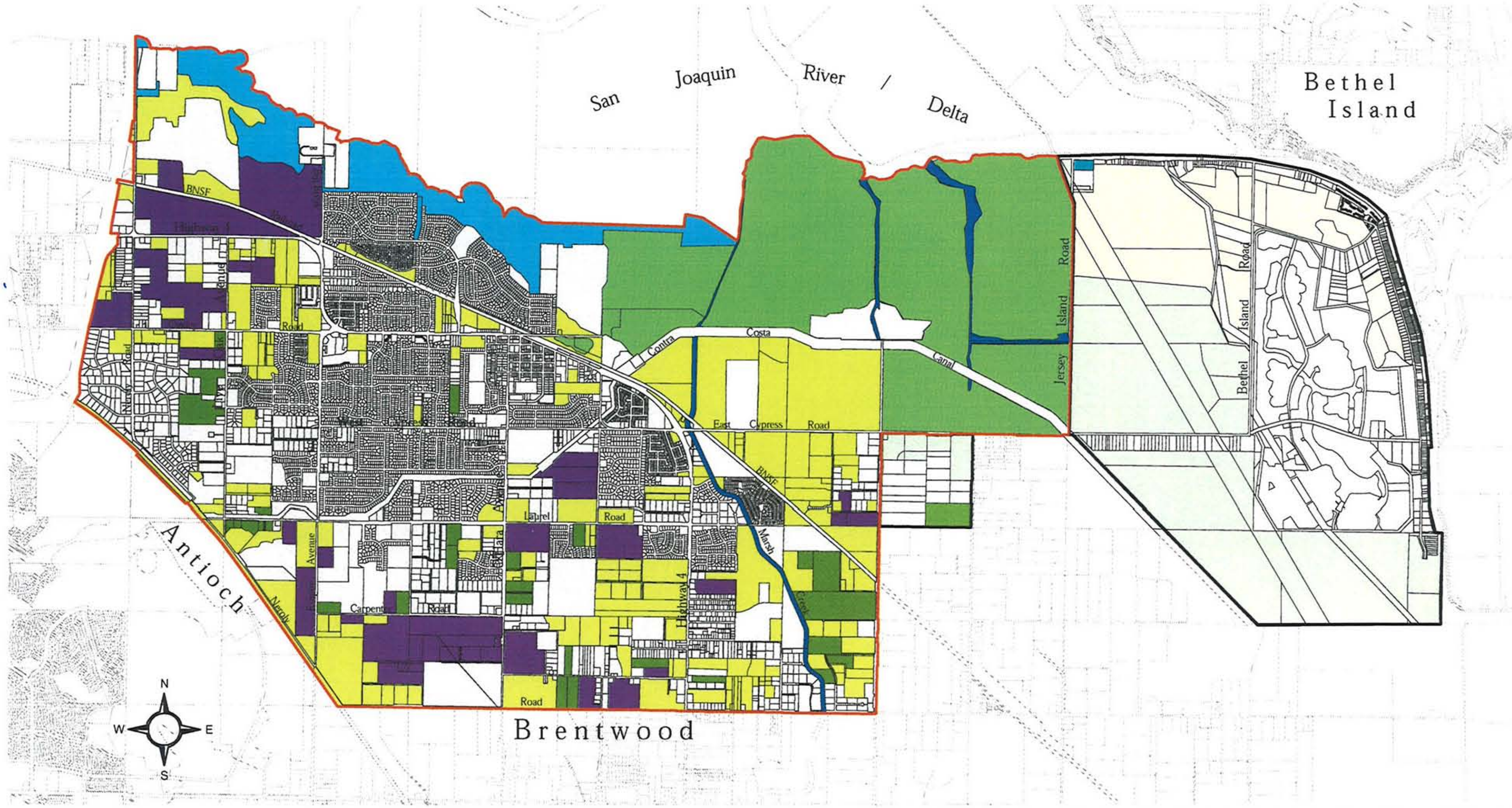
Delta Secondary Zone



Source: Department of Water Resources 1995

Delta Protection Commission

MILES 10



City of Oakley
A Place for Families in the Heart of the Delta

LEGEND
- Developed
- Agricultural/Ruderal
- Irrigated pasture
- Marsh
- Orchard
- Riparian
- Vineyard
- City Boundary
- Expansion Area Boundary
- Cypress Lakes Project
- County

City of Oakley
General Plan 2020

Figure 6-1
Vegetation Types

Source: Foothill & Associates

APPENDIX B

Draft Report

City of Oakley Long Range Roadway Plan

Prepared for:
City of Oakley

October 2002

1001-1552

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I. INTRODUCTION

A. Purpose of Study

Prior to its incorporation, Oakley was dependent on Contra Costa County for its transportation planning, transportation facilities funding, and road construction and maintenance. The City of Oakley is currently in the process of adopting its first General Plan and taking control of its long-term transportation planning and facility needs. This long range roadway plan provides the technical background for the General Plan Circulation Element.

B. Relationship to the General Plan

The General Plan Circulation Element identifies Oakley's long range transportation system, addressing all major modes of travel within Oakley, including roadways, transit, bicycle and pedestrian components. The Circulation Element includes a circulation diagram that identifies the major roads in Oakley and describes the characteristics of each roadway type. This Long Range Roadway Plan supports the determination of the major roadway improvements that have been incorporated into the General Plan, and summarizes the analysis conducted to ensure that the roads adequately serve Oakley's growth and the growth in traffic from its neighbors in Antioch, Brentwood and unincorporated Contra Costa County.

C. Scope of Plan

This plan is comprised of the following elements:

- An assessment of existing conditions and existing travel characteristics;
- Long range traffic projections to the year 2025;
- Identification of level of service standards;
- Development of a long range functional classification system and circulation plan;
- Determination of road widths;
- Identification of recommended traffic control at key intersections; and
- Order-of-magnitude construction cost estimates for the long range roadway plan.

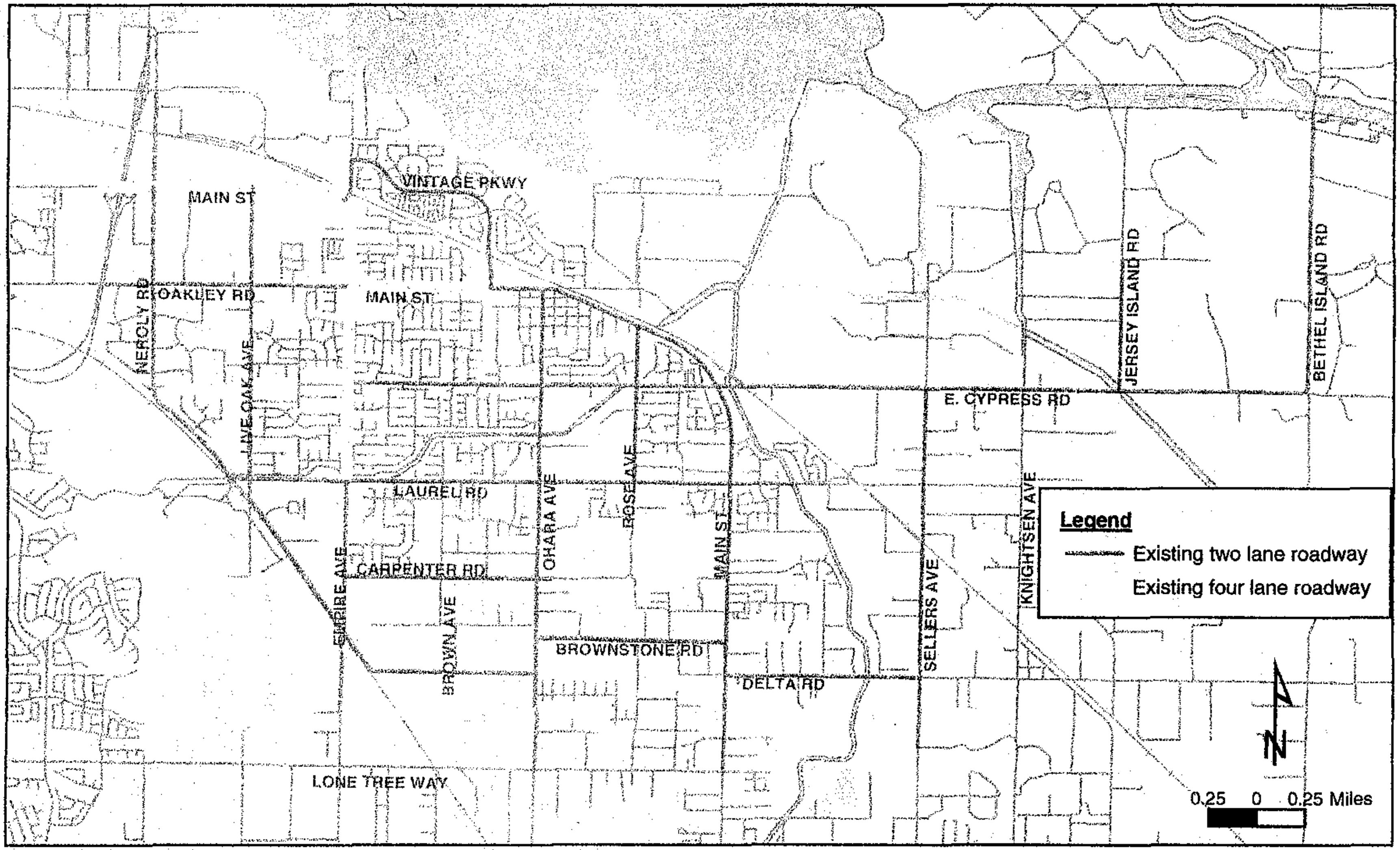
II. EXISTING CONDITIONS

A. Existing Circulation System

Figure 1 illustrates the existing circulation system and the number of lanes on each of the major streets serving Oakley. Oakley's existing circulation system is primarily comprised of a grid pattern of two-lane rural roads and collector streets. The system is based on an approximately one-mile grid of major streets, and a one-half-mile grid of collector streets. Within the one-half-mile grid is a system of local streets serving residential subdivisions and commercial areas. Within the downtown area, roughly bounded by Norcross Lane, 5th Street, Main Street, and Home Street, the street system is pedestrian scaled with short blocks and relatively narrow streets.

Oakley's circulation system contains a few multi-lane arterial streets that serve relatively high levels of traffic. The principal arterial in Oakley is Main Street (State Route 4), which connects Oakley to Brentwood to the south and State Route 160 to the west. While most of Main Street is a two-lane undivided arterial, it widens to a four-lane divided (raised median) arterial from Vintage Parkway to State Route 160. The raised median along this segment is discontinuous, but Main Street provides left-turn lanes at most intersections. Empire Avenue is a major north-south divided arterial from Main Street to West Cypress Road. This arterial routes traffic from Brentwood and many of Oakley's subdivisions to Main Street.

While major intersections along Main Street are controlled with traffic signals, most of the intersections on Main Street and throughout the rest of Oakley are controlled with stop signs. Many of the unsignalized intersections on Main Street are located in Oakley's downtown area, where it can be difficult to turn left onto Main Street during the peak hours because of the high level of traffic on Main Street. Most stop-controlled intersections in other sections of town are currently operating adequately with this type of control. However, as traffic volumes increase, it is expected that more Oakley intersections would require traffic signals.



Oakley Long Range Circulation Plan

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EXISTING CIRCULATION SYSTEM

FIGURE 1

B. Existing Traffic Volumes

1. Roadway Levels of Service

Transportation professionals grade roadway and intersection operations using the concept of level of service (LOS), a qualitative measurement of facility operation and driver comfort. Level of service grades range from A (free-flowing operation with little or no delay) to F (congested stop-and-go operation with low speeds, substantial delay and long vehicle queues). Table 1 summarizes the LOS grading system. The level at which performance standards have traditionally been established in Oakley is LOS D, which is a common standard used in communities throughout Contra Costa County. Table 2 presents the daily volume thresholds to achieve LOS D for the major roadway types addressed in this plan.

Table 1
Level of Service Descriptions

Level of Service	Description
A	Insignificant delays; most vehicles do not stop at intersections.
B	Minimal delays; some drivers begin to notice effects of other vehicles.
C	Moderate delays; most drivers feel somewhat restricted by other traffic, and intermittent cycle failures may appear at intersections.
D	Tolerable delays; queues may develop at intersections, but dissipate rapidly.
E	Significant delays; traffic volumes approach capacity, and vehicles may wait through several signal cycles at intersections.
F	Excessive delays; queues may block upstream intersections, and arrival flow rates exceed capacity.

Source: *Highway Capacity Manual, Special Report 209*, Transportation Research Board, 2000.

Table 2
Volume Thresholds for LOS D by Road Type

Road Classification	Daily Volume
2-lane Collector	12,500
2-lane Rural Undivided Road	16,200
2-lane Arterial	17,800
4-lane Undivided Arterial	33,800
4-lane Divided Arterial	35,600
6-lane Divided Arterial	53,400

Source: 2000 Highway Capacity Manual.

Table 3 compares existing daily roadway volumes with existing daily roadway capacities, and presents the resulting LOS. The information presented in Table 3 is based on traffic counts conducted in May 2002 and on traffic projections from the year 2000 East County Traffic Model. Presently, about 65% of the roads analyzed are operating at LOS D or better. The remaining 35% of the analyzed road segments, all of them located along or adjacent to Main Street, are operating at LOS E or F. While level of service based on average daily traffic volumes is useful for determining the required number of lanes on a road, the primary constraint on roadway capacity is at intersections, which accounts for most of the delay experienced by drivers. Current intersection operations are described below.

Table 3
Existing Roadway Levels of Service

Roadway	Road Type[1]	Daily Volume[2]	Capacity[3]	Level of Service[3]
Main Street, East of Bridgehead Road	4D	39,500	35,600	F
Main Street, West of Empire Avenue	4D	39,600	35,600	F
Main Street, East of Empire Avenue	4D	31,700	35,600	D
Main Street, West of Vintage Parkway	4U	30,000	35,600	D
Main Street, West of Rose Avenue	2RU	27,800	16,200	F
Main Street, South of Cypress Road	2RU	17,000	16,200	F
Main Street, South of Laurel Road	2RU	21,100	16,200	F
Brentwood Boulevard, South of Delta Road	2RU	23,100	16,200	F
Neroly Road, South of Main Street	2RU	16,200	16,200	E
Cypress Road, East of Main Street	2RU	12,500	16,200	C
Delta Road, East of Brentwood Boulevard	2RU	5,900	16,200	C
Empire Avenue, South of Main Street	4D	11,000	35,600	C
O'Hara Avenue, South of Main Street	2RU	4,000	16,200	C
Empire Avenue, South of Laurel Road	2RU	8,700	16,200	C
O'Hara Avenue, South of Laurel Road	2RU	4,800	16,200	C
Laurel Road, East of O'Hara Avenue	2RU	5,400	16,200	C
Laurel Road, West of Empire Avenue	2RU	4,600	16,200	C
Cypress Road, West of O'Hara Avenue	2RU	2,900	16,200	C
Live Oak Road, South of Main Street	2C	5,700	12,500	C
Carpenter Road, East of O'Hara Avenue	2C	2,000	12,500	C

Notes:
1. Road types: 6D – six-lane divided arterial, 4D – four-lane divided arterial, 4U – four-lane undivided arterial, 2U – two-lane undivided arterial, 2C – two-lane collector, 2RU – two-lane rural undivided road.
2. Daily volumes based on traffic counts (2002) and East Contra Costa Travel Demand Model (year 2000).
3. Roadway capacity and level of service based on the 2000 Highway Capacity Manual.

Source: Fehr & Peers Associates, Inc., October 2002.

2. <u>Intersection Levels of Service</u>

Morning and evening peak hour intersection turning movement counts were conducted at thirty intersections within the City of Oakley in May 2002. Figure 2 presents existing morning and evening peak hour turning volumes and intersection configurations at the study intersections.

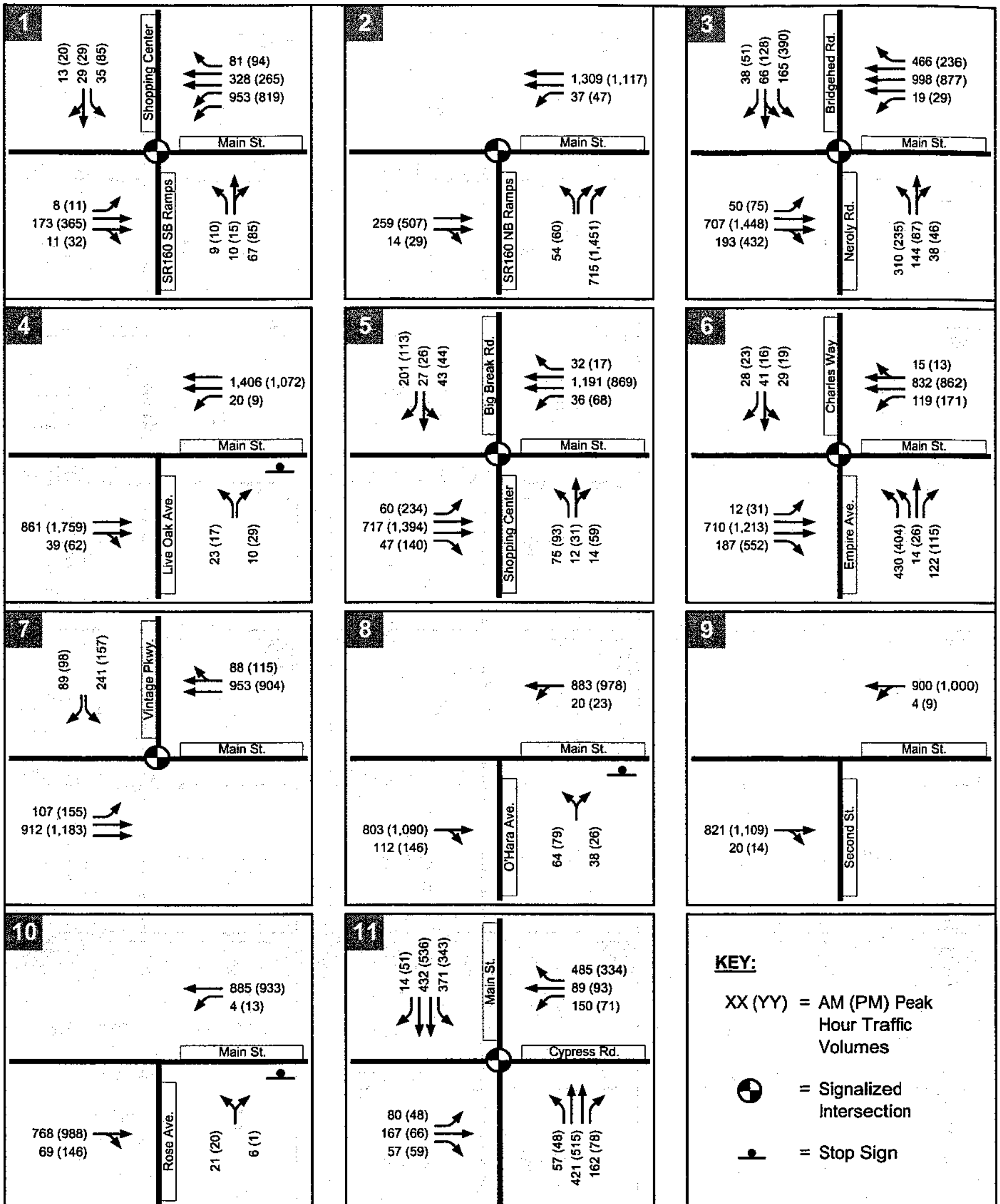
Table 4 documents existing intersection levels of service within Oakley. Six intersections currently operate unacceptably at LOS E or F: four along Main Street (at Live Oak Avenue, O'Hara Avenue, Rose Avenue, and Delta Road); Oakley Road / Neroly Road; and West Cypress Road / Empire Avenue. All are currently side-street stop-controlled with the exception of Oakley Road / Neroly Road, which is controlled with an all-way stop.

C. Level of Service Standards

All Contra Costa jurisdictions, including Oakley, participate in the Measure C-1988 Growth Management Program. Measure C requires, among other things, that each jurisdiction adopt level of service standards for *Basic Routes* and implement actions and adhere to Traffic Service Objectives (TSOs) for *Routes of Regional Significance* (described in Section II.E). The only Route of Regional Significance in Oakley, which is evaluated according to different criteria than Basic Routes, is Main Street (State Route 4).

All other facilities are considered to be Basic Routes. Oakley has adopted LOS D, or a volume-to-capacity (V/C) ratio of 0.90, as the threshold of acceptability for signalized intersections. Any signalized intersection operating worse than LOS D would be considered inconsistent with this standard. Based on current traffic counts, Oakley does not have any signalized intersection on a Basic Route operating below LOS D.

As mentioned above, Main Street is a Route of Regional Significance and is subject to special performance standards called TSOs. The Level of Service TSO established for Main Street in Oakley is a peak hour LOS D at signalized intersections, and a peak hour LOS E for any individual movement at unsignalized intersections, As shown in Table 4, all signalized intersections along Main Street currently meet the TSO; four unsignalized intersections (Live Oak Avenue, O'Hara Avenue, Rose Avenue, and Delta Road) currently exceed the TSO.



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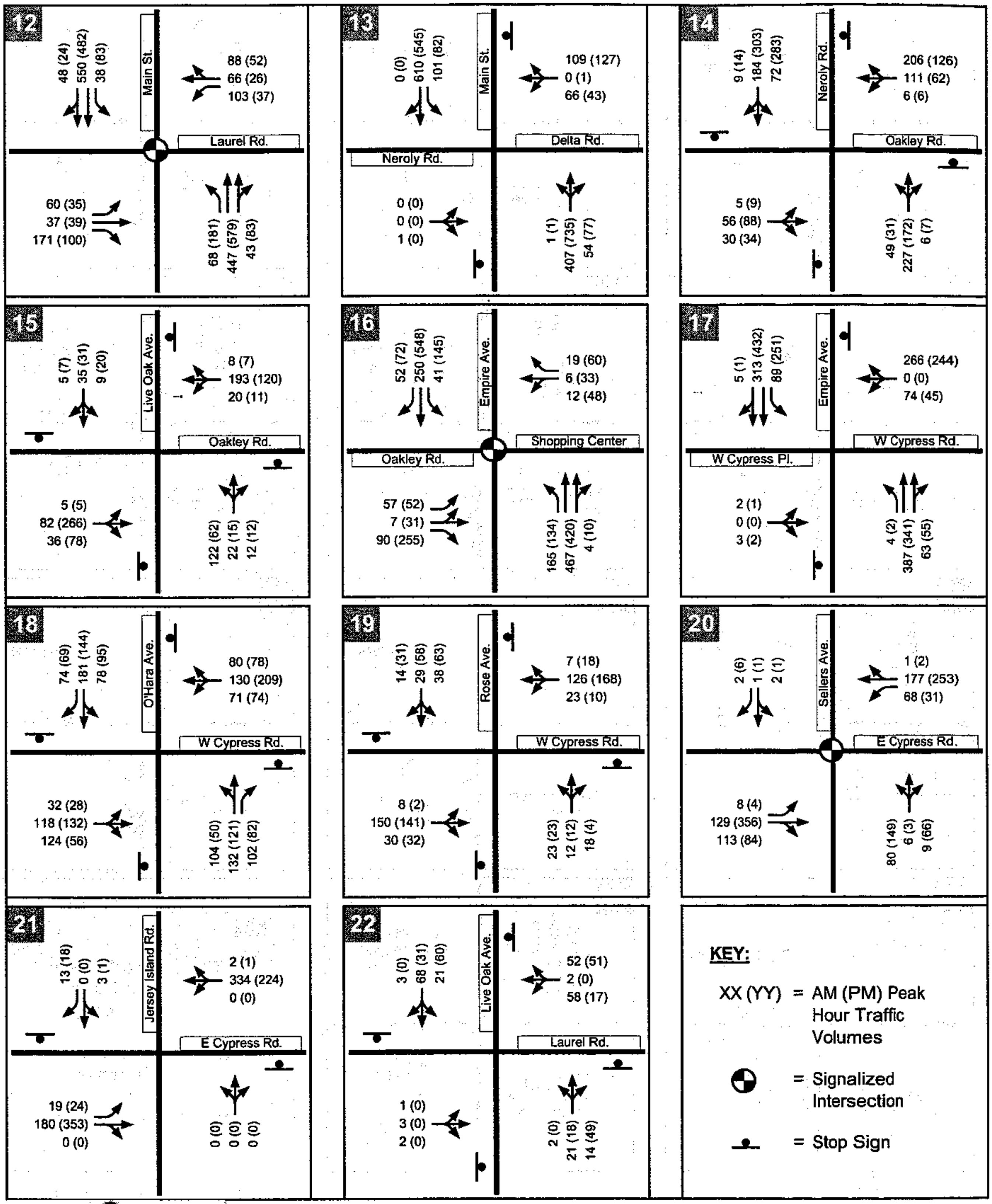
Oakley Long Range Circulation Plan

EXISTING PEAK HOUR TRAFFIC VOLUMES AND INTERSECTION CONFIGURATION AND CONTROL

FIGURE 2A



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Oakley Long Range Circulation Plan

EXISTING PEAK HOUR TRAFFIC VOLUMES AND INTERSECTION CONFIGURATION AND CONTROL

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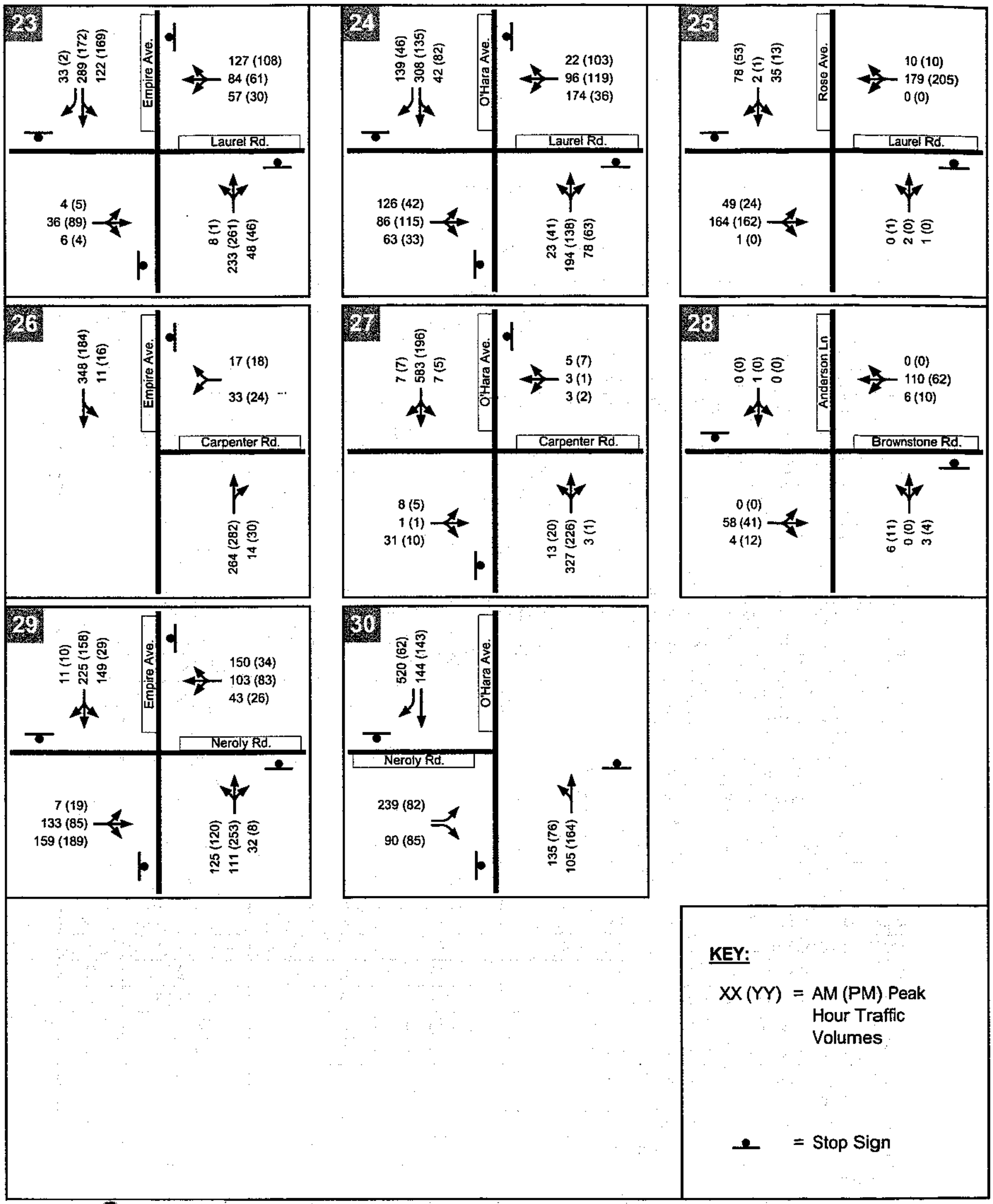
FIGURE 2B



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Oakley Long Range Circulation Plan

EXISTING PEAK HOUR TRAFFIC VOLUMES AND INTERSECTION CONFIGURATION AND CONTROL

FIGURE 2C

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Table 4
Existing Intersection Levels of Service

	Intersection	AM			PM		
		V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS
1	Main Street / SR160 SB Ramps	0.44		A	0.51		A
2	Main Street / SR160 NB Ramps	0.60		A	0.77		C
3	Main Street / Neroly / Bridgehead	0.55		A	0.90		D
4	Main Street / Live Oak Avenue		(NBL) > 50	F		(NBL) > 50	F
5	Main Street / Big Break Road	0.53		A	0.56		A
6	Main Street / Empire Avenue	0.47		A	0.63		B
7	Main Street / Vintage Pkwy	0.50		A	0.48		A
8	Main Street / O'Hara Avenue		(NB) >50	F		(NB) >50	F
9	Main Street / Second Street		(WBL) 1	A		(WBL) 1	A
10	Main Street / Rose Avenue		(NB) >50	F		(NB) >50	F
11	Cypress Road / Main Street	0.54		A	0.45		A
12	Laurel Road / Main Street	0.35		A	0.33		A
13	Delta Road / Main Street		(WB) > 50	F		(WB) > 50	F
14	Oakley Road / Neroly Road		13	B		36	E
15	Oakley Road / Live Oak Avenue		9	A		11	B
16	Oakley Road / Empire Avenue	0.28		A	0.49		A
17	W Cypress Road / Empire Avenue		(WB) 28	D		(WB) 36	E
18	W Cypress Road / O'Hara Avenue		16	C		16	C
19	W Cypress Road / Rose Avenue		9	A		9	A
20	E Cypress Road / Sellers Avenue	0.25		A	0.42		A
21	E Cypress Road / Jersey Island Road		(SBL) 14	B		(SBL) 15	C
22	Laurel Road / Live Oak Avenue		8	A		7	A
23	Laurel Road / Empire Avenue		17	C		14	B
24	Laurel Road / O'Hara Avenue		23	C		12	B
25	Laurel Road / Rose Avenue		(NB) 12	B		(NB) 13	B
26	Carpenter Road / Empire Avenue		(WB) 14	B		(WB) 12	B
27	Carpenter Road / O'Hara Avenue		(WB) 18	C		(EB) 11	B
28	Brownstone Road / Anderson Lane		(SB) 10	B		(NB) 9	A
29	Neroly Road / Empire Avenue		23	C		15	B
30	Neroly Road / O'Hara Avenue		21	C		10	A

Notes:
Results shown as V/C (volume-to-capacity) ratio for signalized intersections, and average delay for unsignalized intersections. Signalized intersection operations analyzed using the CCTALOS methodology (see *Technical Procedures*, CCTA, September 17, 1997), and unsignalized intersection operations analyzed consistent with the 2000 Highway Capacity Manual methodologies.

Source: Fehr & Peers Associates, Inc., October 2002.

D. Existing Travel Characteristics

The US Census collects detailed information on where people work and the characteristics of their travel to work. Data from the 2000 Census on the work locations of Oakley residents are not yet available from the Census Bureau. The 1990 Census indicated that approximately half of Oakley residents worked in eastern or central Contra Costa County; it is likely that these patterns will shift slightly in the 2000 Census, given the increase in commuting between Oakley and the employment centers of eastern Alameda County and Silicon Valley. The 1990 Census also showed that about three-quarters of the people who worked in Oakley lived in East County.

Data from the 2000 Census are available on people's choice of modes for their commute to work. Table 5 compares this information for 1990 and 2000. A large majority of Oakley residents travel to work by car, while small proportions travel by transit or by non-motorized modes. Between 1990 and 2000, the proportion of Oakley residents traveling to work using transit and other modes or working from home increased, while the proportion using carpools decreased.

Table 5
Journey to Work Modal Shares of Oakley Residents

Transportation Mode	1990	2000
Drive Alone	77.5%	77.6%
Carpool	18.6%	14.6%
Bus / Rail	2.0%	2.3%
Bicycle / Walk	1.1%	1.4%
Other[1]	0.8%	4.1%
Total	**100%**	**100%**

Notes:
1. Includes working at home.

Source: 1990 and 2000 Census.

E. Planned Improvements

1. Contra Costa County Capital Road Improvement Program

Prior to Oakley's incorporation, Contra Costa County provided engineering, construction and maintenance services for Oakley's roadway system. Roadway and intersection improvements were included in the County's Capital Road Improvement Program (CRIP). The CRIP is a programming document to secure funding for transportation improvements. CRIP improvements in Oakley were primarily funded through the

Oakley/North Brentwood Area of Benefit fee program (see below) with some additional sources of funds including developer participation. The 1997/98 through 2003/04 CRIP included the following roadway improvements in Oakley[1]:

- A traffic signal at the intersection of Laurel Road/Empire Avenue;
- Extension of Laurel Road to the future interchange with the State Route 4 Bypass (construction was not scheduled within the CRIP timeframe);
- Widening of Laurel Road from Rose Avenue to SR 4 (two-lane arterial standards); and
- Widening of Laurel Road from Brown Road to Neroly Road (two-lane arterial standards).

2. <u>Oakley/North Brentwood Area of Benefit</u>

In 1987, the Contra Costa Board of Supervisors adopted the "Oakley/North Brentwood Area of Benefit (AOB)" to improve the safety and capacity of the circulation system in Oakley and surrounding areas. This AOB expanded the area and scope of the original "Oakley Area of Benefit" adopted in 1985. The AOB and its associated traffic impact fee are intended to fund the construction of major thoroughfare improvements to serve the land use in the Oakley/North Brentwood section of the County General Plan.

The AOB fee only funds the minimum interim roadway improvements needed to meet traffic service level and safety standards. Capital improvements eligible for AOB funding include the basic pavement width to accommodate the needed lanes, necessary intersection improvements (turning lanes and channelization), and traffic signals. The AOB does not fund design elements considered not to have a direct effect on capacity, such as raised medians, general street lighting, landscaping, extensive storm drain systems, curbs and sidewalks, or ultimate right-of-way to provide these design elements.

3. <u>East County Action Plan</u>

The Action Plan for Routes of Regional Significance in Eastern Contra Costa County (June 2000) is a planning document mandated by the County's Measure C Growth Management Program (1988). The vision of the action plan is to improve mobility, sustain economic vitality and maintain a favorable quality of life in eastern Contra Costa County.

Routes of Regional Significance in Oakley

A designation as a "Route of Regional Significance" in the East County Action Plan means that the facility connects two or more regions of the County, carries a significant

[1] The most recent CRIP (2001/02 through 2007/08) was published after the incorporation of Oakley as a City in 1999; therefore, that document does not include any roadway improvement projects in Oakley.

amount of through traffic, and provides access to a regional highway or transit facility. Routes of Regional Significance may benefit from regional traffic impact fees. Main Street (State Route 4) from State Route 160 to the Oakley/Brentwood city limit boundary is the only designated Regional Route in Oakley. Routes of Regional Significance in the vicinity of Oakley include State Route 160, Lone Tree Way, Hillcrest Avenue and the future SR 4 Bypass.

The Level of Service TSOs for Main Street within Oakley were discussed in Section II.C above. An additional TSO for Main Street is to achieve a Delay Index of less than 2.5.[2] Another TSO that applies to all of East County is to increase transit ridership by 25% between 2000 and 2010.

The East County Action Plan includes the following roadway action items to be implemented by the year 2010 in and around the City of Oakley:

- Construct the SR 4 Bypass as a 4-lane expressway from the SR 4 freeway to Balfour Road in Brentwood;
- Widen SR 4 through the City of Oakley to four travel lanes; and
- Widen the SR 4 freeway to eight travel lanes from Bailey Road in Pittsburg to the SR 4 Bypass.

4. <u>Contra Costa County General Plan</u>

The *Contra Costa County General Plan, 1995-2010* (Contra Costa County, 1996) establishes the transportation goals, policies and implementation measures for the County's long range (year 2010) circulation system. The circulation element of the General Plan addresses all modes of travel including vehicular, freight, transit, bicycling, air, water and rail. Within the Oakley area, the General Plan proposes the following roadway improvements:

- SR 4 Bypass;
- Connection of Laurel Road to the Bypass via an interchange;
- Empire Avenue extension south to Brentwood;
- O'Hara Avenue extension south to Brentwood;
- East Cypress connection to Laurel Road (a new road that connects East Cypress Road from east of Main Street to Laurel Road); and
- Delta Road connection to Lone Tree Way (a new road that connects Delta Road from east of Main Street to Lone Tree Way).

[2] The Delay Index is calculated by dividing the peak hour travel time for a given road segment by the free-flow off-peak travel time for the same segment. For example, a Delay Index of 3.0 means that it will take three times as long to traverse a segment of road in the peak hour than it does in the off-peak. This TSO was developed to reflect that there will be significant through traffic and congestion in the peak hours on regional routes, and that more flexible standards are required to address traffic impacts.

The last two roadway improvements on the above list are intended to route high volumes of traffic from eastern unincorporated Contra Costa County (Bethel Island and Knightsen) to roads that connect to the SR 4 Bypass.

The Oakley/North Brentwood section of the County General Plan includes the following additional roadway improvements:

- Brown Road collector extension from Laurel to Neroly;
- Carpenter Road collector extension from O'Hara to SR 4;
- Rose Avenue collector extension from Laurel to Brownstone;
- Del Antico Avenue realignment and extension to Rose;
- Neroly Road arterial extension from O'Hara to SR 4; and
- Downtown Oakley one-way couplet (Main and Acme).

The last item on the list above (Downtown couplet) has been superceded by the recent Old Town Specific Plan, which proposes alternatives to the couplet concept.

5. <u>Contra Costa Countywide Comprehensive Transportation Plan</u>

The *Contra Costa Countywide Comprehensive Transportation Plan* (CCTA, 2000) addresses regionwide transportation issues. In the East County area, the Comprehensive Transportation Plan reflects the regional roadway improvements stated above, namely the construction of the SR 4 Bypass and the widening of the SR 4 freeway.

6. <u>Contra Costa Congestion Management Program</u>

The Contra Costa Congestion Management Program (CMP) was updated in 2001 to respond to changes brought about by the passage of Senate Bill 45. The CMP contains specific components as defined in the CMP legislation including 1) traffic level of service standards, 2) multi-modal performance measurements, 3) a seven-year capital improvement program (CIP), 4) a land use impact analysis program, and 5) a travel demand management element. The seven-year CIP in the 2001 CMP update includes the following roadway improvements:

- SR 4 Bypass;
- Extension of Laurel Road to SR 4 Bypass;
- Main Street Bypass in downtown Oakley; and
- Widening of SR 4 (non-freeway) in Oakley.

The Local Compliance Guide of the CMP presents traffic level of service standards for the following intersections in Oakley that are part of the CMP network:

- Main Street / Neroly Road – LOS E
- Main Street / Big Break Road – LOS E
- Main Street / Empire Avenue – LOS E
- East Cypress Road / Main Street – LOS E

Based on the 2000 Congestion Management Program Level of Service Compliance Monitoring Report, as well as the LOS results presented in Table 4, all CMP intersections in Oakley meet the level of service standards established in the Local Compliance Guide.

III. FUTURE CONDITIONS

A. Long Range Land Use Projections

Table 6 shows the growth forecast for Oakley between 2000 and the buildout of the Oakley General Plan Preferred Alternative. These projections show an increase of 133% in the number of households. Employment is projected to grow at a much greater rate, particularly in the retail sector. Appendix A contains a detailed breakdown of future land use projections in the Oakley area.

Table 6
Growth in Oakley
Year 2000 to General Plan Buildout

	Year		Percent Change
	2000[1]	Buildout[2]	
Households	9,265	21,565	133%
Household Population	27,864	68,451	146%
Total Employees	4,168	34,486	727%
Service Employees	796	8,160	925%
Retail Employees	322	17,192	5,239%
Other Employees	3,053	9,134	199%

1. Based on Association of Bay Area Governments (ABAG) *Projections 2000* data for City of Oakley and the Oakley sphere of influence (SOI) area.
2. Based on the buildout of the Oakley General Plan Preferred Alternative for City of Oakley and the SOI area.

Source: PMC, Fehr & Peers Associates, Inc., June 2002.

Table 7 compares population and employment growth in Oakley's neighboring cities of Antioch and Brentwood, and countywide. Based on the recently updated General Plan, Brentwood's population is projected to grow by 202% in the next 25 years; regional forecasts predict that Antioch's population is expected to grow by 30%. (Note that Antioch is in the process of updating its General Plan, and future land use forecasts for that city may change as a result.) Countywide, population is projected to grow by 24% over the next 25 years.

The Brentwood General Plan shows substantial growth in employment (over 500%) over the next 25 years, compared to Antioch's 78% and the County's 37% employment growth rates.

Table 7
Comparison of Growth in Neighboring Cities and Countywide
Year 2000 to 2025

Jurisdiction	Population		Percent Change	Employment		Percent Change
	Year 2000	Year 2025		Year 2000	Year 2025	
Oakley	27,900	68,500	146%	4,200	34,500	727%
Brentwood	23,300[1]	70,400[2]	202%	5,200[1]	32,100[2]	517%
Antioch	90,500[1]	117,500[3]	30%	16,300[1]	29,000[3]	78%
Countywide	949,000[1]	1,180,000[3]	24%	361,000[1]	495,000[3]	37%

Notes:
1. Based on Association of Bay Area Governments (ABAG) *Projections 2000* for the year 2000.
2. Based on *Brentwood General Plan 2001 Update* (Fehr & Peers Associates, November 2001).
3. Based on Association of Bay Area Governments (ABAG) *Projections 2000* for the year 2025.

Source: Fehr & Peers Associates, Inc., October 2002.

B. Long Range Traffic Conditions

The Contra Costa Transportation Authority develops, maintains and controls the use of the East County Travel Demand Model. This sub-regional model is the basis for most of the long-range planning conducted in East County. The model forecasts traffic volumes based on population and employment projections, and assumptions about future improvements to the transportation system. The model was used to estimate traffic volumes assuming the buildout of the Oakley General Plan Preferred Alternative, as well as growth in neighboring cities, consistent with their current adopted General Plans.

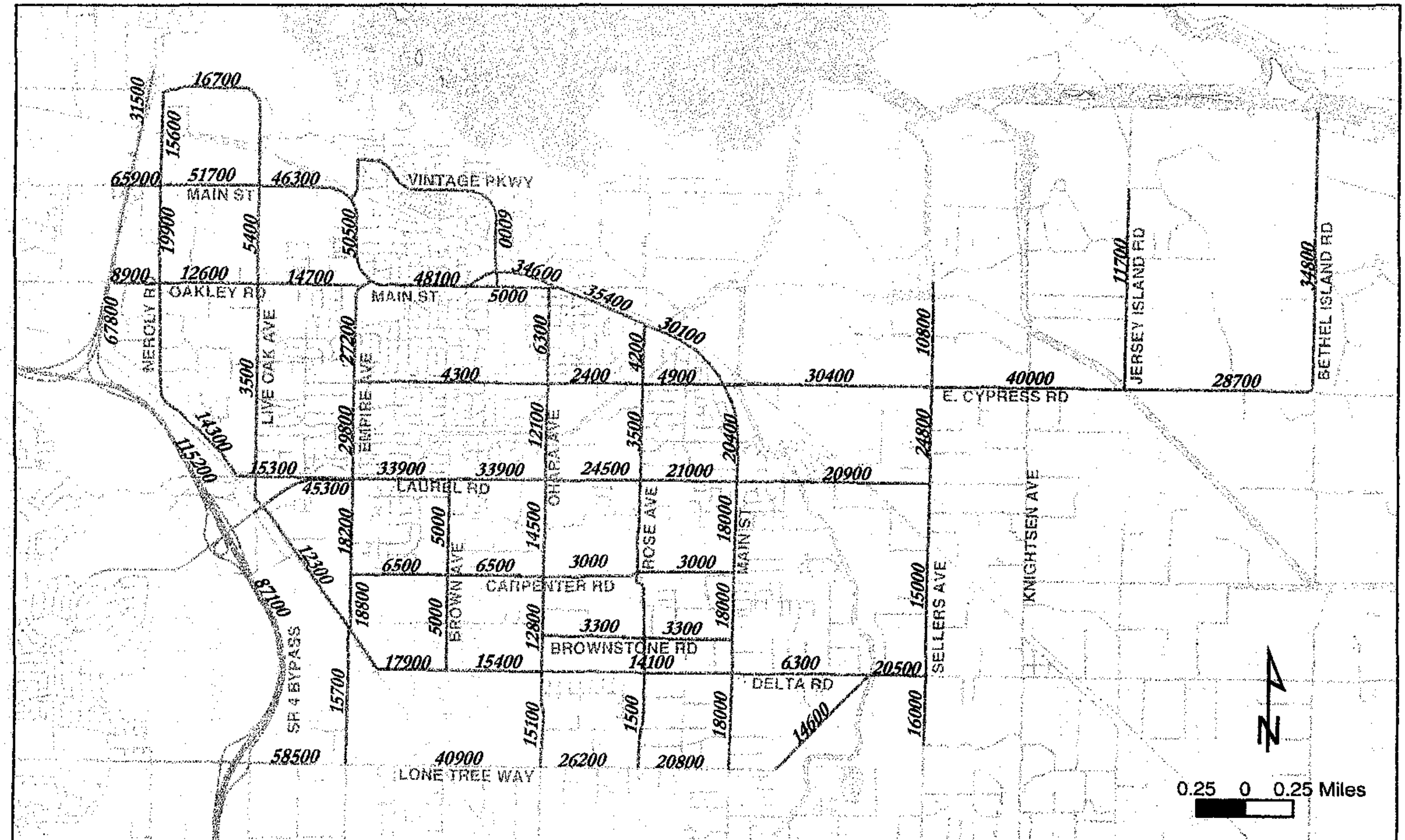
Table 8 and Figure 3 present future average daily traffic volumes on key roadway segments in Oakley as projected by the East County Travel Demand Model. Table 8 also shows levels of service associated with these traffic volumes based on the road's present capacity. As shown, 12 of the 20 segments (60%) are expected to have volumes that approach or exceed the road's current capacity (LOS E or F).

Table 8
Future Roadway Levels of Service Based on Existing Road Widths
Year 2025

Roadway	Road Type[1]	Daily Volume[2]	Capacity[3]	Level of Service[3]
Main Street, East of Bridgehead Road	4D	51,700	35,600	F
Main Street, West of Empire Avenue	4D	50,500	35,600	F
Main Street, East of Empire Avenue	4D	48,100	35,600	F
Main Street, West of Vintage Parkway (Downtown Bypass)	4U	34,600	35,600	E
Main Street, West of Rose Avenue	2RU	35,400	16,200	F
Main Street, South of Cypress Road	2RU	20,400	16,200	F
Main Street, South of Laurel Road	2RU	18,000	16,200	F
Brentwood Boulevard, South of Delta Road	2RU	18,000	16,200	F
Neroly Road, South of Main Street	2RU	19,900	16,200	F
Cypress Road, East of Main Street	2RU	30,400	16,200	F
Delta Road, East of Brentwood Boulevard	2RU	6,300	16,200	C
Empire Avenue, South of Main Street	4D	27,200	35,600	C
O'Hara Avenue, South of Main Street	2RU	6,300	16,200	C
Empire Avenue, South of Laurel Road	2RU	18,200	16,200	F
O'Hara Avenue, South of Laurel Road	2RU	14,500	16,200	D
Laurel Road, East of O'Hara Avenue	2RU	24,500	16,200	F
Laurel Road, West of Empire Avenue	2RU	45,300	16,200	F
Cypress Road, West of O'Hara Avenue	2RU	4,300	16,200	C
Live Oak Road, South of Main Street	2C	5,400	12,500	C
Carpenter Road, East of O'Hara Avenue	2C	3,000	12,500	C

Notes:
1. Road types: 6D – six-lane divided arterial, 4D – four-lane divided arterial, 4U – four-lane undivided arterial, 2U – two-lane undivided arterial, 2C – two-lane collector, 2RU- two-lane rural undivided road.
2. Daily volumes based on East Contra Costa Travel Demand Model (year 2002).
3. Roadway capacity and level of service based on the 2000 Highway Capacity Manual.

Source: Fehr & Peers Associates, Inc., October 2002.



Oakley Long Range Circulation Plan

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FUTURE DAILY TRAFFIC VOLUMES AT GENERAL PLAN BUILDOUT

FIGURE 3

October 2002
/1001-1552/gisanalysis/fdtv.mxd

IV. LONG RANGE CIRCULATION PLAN

A. Recommended Circulation Improvements

1. Roadway Level of Service and Sizing

The improvements planned for Oakley, summarized in Section II.E, result in a comprehensive circulation system, where the one-mile grid of arterials and half-mile grid of collector streets provide an adequate level of street connectivity for regional and local travel. Combined with the proposed connections to the SR 4 Bypass at Laurel Road and Lone Tree Way, the planned circulation system appears to be optimal in terms of connectivity. The key to the success of the system is in the determination of the appropriate number of lanes on each street.

The recommendations of this long range circulation plan are consistent with the planned improvements in terms of roadway alignment, street connectivity and the completion of the grid system. The primary difference between the proposed long range plan and the current planned improvements is the size and type of roadway recommended for various segments, which is determined by the desired level of service.

Table 9 presents recommended roadway widths and future LOS based on the analysis conducted for this long range circulation plan. As part of the study for this plan, the costs and benefits of establishing LOS C or LOS D standards were analyzed.[3] Because of the high cost of improvements necessary to achieve LOS C and because LOS D is the performance threshold in use in many Contra Costa County jurisdictions, the City adopted LOS D as the standard for transportation system performance. Figure 4 presents recommended lane requirements under LOS D standards.

As shown in Table 9, all of the road segments would operate at LOS D or better except the segment of Main Street east of Empire Avenue. This segment of Main Street has a built-out frontage and cannot be substantially widened without physical impacts. However, the need for widening this segment is partially dependent on the effectiveness of the proposed Laurel / Cypress connector and the Downtown Bypass; therefore, the capacity needs for this segment will be more fully investigated as more detailed plans for these additional projects are developed.

Figures 5A through 5C illustrate the proposed street cross-sections for the recommended street types in the circulation plan. These street types are consistent with those presented in the Circulation Element of the General Plan.

[3] For a detailed discussion of the relative costs for establishing LOS C or LOS D standards, please see the memorandum from Fehr & Peers Associates to the City of Oakley dated September 24, 2002.

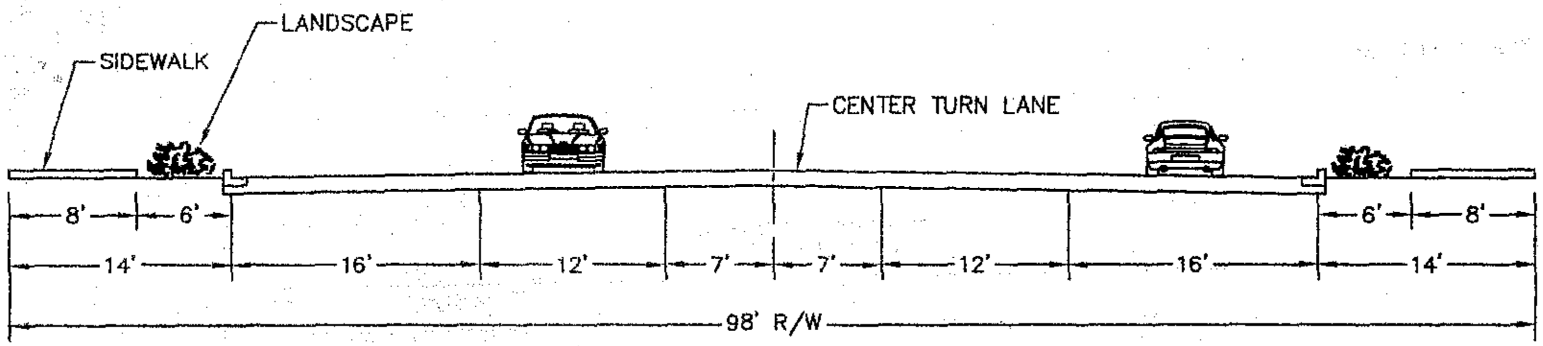
Table 9
Future Roadway Levels of Service With Recommended Road Width
Buildout of General Plan Land Use

Roadway	Daily Volume[1]	Capacity[2]	Level of Service	Recommended Road Width[3]
Main Street W. of Bridgehead Rd.	65,900	53,400	D	6D[4]
Main Street E. of Bridgehead Rd.	51,700	53,400	D	6D
Main Street W. of Empire Ave.	50,500	53,400	D	6D
Main Street E. of Empire Ave.	48,100	53,400	D	6D*
Main Street W. of Vintage Pkwy. (Downtown bypass)	34,600	35,600	D	4D
Main Street W. of Rose Ave.	35,400	35,600	D	4D
Main Street S. of Cypress Rd.	20,400	33,800	C	4U
Main Street S. of Laurel Rd.	18,000	33,800	C	4U
Brentwood Blvd. S. of Delta Rd.	18,000	33,800	C	4U
Bridgehead Rd. N. of Main St.	15,600	17,800	D	2U
Neroly Rd. S. of Main St.	19,900	33,800	C	4U
Neroly Rd. W. of Laurel Rd.	15,300	17,800	D	2U
Live Oak Rd. S. of Main St.	5,400	12,500	C	2C
Empire Ave. S. of Main St.	27,200	33,800	C	4U
Empire Ave. S. of Laurel Rd.	18,200	33,800	C	4U
Vintage Pkwy. N. of Main St	6,000	12,500	C	2C
O'Hara Ave. S. of Main Street	6,300	12,500	C	2C
O'Hara Ave. S. of Laurel Rd.	14,500	17,800	D	2U
Sellers Ave. N. of E. Cypress Rd.	10,800	12,500	D	2C
Sellers Road S. of E. Cypress Rd.	24,800	33,800	C	4U
Sellers Ave. S. of Laurel Rd.	15,000	17,800	D	2U
Jersey Is. Rd. N. of E. Cypress Rd.	11,700	12,500	D	2C
Bethel Is. Rd. N. of E. Cypress Rd.	34,800	35,600	D	4D
Wilbur Ave. E. of Bridgehead Rd.	16,700	17,800	D	2U
Oakley Rd. W. of Empire Ave.	14,700	17,800	D	2U
Cypress Rd. W. of O'Hara Ave.	4.300	12,500	C	2C
E. Cypress Rd. E. of Main St.	30,400	33,800	D	4U
E. Cypress Rd. E. of Sellers Ave.	40,000	53,400	C	6D
E. Cypress Rd. E. of Jersey Is. Rd.	28,700	33,800	D	4U
Laurel Rd. W. of Empire Ave.	45,300	53,400	C	6D
Laurel Rd. E. of Empire Ave.	33,900	35,600	D	4D
Laurel Rd. E. of O'Hara Ave.	24,500	33,800	C	4U
Laurel Rd. E. of Main Street	20,900	33,800	C	4U
Carpenter Rd. E. of O'Hara Ave.	3,000	12,500	C	2C
Neroly Rd. E. of Empire Ave.	17,900	33,800	C	4U
Neroly Rd. W. of Main St.	14,100	17,800	D	2U
Delta Rd. E. of Brentwood Blvd.	6,300	12,500	C	2C
Delta Rd. E. of Lone Tree Way	20,500	33,800	C	4U

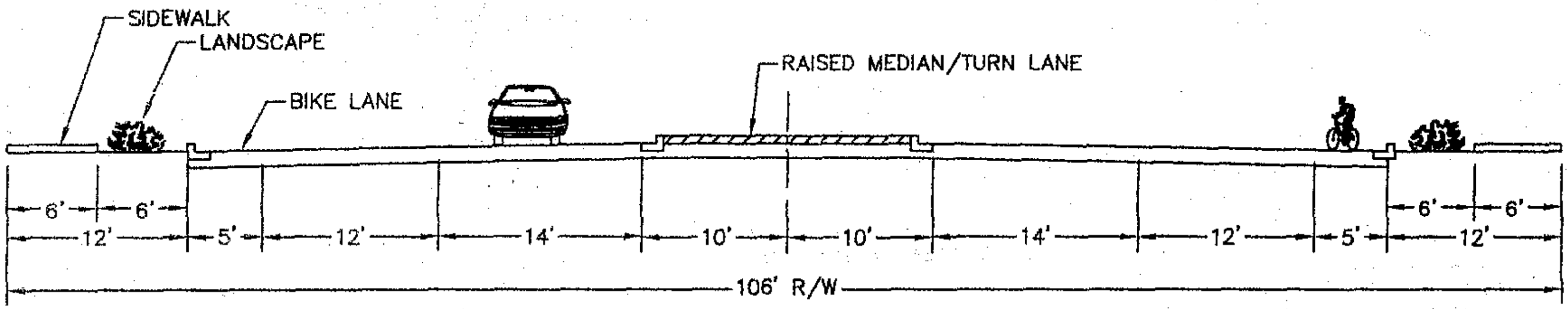
Notes:
1. Based on East Contra Costa Travel Demand Model (year 2025).
2. Based on the 2000 *Highway Capacity Manual*.
3. Lane abbreviations are as follows:
   6D – six-lane divided arterial, 4D – four-lane divided arterial, 4U – four-lane undivided arterial, 2U – two-lane undivided arterial, 2C – two-lane collector.
4. May require localized widening to accommodate westbound left-turning vehicles and northbound right-turning vehicles at freeway ramps; overall cross-section remains as a six-lane divided arterial.

* Substantial widening is not feasible without acquiring right-of-way through developed property.

Source: Fehr and Peers Associates, October 2002.



FOUR LANE ARTERIAL
(UNDIVIDED WITH CENTER TURN LANE – NO PARKING)



FOUR LANE ARTERIAL
(RESIDENTIAL PARKWAY)
(DIVIDED – BIKE LANE)

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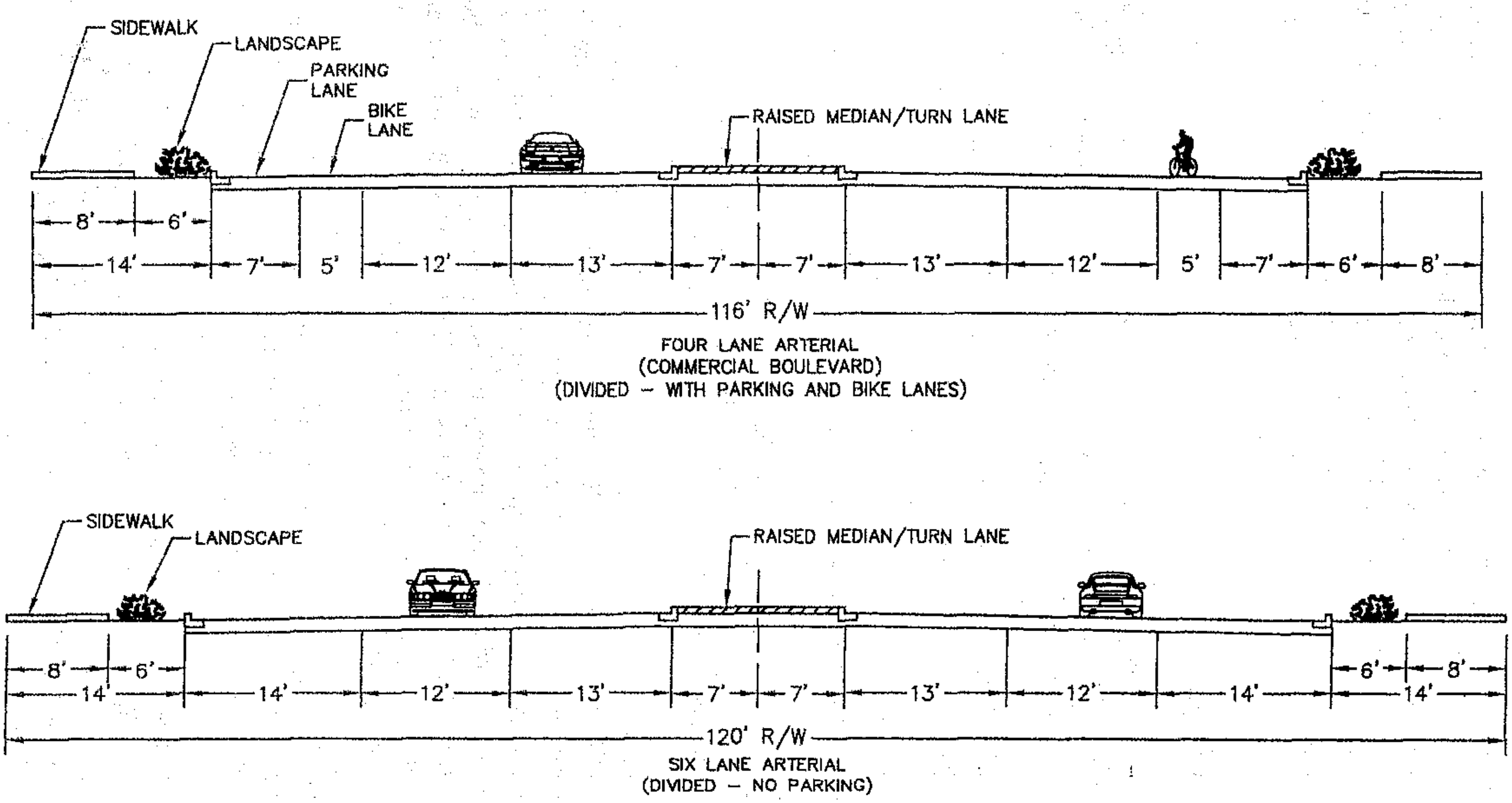
Oakley Long Range Circulation Study

RECOMMENDED STREET CROSS-SECTIONS
FIGURE 5B



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Oakley Long Range Circulation Study

RECOMMENDED STREET CROSS-SECTIONS
FIGURE 5C

While it is difficult to forecast intersection turning movement volumes under very long range conditions, it is possible to identify intersection locations likely to require installation of traffic signals given the recommended roadway types. In order to safely accommodate the traffic volumes forecasted in this analysis, it is recommended that traffic signals be installed at all intersections of four-lane streets, and at intersections of two-lane collectors with four-lane arterials. The likely locations of future traffic signals are shown in Figure 6.

2. <u>Downtown Main Street Options</u>

The City of Oakley is considering two options for the treatment of SR 4 through the downtown area. The Old Town Oakley Specific Plan prepared in 1999 proposed three alternative plans for widening and/or realigning SR 4 through the downtown.

<u>Alternative A</u> (Widen in Place) – widening SR 4 to a four-lane divided road in its current alignment from 2nd Street to Vintage Parkway.

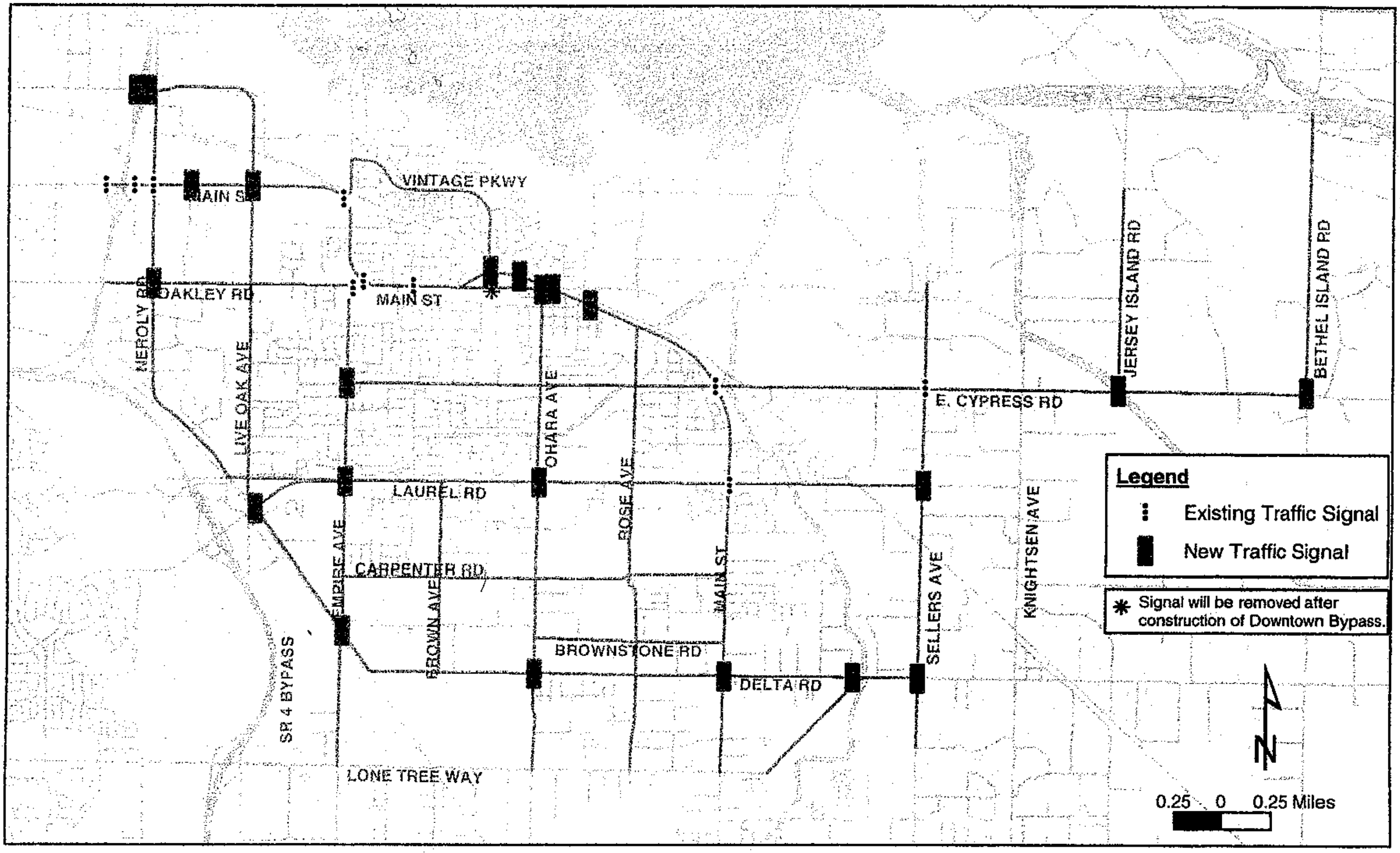
<u>Alternative B</u> (General Plan Couplet) – a one-way couplet utilizing Main Street as the westbound direction and Acme Street as the eastbound direction.

<u>Alternative C</u> (North Realignment) – realigning SR 4 north of Main Street and reconnecting to Main Street west of Vintage Parkway. This alternative includes extending Norcross Lane and O'Hara Avenue to intersect the realigned SR 4.

Subsequent to the completion of the Old Town Oakley Specific Plan, the project's advisory committee eliminated Alternative B from further consideration. Figure 7A illustrates the two remaining alternatives. Alternative C has been recommended because of its advantages from a transportation perspective and its benefits to the vitality of the downtown. Alternative C provides a high-capacity bypass of the downtown area, but maintains adequate access to the downtown. Alternative C allows Main Street to revert to a true main street serving downtown businesses and creating a pedestrian-oriented area without the barrier created by SR 4.

Figure 7B schematically illustrates the recommended downtown circulation system incorporating the Alternative C concept. In addition to the north realignment of SR 4, Figure 7B illustrates other recommendations including:

- The elimination of one-way streets in the downtown, because isolated, unpaired one-way streets lead to confusion and result in a circuitous circulation system; and,
- The provision of a traffic signal at 4th Street and Main Street to provide alternative access to SR 4 from the downtown, Home Street and Las Dunas Avenue.



Oakley Long Range Circulation Plan

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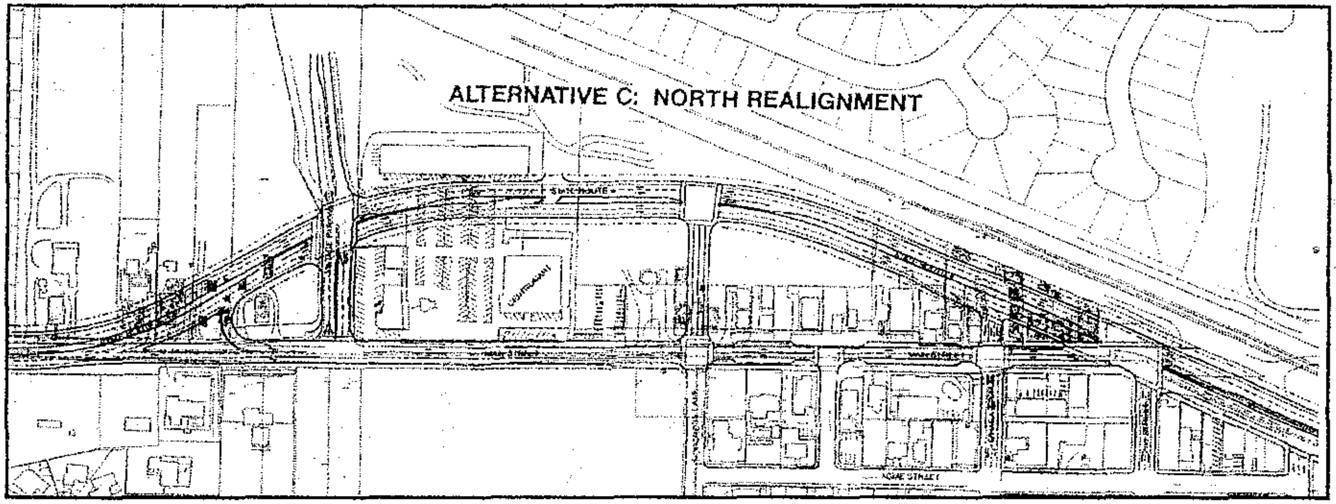
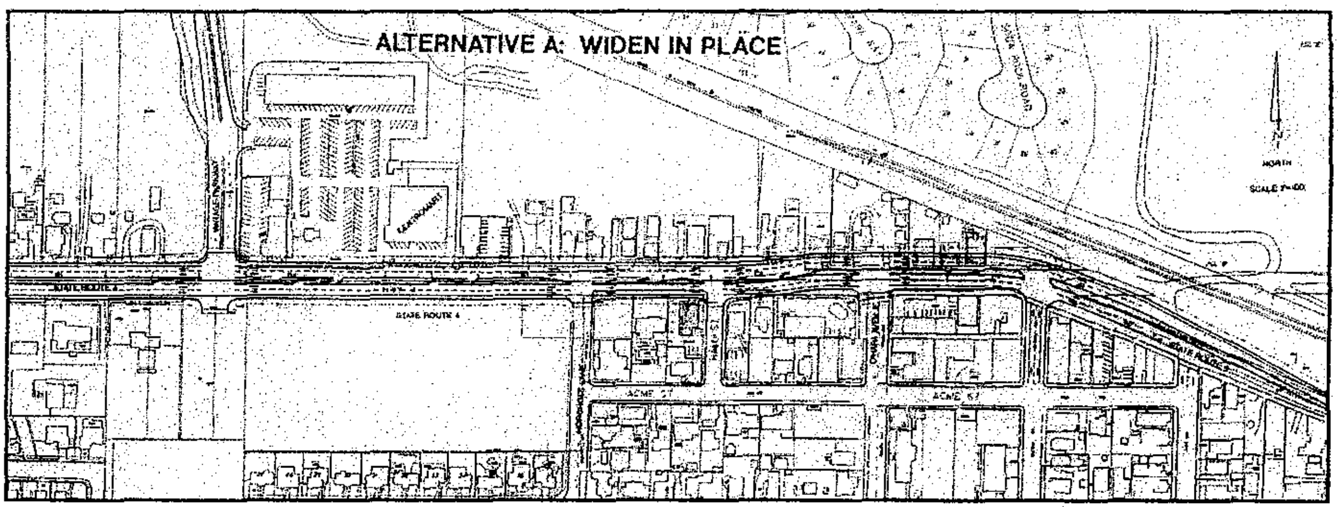
/1001-1552/gisanalysis/intersections_map.mxd

TRAFFIC SIGNAL LOCATIONS

FIGURE 6





SOURCE: Old Town Oakley Specific Plan

N
Not to Scale

Oakley Long Range Circulation Plan

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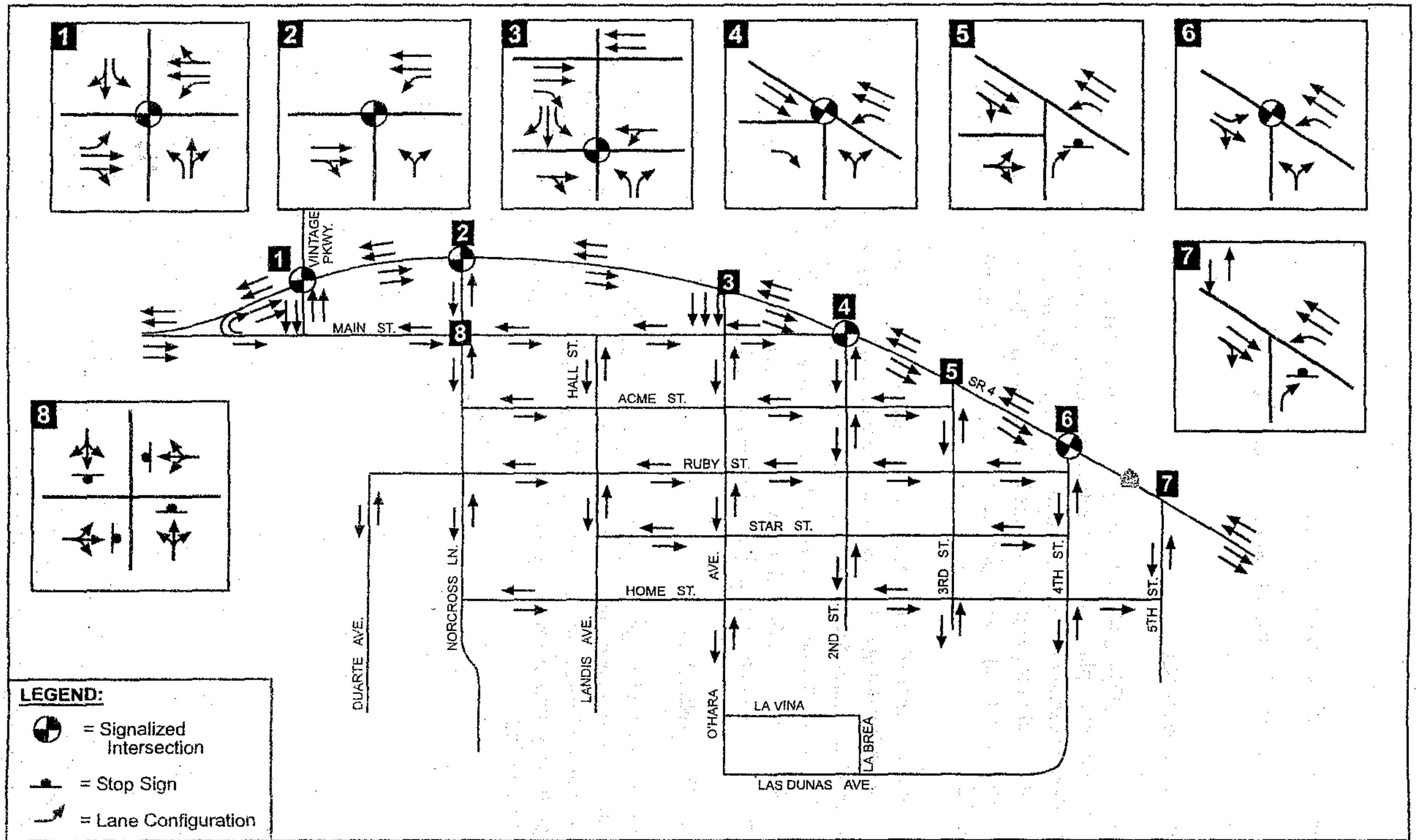
DOWNTOWN MAIN STREET OPTIONS

FIGURE 7A



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Oakley Long Range Circulation Plan

RECOMMENDED LONG RANGE CIRCULATION PLAN IN DOWNTOWN AREA

FIGURE 7B

B. Order-of-Magnitude Cost Estimates

Cost estimates have been divided into three components, which are discussed in further detail below.

1. Roadway Construction

Table 10 presents order-of-magnitude roadway construction cost estimates to implement the long range circulation plan. The cost estimates are based on urban standards that include sidewalks, landscaping, curb and gutter, drainage, lighting, etc., as shown in the street cross-sections and in the unit cost details in Appendix B. The cost estimates do not include traffic signals, railway crossings or canal and creek bridges, which are treated as separate items below.

The appendix contains detailed unit cost information for each roadway type and explains the cost estimating methodology. Cost estimates were developed for the following types of roads (as shown in Figures 5A through 5C): 1) six-lane divided arterials, 2) four-lane divided arterials, 3) four-lane undivided arterials, 4) two-lane undivided arterials, and 5) two-lane collectors. On-street parking and bicycle lanes have been taken into account where required. Existing improvements have also been taken into account.

2. Right-of-Way Acquisition

Table 11 presents order-of-magnitude cost estimates for acquiring right-of-way for constructing roadways to their ultimate width to achieve LOS D standards. The amount of right-of-way required to be purchased by the City is determined by subtracting the amount of right-of-way already owned by the City from the right-of-way required for the roadway's ultimate width.

Table 10
Order-of-Magnitude Construction Cost Estimates
for Long Range Circulation Plan

Roadway	Segment	Length (mi.)	Existing Lanes[1]	Future Lanes[1]	Cost[2]
Main St.	Neroly-Big Break	1.0	4D	6D	$ 3,520,000
Main St.	Big Break-Empire	0.4	4D	6D	$ 1,330,000
Main St.	Empire-Teakwood	0.3	4D	4Dc	$ 200,000
Main St.	Teakwood-Vintage	0.4	4D	4Dc	$ 100,000
Main St.	2nd-E.Cypress	1.0	2RU	4Dc	$ 4,310,000
Main St.	E. Cypress-Laurel	0.5	2RU	4U	$ 1,500,000
Main St.	Laurel-Delta	1.0	2RU	4U	$ 2,950,000
Wilbur Ave.	Bridgehead-Live Oak	0.5	N/A	4Dc	$ 3,000,000
Oakley Rd.	SR 160-Neroly	0.2	2RU	2C	$ 430,000
Oakley Rd.	Neroly-Live Oak	0.5	2RU	2C	$ 940,000
Oakley Rd.	Live Oak-Empire	0.5	2RU	4Dc	$ 1,190,000
W. Cypress Rd.	Empire-Main	1.8	2C	2C	$ 1,410,000
E. Cypress Rd.	Main-Sellers	1.0	2RU	4U	$ 3,460,000
E. Cypress Rd.	Sellers-Jersey Is. Rd	1.0	2RU	6D	$ 4,440,000
E. Cypress Rd.	Jersey Is. Rd - Bethel Is. Rd.	1.0	2RU	4Dr	$ 3,630,000
Laurel Rd.	Empire-Live Oak	0.5	2RU	2U	$ 1,000,000
Laurel Rd.	Empire-O'Hara	1.0	2RU	4Dr	$ 3,030,000
Laurel Rd.	O'Hara-Main	1.0	2RU	4U	$ 2,550,000
Laurel Rd.	Main-Sellers (Existing)	0.5	2RU	4U	$ 1,600,000
Laurel Rd.	Main-Sellers (New)	0.5	N/A	4U	$ 2,560,000
Carpenter Rd.	Empire-O'Hara	1.0	2RU	2C	$ 1,850,000
Carpenter Rd.	O'Hara-Main	1.0	N/A	2C	$ 3,650,000
Brownstone Rd.	O'Hara-Main	1.0	2RU	2C	$ 1,850,000
Neroly Rd.	Empire-Brown	0.6	2RU	4U	$ 1,730,000
Neroly Rd.	Brown-O'Hara	0.5	2RU	2U	$ 980,000
Neroly Rd.	O'Hara-Main	1.0	N/A	2U	$ 3,500,000
Delta Rd.	Main-Lone Tree Ext.	0.7	2RU	2U	$ 1,490,000
Delta Rd.	Lone Tree Ext.-Sellers	0.3	2RU	4U	$ 870,000
Bridgehead Rd.	Wilbur-Main	0.5	2RU	4Dc	$ 2,140,000
Neroly Rd.	Main-Oakley	0.5	2RU	4Dc	$ 2,140,000
Sandy Ln.	Main-Oakley	0.5	2RU	2C	$ 940,000
Live Oak Ave.	Wilbur-Main	0.5	N/A	4Dc	$ 3,060,000
Live Oak Ave.	Main-Oakley	0.5	2RU	4Dc	$ 2,140,000
Live Oak Ave.	Oakley-Laurel	1.0	2RU	2C	$ 1,730,000
Empire Ave.	Main-Laurel	1.0	4D	4D	$ 840,000
Empire Ave.	Laurel-Neroly	0.8	2RU	4U	$ 2,650,000
Brown Rd.	Laurel-Carpenter	0.5	2RU	2C	$ 880,000
Brown Rd.	Carpenter-Neroly	0.5	N/A	2C	$ 1,950,000
O'Hara Ave.	Main-W. Cypress	0.5	2U	2U	$ 100,000
O'Hara Ave.	W. Cypress-Laurel	0.5	2RU	2C	$ 850,000
O'Hara Ave.	Laurel-Carpenter	0.5	2RU	2C	$ 840,000
O'Hara Ave.	Carpenter-Neroly	0.5	2RU	2U	$ 980,000
Rose Ave.	Main-Laurel	0.8	2RU	2C	$ 1,190,000
Rose Ave.	Laurel-Neroly	1.0	N/A	2C	$ 3,510,000
Sellers Rd.	N. of E. Cypress	0.5	2RU	2C	$ 940,000
Sellers Rd.	E. Cypress-Laurel	0.5	2RU	4U	$ 1,680,000
Sellers Rd.	Laurel-Delta	1.0	2RU	2U	$ 2,010,000
Jersey Island Rd	N. of E. Cypress	1.3	2RU	2C	$ 2,340,000
Bethel Island Rd	N. of E. Cypress	1.4	2RU	4Dr	$ 5,500,000
Bethel Island Rd	S. of E. Cypress	1.1	N/A	2U	$ 3,810,000
		36.5			**$ 101,290,000**

Notes:

1. Existing and future lanes (see Figure 6A-6C for cross-section assumptions):
   2RU - Two-lane rural road, 2C - Two-lane undivided collector, 2U - Two-lane undivided arterial, 4U - Four-lane undivided arterial, 4Dc - Four-lane divided arterial (commercial), 4Dr - Four-lane divided arterial (residential), 6D - Six-lane divided arterial.
2. All costs are in 2002 dollars. The detailed unit cost estimates are attached as Appendix B.

Source: Fehr and Peers Associates, October 2002.

Table 11
Right-of-Way Acquisition Cost Estimates
for Long Range Circulation Plan

Roadway	Segment	Length (mi.)	Existing Lanes[1]	Future Lanes[1]	Cost[2]
Main St.	Neroly-Big Break	1.0	4D	6D	$1,280,000
Main St.	Big Break-Empire	0.4	4D	6D	$1,950,000
Main St.	Empire-Teakwood	0.3	4D	4Dc	$80,000
Main St.	Teakwood-Vintage	0.4	4D	4Dc	$120,000
Main St.	2nd-E.Cypress	1.0	2RU	4Dc	$290,000
Main St.	E. Cypress-Laurel	0.5	2RU	4U	$40,000
Main St.	Laurel-Delta	1.0	2RU	4U	$460,000
Wilbur Ave.	Bridgehead-Live Oak	0.5	N/A	4Dc	$1,040,000
Oakley Rd.	SR 160-Neroly	0.2	2RU	2C	$70,000
Oakley Rd.	Neroly-Live Oak	0.5	2RU	2C	$190,000
Oakley Rd.	Live Oak-Empire	0.5	2RU	4Dc	$350,000
W. Cypress Rd.	Empire-Main	1.8	2C	2C	$120,000
E. Cypress Rd.	Main-Sellers	1.0	2RU	4U	$670,000
E. Cypress Rd.	Sellers-Jersey Is. Rd	1.0	2RU	6D	$1,100,000
E. Cypress Rd.	Jersey Is. Rd - Bethel Is. Rd.	1.0	2RU	4Dr	$790,000
Laurel Rd.	Empire-Live Oak	0.5	2RU	2U	$120,000
Laurel Rd.	Empire-O'Hara	1.0	2RU	4Dr	$270,000
Laurel Rd.	O'Hara-Main	1.0	2RU	4U	$510,000
Laurel Rd.	Main-Sellers (Existing)	0.5	2RU	4U	$510,000
Laurel Rd.	Main-Sellers (New)	0.5	N/A	4U	$880,000
Carpenter Rd.	Empire-O'Hara	1.0	2RU	2C	$270,000
Carpenter Rd.	O'Hara-Main	1.0	N/A	2C	$1,150,000
Brownstone Rd.	O'Hara-Main	1.0	2RU	2C	$450,000
Neroly Rd.	Empire-Brown	0.6	2RU	4U	$480,000
Neroly Rd.	Brown-O'Hara	0.5	2RU	2U	$20,000
Neroly Rd.	O'Hara-Main	1.0	N/A	2U	$670,000
Delta Rd.	Main-Lone Tree Ext.	0.7	2RU	2U	$80,000
Delta Rd.	Lone Tree Ext.-Sellers	0.3	2RU	4U	$110,000
Bridgehead Rd.	Wilbur-Main	0.5	2RU	4Dc	$510,000
Neroly Rd.	Main-Oakley	0.5	2RU	4Dc	$650,000
Sandy Ln.	Main-Oakley	0.5	2RU	2C	$90,000
Live Oak Ave.	Wilbur-Main	0.5	N/A	4Dc	$1,060,000
Live Oak Ave.	Main-Oakley	0.5	2RU	4Dc	$670,000
Live Oak Ave.	Oakley-Laurel	1.0	2RU	2C	$290,000
Empire Ave.	Main-Laurel	1.0	4D	4D	$270,000
Empire Ave.	Laurel-Neroly	0.8	2RU	4U	$600,000
Brown Rd.	Laurel-Carpenter	0.5	2RU	2C	$200,000
Brown Rd.	Carpenter-Neroly	0.5	N/A	2C	$630,000
O'Hara Ave.	Main-W. Cypress	0.5	2U	2U	$40,000
O'Hara Ave.	W. Cypress-Laurel	0.5	2RU	2C	$0
O'Hara Ave.	Laurel-Carpenter	0.5	2RU	2C	$0
O'Hara Ave.	Carpenter-Neroly	0.5	2RU	2U	$130,000
Rose Ave.	Main-Laurel	0.8	2RU	2C	$260,000
Rose Ave.	Laurel-Neroly	1.0	N/A	2C	$1,270,000
Sellers Rd.	N. of E. Cypress	0.5	2RU	2C	$90,000
Sellers Rd.	E. Cypress-Laurel	0.5	2RU	4U	$330,000
Sellers Rd.	Laurel-Delta	1.0	2RU	2U	$0
Jersey Island Rd	N. of E. Cypress	1.3	2RU	2C	$230,000
Bethel Island Rd	N. of E. Cypress	1.4	2RU	4Dr	$1,210,000
Bethel Island Rd	S. of E. Cypress	1.1	N/A	2U	$1,180,000
Total		**36.5**			**$ 23,780,000**

Notes:

1. Existing and future lanes (see Figure 6A-6C for cross-section assumptions):
   2RU - Two-lane rural road, 2C - Two-lane undivided collector, 2U - Two-lane undivided arterial, 4U - Four-lane undivided arterial, 4Dc - Four-lane divided arterial (commercial), 4Dr - Four-lane divided arterial (residential), 6D - Six-lane divided arterial.
2. Vacant land: $3.45/square foot. Developed land: $325,000 per single-family dwelling.

Source: Fehr and Peers Associates, October 2002.

3. Miscellaneous Items

Table 12 presents the order-of-magnitude cost estimates for the following miscellaneous items.

1. Traffic signals – Locations of all existing and proposed traffic signals were presented in Figure 6.
2. Canal / creek bridges – Locations of canal / creek bridges that need to be widened are presented in Figure 8.
3. Railway crossings - Locations of railroad crossings that need to be improved are presented in Figure 8.
4. Main Street Downtown Bypass – Includes the realignment of SR 4 in the downtown, and its associated street extensions, traffic signals, and other improvements as shown in Figures 7A and 7B.
5. Laurel Road railroad grade separation – Railroad grade separation of Laurel Road to the SR 4 Bypass and the planned Laurel interchange.

Table 12
Miscellaneous Cost Estimates
for Long Range Circulation Plan

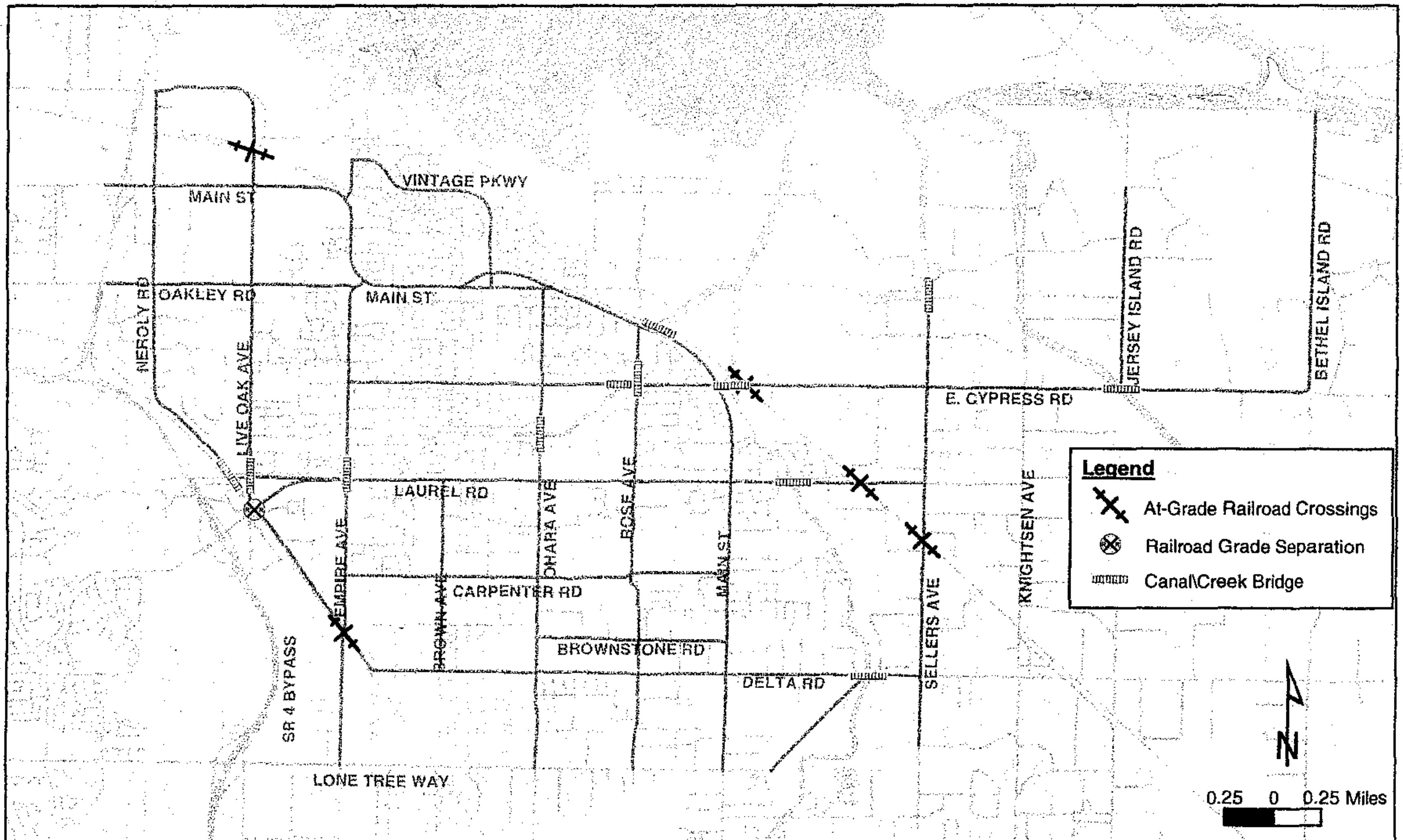
Item	Cost[1]
Traffic Signals[2]	$4,950,000
Canal/Creek Bridges	$2,170,000
Railroad Crossings	$1,380,000
Main Street Downtown Bypass	$4,400,000
Laurel Road Railroad Grade Separation	$3,500,000
Total Miscellaneous Costs	**$16,400,000**

Notes:
1. All costs are in 2002 dollars.
2. Includes 18 new traffic signals.

Source: City of Oakley and Fehr and Peers Associates, October 2002.

4. Total Costs and Funding Sources

Table 13 presents a summary of costs associated with implementing the long range circulation plan. Again, please note that these are order-of-magnitude cost estimates based on currently available information; all improvements will be subject to further engineering studies and more refined cost estimates as the project development process moves forward.



Oakley Long Range Circulation Plan

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October 2002
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RECOMMENDED CANAL/CREEK BRIDGES AND RAILROAD CROSSINGS

FIGURE 8

Table 13
Total Cost Estimates
for Long Range Circulation Plan

Item	Cost
Roadway Construction	$ 101,290,000
Right-of-way Acquisition	$ 23,780,000
Miscellaneous Items	$ 16,400,000
Total Cost	**$ 141,470,000**

Source: Fehr and Peers Associates, October 2002.

Funding for the roadway system of arterials and collectors outlined in this plan will come primarily from the sponsors of new development projects in the City, through direct improvements to the frontage of each property and contributions to a citywide traffic impact fee. The citywide fee is currently being developed consistent with the requirements of AB 1600. This fee will replace the Oakley / North Brentwood Area of Benefit fee currently collected to support transportation improvements in Oakley. Other sources of funds may include state programs, regional fee programs to support improvements on major regional routes, and the potential reauthorization of the Measure C transportation sales tax.

APPENDIX A

City of Oakley
General Plan Buildout Land Use Projections

Appendix A

City of Oakley
General Plan Buildout Land Use Estimates

Zone[1]	Acres	Households	Household Population	Service Empl.	Other Empl.	Retail Empl.	Total Empl.
152	38	0	0	66	0	423	489
153	38	0	0	0	27	1270	1297
154	102	168	554	0	0	0	0
186	234	0	0	1345	3155	0	4500
187	182	0	0	6658	603	0	7262
188	975	669	2210	0	0	475	475
189	975	325	1073	0	0	0	0
190	975	0	0	0	342	90	431
191	60	0	0	0	0	1704	1704
192	16	0	0	0	0	548	548
193	44	0	0	0	222	561	784
194	36	0	0	0	258	627	885
195	43	0	0	0	426	441	867
196	43	0	0	0	207	664	871
197	45	0	0	0	1042	0	1042
198	37	0	0	0	936	0	936
199	63	150	433	0	445	0	445
200	23	157	409	0	0	255	255
201	73	254	840	0	0	170	170
202	75	275	910	0	0	513	513
203	17	0	0	0	0	400	400
204	160	384	1270	0	0	0	0
205	117	227	750	0	0	0	0
206	160	406	1341	0	0	0	0
207	120	252	831	0	0	0	0
208	55	250	776	0	0	166	166
209	13	13	28	0	0	310	310
210	113	442	1377	0	0	268	268
211	100	465	1538	0	0	0	0
212	63	83	275	0	0	0	0
213	7	7	22	0	0	284	284
214	4	9	30	0	0	92	92
215	4	0	0	0	0	32	32
216	20	84	276	0	0	175	175
217	35	52	173	0	0	706	706
218	65	158	521	0	0	0	0
219	18	89	294	0	0	0	0
220	17	27	88	0	0	0	0
221	39	176	385	0	0	226	226
222	35	172	390	0	0	98	98
223	116	287	921	0	0	61	61
224	97	344	1138	0	0	26	26
225	63	31	101	0	0	0	0
226	8	0	0	0	0	248	248
227	102	278	920	0	0	183	183
228	88	338	1116	91	0	0	91
229	122	473	1563	0	0	0	0
230	160	435	1439	0	0	0	0
231	73	84	276	0	0	0	0
232	97	207	604	0	0	0	0
233	160	258	853	0	0	0	0
234	165	283	817	0	0	1258	1258

Appendix A

Zone[1]	Acres	Households	Household Population	Service Empl.	Other Empl.	Retail Empl.	Total Empl.
235	9	0	0	0	0	445	445
236	156	20	68	0	0	515	515
253	48	77	255	0	0	340	340
254	58	118	390	0	0	0	0
255	106	221	732	0	0	0	0
256	92	329	1087	0	0	148	148
257	79	327	1079	0	0	0	0
258	72	356	1175	0	0	0	0
259	142	493	1630	0	0	279	279
260	9	12	38	0	0	320	320
261	18	34	112	0	0	247	247
262	107	329	947	0	0	84	84
263	144	283	936	0	0	0	0
264	123	321	1061	0	0	29	29
265	103	348	1149	0	0	0	0
266	145	630	1807	0	0	0	0
267	58	74	246	0	0	0	0
268	115	233	706	0	0	66	66
269	115	485	1364	0	0	0	0
270	29	44	146	0	0	25	25
271	20	69	228	0	0	0	0
272	9	0	0	0	0	125	125
273	56	0	0	0	0	0	0
274	115	302	997	0	0	0	0
275	86	492	1628	0	0	0	0
276	86	432	1241	0	0	139	139
277	234	0	0	0	0	0	0
278	528	0	0	0	0	0	0
279	396	0	0	0	0	0	0
280	396	0	0	0	0	0	0
289	18	37	121	0	0	389	389
290	28	22	72	0	0	600	600
291	110	271	651	0	0	209	209
292	91	173	548	0	7	0	7
293	364	637	2066	0	123	0	123
294	455	1293	4042	0	0	578	578
295	250	543	1762	0	839	39	878
296	45	15	50	0	96	0	96
297	353	645	2084	0	394	0	394
298	360	1100	3565	0	13	0	13
299	270	818	2654	0	0	0	0
300	320	508	1648	0	0	0	0
302	85	184	609	0	0	0	0
303	85	139	460	0	0	0	0
304	85	265	777	0	0	140	140
305	213	571	1778	0	0	0	0
399	9	0	0	0	0	202	202
Total		**21565**	**68451**	**8160**	**9134**	**17192**	**34486**

Notes:

1. Zone numbers correspond to Traffic Analysis Zones (TAZs) in the East County Travel Demand Model.

Source: PMC, June 2002.

APPENDIX C

CIRCULATION ELEMENT

The following new paragraph is added to the "Roadways" section of the Circulation Element between the last paragraph and the "Road Classifications" heading (new text is underlined):

> Readers should also note that Figure 2-2, the Land Use Diagram, proposes significantly more commercial development in the City than was planned under the City-adopted County General Plan. The discussion of the Commercial land use designation indicates that some of that development may be "large-scale retail, regional-serving retail." Commercial development of that form may draw customers from outside Oakley, increasing vehicle trips into the City. The Long Range Roadway Plan began its analysis with the General Plan's proposed land uses, including the additional commercial development. It calculated the level of traffic that those land uses would generate and the improvements to the circulation system that would need to be made to maintain the specified level of service on affected roadways. In the case of potential large-scale or region-serving retail, that included an examination of improvements necessary to arterial streets that would likely be used by drivers from outside the City to reach the proposed commercial locations. The roadway widths and improvements discussed in the Circulation Element and the Long Range Circulation Plan are considered adequate to meet the specified level of service for all roadways that might be used to reach the proposed sites of commercial development in the City, and this Element contains policies that assure adequate financing for necessary improvements.