DRAFT ENVIRONMENTAL IMPACT REPORT for
OFF-CHANNEL MINING PLAN
for LOWER CACHE CREEK

SCH #95113034

Yolo County

March 26, 1996

County of Yolo

COUNTY ADMINISTRATIVE OFFICE
625 Court Street, Room 202 Woodland, CA 95695 (916) 666-8150 FAX (916) 666-81

ROY PEDERSON
County Administrative Officer

NOTICE OF AVAILABILITY AND PUBLIC HEARING
DRAFT ENVIRONMENTAL IMPACT REPORT for the
YOLO COUNTY OFF-CHANNEL MINING PLAN

TO: Interested Agencies and Individuals

FROM: Heidi Tschudin, Contract Planner

DATE: March 26, 1996

The County of Yolo has prepared and is analyzing the Off-Channel Mining Plan (OCMP), one of two key plans to manage the resources of the mining reach of Cache Creek. The planning area for the OCMP extends approximately 14.5 miles, from the Capay Dam to the Town of Yolo, covering approximately 23,174 acres. The OCMP was developed pursuant to the Statement of Goals, Objectives, and Policies for the Off-Channel Mining Plan adopted by the Board of Supervisors in June of 1994.

The draft OCMP identifies 216 million tons of aggregate on 2,887 acres of the 23,174 acre study area, as feasible to mine over the next fifty years. Control of this mining would occur through the OCMP and implementing ordinances, and project-specific conditional use permits for which consistency with the OCMP and CCRMP would be required. A total of 179.5 million tons of aggregate would be mined on 2,211 acres over the next thirty years. Reclamation of the 2,211 acres would be as follows: agriculture including row crop, tree crop, and pasture land - 988 acres (45%); open water areas - 771 acres (35%); wildlife habitat - 273 acres (12%); and slopes and maintenance roads - 179 acres (8%). It is estimated that 36.5 million tons of aggregate are contained on the remaining 667 acres, which would be rezoned with a Sand and Gravel Reserve (SGR) overlay to delineate properties appropriate for mining in the next 30-50 years.

The draft OCMP is organized into an introduction and six "elements," including an Aggregate Resources Element, a Water Resources Element, a Floodway and Channel Stability Element, an Agricultural Resources Element, a Biological Resources Element, and an Open Space and Recreation Element. These elements are similar to the organization of the OCMP adopted by the Board of Supervisors in June of 1994. Each of the six "elements" includes an introduction and a list of goals, objectives, actions, and performance standards.

In order to implement the OCMP, draft mining and reclamation ordinances have been prepared. The ordinances have been revised to include the performance standards recommended in the OCMP, new procedures and requirements established in the California Surface Mining and Reclamation Act (SMARA), and policy documents issued by both the State Department of Conservation and State Mining and Geology Board. All new mining and reclamation permits will be required to conform with the implementing ordinances. The OCMP also proposes to amend the County Zoning Code to allow commercial mining within the Agricultural Preserve (A-P) Zone, in conformance with the requirements of the State Williamson Act.

The County and its consultant, EDAW Inc., have prepared a Program-level Draft Environmental Impact Report (DEIR) which fulfills the requirements of the California Environmental Quality Act (CEQA). The County Planning Commission and Board of Supervisors will consider this information when deliberating the project. Following certification of the EIR, in order to allow the project to proceed, the County must approve the Off-Channel Mining Plan, the revised Mining and Reclamation Ordinances, and amendments to the Zoning Code.

The DEIR identifies significant effects anticipated as a result of this project and alternatives, in the areas of land use and planning, geology and soils, hydrology and water quality, agriculture, biological resources, air quality, traffic and circulation, noise, aesthetics, cultural resources, public services and utilities, and hazards. All identified significant impacts can be eliminated or reduced to a less than significant level through the implementation of recommended mitigation measures, except agriculture, biological resources, air quality, and aesthetics. These four impact areas remain significant and unavoidable.

The DEIR is now available for public review at the public counter of the Community Development Agency, at 292 West Beamer Street, Woodland, California 95695. The document is also available for public review at the Davis, Esparto, Woodland, and Yolo Branch County Libraries. The project file, including all documents referenced in the DEIR, may be reviewed upon request at the Community Development Agency public counter. The Community Development Agency requests your comments on the DEIR during the 45-day public review period which begins March 26, 1996 and ends on May 10, 1996. Written comments postmarked by May 10, 1996 will be accepted and should be directed to David Morrison, Resource Management Coordinator, Yolo County Community Development Agency, 292 West Beamer Street, Woodland, California 95695. A **public hearing** in front of the County Planning Commission will be held on April 17, 1996 in the Commission Chambers located at 292 West Beamer Street in Woodland, to accept oral comments from the public regarding the DEIR.

For more information regarding this project, please contact Heidi Tschudin at (916) 447-1809 or David Morrison at (916) 666-8020.

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1.0 INTRODUCTION

CHAPTER 1.0 INTRODUCTION

This Draft Environmental Impact Report (DEIR) has been prepared pursuant to the California Environmental Quality Act (CEQA) of 1970, as amended. The County of Yolo is the "lead agency" for the project evaluated in this DEIR and, as such, has the primary responsibility for approving the project. The proposed project is the adoption of a plan (Off-Channel Mining Plan or OCMP) and ordinances to regulate mining adjacent to Cache Creek, outside the creek channel. The draft OCMP addresses a variety of issues relevant to mining as may occur in an area of approximately 23,174 acres, outside of the creek channel. The Plan allows for off-channel, deep-pit mining under controlled and monitored circumstances, as an alternative to continued in-channel mining. It prescribes standards and regulations for siting of operations in relation to the creek channel, adjoining pits, and other land uses. It identifies protections for groundwater quality and quantity. It allows for multiple reclamation uses including agriculture, habitat, flood control, water storage, groundwater recharge, and recreation. It also establishes the groundwork for the development of a future plan to allow for public recreational activities and uses along the creek. A separate environmental impact report is being prepared for a second plan (the Cache Creek Resources Management Plan or CCRMP) which focuses on resources within the creek channel. The two plans are on file and available for public review at the Yolo County Community Development Agency offices; once completed, they will together comprise the Cache Creek Area Plan.

The County determined that preparation of an EIR was appropriate in light of potentially significant impacts which could be caused by implementing the proposed project. Primary issues of concern identified in the Notice of Preparation included:

Land use and Planning
Hydrology and Water Quality
Biological Resources
Traffic and Circulation
Aesthetics
Hazards
Geology and Soils
Agriculture
Air Quality
Noise
Cultural Resources
Public Services and Utilities

1.1 BACKGROUND AND NATURE OF PROJECT

The impetus for the OCMP came from the 1975 report of the Aggregate Resources Advisory Committee (ARAC), the 1984 report of the Aggregate Technical Advisory Committee (AgTAC), and the June 1994 Statement of Goals, Objectives, and Policies regarding the management of aggregate resources in and adjoining Cache Creek. All of these reports suggested a need for the County to expand its efforts beyond sand and gravel, and to take a comprehensive approach in planning for all of the creek's resources.

These documents also recommended that the amount of in-stream mining be reduced, while continuing to maintain 100-year flood protection for adjoining properties.

In a previously approved conceptual workplan for guiding development of the Cache Creek Resources Management Plan (CCRMP), the County outlined a vision to integrate policies for all of the creek's resources within a comprehensive framework. The workplan emphasized a number of goals, including: the restoration of native habitat, the enhancement of open space and recreation opportunities, the coordination of surface water and groundwater, to increase the available water supply, the maintenance of Cache Creek as a dynamic system, and the minimization of flooding.

As presented to, and accepted by, the Board and Planning Commission in a workshop held October 24, 1995, three technical studies regarding various physical components of the Creek have been prepared (they are collectively referred to as the Technical Studies). These studies of creek geomorphology, groundwater resources, and biological resources have been used as the technical basis for the draft OCMP (the subject of this EIR).

In addition to historical documents, previous direction of the Board, and the Technical Studies, the staff also incorporated the following input into the OCMP and ordinances:

- discussions and interaction with interested citizens, technical consultants, other government agency officials, and representatives of the aggregate industry, over the last three years;

- data and analysis from previous studies of Cache Creek, and generally accepted practices for riparian management; and

- relevant plans and programs from other jurisdictions.

In past actions, the Yolo County Board of Supervisors has recognized that although mining is an important consideration, the creek is integrally bound to the environmental and social resources of the County. Therefore, development of the OCMP is based on the key assumption that the creek must be viewed as an integrated system, with an emphasis on the management of all of Cache Creek's resources, rather than a singular focus on the issue of mining. The OCMP has been prepared as a means to assist in this overall management, balancing issues and concerns within the overriding vision of enhancing the variety of resource needs for the region.

The purpose of the OCMP, together with the CCRMP, is to provide the necessary structure and policies for implementing a program to manage the wide variety of resources associated with the creek, including habitat, water resources, aggregate resources, agriculture, and recreation. One of the means for implementing this program is the adoption of new surface mining and reclamation ordinances. The Off-Channel Surface Mining Ordinance and Surface Mining Reclamation Ordinance include specific performance standards for ensuring that the goals and objectives spelled out in the OCMP

are achieved. Provisions are also made for establishing an ongoing Technical Advisory Committee, to continue monitoring and studying Cache Creek as it responds to the programs carried out within the plans and ordinances. The TAC will make recommendations to the County, as appropriate, to ensure that management is responsive to the dynamic nature of the creek.

Performance standards covering an array of issues, including those designed to protect groundwater quality and preclude pit capture, have been developed from the Lower Cache Creek Technical Studies and included in the OCMP, as well as the Off-Channel Mining Ordinance. Guidance regarding appropriate reclamation on various off-channel mining reaches of the Creek are included in the OCMP. Copies of the Technical Studies are available for review at the Yolo County Community Development Agency.

The goal statements, policies, performance standards, and implementation guidance in the OCMP address off-channel mining within the 28,130 acres the Department of Conservation has identified as potentially containing minable aggregate resources. With the exception of resources within the Cache Creek channel, mining anywhere in the 28,130 acres would be subject to the guidance and standards of the OCMP and implementing ordinances. As a practical matter, based on pending and foreseeable applications for surface mining permits, feasibly minable reserves likely occur on less than 2,887 acres of the total. The reserves associated with the 2,887 acres are used as the basis for the cumulative analysis in this DEIR.

1.2 PURPOSE AND SCOPE OF EIR

As provided for in the CEQA Guidelines, public agencies are charged with the duty to avoid or minimize environmental damage where feasible. In discharging this duty, the public agency has an obligation to balance a variety of public objectives, including economic, environmental, and social (Section 15021 of the CEQA Guidelines). This EIR is an informational document, the purpose of which is to inform public agency decision-makers and the general public of the significant environmental effects of the project. Additionally, the EIR identifies possible means to minimize the significant effects and describes reasonable alternatives to the project. (The proposed project and alternatives have been subjected to equivalent levels of analysis, and an environmentally superior alternative has been designated.) The public agency is required to consider the information in this EIR and previous environmental documentation, along with any other relevant information, in making its decision on the project (Section 15121 of the CEQA Guidelines). Sections 15122 through 15132 of the CEQA Guidelines describe the content requirements for the Draft EIR and Final EIR.

The purpose of this DEIR is to: 1) identify the potential significant effects on the environment resulting in the implementation of the OCMP and to indicate the manner in which those significant effects can be mitigated or avoided; and 2) to identify any unavoidable adverse impacts that cannot be mitigated. The County must consider the

information in this document and respond to each identified significant effect. The CEQA requirement is to provide sufficient information concerning the potential environmental effects resulting from the project, so that decision-makers can make an informed decision regarding the efficiency, feasibility, and relative environmental merits of the project.

The preparation, content, and processing of this document are governed by CEQA Guidelines 15168. Under this section, the following relevant criteria for the preparation of a Program EIR are established:

- geographically;
- as logical parts in a chain of contemplated action;
- in connection with the issuance of rules, regulations, plans or other general criteria to govern the conduct of a continuing program; or
- as individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways.

The OCMP constitutes a series of actions affecting properties within the plan boundaries. The study area is related geographically. The Plan includes maps, goals, objectives, actions, and performance standards that are logical parts in a chain of contemplated action. Each of these components comprises rules, regulations, or general criteria governing the implementation of the Plan. These components would be carried out under the authority of the Plan, as enabled by County approval. Specific projects carried out in a manner consistent with the Plan would have similar environmental impacts which could be mitigated in similar ways.

There are several advantages to a Program EIR. It provides a more thorough consideration of regional influences, secondary effects, cumulative impacts, broad alternatives, and other factors that apply to the program as a whole. Program EIRs avoid duplicative reconsideration of basic policy considerations. They allow the Lead Agency to consider broad policy alternatives and program-wide mitigation measures at a time when the agency has greater flexibility to deal with basic problems or cumulative impacts.

Subsequent projects approved pursuant to a Program EIR still require additional environmental review. However, Program EIRs allow subsequent environmental documents to focus on issues that are unique to the site and that were not specifically addressed in the Program EIR. This allows decision makers and interested parties to focus an EIR for a subsequent project on new effects that have not been considered before. Although they help to streamline the process, Program EIRs and any subsequent focused project-level EIRs do not restrict public participation. They still require circulation of the documents and a comment period, notification of interested parties, and public hearings. At this time, there are five mining permit applications pending before the County; the potential environmental impacts of each of these will be examined in a separate, project-level EIR that will "tier" off this Program EIR.

A second program-level EIR is being prepared for the CCRMP, focusing on in-channel resources (the County's proposed creek improvement program is being addressed at the project level in that EIR). Focused project-level EIRs will be prepared for each long-term, off-channel surface mining permit and reclamation plan application submitted for sites located within the planning area. Therefore, this Program EIR focuses on cumulative environmental impacts, such as air quality, traffic, channel stability, and loss of agricultural land. Site-specific issues, such as aesthetics, groundwater effects, drainage, slope stability, flood protection, and noise will generally be dealt with as part of the project-level EIRs.

1.3 ENVIRONMENTAL REVIEW PROCESS

A Notice of Preparation (NOP) was prepared and circulated for a 30-day period of public review and comment from November 17, 1995 through December 18, 1995. A copy of the NOP and comments received on the NOP are included in this document (Section 7.1). A public scoping meeting was held for the OCMP on November 27,1995. In preparing this EIR, the County and its consultants considered all written comments on the NOP, as well as the oral comments provided at the scoping meeting. This DEIR was publicly circulated on March 26, 1996 for a 45-day period of review and comment by the public and other interested parties, agencies, and organizations. A special Planning Commission hearing on the DEIR will be held on **Wednesday, April 17, 1996** at the Planning Commission Chambers at 292 West Beamer Street in Woodland, CA 95695, for the purpose of obtaining public comments on this EIR. All comments or questions about the EIR should be addressed to:

Mr. David Morrison, Resource Management Coordinator
Yolo County Community Development Agency
292 West Beamer Street
Woodland, CA 95695
Tel. (916) 666-8020; Fax: (916) 666-8156

The public review period for the Draft EIR concludes on **May 10, 1996**. Following public review, a final document will be prepared in response to written comments received during the public review period and to oral comments made at the public hearing. The final Response to Comments document will be available for public review a minimum of 10 days prior to its consideration by the Planning Commission and Board of Supervisors. Both the Planning Commission and the Board of Supervisors will hold one or more public hearings to consider adoption of the OCMP (the dates of these hearings will be publicly noticed). Following their deliberations the Planning Commission will make a recommendation to the Board regarding the adequacy of the EIR and the desirability of the OCMP. The Board must take the final action to certify the EIR as adequate for decision-making purposes, and to approve or deny the OCMP. Specific Findings of Fact pursuant to Public Resources Code Section 21081 will be prepared to reflect the final action of the Board.

1.4 MITIGATION MONITORING

The CEQA requires that when a public agency makes findings based on an EIR, the public agency must adopt a report or monitoring plan for those measures which it has adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment (Public Resources Code Section 21081.6, AB 3180 [1988]). The reporting or monitoring plan must be designed to ensure compliance during project implementation (Public Resources Code Section 21081.6). A Mitigation Monitoring Plan for the OCMP will be prepared in conjunction with the Response to Comments on this DEIR, and it will be provided to the Planning Commission and Board of Supervisors for consideration in their deliberations.

1.5 ORGANIZATION OF THE DOCUMENT

This document is organized into the following sections:

Chapter 1.0 - Introduction

This chapter provides an introduction and overview describing intended uses of the DEIR, and the review and certification process.

Chapter 2.0 - Summary of Impacts and Mitigation Measures

This chapter summarizes environmental impacts that have been identified as results of implementing the OCMP, describes each of the alternatives to the OCMP, describes proposed mitigation measures, and indicates the projected level of significance of impacts after the proposed mitigation is implemented. It also provides the required monitoring plan for implementation of the adopted mitigation measures.

Chapter 3.0 - Description of Project and Alternatives

This chapter provides a detailed description of the OCMP, including plan area, major objectives, project components and characteristics, and required actions. This section also describes the alternatives examined in the EIR, including the designation of an environmentally superior alternative as determined by the environmental analysis contained in Chapter 4.0.

Chapter 4.0 - Environmental Analysis

This chapter contains a program-level analysis of environmental issue areas. The analysis of each environmental issue contains an introduction and description of the relevant regulatory and physical setting of the planning area, description of impacts of the OCMP and alternatives, and recommendations regarding appropriate mitigation measures.

Chapter 5.0 - CEQA Considerations

This chapter describes the cumulative analysis, growth inducing impacts, and significant irreversible environmental changes.

Chapter 6.0 - Report Preparation

This chapter lists report authors by section, supporting and reference data used in preparation of this document, and County staff and others assisting in preparation and review of the document.

Chapter 7.0 - Appendices

This chapter includes technical and informational appendices to the document.

1.6 SUMMARY OF INITIAL STUDY/NOP CONCLUSIONS; EFFECTS FOUND NOT TO BE SIGNIFICANT

The County determined that an EIR is clearly required for this project, and therefore opted to conduct no further initial review pursuant to Section 15060(c) of the CEQA Guidelines. Instead the County began work directly on the EIR process as described in Article 7 of the Guidelines, commencing with Section 15080. The NOP identified the following areas of potential impact:

Land Use and Planning
Hydrology and Water Quality
Biological Resources
Traffic and Circulation
Aesthetics
Hazards
Geology and Soils
Agriculture
Air Quality
Noise
Cultural Resources
Public Services and Utilities

The County determined that there was no potential for project impact in the areas of population, housing, or energy (please refer to Section 2.5).

2.0 SUMMARY OF IMPACTS AND MITIGATION MEASURES

CHAPTER 2.0 SUMMARY OF IMPACTS AND MITIGATION MEASURES

2.1 PROJECT UNDER REVIEW

This Draft EIR evaluates the potential environmental impacts related to implementation of the Draft OCMP. The Draft OCMP addresses a variety of issues relevant to mining outside of the creek channel in an area of approximately 23,174 acres along a 14.5-mile area extending from Capay Dam downstream to a levied section of the creek near the Town of Yolo. The Plan encourages off-channel, deep-pit mining under controlled and monitored circumstances, as an alternative to continued in-channel mining. It prescribes standards and regulations for siting of operations in relation to the creek channel, adjoining pits, and other land uses. It identifies protections for groundwater quality and quantity. It allows for multiple reclamation uses including agriculture, habitat, flood control, water storage, groundwater recharge, and recreation. It also establishes the groundwork for the development of a future plan to allow for public recreational activities and uses along the creek.

The draft OCMP identifies 216 million tons of aggregate on 2,887 acres of the planning area as feasible to mine over the next 50 years. Regulation of this mining would occur through the OCMP and implementing ordinances, and project-specific conditional use permits that would be required to be consistent with the OCMP and CCRMP. A complete description of the project is contained in Chapter 3.0, Description of Project and Alternatives.

2.2 AREAS OF CONTROVERSY

Section 15123 of the CEQA Guidelines requires the summary section of an EIR to include "areas of controversy known to the lead agency." The following issues (in no particular order) fit that requirement:

- Continued permitting of aggregate mining in Yolo County.
- The potential for impacts on groundwater quality as a result of implementing the OCMP.
- The potential hazards associated with reclaimed lakes.
- Recommendations of the OCMP relating to the (30-year) life of mining permits.

- Channel stability and proximity of mining to the channel.
- The accumulation of mercury in local wildlife.
- Permanent loss of agricultural land.
- Reclamation of previously agricultural land for other uses.
- Interpretation of net gain.
- Recommended frequency of well monitoring and listing of constituents to monitor.
- Depths of mining and the issue of mining below the groundwater table.
- Steepness of reclaimed pit slopes.

2.3 ISSUES TO BE RESOLVED

Section 15123 of the CEQA Guidelines requires the summary section of an EIR to include "issues to be resolved including choices among alternatives and whether and how to mitigate significant effects." The following issues fit this requirement:

- Creation of an ongoing Technical Advisory Committee to review annual monitoring data and provide recommendations and feedback to the County regarding the conditions of the creek.
- Coordination with Yolo County Flood Control and Water Conservation District (FCWCD) to use off-channel excavations as recharge and/or storage basins.
- Coordination with FCWCD to provide a regular source of surface water within the losing reaches of the creek, when there is sufficient rainfall.
- Development of an Open Space and Recreation Plan to provide a range of public activities and uses along the creek.

2.4 SUMMARY OF REGULATORY/POLICY CONSISTENCY

Section 15125(b) of the CEQA Guidelines requires the EIR to discuss "any inconsistencies between the proposed project and applicable general plans and regional plans." A number of regulations and plans exist that address conservation and development of aggregate resources and related issues, including the California Surface Mining and Reclamation Act, the Yolo County General Plan, and the Interim In-Channel Surface Mining Regulations of

Yolo County. A discussion of the consistency between the OCMP and these regulations and plans is provided in Section 4.2, Land Use and Planning, as referenced in Table 2-1.

2.5 SUMMARY OF IMPACTS

This summary provides an overview of the analysis contained in Chapter 4.0, Environmental Analysis. This summary also includes discussions of: a) effects found not to be significant; b) significant impacts; c) mitigation measures to avoid or reduce identified significant impacts; and d) unavoidable significant impacts.

Effects Found Not to Be Significant

Section 15128 of the CEQA Guidelines requires an EIR to contain a statement briefly indicating the reasons why various possibly significant effects of a project were determined not to be significant and were therefore not discussed in detail. The following statements, explaining why various effects of the project on population/housing and energy were found not to be significant, meet this requirement:

Population/Housing

No official regional or local population projections would be exceeded as a result of implementing the OCMP. The project would not induce substantial growth in the planning area either directly or indirectly, or extend major infrastructure. The hiring of additional personnel would be minimal and therefore no significant increase in housing demand would be expected, and no existing housing would be displaced. An additional discussion of these topics can be found in Section 5.2, Growth Inducing Impacts.

Energy

Implementation of the OCMP would not conflict with any adopted energy conservation plan. The effects of the project on local and regional energy supplies and on requirements for additional capacity would be minimal. Energy resources would not be used in a wasteful, inefficient, or unnecessary manner. Protection of lands containing identified mineral deposits from the encroachment of incompatible land uses would allow aggregate resources to remain available for future use and thereby reduce transportation energy use requirements. Policies in the OCMP, such as encouraging recycling efforts and mining efficiencies (such as wet pits), would result in energy conservation.

Effects Found to Be Significant and Avoidable

Under CEQA, a significant effect on the environment is defined as a substantial, or potentially substantial, adverse change in any physical conditions within the area affected by the project. This includes water, land, air, ambient noise, wildlife, and objects of aesthetic significance.

Implementation of the project would generate environmental impacts in several areas, as described in Chapter 4 and summarized in Table 2-1.

Mitigation Measures to Avoid or Reduce Identified Significant Impacts

This Program EIR discusses mitigation measures that could be implemented. Generally, program-level mitigation for the OCMP includes modifications to the plan, or the addition or modification of goals, performance standards, or other requirements. The mitigations presented form the basis of the proposed Mitigation Monitoring Plan discussed in Section 1.4.

Effects Found to Be Significant and Unavoidable

Under CEQA, a significant and unavoidable effect of the project is one that would cause a substantial adverse effect on the environment and for which no mitigation is available to reduce the impact to a less-than-significant level if the project is approved. These impacts are discussed in Chapter 4.0 of this EIR and summarized in Table 2-1.

2.6 SUMMARY OF ALTERNATIVES

The following alternatives to the project are described in Chapter 3.0, Project Description, and given equal weight in Chapter 4.0, Environmental Analysis:

Alternative #1a:	No Project (Existing Conditions);
Alternative #1b:	No Project (Existing Permits and Regulatory Condition);
Alternative #2:	No Mining (Alternative Site);
Alternative #3:	Plant Operation Only (Importation);
Alternative #4:	Shallow Mining (Alternative Method/Reclamation);
Alternative #5a:	Decreased Mining (Restricted Allocation);
Alternative #5b:	Decreased Mining (Shorter Mining Period); and
Alternative #6:	Agricultural Reclamation (with Mining Operations as Proposed).

2.7 SUMMARY TABLE

The following table (Table 2-1, Summary of Impacts and Mitigation Measures) has been organized to correspond with environmental issues discussed in Chapter 4.0 of this EIR. The summary table is arranged in four columns:

1. environmental impact;
2. level of significance before mitigation;
3. recommended mitigation measures; and
4. level of significance after mitigation.

A series of measures is noted where more than one mitigation may be required to reduce the impact to a less-than-significant level. See Chapter 4.0 for complete analysis and full text of mitigation measures.

Table 2-1: SUMMARY OF IMPACTS AND MITIGATION MEASURES					
Environmental Impact	Level of Significance Before Mitigation		Mitigation Measures	Level of Significance After Mitigation	
	LS	S		LS	SU
Land Use and Planning					
Impact 4.2-1: Consistency with Yolo County General Plan	OCMP, A-4, A-5a, A-5b and A-6	A-1a, A-1b, A-2, A-3	*Mitigation Measure 4.2-1a (OCMP, A-4, A-5a, A-5b, A-6)* *None required. However, the amendment to draft OCMP Objective 5.3-1 proposed in Mitigation Measure 4.2-5a would reinforce Implementation Strategy #2 of the Capay Valley Area Plan (as discussed above under "Draft OCMP and Implementing Ordinances") by encouraging the reclamation of land within the Capay Valley Area to agricultural uses (i.e., areas of creek maintenance). This action would enhance the compatibility of the OCMP, A-4, A-5a, A-5b, and A-6 with the Capay Valley Area Plan.* *Mitigation Measure 4.2-1b (A-1a, A-1b, A-2, A-3)* *In lieu of adopting an OCMP and its implementing ordinances, the County shall develop an alternate approach for responding to the requirements of General Plan Conservation Policies 34 and 35. An alternate approach would be to amend the General Plan to include Conservation Policies 42, 43, 44, and 45 as discussed in Section 4.2.*	OCMP, A-4, A-5a, A-5b, and A-6	A-1a, A-1b, A-2, A-3
Impact 4.2-2: Consistency with the Yolo County Zoning Ordinance and County Code	A-1a, A-1b, A-2, and A-3	OCMP, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.2-2a (OCMP, A-4, A-5a, A-5b, A-6)* *The following sections of the Yolo County Zoning Ordinance shall be amended to implement the OCMP and its implementing ordinances: Sections 8-2.404(g), 8-2.404(j), 8-2.604(n), 8-2.2311, 8-2.2312(a), and 8-2.2312(b). New sections shall be added to the Yolo County Zoning Ordinance at Section 8-2.404 (to address land use contracts in the A-P Zone), and at 8-2.23.8 (to address the Special Sand and Gravel Combining Zone [SGR]).*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.2-3: Consistency with the State Mining and Reclamation Act (SMARA) and the State Mining and Geology Board Reclamation Regulations	OCMP, A-4, A-5a, A-5b, and A-6	A-1a, A-1b, A-2, and A-3	*Mitigation Measure 4.2-3b (A-1a, A-1b, A-2 and A-3)* *In lieu of adopting an OCMP and its implementing ordinances, the County shall amend the mining regulations and ordinances to ensure consistency with SMARA and the State Reclamation Regulations.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.2-4: Consistency with the Regional Water Quality Control Board's Basin Plan		OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	*None Required* *Implementation of Mitigation Measures 4.4-2a and 4.4-3b would adequately mitigate this impact.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

LS = less than significant
S = significant
SU = significant and unavoidable
OCMP = Draft Off-Channel Mining Plan and Implementing Ordinances
A-1a = No Project (Existing Conditions)
A-1b = No Project (Existing Permits and Regulatory Condition)
A-2 = No Mining (Alternative Site)
A-3 = Plant Operations Only (Importation)
A-4 = Shallow Mining (Alternative Method/Reclamation)
A-5a = Decreased Mining (Restricted Allocation)
A-5b = Decreased Mining (Shorter Mining Period)
A-6 = Agricultural Reclamation (with Mining Operations as Proposed)

Table 2-1: SUMMARY OF IMPACTS AND MITIGATION MEASURES					
Environmental Impact	**Level of Significance Before Mitigation**		**Mitigation Measures**	**Level of Significance After Mitigation**	
	LS	**S**		**LS**	**SU**
Impact 4.2-5: Consistency with the RCD Agriculture Policies	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6		*Mitigation Measure 4.2-5a (OCMP, A-4, A-5a, A-5b, A-6)* *None required. As an improvement measure, however, it is recommended that the following language be added to Objective 5.3-1 of the OCMP:* *Reclamation of agricultural lands to other uses, however, is discouraged, wherever agricultural reclamation is feasible.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.2-6: Compatibility with Existing and Planned Land Uses	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6		*None required.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.2-7: Change in Land Use Intensity	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6		*None required at the program level.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.2-8: Land Use Incompatibility Due to Changes in the Creek Boundary	OCMP, A-1a, A-1b, A-2, and A-3, A-4, A-5a, A-5b, and A-6		*None required.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.2-9: Land Disturbance During Mining	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6		*None required.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.2-10: Potential for Additional Mining Above That Which Is Currently Known	A-1a, A-1b, A-2, and A-3	OCMP, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.2-10a (OCMP, A-4, A-5a, A-5b, A-6)* *The final OCMP boundaries shall be defined as including only those 2,932 acres (including a 45-acre borrow area) presently under consideration for rezoning.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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	LS	S		LS	SU
Impact 4.2-11: Potential Impacts from the Future Sale or Transfer of Property Included within a Current Mining/Reclamation Application	A-1a, A-1b, A-2, and A-3	OCMP, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.2-11a (OCMP, A-4, A-5a, A-5b, A-6)* *The OCMP and its implementing ordinances shall be expanded and clarified to address the issue of transferability of mining permits. The clarification would indicate that if a property is sold or transferred, the tonnage attributed to that property transfers as well. If that tonnage is still processed at the original plant site pursuant to the original permit approval, no additional environmental assessment or permits would be required. If that transferred tonnage is processed elsewhere, additional analysis and approvals would be required.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.2-12: Compatibility with Watts-Woodland Airport Comprehensive Land Use Plan	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6		*None required at the program level.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Geology and Soils					
Impact 4.3-1: Potential for Damage from Seismic Shaking		OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.3-1a (OCMP, A-4, A-5a, A-5b, A-6)* *The following performance standards shall be added to the OCMP and its implementing ordinances and existing ordinances:* *Performance Standard 2.5-25: Improvements, including the construction of buildings, roadways or other public facilities proposed for construction in reclaimed mining pits shall require a geotechnical investigation of the stability of fills conducted by a qualified and licensed geotechnical engineer. A report on the results and recommendation of the investigation shall be submitted to the Yolo County Community Development Agency prior to the issuance of building permits.* *Performance Standard 2.5-26: Backfilled mining areas and slopes shall be inspected by the landowner following strong seismic shaking events. Observable damage shall be reported to the Yolo County Community Development Agency. If, upon inspection of the reported damage, the YCCDA determines that the damage requires repair to meet the intended use of the reclaimed land, the landowner shall perform the required repairs.* *Performance Standard 2.5-27: The cost of implementing recommendations for repair of reclaimed land caused during earthquakes or other natural events shall be met through application of contingency costs provided for by the project's financial assurances as required by SMARA.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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			Mitigation Measure 4.3-1b (A-1a, A-1b, A-2, A-3) *Existing mining ordinances shall require a geotechnical investigation of the stability of fills conducted by a qualified and licensed geotechnical engineer for improvements proposed for construction in reclaimed mining pits, including the construction of buildings, roadways, or other public facilities. A report on the results and recommendation of the investigation shall be submitted to the Yolo County Community Development Agency (or other similar authority in areas outside Yolo County) prior to the issuance of building permits.*		
Impact 4.3-2: Potential Impacts Related to Slope Stability, Erosion, and Sedimentation	A-1a and A-1b	OCMP, A-2, A-3, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.3-2a (OCMP, A-4, A-5a, A-5b, A-6)* *The following performance standards of the OCMP shall be modified as follows:* *Performance Standard 2.5-4: During mining operations, a series of benches may be excavated in a slope. The vertical height and slope of the benches shall not exceed ~~ten (10) feet, and all banks shall not exceed 1:2 (horizontal to vertical)~~ maximum standards for the specific soil types presented in California Code of Regulations, Title 8, Article 6. In general, vertical cutslopes between benches shall not exceed four (4) feet in height in topsoil and overburden sediments. Benching shall be allowed in cohesive soil (clay, sandy or silty clay, clayey silt) only. Slopes above the elevation of groundwater (determined at the time of excavation by the level of exposed water in the excavation) that exceed the maximum vertical height shall be excavated and maintained at slopes not greater than 2:1. Slopes located five (5) feet or less below the average summer low groundwater level shall not be steeper than 2:1. Slopes located more than five (5) feet below the average summer low groundwater level shall not ~~exceed~~ be steeper than 1:1 (horizontal to vertical). ~~below the summer low water level of exposed groundwater in water-filled excavations.~~* *Performance Standard 2.5-16: Except where benches are used, all banks above groundwater level shall be sloped no steeper than 2:1 (horizontal:vertical). Proposed steeper slopes shall be evaluated by a slope stability study, prepared by a qualified engineer. Slopes below the groundwater level shall be no steeper than 1:1 (horizontal:vertical). Slopes located five feet or less below the summer low groundwater level shall not be steeper than 2:1.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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			Performance Standard 2.5-17: Upon the completion of operations, grading and revegetation shall minimize erosion and convey surface runoff to natural outlets or interior basins. The condition of the land shall allow sufficient drainage to prevent water pockets or undue erosion. Natural and storm water drainage shall be designed so as to prevent flooding on surrounding properties and County rights-of-way. *Storm water runoff from mining areas shall be conveyed to lowered areas (detention basins) to provide detention of runoff generated during a 20-year, one-hour storm event. All drainage conveyance channels or pipes (including spillways for detention areas) shall be designed to ensure positive drainage and minimize erosion. The drainage conveyance system and storm water detention areas shall be designed and maintained in accordance with Best Management Practices for the reduction of pollutants associated with runoff from mined areas. The design and maintenance procedures shall be documented in the Storm Water Pollution Prevention Plan required for mining operations. The drainage system shall be inspected annually to ensure that the drainage system is functioning effectively and that adverse erosion and sedimentation are not occurring. The annual inspection shall be documented in the Annual Mining and Reclamation Report.* *Performance Standard 2.5-18: All final reclaimed slopes shall have a minimum safety factor equal to or greater than the critical gradient as determined by an engineering analysis of the slope stability. Final slopes less than five (5) feet below the average summer low groundwater level shall be designed in accordance with the reclaimed use and shall not be steeper than 2:1. Reclaimed wet pit slopes located five (5) feet or more below the average summer low groundwater level shall not ~~exceed~~ be steeper than 1:1 (horizontal:vertical), in order to minimize the effects of sedimentation and biological clogging on groundwater flow, to prevent stagnation and to protect the public health.* *The maximum slope angle for all final reclaimed slopes shall be determined by slope stability analysis performed by a licensed and qualified civil or geotechnical engineer and submitted with any mining and reclamation application for review by the Yolo County Community Development Agency (YCCDA). The slope stability analysis shall conform with industry standard methodologies rotational slope failures under static and pseudostatic (seismic) conditions. The minimum factor of safety for all design reclamation slopes located adjacent to levees or below existing structures shall not be less than 1.5 for static and 1.1 for pseudostatic (seismic) conditions. Other reclamation slopes shall meet a minimum factor of safety that is consistent with the post-reclamation use proposed for the mining area.*		

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			Performance Standard 2.5-21: The grading of final slopes, the replacement soil, and associated erosion control measures shall take place prior to November 1 in areas where mining has been completed. To minimize erosion, the finish grading of mining pit slopes above the average seasonal high groundwater level, with the exception of the location of designated haul roads, shall be performed as soon as practical after the completion of mining of overburden and unsaturated aggregate resources. A drought-tolerant, weed-free mix of native and non-native grass species shall be established on slopes prior to November 1 or alternate erosion control (mulch or netting) shall be placed on exposed soil on the slopes prior to this date. Phasing of mining to minimize the length of exposed mining slopes during the rainy season is encouraged. ~~all slopes above the groundwater level shall be seeded with a drought tolerant mix of native and non-native grass species, as soon as is practical after grading and prior to November 1. The grass seed mix shall be weed-free.~~ *Mitigation Measure 4.3-2b (A-2, A-3)* *Local mining and reclamation regulations for mining operations outside the OCMP planning area shall adopt standards similar to Performance Standards 2.5-4, 2.5-17, 2.5-18, and 2.5-21 to control erosion during mining activities.*		
Impact 4.3-3: Potential for Erosion from Surface Water Discharge, Including "Pit Capture"	A-1a, A-1b, A-2 and A-3	OCMP, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.3-3a (OCMP, A-4, A-5a, A-5b, A-6)* *The following text shall be added to Action 4.4-2:* *Action 4.4-2: Designate the streamway influence boundary described in the Technical Studies as part of the Off-Channel Mining Plan. The boundary describes the general area of the creek subject to meandering, as defined by the historical activities of the channel. The streamway influence boundary also defines the area where in-stream and off-channel issues overlap and are addressed in each both plans. Whereas the streamway influence boundary shall be recognized as representative of historical conditions, the current hydraulic conditions of creek shall be considered in decision-making regarding channel and floodplain management.* *Action 4.4-3 from the OCMP shall be replaced by the following action:* *Action 4.4-3: Evaluation of proposed significant modifications to the flood plain, including off-channel mining areas, shall be made with reference to the channel improvement strategy and guidelines presented in the Cache Creek Resource Management Plan. This would ensure a consistent frame of reference and allow consideration of such modifications in the context of an integrated creek management program.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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			Action 4.4-6 shall be amended as follows: *Action 4.4-6: Allow for the design of spillways or other engineered features that provide controlled ~~pit capture during a catastrophic flood event~~ flooding of off-channel mining pits during flood events which exceed the 100-year flood event.* *Performance Standard 4.5-1 shall be amended as follows:* *Performance Standard 4.5-1: All off-channel surface mining operations shall be provided with a minimum one-hundred (100) year flood protection. Off-channel excavations that extend below the existing streambed elevation of Cache Creek shall be designed to minimize the possibility of levee breaching and/or pit capture~~, except under controlled circumstances~~.* *Performance Standard 4.5-2 shall be deleted from the OCMP.* *Performance Standard 4.5-3 shall be amended as follows:* *Performance Standard 4.5-3: Proposed off-channel excavations within the streamway influence boundary shall be set back a minimum of seven-hundred (700) feet from the existing channel bank, unless it is demonstrated ~~in a manner consistent with the Technical Studies~~ that a smaller distance would not adversely affect channel stability. Under no circumstances shall the setback be less than two-hundred (200) feet. The evaluation of the potential for adverse effects of bank erosion or failure of the land separating pits located less than 700 feet from the active channel shall include, at minimum, the following analyses:* • *The 200-foot setback area shall not include portions of the former historic active floodplain or formerly mined lands separated from the active channel by levees or unmined areas less than 200 feet wide (measured perpendicular to the active channel).* • *Identification of the former historic positions of the Cache Creek channels as delineated in the CCRMP Technical Studies, and determination if proposed project is located within the limits of the historic channel.* • *Description of current channel hydraulic conditions (based on existing or site-specific hydraulic models) for the Cache Creek channel adjacent to the site and extending not less than 1,000 feet upstream and downstream of the site.*		

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			• *Determination of erosion potential of stream bank adjacent to the site made on the basis of stream flow velocity and estimated shear stress on bank materials during 100-year flood flows and historic patterns of erosion.* • *Analytical slope stability analysis in conformance with Performance Standards 2.5-16 and 2.5-18. This slope stability analysis of the slopes separating the mining area from the creek channel shall include evaluation of stability conditions during 100-year flood flows in the channel.* • *Future proposed bank stabilization designs, if recommended, shall not conflict with channel design recommendations of the Cache Creek Resource Management Plan unless approved by the Technical Advisory Committee.* *The following Performance Standard shall be added to the OCMP and implementing ordinances:* *Performance Standard 4.5-8: Financial assurances for off-channel mining operations which include mining within 700 feet of the active channel of Cache Creek shall include adequate funding for maintenance during the mining and reclamation period of any bank stabilization features approved for the mining permit. Maintenance of the bank stabilization features following the completion of reclamation shall be the responsibility of the property owners under the Cache Creek Resource Management Plan.*		
Impact 4.3-4: Decreased Availability of Aggregate Resources	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6		*None required.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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IHydrology and Water Quality					
Impact 4.4-1: Potential Impacts to Groundwater Levels, Rate of Flow, and Direction of Flow	A-1a, A-1b, A-2, A-3, and A-4	OCMP, A-5a, A-5b, and A-6	*Mitigation Measure 4.4-1a (OCMP, A-5a, A-5b, A-6)* *Performance Standard 3.5-1 included in the OCMP shall be as follows:* *Performance Standard 3.5-1: The area of backfilled off-channel excavations extending below the groundwater table shall be minimized to reduce changes to groundwater levels and flow. Backfilled pits shall be oriented with regard to the direction of groundwater flow to prevent localized obstructions. If a backfilled off-channel excavation is proposed to penetrate either fifty (50) feet or one-half (½) into the saturated thickness of the shallow aquifer, then at least six months prior to the commencement of excavation below ~~the water table~~ average high groundwater level the applicant shall demonstrate in a manner consistent with the Technical Studies, that the pit design would not adversely affect active off-site wells within one-thousand (1,000) feet of the proposed pit boundary. If the application includes a series of backfilled pits, then the applicant shall also demonstrate that the cumulative effects of the multiple backfilled pits would not adversely affect groundwater flow, if there are any active off-site wells within one-thousand (1,000) feet of the pit boundaries.* *The applicant shall demonstrate, using MODFLOW,[1] that the proposed pit design would not adversely impact active off-site wells within 1,000 feet of the proposed pit boundary. An effect shall be considered adverse if the reduction in simulated groundwater levels exceeds two feet at any well located within 1,000 feet of the pit boundary or results in well failure. Average, historic low groundwater levels, which represent the condition of maximum threat to water levels in the subject well, shall be used for this simulation. If an adverse impact is identified by the MODFLOW simulation, the mining and reclamation plan would be modified or the applicant shall submit a written agreement that the well owner has agreed to relocate or redesign the well (at no expense to the County).* *In addition, the following performance standards measures shall be added to the OCMP:* *3.5-16 Site-specific aquifer testing shall be conducted, if needed, to determine aquifer properties for the required modeling.* *3.5-17 A well survey shall be conducted and all wells within 1,000 feet of the limits of mining plotted on a scaled map. Each property owner owning a parcel(s) within 1,000 feet of the proposed limits of mining shall be contacted and queried about wells that may be located near the mining area.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

[1]MODFLOW is a three-dimensional finite difference model used to simulate groundwater flow. A three-dimensional model would be necessary since aquifer permeability would vary with depth after reclamation.

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Impact 4.4-2: Potential Degradation of Water Quality During Aggregate Mining and Reclamation	A-1a, A-1b, A-2, A-3, and A-4	OCMP, A-5a, A-5b, and A-6	*Mitigation Measure 4.4-2a (OCMP, A-5a, A-5b, A-6)* *Mitigation of potential water quality impacts would be addressed as described in the flowchart presented as Figure 4.4-9. The OCMP and implementing ordinances shall be modified as described below.* *Pollution Prevention* *Performance Standard 3.5-6 of the OCMP and the associated ordinance shall both be modified as follows:* *If any off-channel excavation proposes to extend below the level of seasonal high groundwater ~~level~~, then six months prior to the commencement of excavation below the ~~water table~~ average high groundwater level the applicant shall ~~demonstrate in a manner consistent with the Technical Studies that the pit is sufficiently set back from any active drinking water wells within one-thousand (1,000) feet of the proposed pit boundaries in order to ensure that potential groundwater contamination is prevented~~. identify and locate all off-site wells within 1,000 feet of the proposed mining boundary. If active wells are identified, well characteristics (pumping rate, depth, and locations of screens) shall be determined. If wells are not located within 1,000 feet, the pre-mining impact evaluation would be considered complete.* *If mining is proposed within 1,000 feet of a municipal water supply or within 500 feet of a domestic water supply well, a capture zone analysis shall be conducted using the U.S. Environmental Protection Agency model WHPA. The simulation shall assume 30 days of continuous pumping of the water supply well (at its maximum probable yield) under analysis. A mining setback shall be established so that the capture zone and the pit do not coincide. Alternatively, the applicant shall submit a written agreement that the well owner has agreed to relocate or redesign the well (at no expense to the County). The analysis shall be prepared and signed by a Registered Professional Engineer or Certified Hydrogeologist and submitted to the County for review and shall be submitted to, and approved by, the County at least six months prior to commencement of excavation below the seasonal high groundwater level.* *Any new drinking water wells proposed for installation within 1,000 feet of a proposed wet pit mining area shall be subject to review by the Yolo County Environmental Health Department. The County shall determine, based on site-specific hydrogeology and available water quality data, whether to approve the proposed well installation.* *The County may retain appropriate staff or a contract consultant to provide third party critical review of all hydrogeologic reports related to mining applications.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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			Performance Standard 3.5-3 of the OCMP and the associated ordinance shall be replaced with the following Performance Standard: *Surface water shall be prevented from entering mined areas, through perimeter berms or ditches and grading. Appropriate erosion control measures shall be incorporated into all surface drainage systems. Drainage and detention facilities within the proposed mining areas shall be designed to prevent discharges to the wet pits and surface water conveyances (i.e., creeks and sloughs) from the 20-year/1-hour storm or less. For events greater than the 20-year/1-hour storm, runoff shall be directed into surface water conveyances. Drainage plans shall not rely solely on ditches and berms to direct runoff away from the wet pit. Without proper maintenance, berms and ditches may deteriorate with time and become ineffective. Drainage plans shall emphasize grading of disturbed areas that results in broad gentle slopes that drain away from the pits. Grading plans shall be reviewed by the County to evaluate compliance with drainage plan objectives prior to project approval.* *In addition, a restriction shall be recorded on the deed that requires berms and ditches to be permanently maintained in a condition consistent with the final approval. The deed restriction shall require inspection of the berms and ditches by a registered geologist or professional engineer every five years after completion of reclamation. An inspection report including recommendations for corrective action, if needed, shall be submitted to the Yolo County Community Development Agency following each inspection. The property owner shall be required to implement recommended corrective action, if any. In addition, an inspection easement (which allows County staff or other authorized personnel) to inspect the ditches and berms shall be recorded on the deed.* *Performance Standard 2.5-8 of the OCMP and the associated ordinance shall be modified as follows:* *Unnecessary personnel shall be excluded from off-channel excavations. Open wet pits shall be fenced with a four strand barbed wire fence or the equivalent, prior to the commencement of excavation, during excavation, and during reclamation. Fencing may enclose the property of which mining is a part, the mining site, or both. In addition, signs shall be installed at the project site boundaries and access road, indicating that the excavation area is ~~a danger zone~~ restricted. Additional security (e.g., gates with protected locks and wing fences to prevent drive-arounds) shall be provided at all vehicular access routes. The fencing and gates shall be maintained throughout the mining and reclamation period and after completion of reclamation. A requirement shall be recorded on the deed of the property which requires the landowner to maintain fences and gates.* *The potential for water quality degradation resulting from operation of motorized watercraft is adequately mitigated by Performance Standards 3.5-10 and 2.5-8.*		

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			The potential for eutrophication of the wet pit lakes would be adequately mitigated by Performance Standards 2.5-18 and 3.5-11 (discussed in Impact 4.4-3). *Performance Standard 2.4-11 of the OCMP and associated ordinance shall be deleted.* *Monitoring* *Performance Standard 3.5-4 of the OCMP and the associated ordinance shall be modified as follows:* *All surface mining operations that propose off-channel excavations extending below the groundwater table shall develop and maintain a groundwater monitoring program consisting of two components; water level measurements and water quality testing. A groundwater level monitoring program shall be initiated at least six months prior to removal of overburden. At a minimum, the groundwater level monitoring program shall consist of three monitoring wells, with at least one well upgradient of the wet pit and one well downgradient of the wet pit. Monitoring programs for proposed mining areas exceeding 100 acres (total proposed mining area over the life of the project) shall include one additional well for each 100 acres to be mined. Therefore, proposed mining areas of 1 to 99 acres would require 3 wells, 100 to 199 acres would require four wells, 200 to 299 acres would require 5 wells, and so on. These wells shall be distributed through the vicinity of the proposed mining area and used for groundwater level measurements. Groundwater levels shall be collected from the monitoring wells on a quarterly basis for six months prior to mining and for the duration of the mining period. All wellheads shall be surveyed with horizontal and vertical control to allow calculation of groundwater elevations and development of groundwater contour maps. Groundwater levels shall be measured with an accuracy of plus or minus 0.01 foot, at minimum.* *Water quality in the vicinity of each active wet pit mining location would be evaluated by analyzing samples from selected monitoring wells (one upgradient and one downgradient) and wet pit surface water sampling locations. Since mining would be conducted in phases over a relatively long period of time, pit boundaries would change with time. Selection, and installation if necessary, of downgradient monitoring wells, which would be critical to adequately characterize the groundwater quality in the vicinity of the wet pits, would be proposed by the applicant for review and approval by the County. The selected monitoring wells shall be installed and sampled at least six months prior to removal of overburden. The downgradient wells shall be located as near to active wet pit mining areas as is practical. The upgradient wells shall be located an adequate distance from the proposed mining area to ensure that effect of the wet pit on water quality in the well would be negligible. The water samples from the wet pit shall be collected in a manner so as to ensure that they are representative of water quality within the wet pit. The minimum sampling schedule and required analyses are described below.*		

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			Groundwater level and pit water surface level measurements: *Quarterly in all wells for the duration of mining and reclamation* *For proposed wet pit mining, sample collection and analysis of physical, chemical, and biological constituents shall be conducted according the following specifications:* • *Prior to removal of overburden- One upgradient and one downgradient well shall be sampled at least six months prior to removal of overburden and again at the start of excavation. The samples shall, at minimum, be analyzed for general minerals, inorganics, nitrates, total petroleum hydrocarbons (TPH) as diesel and motor oil, benzene, toluene, ethylbenzene, and xylenes (BTEX), pesticides (EPA 8140 and 8150), and coliform (with E. coli confirmation).* • *During wet pit mining and active reclamation- The wet pit shall be sampled semi-annually for the duration of mining and active reclamation. The samples shall, at minimum, be analyzed for general minerals, inorganics, nitrates, TPH as diesel and motor oil, BTEX, pesticides (EPA 8140 and 8150), and coliform (with E. coli confirmation).* *One upgradient and one downgradient well shall be analyzed, at minimum, for general minerals, inorganics, nitrates, TPH as diesel and motor oil, BTEX, pesticides (EPA 8140 and 8150), and coliform (with E. coli confirmation). The wells shall be sampled according to the following schedule:* *0-2 years: Semi-annually* *2 years to completion of reclamation: Annually* • *After active reclamation- After all heavy equipment work has been completed in the vicinity of the pit, the TPH and BTEX analyses may be discontinued. The wet pit and one upgradient and one downgradient well shall be sampled and analyzed for pH, temperature, nutrients (phosphorus and nitrogen), total dissolved solids, total coliform (with E. coli confirmation), and biological oxygen demand. This monitoring shall be conducted every two years for a ten year period after completion of reclamation.*		

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			A report to the County Community Development Agency and Department of Environmental Health shall be submitted ~~annually regarding the results of the groundwater monitoring program~~ within 30 days of the required groundwater testing. *If, at the completion of the mining and reclamation period, water quality has not been impacted, all monitoring wells shall be destroyed in accordance with California Department of Water Resources Well Standards (DWR, 1991). If the County or other agency wishes to maintain the wells for future water resources evaluation, selected wells could be preserved for this use.* *The County may retain appropriate staff or a contract consultant to provide third party critical review of all hydrogeologic reports related to monitoring.* *Data Evaluation/Corrective Action* *The following Performance Standard shall be added to the OCMP and implementing ordinance.* *PS. 3.5-16: A performance bond shall be acquired to ensure that monitoring continues through the mining period and ten years after the completion of reclamation.* *Action 3.4-4 of the OCMP shall be modified as follows:* *The Yolo County Community Development Agency shall designate staff to ~~begin compiling and coordinating the monitoring information generated by the off-channel mining operations, in order to form the foundation for preparing an ongoing groundwater database covering the entire County~~ coordinate with City, County, regional, and State agencies that may wish to receive copies of data generated from the off-channel mining operations, including the towns of Capay, Esparto, Yolo, and Madison, the city of Woodland, and the Yolo County Flood Control and Water Conservation District, the Water Resources Agency, the Central Valley Regional Water Quality Control Board, and the California Department of Water Resources. The data base shall be expanded to include other relevant sources of information, so that it can be used as reference material for ~~the Water Resources Agency and other~~ regional water planning efforts.*		

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			If at any time during the monitoring period, testing results indicate that sampling parameters exceed Maximum Contaminant Levels (MCLs), as reported in the California Code of Regulations, or established background levels, a qualified professional shall evaluate potential sources of the contaminants. The evaluation shall determine the source and process of migration (surface or subsurface) of the contaminants. A report shall be submitted to the regulatory agencies (Yolo County Community Development Agency and the Central Valley Regional Water Quality Control Board) which identifies the source of the detected contaminants and specifies remedial actions to be implemented by the applicant for corrective action. If it is determined that the source of water quality degradation is off- site, and County and RWQCB are in agreement with this conclusion, the applicant shall not be responsible for corrective action. *If corrective action is ineffective or infeasible, the responsible party must provide reparation to affected well owners, either by treatment of water at the wellhead or by procurement of alternate water supply.* *Analysis of environmental impact for projects in the vicinity of the wet pits shall include consideration of potential water quality impacts on the open water bodies.*		
Impact 4.4-3: Potential Degradation of Water Quality after Reclamation of Mined Lands	A-1a, A-1b, A-2, A-3, and A-4	OCMP, A-5a, A-5b, and A-6	*Mitigation Measure 4.4-3a (OCMP, A-5a, A-5b, A-6)* *In addition to the policies included in the OCMP, the following mitigation measures shall be implemented:* *The potential for eutrophication and biological degradation of wet pit lakes would be adequately mitigated by Performance Standards 2.5-18 and 3.5-11, and Mitigation Measure 4.4-2a.* *The potential for illegal discharges to occur would be adequately mitigated by Mitigation Measure 4.4-2a.* *The potential for water quality degradation resulting from legal operation of motorized watercraft is adequately mitigated by Performance Standard 3.5-10. The potential impacts associated with illegal operation of watercraft in the lakes is adequately mitigated by the requirement for fencing and locked gates, discussed above (Performance Standard 2.5-8).*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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			The potential impacts associated with groundwater quality degradation would be partially mitigated by implementation of the monitoring program described in Mitigation Measure 4.2-2. In addition, the following Performance Standard shall be added to the OCMP and implementing ordinance: *Overburden and processing fines shall be used whenever possible to support reclamation activities around reclaimed wet pits. These materials may be used in reclamation activities without testing for agricultural chemicals. If topsoil (A-horizon soil), formerly in agricultural production, is proposed for use within the drainage area of a wet pit, the soils must be sampled prior to placement and analyzed for pesticides and herbicides (EPA 8140 and 8150). Samples shall be collected and analyzed in accordance with EPA Test Methods for Evaluating Solid Waste Physical/Chemical Methods, SW-846, Third Edition (as updated). Topsoil that contains pesticides or herbicides above the Maximum Contaminant Levels for primary drinking water (California Code or Regulations) shall not be placed in areas that drain to the wet pits.* *The following performance standards shall be added to the OCMP:* *Prior to approval of reclamation of aggregate mining areas to permanent lakes, the County shall commission a sampling and analysis program, to be implemented in one existing wet pit mining area within the OCMP planning area, to evaluate the potential for increased methylmercury production associated with wet pit mining and reclamation of mining areas to permanent lakes. The program shall include sampling of water and sediments from the bottom of the existing pit and analysis of the samples for organic content, pH, dissolved oxygen content, dissolved carbon content, and total mercury. In addition, samples of predatory fish (preferably, largemouth bass) shall be collected and analyzed for mercury and methylmercury content. If the initial sampling indicates either of the following conditions, the County shall perform verification sampling:* • *Average concentrations of total mercury in excess of 0.000012 mg/l in the water;* • *Mercury levels in fish samples in excess of 0.5 mg/kg.* *If verification sampling indicates exceedance of these mercury standards, the County shall not approve reclamation of mining areas to permanent lakes.*		

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			In the event of approval of reclamation of mined areas to permanent lakes, the first lake reclaimed as part of each approved long-range mining plan shall be evaluated annually by the landowner for five years for conditions that could result in significant methylmercury production. The annual evaluations shall be conducted by a qualified aquatic biologist or limnologist and shall include the following analyses: • *Lake condition profiling during the period June through September, including measurements of pH, eH (or redox potential), temperature, dissolved oxygen, and total dissolved carbon.* • *Collection of a minimum of five predator fish (preferably largemouth bass) specimens and analysis of the specimens for mercury and methylmercury content.* *If the average fish specimen mercury content exceeds 0.5 mg/kg for two consecutive years, wet pit mining on property controlled by the mining operator/owner shall be suspended and the owner/operator shall either:* • *Present a revised reclamation plan to the Yolo County Community Development Agency which provides for filling reclaimed lake to a level five feet above average seasonal high groundwater level with a suitable backfill material, or* • *Present a mitigation plan to the Yolo County Community Development Agency which provides a feasible and reliable method for reducing methylmercury production. Potential mitigation could include permanent aeration of bottom levels of the lake, alteration of water chemistry (increasing pH or dissolved organic carbon levels), or control of anaerobic bacteria populations. The mitigation plan would require approval by the Regional Water Quality Control Board, Department of Fish and Game, and the Yolo County Department of Environmental Health.*		
Impact 4.4-4: Loss of Water from Aquifer Storage Due to Evaporation	A-1a, A-1b, A-2, A-3, and A-4	OCMP, A-5a, A-5b, and A-6	*Mitigation Measure 4.4-4a (OCMP, A-5a, A-5b, A-6)* *Performance Standard 3.5-12 of the OCMP shall be modified as follows:* ~~*Reclaimed wet pits shall minimize shallow depths in order to reduce evapotranspiration, unless the shallow areas are being reclaimed to wetland habitat. Wet pits shall be considered shallow when they extend less than ten (10) feet into the groundwater table.*~~ *All permanent wet pits shall be reclaimed to include valuable wildlife habitat to offset evaporation losses from wet pits.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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Impact 4.4-5: Potential Impacts Associated with Groundwater Recharge	A-1a, A-1b, A-2, and A-3	OCMP, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.4-5a (OCMP, A-4, A-5a, A-5b, A-6)* *The County shall eliminate the following Actions and Performance Standards from the OCMP: Objective 3.3-3, Actions 3.4-2, 3.4-6 through 3.4-8, Performance Standards 3.5-7, 3.5-9, 3.5-14, and 3.5-15.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.4-6: Potential Impacts Resulting from Storm-Related Flooding	A-1a, A-1b, A-2, and A-3	OCMP, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.4-6a (OCMP, A-4, A-5a, A-5b, A-6)* *The following performance standard shall be added to the OCMP:* *Performance Standard 4.5-8: Flood protection upgrades shall be completed in the vicinity of the mining and processing areas, if necessary, to ensure protection from the 100-year flood event. Flood protection shall be provided from flooding associated with overtopping of the alluvial separators or levees along Cache Creek and all tributaries and drainage channels (including, but not limited to, Willow Slough and Lamb Valley Slough).* *The flood protection upgrades shall be designed and constructed to provide the necessary 100-year protection without exacerbating downstream flooding problems. Downstream flooding could be increased if floodplain storage areas were removed from the drainage system by constructing levees in areas where they did not exist before (or raising levees that are overtopped in floods up to the 100-year event). Alternative flood management design systems (potentially using detention basins, infiltration galleries, and/or floodplain storage in noncritical areas) shall be required as a condition of project approval.* *The following performance standard shall be added to the OCMP:* *Performance Standard 4.5-9: The County Floodplain Administrator shall file for a Letter of Map Revision with FEMA, to update the FIRMs affected by channel maintenance activities and levee improvements with the planning area every ten years.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.4-7: Potential Impacts from Flooding Related to Dam Failure	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6		*None required.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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Impact 4.4-8: Potential Impacts Associated with Inundation of Dry Pits or Lowered Reclaimed Surfaces by High Groundwater Conditions	A-1a, A-1b, A-2, A-3, and A-4	OCMP, A-5a, A-5b, and A-6	*Mitigation Measure 4.4-8a (OCMP, A-5a, A-5b, A-6)* *The following performance standard shall be added to the OCMP and associated ordinance:* *Performance Standard 3.5-16: The final distance between reclaimed lowered surfaces and average high groundwater shall not be less than five feet. The average high groundwater level shall be established for each proposed mining area. The degree of groundwater level fluctuation varies with location throughout the basin and within relatively small areas (proposed mining sites). The determination of average high groundwater level shall be conducted by a professional engineer or certified hydrogeologist and shall be based on wet season water level elevation data collected at the proposed site or adjacent areas with similar hydrogeological conditions. Water level records prior to 1977 shall not be used since they would reflect conditions prior to installation of the Indian Valley Dam. The dam caused a significant change in hydrology of the basin and data collected before its installation shall not be used in estimation current average high groundwater levels. The wells shall be adequately distributed throughout the proposed mining site to reflect spatial variation in groundwater levels and fluctuations.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Agriculture					
Impact 4.5-1: Consistency with the California Land Conservation Act of 1965 (Williamson Act) Regulations	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6		*None required.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.5-2: Potential Impact of Permanent Loss of Agricultural Land Caused by Conversion of Agricultural Land to Other Post-Reclamation Uses		OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.5-2a (OCMP, A-4, A-5a, A-5b, A-6)* *The following Performance Standards shall be included in OCMP:* *Performance Standard 4.5-8: All proposed mining and reclamation plans shall provide information in permit applications to allow identification of portions of the proposed mined lands that meet the definition of "prime farmlands" as defined under the Williamson Act.*		OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6

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			Performance Standard 4.5-9: All mining permit applications that include "prime farmlands" as defined by the provisions of the Williamson Act shall identify the location and acreage of "prime farmlands" which, as a result of reclamation, would be permanently converted to non-agricultural uses. For each acre of "prime farmland" that would be converted to non-agricultural use, the reclamation plan shall present provisions to offset (at a 1:1 ratio) the conversion of these lands. The potential offsets can include, but not be limited to one or more of the following options: *• Identification of improvements by a qualified soil scientist to the agricultural capability of non-prime lands within or outside the project site that convert non-prime to prime agricultural conditions. These improvements can include permanent improvement of soil capability though soil amendments, reduction of soil limitations (such as excessive levels of toxins), or improvements in drainage for areas limited by flooding or low permeability soils.* *• Placement of permanent Agricultural Preserve easements on lands meeting Williamson Act definition of "prime farmland" that are not currently under Williamson Act contract.* *• Demonstration of the ability to provide irrigation to non-prime lands limited only by lack of irrigation water supply. The identified water supply cannot be made at the expense of "prime farmlands" currently using the same water supply.* *Mitigation Measure 4.5-2b (A-2, A-3)* *None required. However, agencies regulating aggregate mining projects in agricultural areas outside Yolo County shall consider adopting regulations similar to Performance Standard 4.5-9 to reduce the impacts of permanent conversion of agricultural land to non-agricultural uses.* *Mitigation Measure 4.5-2c (A-1a, A-1b)* *None available.*		
Impact 4.5-3: Potential Impacts of the Temporary Loss of Agricultural Productivity Due to Disturbance by Mining		OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.5-3a (OCMP, A-4, A-5a, A-5b, A-6)* *The following performance standard shall be added to OCMP:* *Performance Standard 5.5-3: All proposed mining and reclamation plans shall present a phasing plan for mining and reclamation activities. The phasing plan shall be structured to minimize the area of disturbed agricultural lands during each mining phase, and encourage the early completion of reclamation of agricultural land.*		OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6

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			Mitigation Measure 4.5-3b (A-1a, A-1b) *None available.* *Mitigation Measure 4.5-3c (A-2, A-3)* *Agencies regulating aggregate mining projects in agricultural areas outside Yolo County shall adopt performance standards, similar to Performance Standard 5.5-3 of the OCMP, to minimize the area and duration of disturbance of agricultural lands.*		
Impact 4.5-4: Permanent Loss of Agricultural Soils Due to Wind or Water Erosion	A-1a and A-1b	OCMP, A-2, A-3, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.5-4a (OCMP, A-2, A-3, A-4, A-5a, A-5b, A-6)* *OCMP Action 5.5-2 shall be amended as follows :* *Action 5.5-2: Topsoil, subsoil, and subgrade materials in stockpiles shall not exceed (40) feet in height, with slopes no steeper than 2:1 (horizontal:vertical). Stockpiles shall be seeded with a vegetative cover to prevent erosion and leaching. The use of topsoil for purposes other than reclamation shall not be allowed without the prior approval of the Community Development Director.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.5-5: Potential Impacts on Agricultural Capability Caused by Soil Management During Removal, Stockpiling, and Reuse		OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	*None required.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.5-6: Potential Impacts on Agricultural Production Related to Lowered Reclaimed Surfaces	A-1a and A-1b	OCMP, A-2, A-3, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.5-6a (OCMP, A-2, A-3, A-4, A-5a, A-5b, A-6)* *The OCMP and ordinances shall be augmented with the following standard:* *Performance Standard 5.5-5: Reclaimed agricultural surfaces shall be graded to provide adequate field gradients to allow surface/furrow irrigation of crops and allow for adequate storm water drainage.* *Mitigation Measure 4.5-6b (A-4, A-5a, A-5b, A-6)* *The addition of Performance Standard 3.5-16 (Mitigation Measure 4.4-2a) would reduce the potential damage to crops by high groundwater conditions.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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Impact 4.5-7: Potential Cumulative Loss of Productive Agricultural Land Within Yolo County		OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.5-7a (OCMP, A-1a, A-1b, A-4, A-5a, A-5b, A-6)* *Implementation of Mitigation Measure 4.5-2a would reduce the cumulative impact of permanent conversion of agricultural land to non-agricultural uses but not to a less-than-significant level.* *Mitigation Measure 4.5-7b (A-2, A-3)* *No enforceable mitigation available.*		OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6
Biological Resources					
Impact 4.6-1: Impact on Existing Vegetative Cover	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6		*None required.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.6-2: Impact on Sensitive Natural Community Types		OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.6-2a (OCMP, A-4, A-5a, A-5b, A-6)* *Section 10-4.502(b)(1) of the Off-Channel Surface Mining Ordinance shall be revised as follows:* *...The analysis shall propose appropriate measures to reduce any potential adverse impacts to species of concern, sensitive natural communities, or significant habitat.* *The following revisions shall be made to Performance Standard 6.5-2 of the OCMP:* 6.5-2. Avoid disturbance of ~~R~~riparian vegetation, including identified off-channel vegetation ~~shall be retained~~. Replacement habitat shall be established where complete avoidance is not possible ~~or replaced~~ according to a habitat restoration plan prepared by a qualified biologist, consistent with the goals of this plan. *The following shall be included as an additional Performance Standard in Chapter 6 of the OCMP:* *6.4-12. Avoid disturbance of oak woodland vegetation and mature oaks Replacement habitat and plantings shall be established where complete avoidance is not possible according to a habitat restoration plan prepared by a qualified biologist, consistent with the goals of this plan.* *Mitigation Measure 4.6-2b (A-1a, A-1b, A-2, A-3)* *None Required.*	OCMP, A-4, A-5a, A-5b, and A-6	A-1a, A-1b, A-2, and A-3

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Environmental Impact	Level of Significance Before Mitigation		Mitigation Measures	Level of Significance After Mitigation	
	LS	S		LS	SU
Impact 4.6-3: Disturbance to Wildlife Habitat and Disruption of Movement Corridors		OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.6-3a (OCMP, A-4, A-5a, A-5b, A-6)* *The following shall be incorporated as an additional Action policy in Chapter 6 of the OCMP:* *6.4-13. Where fence row habitat previously existed, reestablish fence row habitat as part of reclamation to agricultural use to replace and improve the wildlife habitat value of agricultural lands, allowing for reestablishment of scattered native trees, shrubs, and ground covers along the margins of reclaimed fields. Reestablished habitat can be in locations other than where occurred originally. Restoration plans shall specify ultimate fence row locations, identify planting densities for trees and shrubs, and include provisions for monitoring and maintenance to ensure establishment.* *The following shall be incorporated as an additional Action policy in Chapters 6 and 7 of the OCMP:* *6.4-14 and 7.4-9. Avoid disturbance to important wildlife habitat features such as nest trees, colonial breeding locations, elderberry host plants for VELB, and essential cover associated with riparian forest and oak woodland habitat. This shall include sensitive siting of haul roads, trails, and recreational facilities away from these features.* *Mitigation Measure 4.6-3a (A-1a, A-1b, A-2, A-3)* *None Required.*	OCMP, A-4, A-5a, A-5b, and A-6	A-1a, A-1b, A-2, and A-3
Impact 4.6-4: Impact on Special-Status Species		OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.6-4a (OCMP, A-4, A-5a, A-5b, A-6)* *The following shall be included as additional Action policies in Chapter 6 of the OCMP:* *6.4-15. Essential habitat for special-status species shall be protected and enhanced, or replaced as part of mitigation plans prepared by a qualified biologist.* *6.4-16. Restoration components of reclamation plans shall include provisions to enhance habitat for special-status species, where feasible.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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			Performance Standard 6.5-3 of the OCMP shall be replaced with the following: *6.5-3. Slopes on stockpiled soils shall be graded to 2:1 for long-term storage to prevent use by bank swallows. At no time during the active breeding season (1 May through 31 July) shall slopes on stockpiles exceed 1:1, even on a temporary basis. Stockpiles shall be graded to a minimum 1:1 slope at the end of each work day where stockpiles have been disturbed during the active breeding season.* *Performance Standard 6.5-7 of the OCMP shall be revised as follows:* *6.5-7. Proposed habitat restoration or mitigation plans shall be sent to the California Department of Fish and Game, U.S. Fish and Wildlife Service, and the U.S. Army Corps of Engineers for review and comment to ensure that the projects do not conflict with other existing habitat enhancement efforts.* *Performance Standard 6.5-8 of the OCMP shall be revised as follows:* *6.5-8 All surface mining operations and reclamation plans shall complement the preservation and enhancement measures in ~~requirements of~~ the Yolo County Habitat ~~Management~~ Conservation Plan. Mining operators with lands designated as having a moderate to high potential for use as mitigation areas in the HCP shall be encouraged to participate in the Developer HCP Participation Options, including use of lands as mitigation sites.*		
Impact 4.6-5: Modifications to Jurisdictional Wetlands or Other Waters		OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.6-5a (OCMP, A-4, A-5a, A-5b, A-6)* *The following shall be included as an additional Action policy in Chapter 6 of the OCMP:* *6.4-14. Existing jurisdictional wetlands shall be retained to the extent possible. Replacement wetlands shall be provided where complete avoidance is not possible according to a habitat restoration plan prepared by a qualified wetland specialist and approved by jurisdictional agencies, ensuring no net loss of wetland acreage or habitat value.* *Performance Standard 6.5-7 of the OCMP shall be revised as recommended in Mitigation Measure 4.6-4a.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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	LS	S		LS	SU
Impact 4.6-6: Compatibility and Consistency of Restoration Provisions		OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.6-6a (OCMP, A-4, A-5a, A-5b, A-6)* *Action Policy 6.4-2 of the OCMP shall be revised as follows:* *6.4-2. Coordinate with the California Department of Fish and Game, U.S. Fish and Wildlife Service, and U.S. Army Corps of Engineers to ensure that proposed habitat restoration projects ~~do not conflict~~ are consistent with or complement the Off-Channel Mining Plan.* *Performance Standard 6.4-10 of the OCMP shall be revised as follows:* *6.4-10. Restore riparian habitat throughout the planning area, wherever appropriate. However, revegetative efforts shall be primarily focussed on implementing recommendations ~~Zones 1 and 2 of the Recommended Management Activity Zones, as~~ described in the Technical Studies and the subsequent Restoration Recommendations incorporated into the CCRMP.* *Performance Standard 6.5-9 of the OCMP shall be revised as follows:* *6.5-9. If any wet pit is proposed to be reclaimed for recreational uses and/or riparian habitat, the ~~application shall~~ design shall ~~the facility to~~ account for fluctuations in the groundwater table.* *Performance Standard 6.5-7 of the OCMP shall be revised as recommended in Mitigation Measure 4.6-4a.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Air Quality					
Impact 4.7-1: Potential Emissions of PM_{10}	A-1a, A-2, A-3, A-4, and A-5a	OCMP, A-1b, A-5b, and A-6	*Mitigation Measure 4.7-1a (OCMP, A-1b, A-5b, A-6)* *The following Performance Standards shall be added to the OCMP:* *Wherever practical and economically feasible, portable or movable conveyor systems shall be used to transport raw materials and overburden.*	A-1a, A-2, A-3, A-4, and A-5a	OCMP, A-1b, A-5b, and A-6

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	LS	**S**		**LS**	**SU**
Impact 4.7-2: Potential Emissions of Ozone Precursors (ROG and NO_x)	A-1a, A-2, A-4, and A-5a	OCMP, A-1b, A-3, A-5b, and A-6	*Mitigation Measure 4.7-2a (OCMP, A-1b, A-3, A-5b, A-6)* *The following Performance Standards shall be added to the OCMP:* *Wherever practical and economically feasible, portable or movable conveyor systems shall be used to transport raw materials and overburden.* *OCMP Performance Standard 2.5-7 and proposed Off-Channel Surface Mining Ordinance Section 10.4.11 shall be amended as follows:* *All ~~operational heavy equipment~~ internal combustion engine driven equipment and vehicles shall be kept tuned according to the manufacturer's specifications and properly maintained to minimize the leakage of oils and fuels. No vehicles or equipment shall be left idling longer than 5 minutes.*	A-1a, A-2, A-4, and A-5a	OCMP, A-1b, A-3, A-5b, and A-6
Impact 4.7-3: Cumulative Effects on Attainment of State and Federal Standards	A-1a, A-4, and A-5a	OCMP, A-1b, A-2, A-3, A-5b, and A-6	*Mitigation Measure 4.7-3b (OCMP, A-1b, A-2, A-3, A-5b, A-6)* *No enforceable mitigation measures are available.*	A-1a, A-4, and A-5a	OCMP, A-1b, A-2, A-3, A-5b, and A-6
Impact 4.7-4: Potential Impacts on Sensitive Receptors	OCMP, A-1a, A-2, A-3, A-4., A-5a, A-5b, and A-6	A-1b	*Mitigation Measure 4.7-4a (A-1b)* *None available.*	OCMP, A-1a, A-2, A-3, A-4., A-5a, A-5b, and A-6	A-1b
Traffic and Circulation					
Impact 4.8-1: Potential Increase in Trips Associated with Recycling	OCMP, A-1a, A-1b, A-2, A-3, A-4., A-5a, A-5b, and A-6		*None required.*	OCMP, A-1a, A-1b, A-2, A-3, A-4., A-5a, A-5b, and A-6	

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Impact 4.8-2 Potential for Increase in Vehicle Trips	A-la, A-1b, A-2, A-4, and A-5a	OCMP A-3, 5b, and 6	*Mitigation Measure 4.8-2a (OCMP, A-3, A-5b, and A-6)* *Performance Standard 2.5-5 of the OCMP and Section 10-4.407 of the Off-Channel Surface Mining Ordinance shall be amended as follows:* *As a condition of approval, the operator shall ~~be required to construct~~ agree to assume joint pavement maintenance responsibility with the County (or shared with another producer using the same roadway) for all County roads along a designated haul route ~~to an engineered standard as established by the Public Works Department,~~ from the access point of the surface mining operation to the nearest State Highway. ~~Construction of the required improvements shall be completed prior to commencement of the mining operation.~~ The operator shall agree to submit an evaluation of the structural integrity of the identified roadways on or before December 1 of each year in which mining operations are permitted. The report shall be prepared by a registered professional engineer and/or Country staff with expertise in the area of roadway pavement and shall be subject to the approval of the Public Works Department. Based on the results of this annual evaluation, the Public Works Department shall identify the improvements required to maintain safe and efficient traffic operations on the road for the upcoming year. The County agrees to implement maintenance improvements similar to other County roads (i.e., fill cracks and chip seal). The operator agrees to implement the improvements beyond the typical County improvements in a timeframe set forth by the Public Works Department. ~~As an alternative, the operator may provide security in a form authorized by County Counsel equal to the estimated cost of road construction improvements, in which case improvements shall be completed within one (1) year.~~* *If a subsequent mining operation utilizes a road previously required to be improved pursuant to this subsection, then the subsequent operator shall ~~make a payment to the County based on an equitable portion of the relative impact of the proposed project. The amount paid to the County shall be reimbursed to the operator who made the previous road improvement~~ be responsible for compliance with the agreements and requirements of the previous operator.*	A-la, A-1b, A-2, A-4, and A-5a	OCMP, A-3, 5b and 6

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Environmental Impact	Level of Significance Before Mitigation		Mitigation Measures	Level of Significance After Mitigation	
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Impact 4.8-3: Potential Change in LOS at the State Route 16 / Road 98 / Main Street Intersection	A-la, A-1b, A-2, A-4, and A-5a	OCMP, A-3, A-5b, and A-6	*Mitigation Measure 4.8-3a: (OCMP, A-3, A-5b, A-6)* *The following performance standard shall be added to the OCMP and its implementing ordinance:* *Each operator shall pay its fair share toward improvements required to maintain LOS C operations on County roads or LOS D operations on State Highways. Fair share mitigation shall also be required to improve existing operational deficiencies of the transportation system. Specific locations shall be identified through the project-specific environmental review process for each operator's long-term mining permit application. Each operator shall participate in a funding program operated by Yolo County which is designed to ensure that all improvements are made in a timely manner and that a reimbursement mechanism is in place to ensure repayment of any costs contributed in excess of fair share amounts. The program shall be initiated upon the approval of the long-term mining permits and shall be updated biennially by Yolo County to ensure any new or modified impacts or funding sources are being addressed.*	OCMP, A-1a, A-1b, A-2, A-3, A-4., A-5a, A-5b, and A-6	
Impact 4.8-4: Potential Change in LOS at the State Route 16 / Road 89 Intersection	A-1a, A-1b, A-2, A-4, and A-5a	*OCMP, A-3, A-5b, and A-6*	*Mitigation Measure 4.8-4a (OCMP, A-3, A-5b, A-6)* *Implementation of Mitigation Measure 4.8-3a would reduce this impact to a less-than-significant level for the OCMP and Alternatives 3, 5b and 6.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.8-5: Potential Impacts to the Non-Standard Segment of Road 19, West of Interstate 505	A-1a, A-1b, A-2, A-3	OCMP, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.8-5a (OCMP, A-4, A-5a, A-5b, A-6)* *Implementation of Mitigation Measure 4.8-3a would reduce this impact to a less-than-significant level for the OCMP and Alternatives 4, 5a, 5b and 6.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.8-6: Potential Impacts to the Non-Standard Segment of State Route 16 Between I-505 and the Entrance to the Solano Concrete Plant	A-1a, A-1b, A-2, A-4, and A-5a	OCMP, A-3, A-5b, and A-6	*Mitigation Measure 4.8-6a (OCMP, A-3, A-5b, A-6)* *Implementation of Mitigation Measure 4.8-3a would reduce this impact to a less-than-significant level for the OCMP and Alternatives 3, 5b and 6.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.8-7: Potential Impacts to the Non-Standard Segment of Road 14, West of Interstate 505	A-1a, A-1b, A-2, A-3	OCMP, A-4, A-5a, A- 5b, and A-6	*Mitigation Measure 4.8-7a (OCMP, A-4, A-5a, A-5b, A-6)* *Implementation of Mitigation Measure 4.8-3a would reduce this impact to a less-than-significant level for the OCMP and Alternatives 4, 5a, 5b and 6.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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Impact 4.8-8: Potential Impacts to the Non-Standard Pavement Segment of Road 14, West of Interstate 505	A-1a, A-1b, A-2, A-3	OCMP, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.8-8a (OCMP, A-4, A-5a, A-5b, A-6)* *Implementation of Mitigation Measure 4.8-3a would reduce this impact to a less-than-significant level for the OCMP and Alternatives 4, 5a, 5b and 6.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.8-9: Potential Impacts to Two Non-Standard Bridges on Road 89, North of State Route 16	A-1a, A-1b, A-2, A-4, and A-5a	OCMP, A-3, A-5b, and A-6	*Mitigation Measure 4.8-9a (OCMP, A-3, A-5b, A-6)* *Implementation of Mitigation Measure 4.8-3a would reduce this impact to a less-than-significant level for the OCMP and Alternatives 3, 5b and 6.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.8-10: Potential Impacts to a Non-Standard Bridge on Road 19, West of Interstate 505	A-1a, A-1b, A-2, A-3	OCMP, A-3, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.8-10a (OCMP, A-4, A-5a, A-5b, A-6)* *Implementation of Mitigation Measure 4.8-3a would reduce this impact to a less-than-significant level for the OCMP and Alternatives 4, 5a, 5b and 6.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.8-11: Potential Impacts to a Non-Standard Bridge on Road 85, North of Road 16A	A-1a, A-1b, A-2, A-3	OCMP, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.8-11a (OCMP,* A-4, A-5a, *A-5b, A-6)* *Implementation of Mitigation Measure 4.8-3a would reduce this impact to a less-than-significant level for the OCMP and Alternatives 4, 5a, 5b and 6.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.8-12: Potential Impacts to a Non-Standard Bridge on Road 14, West of Interstate 505	A-1a, A-1b, A-2, A-3	OCMP, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.8-12a (OCMP,* A-4, A-5a, *A-5b, A-6)* *Implementation of Mitigation Measure 4.8-3a would reduce this impact to a less-than-significant level for the OCMP and Alternatives 4, 5a, 5b and 6.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.8-13: Potential Impacts to the Non-Standard Curve Radii at the Road 85 / Road 14 Intersection	A-1a, A-1b, A-2, A-3	OCMP, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.8-13a (OCMP,* A-4, A-5a, *A-5b, A-6)* *Implementation of Mitigation Measure 4.8-3a would reduce this impact to a less-than-significant level for the OCMP and Alternatives 5a, 5b and 6.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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Impact 4.8-14: Potential Impacts to the Non-Standard Curve Radii at the State Route 16 / Road 89 Intersection	A-1a, A-1b, A-2, A-4, and A-5a	OCMP, A-3, A-5b, and A-6	*Mitigation Measure 4.8-14a (OCMP, A-3, A-5b, A-6)* *Implementation of Mitigation Measure 4.8-3a would reduce this impact to a less-than-significant level for the OCMP and Alternatives 3, 5b and 6.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.8-15: Potential Impacts to the Non-Standard Curve Radii at the Road 20 / Road 96 Intersection	A-1a, A-1b, A-2, A-4, and A-5a	OCMP, A-3, A-5b, and A-6	*Mitigation Measure 4.8-15a (OCMP, A-3, A5b, A-6)* *Implementation of Mitigation Measure 4.8-3a would reduce this impact to a less-than-significant level for the OCMP and Alternatives 3, 5b and 6.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.8-16: Potential for Accelerated Pavement Deterioration	A-1b an d A-2	OCMP, A-1a, A-3, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.8-16a (OCMP, A-1a, A-3, A-4, A-5a, A-5b, A-6)* *Implementation of Mitigation Measure 4.8-2a would reduce this impact to a less-than-significant level for the OCMP and Alternatives 1a, 3, 4, 5a, 5b and 6.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Noise					
Impact 4.9-1: Exposure to Unacceptable Noise Levels from Mining, Processing, Hauling, Reclamation, and Post-Reclamation Activities On Site	A-1a, A-1b, A-2, and A-3	OCMP, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.9-1a (OCMP, A-4, A-5a, A-5b, A-6)* *The performance standards in the Off-Channel Surface Mining Ordinance (Section 10-4.418) shall be modified so that the residential noise limit is a CNEL of 60 dB rather than the currently specified L_{eq} of 60 dB. This change shall also be made in the Off-Channel Mining Plan.* *Mitigation Measure 4.9-1b (OCMP, A-4, A-5a, A-5b, A-6)* *From 6:00 a.m. to 6:00 p.m., noise levels shall not exceed an average noise level equivalent (L_{eq}) of eighty (80) decibels (dBA) measured at the property boundaries of the site. However, noise levels may not exceed an average noise level equivalent (L_{eq}) of sixty (60) decibels for any nearby off-site residences or other noise-sensitive land uses.* *From 6:00 p.m. to 6:00 a.m., noise levels shall not exceed an average noise level equivalent (L_{eq}) of sixty-five (65) decibels (dBA) measured at the property boundaries of the site.* *Noise levels shall not exceed a community noise equivalent level (CNEL) of sixty (60) decibels (dBA) for any nearby off-site residence or other noise-sensitive land uses.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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Table 2-1: SUMMARY OF IMPACTS AND MITIGATION MEASURES					
Environmental Impact	Level of Significance Before Mitigation		Mitigation Measures	Level of Significance After Mitigation	
	LS	S		LS	SU
			Mitigation Measure 4.9-1c (OCMP, A-4, A-5a, A-5b, A-6) *The following Performance Standard shall be added to the OCMP:* *Mining activities shall not exceed the noise limit of CNEL 60 dB at existing residences. An existing residence shall be considered the property line of any residentially zoned area or, in the case of agricultural land, any occupied residential structures. Achieving the noise standards could involve setbacks as proposed in the Off-Channel Surface Mining Ordinance (Section 10.4.425), the use of quieter equipment adjacent to residences, or the construction of landscaped berms between mining activities and residences.*		
Impact 4.9-2: Exposure to Unacceptable Increases in Noise Generated by Off-Site Truck Traffic	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6		*None required.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.9-3: Contribution to Increase in Cumulative Noise	A-2	OCMP, A-1a, A-1b, A-3, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.9-3a (OCMP, A-4, A-5a, A-5b, A-6)* *The following performance standard shall be added to the OCMP and its implementing ordinances:* *Operators shall provide acoustical analysis for future truck and traffic noise associated with the individual operations along County roadways identified as experiencing significant impacts due to increased traffic noise. The study shall identify noise levels at adjacent noise-sensitive receptors and ways to control the noise to the "normally acceptable" goal of a CNEL of 60 dB and reduce the increase over existing conditions to 5 dB or less. Typical measures that can be employed include construction of noise barriers (wood or masonry), earthen berms, or re-routing of truck traffic.* *Mitigation Measure 4.9-3c (A-1a, A-1b, A-3)* *Existing mining ordinances shall be modified to require an acoustical analysis for future truck and traffic noise associated with individual operations along County roadways identified as experiencing significant impacts due to increased traffic noise. The study shall identify noise levels at adjacent noise-sensitive receptors and ways to control the noise to the "normally acceptable" goal of a CNEL of 60 dB and reduce the increase over existing conditions to 5 dB or less. Typical measures that can be employed include construction of noise barriers (wood or masonry), earthen berms, or re-routing of truck traffic.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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Environmental Impact	Level of Significance Before Mitigation		Mitigation Measures	Level of Significance After Mitigation	
	LS	S		LS	SU
Impact 4.9-4: Generation of Vibration or Nuisance Noise	A-1a, A-1b, and A-2	OCMP, A-3, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.9-4a (OCMP, A-3, A-4, A-5a, A-5b, A-6)* *The following new performance standard shall be added to the OCMP:* *If mining occurs within 1500 feet of residences, equipment used during nighttime activities shall be equipped with non-sonic warning devices consistent with OSHA regulations, which may include fencing of the area to avoid pedestrian traffic, adequate lighting of the area, and placing an observer in clear view of the equipment operator to direct backing operations. Prior to commencement of operations without sonic warning devices, operators shall file a variance request with the Cal OSHA Standards Board showing that the proposed operation would provide equivalent safety to adopted safety procedures, including sonic devices.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Aesthetics					
Impact 4.10-1: Effects on Existing Views or Vistas During Mining	A-2 and A-3	OCMP, A-1a, A-1b, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.10-1a (OCMP, A-4, A-5a, A-5b, A-6)* *In conjunction with the environmental review of individual projects permitted under the OCMP, means of minimizing the visibility of mining operations, facilities and landform alterations from public viewpoints shall be assessed based on site-specific visual characteristics and viewing conditions. The use of berms, vegetative screens, seeding, special plant materials and contouring the sides and top surfaces of modified landforms, or other measures, shall be incorporated into the individual mine and reclamation plans as appropriate.* *Mitigation Measure 4.10-1b (OCMP, A-4, A-5a, A-5b. A-6)* *Where mining occurs within 1,000 feet of a public right-of-way, including Roads 85, 87, 89, 94B and I-505, the operators shall phase mining such that no more than 50 acres of the area that lies within 1,000 feet of the right-of-way would be actively disturbed at any time. Actively disturbed areas are defined as those on which mining operations of any kind, or the implementation of reclamation such as grading, seeding or installation of plant material are taking place.* *Mitigation Measure 4.10-1c (A-1a, A-1b)* *None available.*		OCMP, A-1a, A-1b, A-4, A-5a, A-5b, and A-6

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Environmental Impact	Level of Significance Before Mitigation		Mitigation Measures	Level of Significance After Mitigation	
	LS	S		LS	SU
Impact 4.10-2: Effects on Views or Vistas Following Reclamation	OCMP, A-4, A-5a, A-5b, and A-6	A-1a, A-1b, A-2, and A-3	*Mitigation Measure 4.10-2a (OCMP, A-4, A-5a, A-5b, A-6)* *None required. However, the following measure would further reduce impacts:* *In conjunction with the environmental review of individual projects permitted under the OCMP, further means of improving the appearance of the landscape after reclamation shall be assessed based on site-specific visual characteristics, site lines and view corridors. The use and placement of berms, vegetative screens, special plant materials, grading slopes and contouring the sides and top surfaces of modified landforms to mimic surrounding landforms, or other measures, shall be incorporated into the mine reclamation plans as appropriate.* *Mitigation Measure 4.10-2b (A-1a, A-1b, A-2 and A-3)* *No mitigation available.*	OCMP, A-4, A-5a, A-5b, and A-6	A-1a, A-1b, A-2, and A-3
Impact 4.10-3: Potential for Visual Incompatibility with Surrounding Land Uses	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6		*None required.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.10-4: Introduction of Light and Glare	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6		*None required.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.10-5: Consistency with Yolo County General Plan Policies	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6		*None required.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Issue 4.10-6: Contribution to Cumulative Visual Impacts	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6		*None required.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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Environmental Impact	Level of Significance Before Mitigation		Mitigation Measures	Level of Significance After Mitigation	
	LS	S		LS	SU
Cultural Resources					
Impact 4.11-1: Potential Impacts to Cultural Resources		OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.11-1a (OCMP, A-4, A-5a, A-5b, A-6)* *The following Performance Standard shall be added to the OCMP:* *Damaging effects on cultural resources shall be avoided whenever possible. If avoidance is not feasible, the importance of the site shall be evaluated by a qualified professional prior to commencement of mining operations. If a cultural resource is determined not to be important, both the resource and the effect on it shall be reported to the County, and the resource need not be considered further. If avoidance of an important cultural resource is not feasible, a mitigation plan shall be prepared and implemented. The mitigation plan shall explain the importance of the resource, describe the proposed approach to mitigate destruction or damage to the site, and demonstrate how the proposed mitigation would serve the public interest.* *In addition, Performance Standard 2.5-3 of the OCMP shall be modified as follows:* *If human skeletal remains are encountered during excavation, all work within seventy-five (75) feet shall immediately stop, and the County Coroner shall be notified within twenty-four (24) hours. If remains are of Native American origin, the appropriate Native American community identified by the Native American Heritage Commission shall be contacted, and an agreement for treating or disposing of, with appropriate dignity, the remains and associated grave goods shall be developed. If any cultural resources such as chipped or ground stone, historical debris, building foundations, or paleontological materials are encountered during excavation, then all work within seventy-five (75) feet shall immediately stop and the Director shall be notified at once. Any cultural resources found on the site shall be recorded by a qualified archaeologist and the information shall be submitted to the County.* *Mitigation Measure 4.11-1b (A-1a, A-1b, A-2, A-3)* *None required. Impacts to cultural resources within areas where mining currently is permitted or in off-site areas are subject to existing State and Federal regulations and restrictions related to the disturbance of cultural resources.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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Environmental Impact	Level of Significance Before Mitigation		Mitigation Measures	Level of Significance After Mitigation	
	LS	S		LS	SU
Hazards					
Impact 4.12-1: Potential Human Health And/Or Environmental Impacts from the Accidental Release of Petroleum Products and Other Chemicals Used During Mining and Reclamation And/Or at Processing Plants	A-1a, A-1b, A-2, and A-3	OCMP, A-4, A-5a, A-5b, and A-6	*Mitigation Measure 4.12-1a (OCMP, A-4, A-5a, A-5b, A-6)* *Goal 2.2-4 shall be revised as follows:* *Eliminate or minimize hazards to the public health and safety that are associated with surface mining operations and reclamation.* *Objective 2.3-3 shall be revised as follows:* *Provide standards and procedures for regulating surface mining operations and reclamation so that hazards are eliminated or minimized and potential adverse environmental effects are reduced or prevented.* *Action 2.4-2 shall be revised as follows:* *Improve the County's monitoring of surface mining by requiring that all operations within the planning area submit detailed annual reports, as well as copies of permits approved by other agencies of jurisdiction. Hazardous materials business plans must be submitted biannually, as required by the Health and Safety Code, unless the types of hazardous materials used change, in which case revised business plans must be submitted within 30 days of the change. This would enable the County to better assess the impacts of off-channel mining and the success of reclamation efforts.* *The following Performance Standard shall be added to the Aggregate Resources Element of the OCMP:* *Fueling and maintenance activities of rubber-tired equipment are prohibited within 100 feet of open bodies of water during mining and reclamation. All Storm Water Pollution Prevention Plans shall include provisions for releases of fuels during fueling activities for draglines.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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Environmental Impact	Level of Significance Before Mitigation		Mitigation Measures	Level of Significance After Mitigation	
	LS	S		LS	SU
			Objective 3.3-3 and Action 3.4-3 shall be revised as follows: *Objective 3.3-3: Ensure that off-channel surface mines are operated such that surface and groundwater supplies are not adversely affected by erosion, lowering of the water table, and/or contamination <u>during mining and reclamation</u>.* *Action 3.4-3: Include a groundwater monitoring program as a condition of approval for any surface mining <u>and reclamation</u> operation that proposes off-channel excavations that extend below the groundwater level. The monitoring program shall require regular groundwater level data, as well as ~~an annual test for~~ a water quality <u>monitoring program</u> based on a set of developed standards.*		
Impact 4.12-2: Historic Pesticide Use May Affect the Health and Safety of Workers Engaged in Mining or Reclamation Activities	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6		*None required.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.12-3: Steep Pit Slopes May Present a Drowning Hazard to the Public	A-1a, A-1b, A-2, A-3, and A-4	OCMP, A-5a, A-5b, and A-6	*Mitigation Measure 4.12-3a (OCMP, A-5a, A-5b, A-6)* *Goals 2.2-4 and 2.3-3 shall be revised to include references to reclamation. Refer to Mitigation Measure 4.12-1a.* *Performance Standards 2.5-4, 2.5-16, and 2.5-18 shall be revised as required by Mitigation Measure 4.3-2a to require that slopes shall not be steeper than 2:1 five feet below the average summer low groundwater level.* *Performance Standard 2.5-8 shall be revised to include signage and fencing requirements during and after reclamation. These changes have been included in Mitigation Measure 4.4-2a in the Hydrology section.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.12-4: Open Bodies of Water May Become Breeding Areas for Mosquitoes. An Increase in the Mosquito Population Could Adversely Affect the Public Health	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6		*None required.*	OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, and A-6	

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Environmental Impact	Level of Significance Before Mitigation		Mitigation Measures	Level of Significance After Mitigation	
	LS	S		LS	SU
Public Services and Utilities					
Impact 4.13-1: Potential for Long-Term Impacts to Open Space and Recreational Opportunities in the Lower Cache Creek Area	OCMP, A-1a, A-1b, A-2, and A-3, A-4, A-5a, A-5b, and A-6		*None required.*	OCMP, A-1a, A-1b, A-2, and A-3, A-4, A-5a, A-5b, and A-6	
Impact 4.13-2: Potential Increase in Demand for Public Services	OCMP, A-1a, A-1b, A-2, and A-3, A-4, A-5a, A-5b, and A-6		*Mitigation Measure 4.13-2a (OCMP, A-4, A-5a, A-5b, A-6)* *None required; however, the following is recommended:* *The County shall identify the costs of implementing the policies contained in the OCMP, and determine a fair-share cost program for reimbursement by gravel operators and any other affected parties.* *Mitigation Measure 4.13-2b (A-1a, A-1b, A-2, A-3)* *None required.*	OCMP, A-1a, A-1b, A-2, and A-3, A-4, A-5a, A-5b, and A-6	

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3.0 DESCRIPTION OF PROJECT AND ALTERNATIVES

CHAPTER 3.0 DESCRIPTION OF PROJECT AND ALTERNATIVES

3.1 INTRODUCTION

The proposed project is the draft Off-Channel Mining Plan (OCMP) for lower Cache Creek (October 30, 1995) and its implementing ordinances, the draft Off-Channel Surface Mining Ordinance and the Surface Mining Reclamation Ordinance. The OCMP will serve as an area plan for approximately 23,174 acres, extending up to one and one half miles on either side of Cache Creek for a distance of 14.5 miles, from Capay Dam downstream to a levied section of the creek near the town of Yolo.

The OCMP represents the first of two key plans prepared by the County of Yolo (lead agency) to manage the resources of the mining reach of Cache Creek. The OCMP addresses a variety of issues relevant to mining outside the creek channel. The other key plan is the Cache Creek Resources Management Plan (CCRMP) which focuses on resources within the creek channel, and is the subject of a separate Program EIR being prepared concurrently with the OCMP Program EIR. Though the plans are meant to stand-alone, it is proposed that the final OCMP and CCRMP be joined together after adoption, as one printed document entitled the Cache Creek Area Plan.

The draft OCMP identifies approximately 216 million tons of aggregate on up to 2,887 acres of the planning area, as feasible to mine over the next fifty years. Regulation of this mining would occur through the OCMP and implementing ordinances, and project-specific conditional use permits for which consistency with the OCMP and CCRMP would be required.

3.2 SETTING

Regional Location

Cache Creek traverses Yolo, Lake and Colusa counties in northern California. Its drainage basin extends from the upper basin highlands north and northeast of Clear Lake to the Yolo Bypass east of the City of Woodland (see Figure 3.2-1). The 14.5-mile segment of lower Cache Creek that would be subject to the requirements of the OCMP and its implementing ordinances falls between Capay Dam and the town of Yolo, at the western margin of the Sacramento Valley in central Yolo County (see Figure 3.2-2). Unincorporated towns in the vicinity of the project area include Capay, Esparto, Madison,

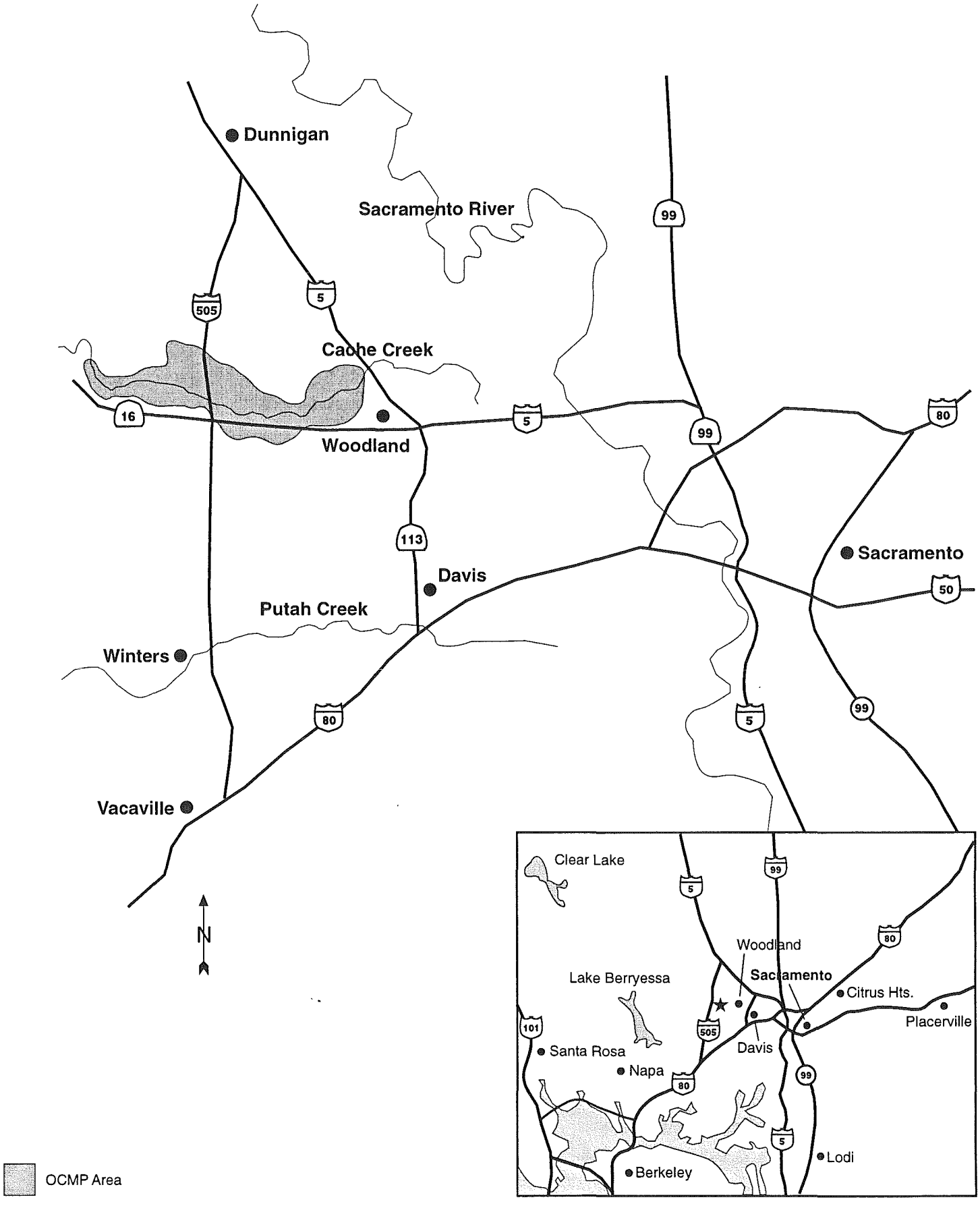


Figure 3.2-1 Regional Location

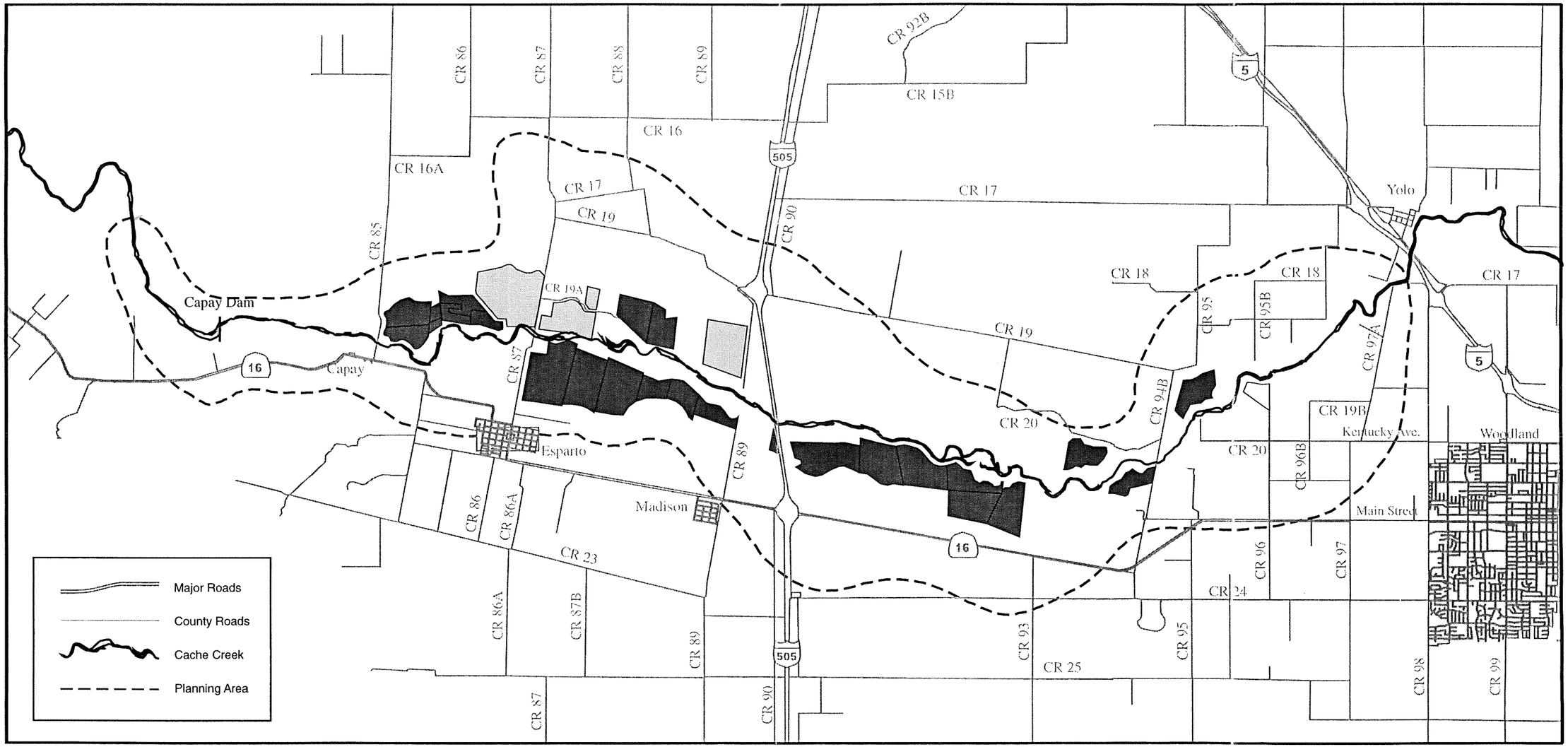


Figure 3.2-2 Site Location Area

SOURCE: INDIVIDUAL MINING APPLICATIONS

and Yolo. The City of Woodland, the county seat, is located to the southeast of the planning area.

The regional topography consists of low rolling hills and broad alluvial plains formed at the base of the eastern flank of the California Coast Range. The predominant land use for the region is agriculture.

Project Location

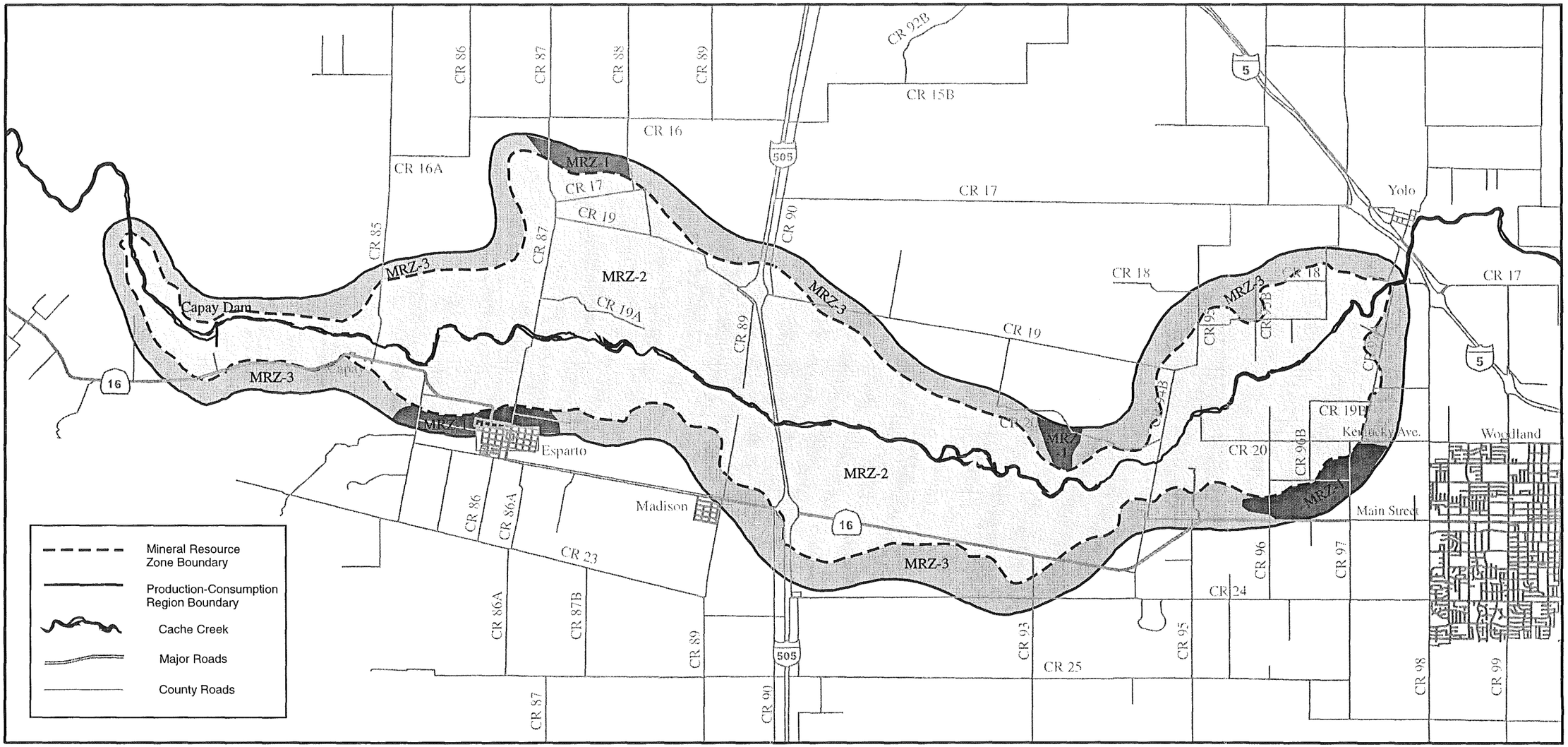
The project location for the OCMP is defined as the area contained within the Mineral Resource Zones (MRZs) delineated by the Department of Conservation as potentially containing mineral aggregate resources, minus the in-channel area to be regulated under the Cache Creek Resource Management Plan (see Figure 3.2-3). The planning area for the CCRMP is equal to the in-channel area of the creek system, as defined by the present channel bank line or the 100-year flood elevation described in the Westside Tributaries Study prepared by the U.S. Army Corps of Engineers, whichever is wider (see Figure 3.2-4). The in-channel area encompasses around 4,956 acres, including several hundred acres located in the floodplain north of the City of Woodland. Subtracting this acreage from the 28,130 acres included in the State MRZs, leaves a total of approximately 23,174 acres within the planning area of the OCMP. With the exception of resources within the Cache Creek channel, mining within the mineral resource zone would be subject to the guidance and standards of the OCMP. Feasibly minable reserves would likely occur on less than 2,887 acres of the total. The reserves associated with this acreage will be used as the basis for the cumulative analysis in this EIR.

3.3 PROJECT OBJECTIVES

Background

Cache Creek has long served as a regional source for aggregates. Mining within the creek dates back to at least the turn of the century, when sand and gravel were removed and shipped by rail to be used in the reconstruction of San Francisco after the devastating 1906 earthquake. Many of the early excavations were small and scattered along a wide expanse, meeting both local needs as well as those of large public projects such as the Golden Gate Bridge. With the post-World War II economic boom in the 1950s, however, the scale and intensity of mining began to increase. The building of airports, schools, hospitals, highways, dams, and residential suburbs created a strong need for concrete and other construction materials. The production of sand and gravel in Cache Creek has continued to escalate over the past several decades, responding to the robust growth in California, particularly in the Bay Area and Sacramento metropolitan areas.

Yolo County has been actively involved in studying and attempting to resolve surface mining issues along Cache Creek for over two decades. Concerns over the environmental impacts of in-stream mining led to the formation by the Board of Supervisors of the



MRZ-1	ADEQUATE INFORMATION INDICATES NO SIGNIFICANT MINERAL DEPOSITS, OR LITTLE LIKELIHOOD OF THEIR PRESENCE.		MRZ-2	ADEQUATE INFORMATION INDICATES SIGNIFICANT MINERAL DEPOSITS, OR HIGH LIKELIHOOD OF THEIR PRESENCE.		MRZ-3	SIGNIFICANCE OF MINERAL DEPOSITS CANNOT BE DETERMINED FROM AVAILABLE DATA.	
	ACRES	%OF TOTAL AREA		ACRES	%OF TOTAL AREA		ACRES	%OF TOTAL AREA
	1,458	5.2		18,452	65.6		8,220	29.2

Figure 3.2-3 Yolo County MRZ Area

SOURCE: YOLO COUNTY COMMUNITY DEVELOPMENT AGENCY

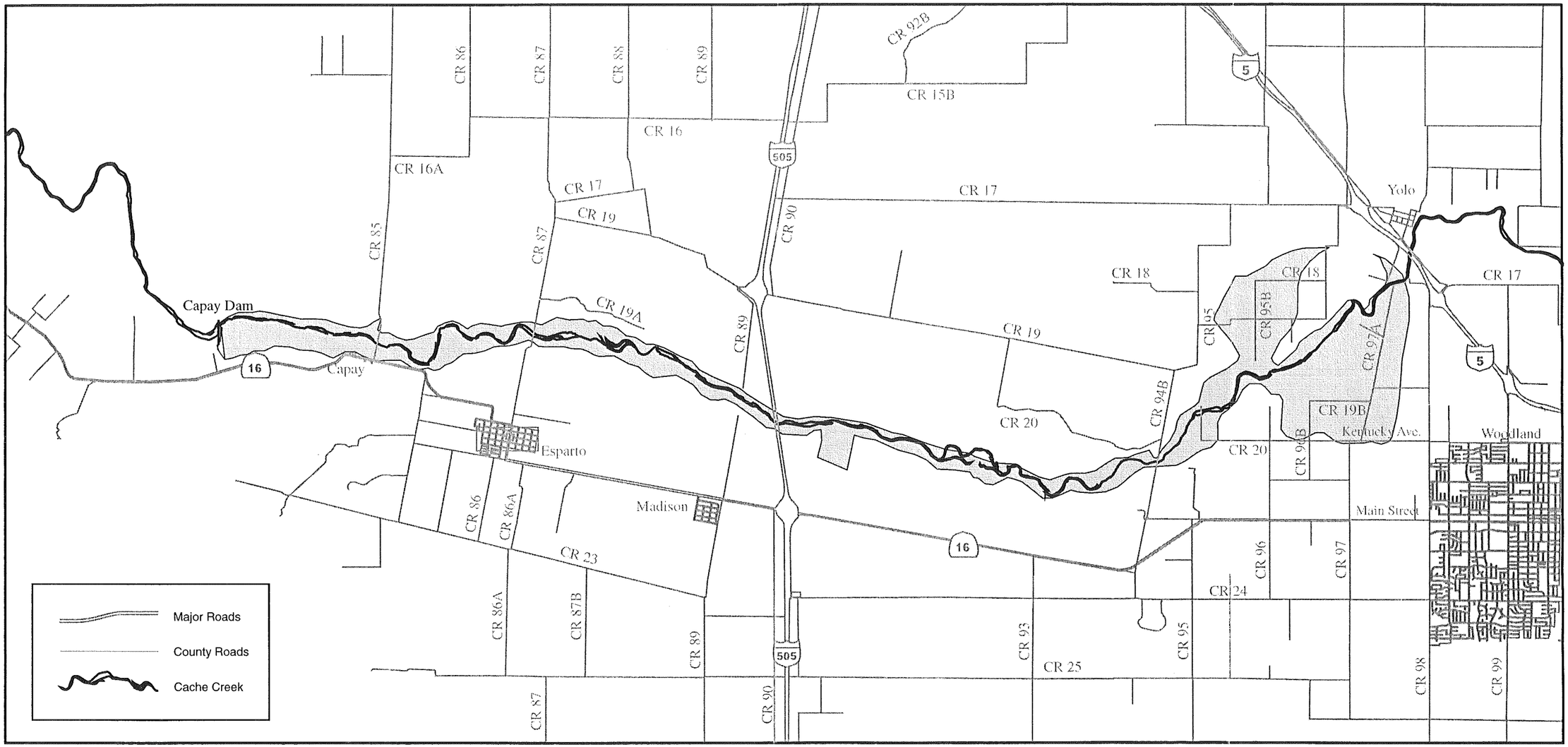


Figure 3.2-4 Lower Cache Creek Channel Boundary

SOURCE: YOLO COUNTY COMMUNITY DEVELOPMENT AGENCY

Aggregate Resources Advisory Committee (ARAC) in 1975. The ARAC commissioned Woodward-Clyde Consultants to prepare a report, analyzing the potential relationships between adverse environmental conditions and the aggregate excavations operating along Cache Creek. The study was released in 1977, and made several suggestions regarding future management of the creek, including: require use permits for all mines operating at the time; establish a maximum depth of excavation; encourage the development of off-channel mining; allow for the channel to be widened in appropriate areas; emphasize erosion control measures; and improve monitoring. It was recommended that these issues be evaluated in the context of County-adopted aggregate resources management policies.

In response to the recommendations made by the ARAC, and as required by the California Surface Mining and Reclamation Act (SMARA) enacted in 1976, the Board of Supervisors adopted in-channel mining and reclamation ordinances. The ordinances, adopted in 1979, required all surface mining operations to apply for use permits and reclamation plans. This was accomplished the following year, with the approval of eight permits/reclamation plans and certification of an EIR (ENVIRON) which analyzed the impacts of mining along the stream. The EIR concurred with the ARAC's recommendation for the development of a broad-based aggregate resource management program. In addition, the EIR included the following recommendations: allow for the development of off-channel mining; protect mineral resources against encroachment; permit mining within the A-P (Agricultural Preserve) Zone; consider reclaimed uses other than agriculture in the A-P Zone, such as groundwater storage and/or recharge; revise the interim ordinances; and gather more data about the creek.

The Aggregate Technical Advisory Committee (AgTAC) was formed by the Board of Supervisors in 1979 to develop a Resource Management Plan (RMP) for the Cache Creek area, as recommended by the ARAC. A draft RMP was submitted in 1984, containing 11 alternative scenarios for the future of the creek. The recommended plan outlined the creation of an engineered floodway to ensure that there would be sufficient capacity to safely accommodate 100-year flood events. In-stream mining would be minimized to maintenance levels, while aggregate mining would take place in deep, off-channel pits. Improvements and maintenance of the creek were to be managed by a separate public or private agency. Finally, AgTAC reiterated support for revising the mining and reclamation ordinances, as well as a review of the compatibility of the A-P Zone requirements with off-channel mining.

A draft Program EIR (Dames & Moore) was prepared in 1989, examining the alternatives discussed in the draft AgTAC plan. Before any recommendations could be adopted, however, the draft Program EIR was subjected to significant controversy regarding the adequacy of its analysis. As a result, the document was abandoned by the County in 1991. Over the next two years, a series of public workshops was held by the Community Development Agency in order to develop a specific project description to form the basis of a Resource Management Plan. This effort was later taken up by a subcommittee of the Board of Supervisors, who made their findings in March of 1994.

In June of 1994, the Board of Supervisors adopted a conceptual framework of goals and objectives for the Cache Creek Resource Management Plan (CCRMP). A work schedule was also approved, describing four primary tasks: (1) adoption of a resource management plan to protect and restore the creek; (2) adoption of an off-channel mining plan and implementing ordinances (the subject is this Program EIR); (3) processing of long-term off-channel mining and reclamation applications; and (4) processing of temporary off-channel mining and reclamation applications to allow operations to continue during development of the necessary plans.

In addition to adopting the conceptual framework, the Board also directed the preparation of the *Technical Studies and Recommendations for the Lower Cache Creek Resource Management Plan* (Technical Studies). The Technical Studies provide baseline data and historical information about the streamway morphology, groundwater resources, and riparian habitat, so that an accurate assessment can be made of the creek's present condition. Constraints and opportunities for activities such as mining, flood control, channel stabilization, groundwater management, and habitat restoration are also identified in the report. The Technical Studies include an extensive list of recommendations on improving the natural resources of Cache Creek. On October 24, 1994, the Board accepted the Technical Studies and directed staff to utilize them as the basis for preparing both the OCMP and the CCRMP.

Overview of the Plan

On June 14, 1994, the Yolo County Board of Supervisors adopted goals and objectives for the Cache Creek Resource Management Plan (CCRMP) and the Off-Channel Mining Plan (OCMP). In doing so, the Board recognized that although mining is an important consideration, the creek is integrally bound to the environmental and social resources of the County, including drainage/flood protection, water supply and conveyance, wildlife habitat, recreation, and agricultural productivity. As such, development of these plans is based on the key assumption that the creek must be viewed as an integrated system and that activities which occur in one area affect the other. The Streamway Influence Boundary (see Figure 3.3-1) described in the Technical Studies' recommendations shows the approximate area subject to these interrelationships, based on the historical extent of the channel. Thus, although the planning areas for the two plans are mutually exclusive, both plans include goals and policies that acknowledge the interrelationships between in-channel and off-channel concerns.

The OCMP establishes a number of goals to assist in this overall management, balancing issues and concerns within the overriding vision of enhancing the variety of resource needs for the region. The OCMP seeks to allow for the development of a sufficient supply of aggregate to meet the future needs of society, while increasing the level of environmental protection and monitoring. In order to provide a sufficient source of sand and gravel over the next 50 years, approximately 2,932 acres would be rezoned to include the SG (Sand and Gravel) Zone and SGR (Sand and Gravel Reserve) overlays. This would clearly delineate where the County would encourage future mining, so that land use decisions

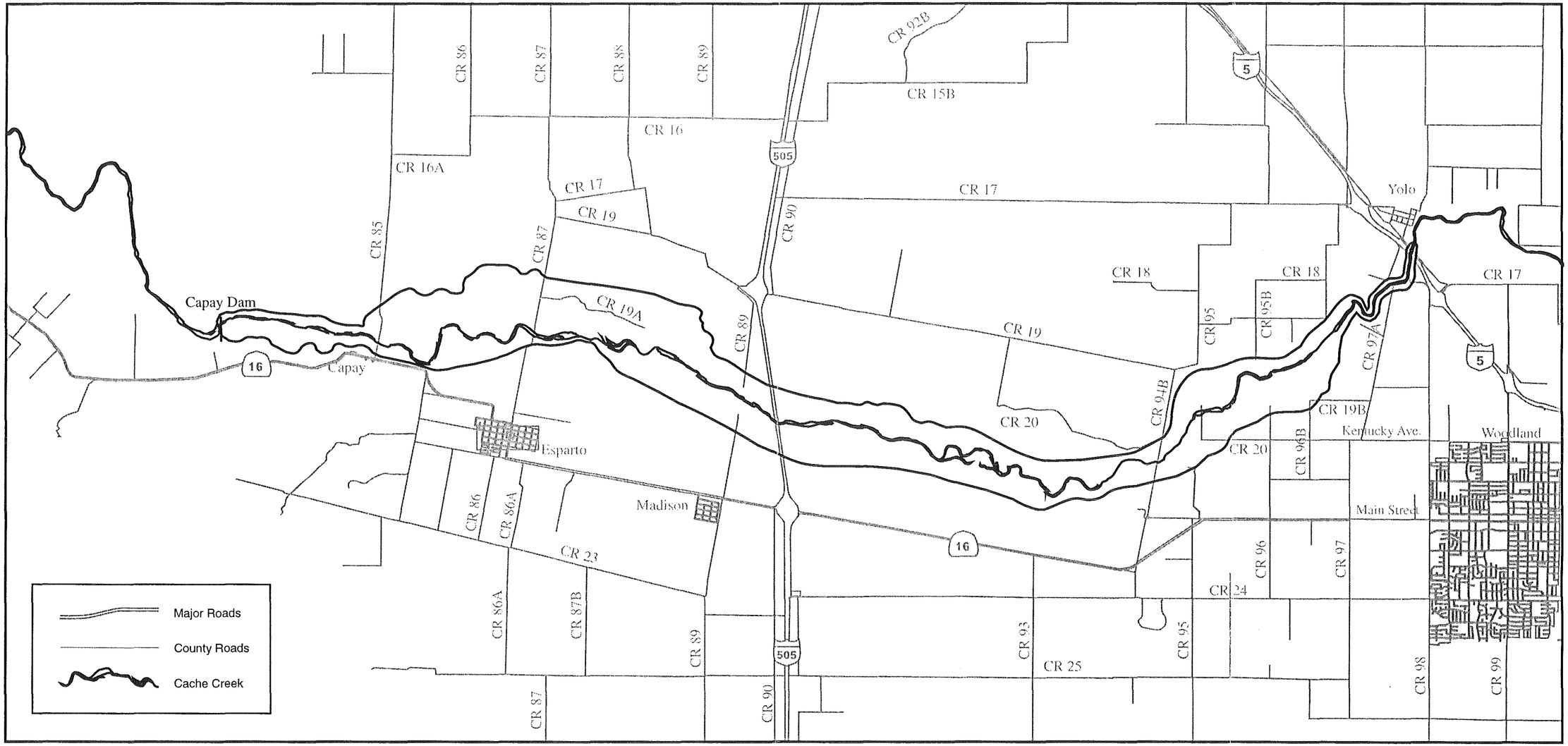


Figure 3.3-1 Streamway Influence Boundary

SOURCE: YOLO COUNTY COMMUNITY DEVELOPMENT AGENCY

could be planned accordingly. It also ensures that additional reserves would be available for development once the mining applications processed under the OCMP are completed. Those areas within the mineral resource zones that do not have the SG or SGR overlay would be conserved for mining beyond the year 2047 or perpetuity. In addition to the SG overlay, the OCMP contains a commitment to maintain the existing agricultural zoning within the planning area. This not only reinforces the County's general policy of encouraging the agricultural industry, but would ensure that mining is buffered from residential and other sensitive land uses.

Although the County recognizes that mining is important to the regional economy, it also acknowledges that mining is an activity that carries with it the potential for adverse environmental impacts. The OCMP includes several provisions to regulate surface mining more effectively to reduce or prevent adverse effects. Specific performance standards have been incorporated into the proposed off-channel mining and reclamation ordinances, based on the Technical Studies, as well as standard procedures used in the industry and other jurisdictions. These standards complement the requirements already mandated by SMARA and the State Reclamation Regulations. The OCMP also recommends a 30-year maximum term for any off-channel mining permit, in order to prevent the establishment of vested rights and to allow for eventual review and update. Similarly, the requirements for annual reporting have been substantially expanded, to provide staff with better information to monitor both mining operations and reclamation efforts.

The OCMP has included the Recommended Management Activity Zones described in the Technical Studies. These zones divide Cache Creek into five physically related reaches and describe what types of uses would be most beneficial within each. The Recommended Management Activity Zones are intended to be used as a guide for off-channel mining applications, so that the individual reclamation efforts of each operation can be combined with others within that zone to meet system-wide management objectives.

Objectives of the County

Goal statements and identified objectives listed in the OCMP include the following:

Aggregate Resources

Goals

2.2-1 Protect lands containing identified mineral deposits from the encroachment of incompatible land uses so that aggregate resources remain available for future use, as needed.

2.2-2 Encourage the production and conservation of mineral resources, while giving consideration to recreation, watershed, wildlife, agriculture, aesthetics, flood control, and other environmental factors.

2.2-3 Prevent or minimize the adverse environmental effects of surface mining.

2.2-4 Eliminate or minimize hazards to the public health and safety that are associated with surface mining operations.

2.2-5 Ensure that mined areas are reclaimed to a usable condition which are readily adaptable for alternative land uses.

2.2-6 Provide a responsive process to consider future changes in environmental and regulatory conditions.

2.2-7 Maintain an economically viable and competitive local aggregate industry that provides a stable job base and tax revenue to Yolo County and contributes to other resource enhancements through the investments in improved technology and reclamation planning.

Objectives

2.3-1 Recognize that the aggregate deposits along Cache Creek are significant to the economy of Yolo County, as well as surrounding jurisdictions.

2.3-2 Discourage the encroachment of incompatible land uses into areas designated for future off-channel surface mining operations.

2.3-3 Provide standards and procedures for regulating surface mining operations so that hazards are eliminated or minimized and potential adverse environmental effects are reduced or prevented.

2.3-4 Coordinate individual surface mining reclamation plans so that regional goals may be achieved.

2.3-5 Create regular opportunities to incorporate new information into the OCMP.

2.3-6 Structure mining so that the disturbance of the existing landscape is short-lived and temporary, as much as possible, and will be reclaimed so that the property can be used and enjoyed in perpetuity by current and future generations.

Water Resources

Goals

3.2-1 Promote the conjunctive use of surface and groundwater to maximize the availability of water for a range of uses, including habitat, recreation, agriculture, water storage, flood control, and urban development.

3.2-2 Maintain the quality of surface and groundwater so that nearby agricultural productivity and available drinking water supplies are not diminished.

3.2-3 Improve the gathering and coordination of information about water resources so that effective policy decisions can be made.

Objectives

3.3-1 Encourage the development of a Countywide water management program, including the participation of the YCFCWCD and other relevant agencies, to coordinate the monitoring and analysis of both surface and groundwater supplies.

3.3-2 Improve the recharge capability along Cache Creek through the development of off-channel ponds, lakes, and canals that have the ability to raise local groundwater levels.

3.3-3 Ensure that off-channel surface mines are operated such that surface and groundwater supplies are not adversely affected by erosion, lowering of the water table, and/or contamination.

Floodway and Channel Stability

Goals

4.2-1 Recognize that Cache Creek is a dynamic stream system that naturally undergoes gradual and sometimes sudden changes during high flow events.

4.2-2 Coordinate land uses and improvements along Cache Creek so that the adverse effects of flooding and erosion are minimized.

4.2-3 Establish a more natural channel floodway capable of conveying floodwaters without damaging essential structures, causing excessive erosion, or adversely affecting adjoining land uses.

Objectives

4.3-1 Provide flood management as required to protect the public health and safety.

4.3-2 Determine an appropriate flood capacity standard for Cache Creek, so that the extent of a more stable channel configuration may be designed.

Agricultural Resources

Goals

5.2-1 Improve soil and water resources so that a diverse agricultural economy, supporting a variety of crops and products, is maintained.

5.2-2 Ensure the compatibility of land uses adjacent to agricultural operations, so that productivity is not adversely affected.

Objectives

5.3-1 Encourage the preservation of prime and important farmland along Cache Creek, while giving consideration to other compatible beneficial uses, such as groundwater storage and recharge facilities, surface mining operations, riparian habitat, and public recreation.

5.3-2 Ensure the use of appropriate agricultural management practices in reclaiming mined areas to productive farmland.

Biological Resources

Goals

6.2-1 Provide for a diverse riparian ecosystem within the off-channel planning area along Cache Creek, that is self-sustaining and capable of supporting wildlife.

6.2-2 Create a continuous corridor of riparian and wetland vegetation to link the foothill habitats of the upper watershed with those of the settling basin.

Objectives

6.3-1 Conserve and protect existing riparian habitat within the off-channel planning area.

6.3-2 Establish conditions to encourage the development of a variety of natural riparian habitat types along the Cache Creek channel.

Open Space and Recreation

Goals

7.2-1 Preserve scenic resources within the off-channel planning area.

7.2-2 Establish a variety of outdoor recreational and educational opportunities along Cache Creek for use by the public.

7.2-3 Ensure the compatibility of recreational facilities with surrounding land uses, in order to minimize adverse impacts.

Objectives

7.3-1 Include use of the "Open Space" zoning designation for the area located within the creek's existing banks and other areas where resource management and habitat protection is warranted.

7.3-2 Consider reclamation plans that include recreational elements as meeting all or a portion of the "net gain" requirement.

7.3-3 Create a continuous corridor of natural open space along the Creek and provide for limited access, at specific locations, to recreational and educational uses.

7.3-4 Discourage the encroachment of incompatible uses into areas surrounding designated recreation sites.

7.3-5 Design recreational facilities to maintain the privacy and security of surrounding property owners.

Draft OCMP

The OCMP is organized into an Introduction and six "elements" similar to the organization of the June 1994 Statement of Goals, Objectives and Policies. Each of the six "elements" includes an introduction, and a list of goals, objectives, actions and performance standards. Provided below is a summary of each chapter.

Introduction

Chapter 1.0 of the OCMP provides an overview of relevant history and background information including the work of the Aggregate Resources Advisory Committee, the Aggregate Technical Advisory Committee, the 1994 Statement of Goals, Objectives and Policies, and the Technical Studies which provide baseline and historical information about the streamway fluvial morphology, groundwater resources, and riparian habitat.

This chapter also discusses the resources estimated to exist in the MRZ-2 (Mineral Resources Zone 2). Including in-channel reserves, it is projected that there are currently 807 million tons of high-grade (Portland Cement Concrete or PCC) aggregate within the planning area (excluding in-channel material below the theoretical thalweg). This compares to a 1982 estimate of 257 million tons along the American River and Morrison Creek in Sacramento County. Demand for Cache Creek resources (assumed at 26 percent of total regional production) has been forecasted as totalling approximately 289 million tons of aggregate, or about 5.8 million tons annually over the 50-year period covered by the OCMP.

Aggregate Resources Element

Chapter 2.0 is the Aggregate Resources Element of the OCMP. It notes that the present total permitted mineral reserves are insufficient to meet the long-term demand for aggregate in Cache Creek, and proposes to rezone some 2,932 acres to include SG (Sand and Gravel) and SGR (Sand and Gravel Reserve) overlay zones. Application of these zones would clearly delineate where the County will allow mining over the next 50 years, so that land use decisions can be coordinated with this commitment. This element also includes the Recommended Management Zone Activities discussed in the Technical Studies. These general recommendations for restoring the creek will provide guidelines for coordinating individual reclamation plans adjoining the channel to maximize their cumulative benefits. Additional performance standards governing both mining and reclamation activities are also contained within this chapter. The primary actions recommended within this element are as follows:

- Establish 30 years as the maximum length of time for granting a mining permit. Reviews that would revise the permit to account for unanticipated environmental effects and/or regulatory changes are recommended every 10 years. Permits will be eligible for an additional 20-year extension, based on the satisfactory performance of the operation.

- Update the OCMP every ten years to account for the results of monitoring programs and reclamation efforts, so that the plan remains responsive to the changing conditions of the creek.

- Encourage recycling, so that less sand and gravel is mined.

- Create a Technical Advisory Committee to provide the County with technical expertise in managing the resources of Cache Creek.

- Improve the County's monitoring requirements, so that the County can more accurately evaluate the success of reclamation efforts and assess the impacts of off-channel mining.

Water Resources Element

Chapter 3.0 is the Water Resources Element of the OCMP. It describes how rainfall, surface water diversion, and pumping are the most important factors in determining the availability of groundwater. Although groundwater levels have generally declined in the past 40 years, the basin has a significant capacity for recovery. The OCMP outlines several actions for improving groundwater levels, through the reclamation of mined areas to water recharge, storage, and conveyance facilities. This will provide additional increments of water that may be used to further the restoration of riparian habitat. The recommended actions included within this element include:

- Coordinate with the Yolo County Flood Control and Water Conservation District (YCFCWCD) to develop an integrated aquifer recharge plan for Cache Creek, in order to increase available groundwater supplies.

- Require a groundwater monitoring program for all off-channel wet pit mining operations and designate County staff to compile and analyze the data to be used as reference material in regional water planning efforts.

- Consider evapotranspiration losses as an acceptable result of exposed groundwater in the provision of wet pit areas for recreation and/or habitat.

- Ensure that proposed off-channel wet pits do not adversely affect the groundwater levels or water quality of nearby (within 1,000 feet) active off-site wells.

Floodway and Channel Stability Element

Chapter 4.0 of the OCMP is the Floodway and Channel Stability Element. Although flooding and stability issues will be more thoroughly discussed in the CCRMP and its Program EIR, these issues overlap between both plans, within the Streamway Influence Boundary as set forth in the Technical Studies. This boundary describes the historical extent of Cache Creek and is used to establish the area where pit capture is of greatest concern. This chapter summarizes the chain of events that have led to the creek's present

condition, including: forest clearing and livestock grazing, surface water diversion, flood protection structures, bridge and road construction, agricultural expansion, and in-stream mining. It is noted that simply leaving the creek alone will not guarantee the reestablishment of a natural equilibrium. The recommended actions described in this section include:

- Adopt a new in-channel mining boundary to more accurately reflect the difference between in-channel and off-channel areas (the 1979 In-Channel Boundary is shown in Figure 3.4-1).
- Ensure that subsequent studies use data and assumptions consistent with those in the Technical Studies, so that a regional model of the creek can be maintained and updated.
- Coordinate with other agencies, such as the YCFCWCD, Department of Water Resources, Federal Emergency Management Agency (FEMA), and the City of Woodland, to create a regional solution to managing flood events along Cache Creek.
- Encourage the use of spillways and other features to allow for controlled filling of the off-channel pits to increase flood protection in other reaches of the creek.

Agriculture Resources Element

Chapter 5.0 of the OCMP is the Agriculture Resources Element. This chapter recognizes that agriculture will remain the primary activity within the 23,174-acre planning area. In order to ensure this, all areas outside of the unincorporated communities (Capay, Esparto, Madison, and Yolo), will remain in either A-1 (General Agriculture) or A-P (Agricultural Preserve) Zoning (see Figure 3.4-2). Approximately 988 acres of the 2,211 acres proposed for mining would be returned to agriculture (row crops, tree crops, and pasture). An additional 3,282 acres owned by the aggregate companies will remain in crop production and will not be mined. The remaining area of approximately 1,223 acres of mined land would be reclaimed to a variety of uses, including habitat, haul/maintenance roads, and open water features. Although a substantial acreage of farmland will be lost to productive agricultural uses, the goal of the OCMP is to balance the various resources that coexist along Cache Creek. Recommended actions within the Agricultural Resources Element include:

- Revise the A-P Zone to allow for the operation of commercial surface mining on contracted land within the areas identified for mining. This would keep more property in the Williamson Act and would discourage the development of uses that are incompatible with agriculture. The permitted mineral reserves within contracted land would be subject to additional property tax.
- Allow the use of wet pit mining, in order to minimize the amount of agricultural acreage disturbed, and to allow for reclamation to other beneficial uses.
- Allow for the transfer of sediment fines from areas where groundwater recharge is encouraged to areas more suitable for agricultural reclamation.

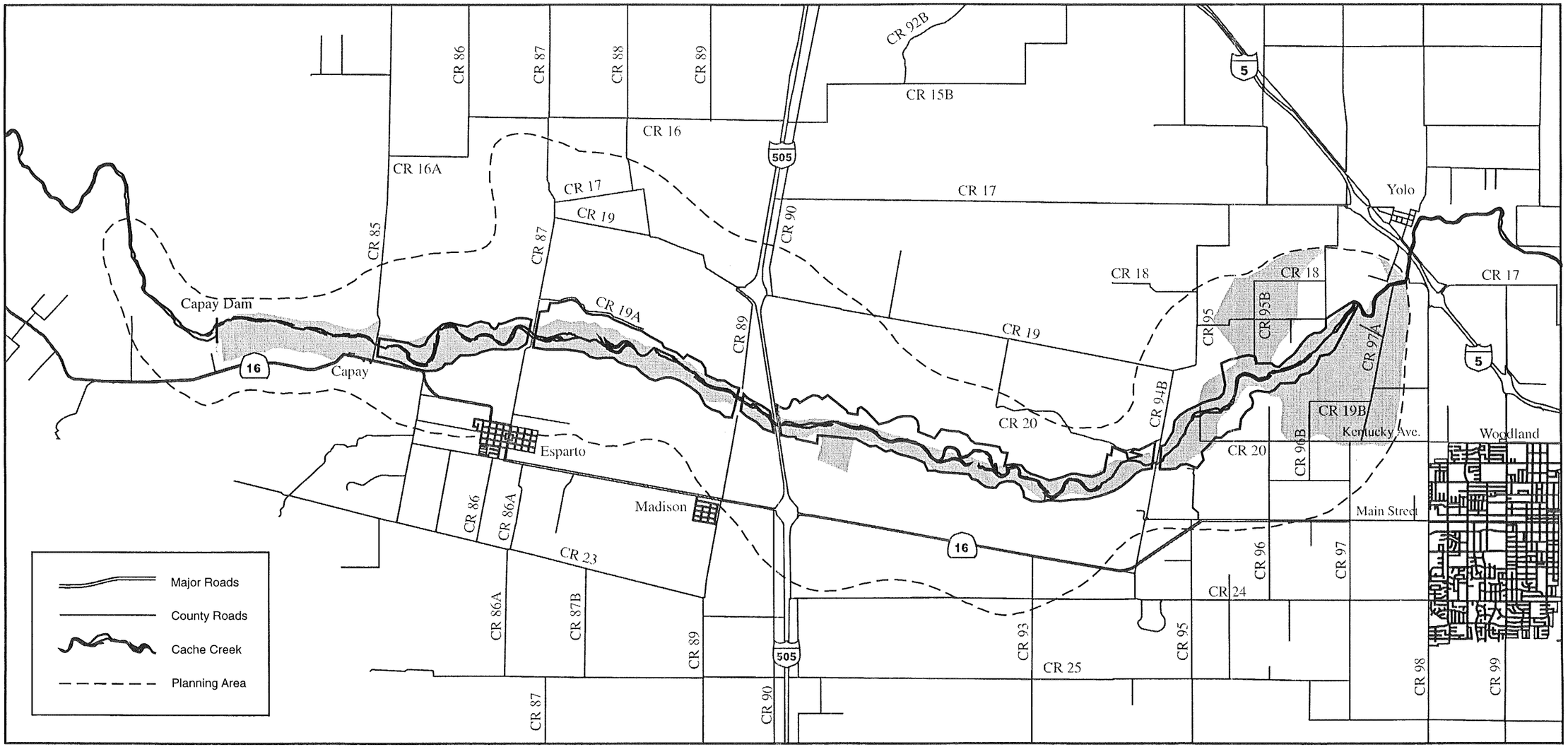
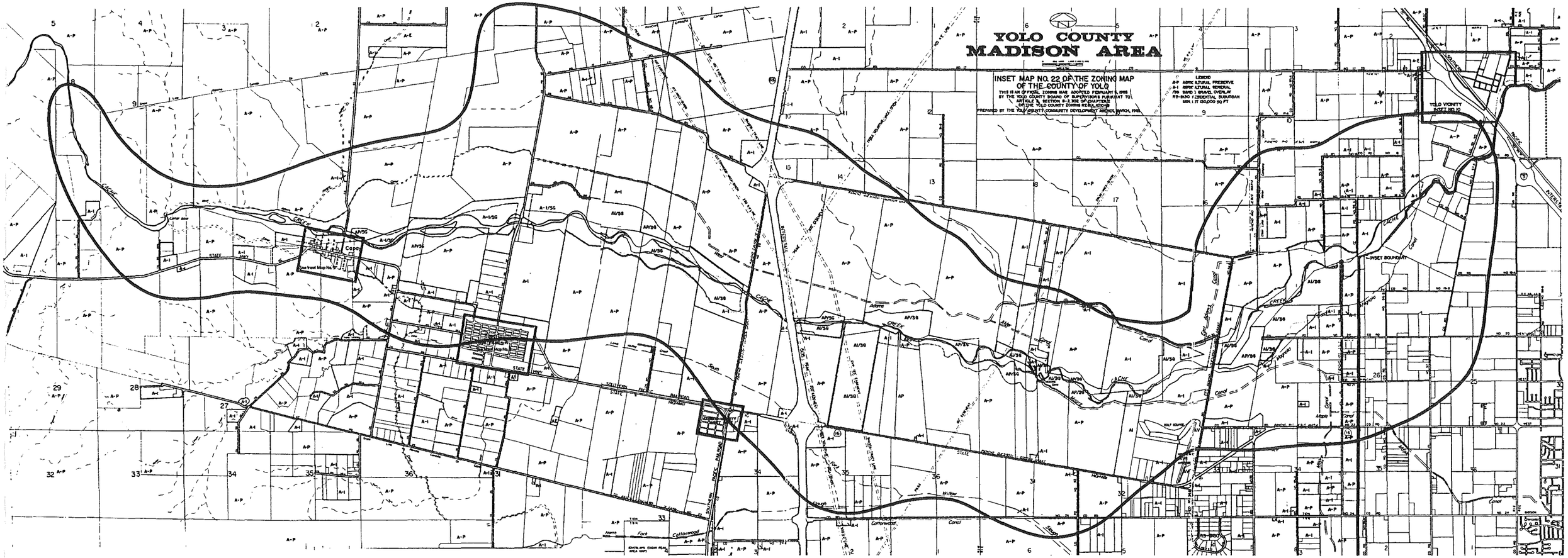


Figure 3.4-1 1979 Regulatory In-Channel Boundary

SOURCE: YOLO COUNTY COMMUNITY DEVELOPMENT AGENCY



N

Scale in Miles

0 1 2

A-P	AGRICULTURAL PRESERVE	/SG	SAND & GRAVEL OVERLAY
A-1	AGRICULTURAL GENERAL		PLANNING AREA

Figure 3.4-2 A-1 and A-P Zoning Within the Planning Area

SOURCE: YOLO COUNTY COMMUNITY DEVELOPMENT AGENCY

Biological Resources Element

Chapter 6.0 of the OCMP is the Biological Resources Element. This chapter discusses the complex series of events that contributed to the decline of riparian habitat along Cache Creek. The four main influences have been: the narrowed stream channel, lack of surface water, lowered groundwater levels, and in-stream mining. As a result, riparian habitat is now concentrated in two areas along the 14.5-mile portion of Cache Creek within the planning area. One is located upstream of the Capay Bridge, while the other is located approximately between Moore Crossing and the Stephens Bridge. The OCMP includes several recommended actions for restoring the extent of riparian habitat, as follows:

- Explore the feasibility of entering into a Memorandum of Understanding (MOU) with the YCFCWCD to provide a regular source of surface water within the losing reaches of Cache Creek, when there is sufficient rainfall.
- Coordinate with groups such as the Cache Creek Conservancy, Army Corps of Engineers, and HAWK, to ensure that proposed restoration projects do not conflict with the OCMP.
- Encourage reclamation plans to include features that promote the development of wildlife habitat, such as permanent vertical banks and shallow wet pit areas.
- Promote the eradication of invasive species, such as the giant reed and tamarisk, where appropriate.
- Include vegetated buffer areas between restored habitat areas and adjoining farmland, in order to minimize the potential impacts of predators and pests on crops, while protecting habitat from dust, noise, and spraying.
- Encourage the use of cooperative agreements and voluntary conservation easements with private landowners, such as the Moore Dam Sanctuary, to preserve the biological resources of Cache Creek.

Open Space and Recreation Element

Chapter 7.0 of the OCMP is the Open Space and Recreation Element. Currently, the high proportion of land in private ownership along Cache Creek severely restricts public access. This chapter suggests the designation of future recreation sites, on reclaimed mined lands that are distributed about every two miles along Cache Creek. These areas are conceptual in nature and serve to identify potential sites so that they may be considered by the County at a future date. The downstream sites would largely provide passive recreational activities, such as horseback riding, hiking, and birdwatching. Upstream areas could support more intensive activities, including boating, fishing, and picnic grounds. The upstream sites could also provide new parks and tourism opportunities for Capay, Madison, and Esparto. The Open Space and Recreation Element contains the following recommended actions:

- Coordinate with the Bureau of Land Management to investigate the eventual linkage of recreational uses along the upper watershed to the proposed recreational nodes within the planning area.
- Develop and manage recreational sites so that trespassing, vandalism, and other undesirable activities are prevented.

- Encourage restored habitat areas and/or recreational areas to be dedicated to the County or an appropriate land trust, in order to provide a future continuous open space corridor along Cache Creek.

- Develop an Open Space and Recreation Plan to provide a range of public activities and uses along Cache Creek.

Off-Channel Surface Mining Ordinance

Mining areas located outside of Cache Creek are currently governed by Chapter 2 of Title 8 of the Yolo County Code, which provides procedures for the processing of use permits, including off-channel mining permits. Chapter 2 provides sufficient authorization to process off-channel mining permits and, when supplemented by CEQA, ensures that adverse environmental impacts are minimized or eliminated. However, as both the scale and intensity of off-channel mining increases, there is a need for specific performance standards that address the potential impacts of off-channel mining.

The existing interim mining ordinance for Yolo County was used as a basis for the new Off-Channel Mining Ordinance. This foundation was then expanded to include SMARA (Surface Mining and Reclamation Act) mandated procedures, the Technical Studies, standards established in the short-term mining permits, policy documents issued by the Department of Conservation and the State Mining and Geology Board, as well as relevant contributions from current mining ordinances in effect in other jurisdictions. As a result, the Off-Channel Mining Ordinance contains several recommended new provisions, including:

- New operating and design standards specific to the requirements of off-channel mining, and consistent with the performance standards discussed in the OCMP.

- Additional application requirements to ensure that the County has sufficient information with which to judge the merits of the project.

- Expanded annual reporting submissions to give the County a clear and accurate depiction of surface mining operations and how they conform with the conditions of approval, mitigation measures, reclamation plan, and other agency requirements.

- Procedures for amendments and modifications to mining use permits.

- Detailed provisions for appeals, public hearings, and violations.

Surface Mining and Reclamation Ordinance

The Yolo County Surface Mining and Reclamation Law applies to all mine sites within the unincorporated areas of the County, both in-channel and off-channel. Like the interim in-stream regulations, the Reclamation Ordinance has not been substantially updated since the early 1980s and is long overdue for revision. Over the past five years, SMARA has been extensively amended, especially in the area of reclamation plans. Consequently, the revised Reclamation Ordinance contains many recommended new components, including:

- New off-channel reclamation standards. These are in addition to those already required by the State Mining and Geology Board Reclamation Regulations.

- Expanded application requirements.

- Methods for considering financial assurances to guarantee that sufficient money will be available to reclaim the mined area should the operator abandon the site.

- Procedures for the submission of interim management plans, to describe how the mined site will be maintained during extended idle periods.

- Detailed provisions for appeals, public hearings, and violations.

Applications for Mining

On September 27, 1995 notices were sent to all property owners within the study area notifying them of a deadline of December 1, 1995 for acceptance of applications for off-channel surface mining consistent with the OCMP. Five mining and reclamation applications were received; they include:

- Cache Creek Aggregates (a subsidiary of R.C. Collet);
- Solano Concrete Co.;
- Syar Industries;
- Teichert Aggregates - Esparto; and
- Teichert Aggregates - Woodland.

These five applications collectively constitute the reasonably foreseeable implementation of the OCMP over the next 50 years, and would represent the cumulative impact of the OCMP.

Two existing operators will continue to operate under their existing permits. Granite's reserves equate to approximately their annual allocation and therefore have been assumed to be exhausted by the end of 1996 for the purposes of this plan. It is assumed that Schwarzgruber may propose modest expansion of their operations sometime in the next five years. Thus, Scharzgruber will be considered as an existing short-term non-conforming use.

All together, the applicants (plus assumptions for Schwarzgruber) are proposing to mine a total of some 179.5 million tons over the next thirty years, which will be sufficient to meet regional demand. Mining during this initial phase would take place over approximately 2,211 acres within the planning area (see Figure 3.4-3). The preliminary plans of each operator over the next thirty years are summarized in Table 3-1. Table 3-2 outlines total disturbed acreage for the proposed off-channel mining operations over the next 30 years in five year increments.

TABLE 3-1
REASONABLY FORESEEABLE MINING OPERATIONS UNDER THE OFF-CHANNEL MINING PLAN

	Cache Creek Aggregates	Solano Concrete	Syar Industries	Teichert-Esparto	Teichert-Woodland	Schwarzgruber[1]	Granite	County (maintenance)	TOTAL
Total Controlled Acreage	1,220	1,828	1,590	290	578	132			5,638
Total Mined Acreage	360	598	734	148	283	88			2,211
Total Mined Tonnage	32,280,000	33,630,000	65,060,000	22,940,000	20,820,000	4,750,000			179,480,000
Total Sold Tonnage	30,000,000	27,910,000	58,430,000	19,500,000	17,700,000	4,510,000			158,050,000
Total Tonnage Mined Wet[2]	31,300,000	33,270,000	65,060,000	22,940,000	20,820,000	4,750,000			178,140,000
Total Tonnage Mined Dry	980,000	360,000	0.00	0.00	0.00	0.00			1,340,000
Total Mined Acreage Under Contract	334	558	561	60	0	0			1,523
Total Mined Acreage Not Under Contract	16	40	173	88	283	88			688
Row Crop Acreage Reclaimed	69	223[3]	235	0	115	0			642
Tree Crop Acreage Reclaimed	0	223	223[4]	0	0	0			446
Pasture Acreage Reclaimed	45	0	0	0	0	0			45
Habitat Acreage Reclaimed	76	65	7	31	6	88			273
Slopes and Maintenance Roads (acres)[5]	28	26	74	19	32	0			179
Lake Acreage Reclaimed	142	161	240	98	130	0			771
Number of Lakes at Final Reclamation	3	4	1	1	2	0			11
Borrow Areas	0	0	45	0	0	0			45
Habitat Acreage Restored[6]	34	30	8	0	40	0			112
Proposed Extraction Over 30 Years (sold: mined tonnage ratio)	30,000,000: 32,280,000	27,910,000: 33,630,000	58,430,000: 65,060,000	19,500,000: 22,940,000	17,700,000: 20,820,000	1,083,000: 1,140,000		9,900,000: 11,000,000[7]	164,523,000: 186,870,000
30-Year Annual Average (sold: mined tonnage ratio)	1,000,000: 1,076,000	930,333: 1,121,000	1,947,666: 2,168,666	650,000: 764,666	590,000: 694,000	36,100: 38,000		330,000: 366,666	5,484,100: 6,229,000
Reasonably Foreseeable Maximum Annual Allocations (sold: mined ratio, tons/year)[8]	1,000,000: 1,075,269	1,200,000: 1,445,783	1,950,000: 2,166,667	1,000,000: 1,176,471	1,200,000: 1,411,765	108,300:114,000[9] 158,650:167,000[10]		1,080,000:1,200,000[9] 180,000:200,000[10]	7,538,300:8,589,955[9] 6,638,300:7,589,955[10]
Years of Operational Life at Continuous Maximum Annual Allocation Rates	30.00	23.26	29.96	19.50	14.75	10.00	0.95[11]		
Increase in Proposed Maximum Annual Allocation over Existing Allocation	+43.63%	+87.18%	+125.49%	+56.86%	+32.66%	0.00%	0.00%[12]	+100.00%	

TABLE 3-1 (CONTINUED)
REASONABLY FORESEEABLE MINING OPERATIONS UNDER THE OFF-CHANNEL MINING PLAN

Total Proposed Maximum Annual Allocations at Continuous Maximum Production (sold: mined ratio)[13]	**1997-2001**		7,538,300:8,589,955
	2002-2006		6,638,300:7,589,955
	2007-2011		6,530,000:7,475,955
	2011-2016		5,330,000:6,064,190
	2016-2020		4,330,000:4,887,719
	2020-2026		3,130,000:3,441,936
	2026-2046		1,603,200:1,798,000

Source: Yolo County, 1996.

[1] Schwarzgruber has not submitted a mining/reclamation permit application at this time. The information for Schwarzgruber has been estimated for the purposes of preparing a conservative cumulative analysis, since they can be considered a reasonably foreseeable project.

[2] The terms wet and dry refer to the ultimate mining condition of an excavation. Thus, if a pit will eventually be mined to a depth below the groundwater table, all of the material mined from the pit is counted as wet aggregate.

[3] The total reclaimed acreage for Solano Concrete includes an additional 100 acres contained within the Hutson parcel. The Hutson parcel has an approved Reclamation Plan, which is being amended through this process.

[4] Reclaimed tree crop acreage includes 45 acres of reclaimed borrow area.

[5] Slope areas would be reclaimed to grasslands which have habitat value, but at a lower intensity than areas specifically reclaimed to habitat.

[6] The restored habitat acreage refers to areas located outside of the proposed mining areas (e.g.: "net gain").

[7] Assumes 1.2 million tons mined annually during the 1997-2001 period, and 200,000 tons mined during the 2002-2026 period.

[8] Assumes the following: 1) 7% waste for Cache Creek Aggregates; 2) 17% waste for Solano Concrete Co.; 3) 10% waste for Syar Industries; 4) 15% waste for Teichert-Esparto and Teichert-Woodland; and 5) 5% waste for Schwarzgruber (in the 1997-2001 period).

[9] 1997-2001 period, assuming 5% waste for Schwarzgruber and 10% waste for County maintenance mining.

[10] 2002-2026 period.

[11] Assumed to end in 1996.

[12] Assumed to end in 2005.

[13] Assumes the following: 1) channel sculpting completed by 2001; 2) Schwarzgruber ends operation in 2005; 3) Teichert-Woodland ends operation in 2011; 4) Teichert-Esparto ends operation in 2016; 5) Solano Concrete Co. ends operation in 2020; 6) Syar Industries and Cache Creek Aggregates end operations in 2026; 7)reserve tonnage averaged-out over 20 years, plus maintenance mining; and 8) assumes 15% waste for Lowe and 10% waste for Syar Industries and Stephens.

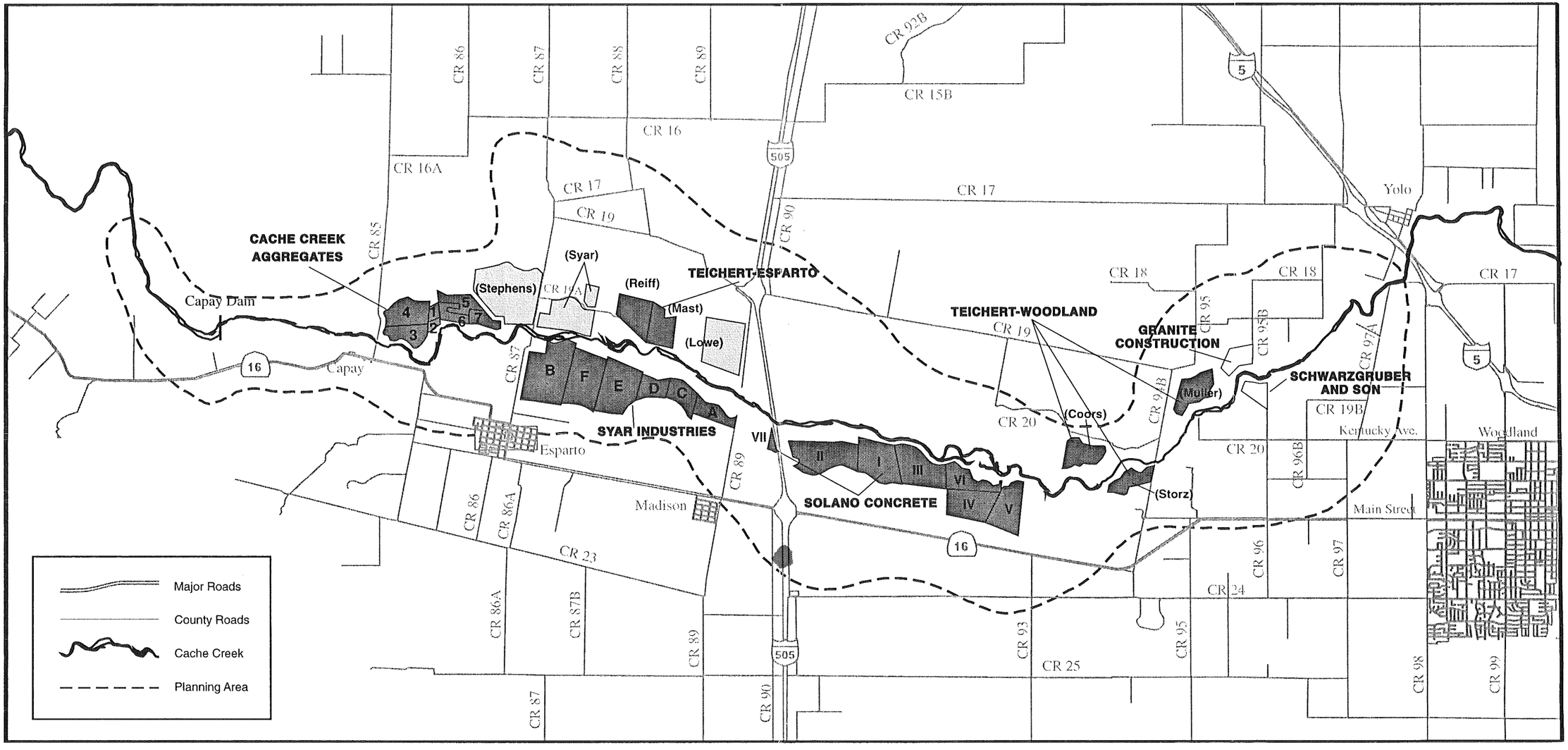


Figure 3.4-3 Requested Off-Channel Mining and Rezoning, 1996-2046

SOURCE: INDIVIDUAL MINING APPLICATIONS

Table 3-2: Total Disturbed Acreage for the Proposed Off-Channel Mining Operations								
Year	5	10	15	20	25	30	35	Total
Cache Creek Aggregates	53	60	60	55	55	5	0	288
Solano Concrete	60	55	133	50	136	15	0	449
Syar Industries	54	70	61	17	57	0	0	259
Teichert-Esparto	50	50	50	50	50	0	0	250
Teichert-Woodland	50	50	50	50	50	0	0	250
Total	267	285	354	222	348	20	0	1,496

Viewing these preliminary proposals as a group, the total acreage proposed for mining represents 40 percent of the land owned or controlled by the applicants, and 8 percent of the land identified by the Department of Conservation within the Mineral Resource Zones. The applicants collectively are proposing that 99 percent of the total tonnage be mined to depths below the groundwater table . Reclamation of the 2,356 acres shown to be disturbed (including a borrow area and the Hutson parcel) would be 48 percent agriculture (27 percent row crops, 19 percent tree crops, and 2 percent pasture), 12 percent habitat, 33 percent open water areas, and the remainder for slopes and haul roads. Of the total acreage proposed for new mining, 68 percent is currently covered by a Williamson Act contract, and would require expiration of the contract under the County's current regulations. The following information provides a summary of the proposed mining operations. Acreages and depths reflect mined conditions and include slope areas. Depths represent approximate averages for each pit.

Cache Creek Aggregates (R.C. Collet)

1 pit (34 acres) to 10 feet
1 pit (20 acres) to 20 feet
2 pits (70 acres) to 30 feet
2 pits (33 acres) to 50 feet
1 pit (43 acres) to 55 feet
1 pit (87 acres) to 75 feet
1 pit (73 acres) to 90 feet

Solano Concrete

1 pit (15 acres) to 26 feet
1 pit (11 acres) to 30 feet
5 pits (200 acres) to 50 feet
6 pits (372 acres) to 70 feet

Syar Industries

1 pit (7 acres) to 35 feet
7 pits (116 acres) to 40 feet
2 pits (31 acres) to 45 feet
8 pits (130 acres) to 50 feet
7 pits (114 acres) to 60 feet
1 pit (26 acres) to 70 feet
3 pits (310 acres) to 80 feet

Teichert-Esparto

1 pit (148 acres) to 150 feet

Teichert-Woodland

1 pit (92 acres) to 29 feet
1 pit (137 acres) to 37 feet
1 pit (54 acres) to 47 feet

Rezoning Applications

In addition, the County has also received requests to designate certain lands for long-term mining beyond the 30-year recommended life of requested mining permits. The OCMP recommends that a new SGR (Sand and Gravel Reserve) Overlay Zone be used to indicate that the property is appropriate for off-channel mining within the next thirty to fifty years, but that re-examination of environmental conditions and conditions of approval will be necessary. This has been requested on 676 acres, in addition to the area proposed to be mined. It is estimated that these rezoned lands contain 36.5 million tons of aggregate, in addition to the 179.5 proposed to be mined initially, for a total of 216 million tons available during the fifty year plan horizon. The proposed rezone applications provided by each operator are summarized in Table 3-3.

TABLE 3-3
PROPOSED REZONING APPLICATIONS

	Lowe	Stephens	Syar	TOTAL
Total Controlled Acreage	662	821	160	1,603
Total Mined Acreage	250	296	130	676
Total Mined Tonnage (million tons)	6.00	24.58	5.95	36.53

Source: Yolo County, 1996.

Assumptions for Cumulative Analysis

In order to look at total cumulative effects, other assumptions had to be included for: 1) channel stability improvements within the creek; 2) recycling of aggregate materials; 3) existing agricultural operations; and 4) area and regional development such as Pheasant Glen, Wild Wing, Woodland growth, Esparto growth, the Cache Creek Casino, and other background growth. Channel stability improvements are assumed to total 11 million tons over 30 years (1.2 million tons per year for the first five years (1997 through 2001) and 200,000 million tons for the remaining 25 years (2002 through 2027). Recycling of aggregate materials is assumed as an additional four percent of total production (7.2 million tons over 30 years), with one-half that amount generating new truck trips. It is assumed that agriculture is the primary land use within the 23,174 acres covered by the Plan. The populations and number of housing units within this acreage is not known, but is assumed to be quite low given regulations covering minimum lot size. It is estimated that

there are approximately 2,720 people living in the study area, 2,480 within the towns of Capay, Madison and Esparto. It is estimated that there are 960 dwelling units in the area, 875 within the three communities. Growth in the area, including buildout of Wild Wing (337 single family units), the Pheasant Glen Golf Course, the three towns, and Woodland, over the next 30 years is assumed at 1.6 percent per year on average.

Required Actions

Certification of the Program EIR

The County must certify that the EIR was completed in compliance with CEQA, that there was independent review and consideration of the information in the EIR prior to taking action on the project, and that a Mitigation Monitoring Plan was adopted to ensure implementation of feasible mitigation measures identified in the EIR.

Adoption of the Off-Channel Mining Plan

County staff is recommending adoption of the OCMP to provide the necessary structure to address a variety of issues relevant to mining outside of the creek channel. The Plan should be updated a minimum of every ten years to take into account the results of monitoring programs and reclamation efforts.

Adoption of the Mining and Reclamation Ordinances

County staff is recommending adoption of these ordinances, which include specific performance standards for both mining and reclamation, in order to implement the OCMP.

Zoning Code Text Amendments

This action allows surface mining in the Agricultural Preserve (A-P) Zone consistent with state law, and establishes a new combining zone called the Sand and Gravel Reserve (SGR) Overlay Zone.

Adoption of Development Agreements Ordinance

This action allows the County to enter into development agreements with the mining applicants so that the development agreements may be used as entitlements to ensure certain mitigations over time.

3.5 ALTERNATIVES

Introduction

The purpose of the alternatives analysis is to allow for informed decision making and meaningful public participation [Section 15126(d)(5) of the CEQA Guidelines]. The EIR must describe a range of reasonable alternatives to the project, or its location, that would feasibly attain most of the basic objectives, but would avoid or substantially lessen any of the significant effects of the project. The comparative merits of the alternatives must be evaluated [Section 15126(d)].

The EIR must include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project [Section 15126(d)(3)]. This becomes the factual basis for reaching conclusions about the feasibility of various alternatives. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, this must be discussed, but at a lesser level of detail.

Range of Alternatives

The range of alternatives to be examined in the EIR is governed by the "rule of reason" that requires that only those alternatives necessary to permit a reasoned choice need be addressed. The CEQA Guidelines require that the number of alternatives analyzed be limited to those that would avoid or substantially lessen any of the significant effects of the project [Section 15126(d)(5)]. Of those alternatives, the EIR need only examine in detail those that the lead agency determines could feasibly attain most of the basic objectives of the project. Among the factors that a lead agency can consider in determining feasibility, the CEQA Guidelines specifically identify site suitability, economic viability, availability of infrastructure, general plan consistency, other plan or regulatory limitations, jurisdictional boundaries, and whether there is a reasonable ability to acquire, control, or otherwise have access to an alternative site [Section 15126(d)(5)(A)].

No one of these factors establishes a fixed limit on the scope of reasonable alternatives. However, the CEQA Guidelines indicate that an EIR need not consider an alternative "...whose effect cannot be reasonably ascertained and whose implementation is remote and speculative" [Section 15126(d)(5)(C)].

The following eight alternatives (by name and assigned number) have been identified by the County for examination and analysis in this EIR:

Alternative 1a: No Project (Existing Conditions);
Alternative 1b: No Project (Existing Permits and Regulatory Condition);
Alternative 2: No Mining (Alternative Site);
Alternative 3: Plant Operation Only (Importation);

Alternative 4: Shallow Mining (Alternative Method/Reclamation);
Alternative 5a: Decreased Mining (Restricted Allocation);
Alternative 5b: Decreased Mining (Shorter Mining Period); and
Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed).

Description of Alternatives

All of the proposed alternatives will be analyzed in Chapter 4.0 (Environmental Analysis) at a level of detail equivalent to that given the project. This level of detail is not required by CEQA, but was determined by the County to be appropriate in order to fully address public concerns and to provide full information disclosure. A summary comparison of the alternatives is provided in Table 3-4 below, and additional detail is presented in the text which follows.

Alternative 1a: No Project (Existing Conditions)

Under this alternative, the County would not adopt the OCMP (or the Cache Creek Resources Management Plan). Mining would continue based on 1995 actual production for each producer. Continuation of all regulations in place as of December 31, 1995 would be assumed, including the 1979 regulatory channel boundary and existing "interim" regulations. Tonnage for overall extraction would be based on total 1995 production (mined tonnage) which was 2,461,343 tons both in- and off-channel. The assumed resulting gravel extraction over 30 years would be 73.8 million tons. Annual maximum tonnage for individual producers under this alternative cannot be provided because the information is proprietary.

Alternative 1b: No Project (Existing Permits and Regulatory Condition)

Under this alternative, the County would not adopt the OCMP (or the CCRMP). Currently approved maximum annual allocations would establish the maximum intensity of mining that would be allowed. It would be assumed that all regulations in place as of December 31, 1995 would remain in place, including the 1979 regulatory channel boundary and existing "interim" regulations. The assumed resulting gravel extraction would be 130.0 million tons over 30 years. Annual maximum tonnage for individual producers would be as follows:

Cache Creek Aggregates	748,650 tons per year in-channel
Solano Concrete Company	772,417 tons per year in- or off-channel
Teichert (Esparto)	750,000 tons per year off-channel
Teichert (Woodland)	1,064,224 tons per year off-channel
Schwarzgruber and Son	114,000 tons per year in-channel
Syar Industries	960,871 tons per year in-channel
TOTAL	4,410,162 tons per year through 2005 (4,296,162 after 2005)

Table 3-4: SUMMARY COMPARISON OF OCMP CEQA ALTERNATIVES									
Alternatives	**OCMP**	**1a**	**1b**	**2**	**3**	**4**	**5a**	**5b**	**6**
Condition	Proposed Project	No Project Existing Conditions	No Project Existing Maximum Allocation	No Mining Alternative Site - Importation of Finished Product	Plant Operation Only - Importation of Raw Materials	Shallow Mining - Alternative Method and Reclamation	Decreased Mining- Restricted Allocation	Decreased Mining - Shorter Mining Period	Agricultural Reclamation Alternative
Mining in Yolo County?	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Processing in Yolo County?	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Implementation of OCMP?	Yes	No	No	No	No	Yes	Yes	Yes	Yes
Total Tonnage (in million tons)/ Period of Mining	179.2mined/30 years	18.8 mined/ 7.6 years	18.8 mined/ 4.25 years	65.0 imported/ 30 years	112.8 processed/ 30 years	33.6 mined/ 30 years	65.6 mined/ 30 years	110.3 mined/ 15 years	179.5 mined/ 30 years
Total Maximum Annual Tonnage (in million tons)	7.4 mined	2.5 mined	4.4 mined	2.2 imported	4.8 imported	1.2 mined	2.3 mined	7.4 mined	7.4 mined
Wet Pit Mining?	Yes - 99%	Yes[1]	Yes[1]	No - 0%	No - 0%	No - 0%	Yes - 99%	Yes - 99%	Yes - 99%
Assumed Reclamation	Agriculture 49% Open Lakes 33% Habitat 12% Roads/Slopes 6%	In-Channel: graded slopes, no revegetation except Collet; Off-Channel: agriculture	In-Channel: graded slopes, no revegetation except Collet; Off-Channel: agriculture	Unknown - Out of County	Unknown - Out of County	Agriculture 80% Habitat 20%	Agriculture 49% Open Lakes 33% Habitat 12% Roads/Slopes 6%	Agriculture 49% Open Lakes 33% Habitat 12% Roads/Slopes 6%	Agriculture 80% Open Lakes and Habitat 20%
Total Disturbed Acreage in County	2,211 acres	543 acres	543 acres	0	0	2,211 acres	1,105 acres	1,105 acres	5250 acres[2]
In Channel or Off Channel?	Off-Channel 100%	In-Channel 41%; Off-Channel 59%	In-Channel 41%; Off-Channel 59%	Unknown	Unknown	Off-Channel 100%	Off-Channel 100%	Off-Channel 100%	Off-Channel 100%

Source: Yolo County, February 1994.

[1] Solano-Hutson - exhausted in 1995. Solano-Farnham West short-term (3 year approval, through 1998).

[2] Includes 2,994 acres for borrow activities.

Alternative 2: No Mining (Alternative Site)

Under this alternative, the County would not adopt the OCMP (or the CCRMP). It is assumed that existing permits to mine in- or off-channel and/or operate plants, for all producers would be voided as of December 31, 1996. Mining would occur elsewhere and be trucked into the County in response to market demand for construction. Market demand for the County would be assumed at 65 million tons over the next thirty years, or approximately 2.2 million tons per year based on interpolations of the State Geologist's estimates. This alternative would examine the potential for satisfying local demand from reserves of PCC-grade aggregate material known to occur in dredger tailings ("gold fields") east of Yuba City and Marysville (zoning and land use is assumed to allow aggregate mining), alluvium deposits underlying Mather Air Force Base in the Rancho Cordova area of Sacramento (industrial zoning and land use area assumed with vernal pool wetland resources), sand and gravel deposits along Morrison Creek in Sacramento (open space mining land uses and zoning are assumed with riparian resources) and alluvial deposits and tailings from Folsom (residential and commercial zoning and land uses are assumed). It should be noted that although gravel reserves are known to occur along the American River, open space and land use and zoning was assumed to preclude access for mining. No assumptions have been made for reclamation on alternative sites as it would be highly speculative.

Alternative 3: Plant Operation Only (Importation)

Under this alternative, the County would not adopt the OCMP (or the CCRMP). This alternative assumes that existing permits to mine would be voided as of December 31, 1996, but that existing processing plants continue to operate to the extent and capacity that they are individually permitted (based on air permit limits). it is assumed that 112.8 million tons would be processed over 30 years. Raw material for processing would be assumed to come from the same alternative sources identified in Alternative 2: No Mining (Alternative Site) based on the same market demand. Tonnage for plant operations would be as follows:

Cache Creek Aggregates	0 tons per year (not permitted to process import)
Solano Concrete Company	936,000 tons per year (existing plant Air Quality Permit)
Teichert (Esparto)	1,100,000 tons per year (existing plant Air Quality Permit; to expire in 1998)
Teichert (Woodland)	1,450,000 tons per year (existing plant Air Quality Permit)
Schwarzgruber and Son	57,000 tons per year (existing plant Air Quality Permit)
Syar Industries	1,242,640 tons per year (existing plant Air Quality Permit)
TOTAL	4,785,640 tons per year through 1998 (3,685,640 after 1998)

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

Under this alternative, the OCMP would limit all new mining to depths no greater than 10 feet above the historic average high groundwater elevation within the same total mined acreage (2,211) assumed for the OCMP (based on information provided by the applicants). The assumed resulting gravel extraction would be 33.6 million total tons, substantially less than the 179.5 million tons proposed over thirty years. Schwarzgruber would continue as presently approved because they are not requesting any new or modified entitlements. The proposed revised channel boundary would be assumed (as would adoption of the CCRMP). Reclamation would be assumed as primarily (80 percent) to agricultural uses, with the remaining amount (20 percent) to habitat restoration and other uses. Tonnage for individual producers would be as follows:

Cache Creek Aggregates	476,533 tons per year (14,295,990 total tons)(lower water table than other sites)
Solano Concrete Company	41,409 tons per year (1,242,278 total tons)
Teichert (Esparto)	246,667 tons per year (7,400,01 total tons)
Teichert (Woodland)	316,667 tons per year (9,500,010 total tons)
Schwarzgruber and Son	114,000 tons per year (1,140,000 total tons based on 10 years estimated remaining reserves)
Syar Industries	0 tons/year (overburden 15 ft. deep; groundwater 25 ft below the surface)
TOTAL	1,195,276 tons per year through 2005 (1,081,276 after 2005)

Alternative 5a: Decreased Mining (Restricted Allocation)

Under this alternative, the OCMP would limit gravel extraction to no more than 2.26 million annually over thirty years (65.6 million total). This alternative assumes that mining proposals would be restricted to one-half of the current annual allocation on half the land area (1,105 acres). The proposed revised channel boundary would be assumed (as would adoption of the CCRMP). All new mining would occur off-channel as proposed, using primarily wet pit methods, as requested. Schwarzgruber would continue at their approved allocation because they are not requesting any new or modified entitlements. Reclamation would be assumed at 49 percent agricultural uses, 13 percent habitat, and 38 percent open water areas which is the same proportional split of reclaimed uses as is currently proposed with slopes and haul roads included proportionally as part of the other uses. Tonnage for individual producers would be as follows:

Cache Creek Aggregates	374,325 tons per year
Solano Concrete Company	386,209 tons per year
Teichert (Esparto)	375,000 tons per year
Teichert (Woodland)	532,112 tons per year

Schwarzgruber and Son	114,000 tons per year (10 year estimated reserves)
Syar Industries	480,436 tons per year
TOTAL	2,262,082 tons per year through 2005 (2,148,082 after 2005)

Alternative 5b Decreased Mining (Shorter Mining Period)

Under this alternative, the OCMP would limit the period of gravel extraction for an individual permit to 15-years, with a potential 10-year renewal based on performance. The assumed resulting gravel extraction would be 110.3 million tons over 15 years. Permits would be reviewed every five years to account for unanticipated changes in environmental or regulatory circumstances. Requested allocations would be assumed on one-half the land area (1,105 acres). The proposed revised channel boundary would be assumed (as would adoption of the CCRMP). All new mining would occur off-channel as proposed, using primarily wet pit methods as propose. Schwarzgruber would continue at their approved allocation because they are not requesting any new or modified entitlements. Reclamation would be assumed at 49 percent agricultural uses, 13 percent habitat, and 38 percent open lake, which is the same proportional split of reclaimed uses as is currently proposed, with slopes and haul roads included proportionally as part of the other uses. Tonnages for individual producers would be as follows:

Cache Creek Aggregates	1,075,269 tons per year
Solano Concrete Company	1,445,783 tons per year
Teichert (Esparto)	1,176,471 tons per year
Teichert (Woodland)	1,411,765 million tons per year
Schwarzgruber and Son	114,000 tons per year
Syar Industries	2,166,667 million tons per year
TOTAL	7,389,955 tons per year through 2005 (7,275,955 after 2005)

Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed)

Under this alternative, all new mining would occur off-channel as proposed, using primarily wet pit methods. Annual gravel extraction would be the same as for the project, 179.5 million tons over 30 years. This alternative assumes the CCRMP is also adopted. The OCMP would not allow for alternative forms of reclamation. A minimum performance standard for individual producers of 80 percent agricultural reclamation would be established; slopes, habitat, and/or water areas lakes could occur in the remaining 20 percent. Total disturbed acreage would be approximately 5,705 acres, which is substantially greater than the 2,256 acres anticipated to be disturbed under the proposed OCMP. It is assumed for the purposes of the analysis that the additional land needed for borrow would come from acreage immediately adjoining the proposed projects. The alternative would assume extensive earth-borrow activities on other lands not proposed for mining, in order to generate pit fill material, as follows:

Cache Creek Aggregates	435 additional acres (lowered 15 feet average)
Solano Concrete Company	598 additional acres (lowered 9 feet average)
Teichert (Esparto)	1,000 additional acres (lowered 11 feet average)
Teichert (Woodland)	350 additional acres (lowered 9.5 feet average)
Syar Industries	1,111 additional acres (lowered 12 feet average)
TOTAL	3,994 acres

CHAPTER 4.0 ENVIRONMENTAL ANALYSIS

4.1 INTRODUCTION TO ENVIRONMENTAL ANALYSIS

4.1 INTRODUCTION TO ENVIRONMENTAL ANALYSIS

This chapter contains an analysis of each environmental issue and, as such, constitutes the major portion of this DEIR. Sections 4.2 through 4.13 describe for each environmental issue area: (1) the focus of the analysis; (2) a summary of the environmental setting as it relates to the specific issue; and (3) project-specific impacts and mitigation measures. The format for each section is further described below.

Determination of Significance

As identified herein, general definitions of the various levels of significance used to characterize project impacts are as follows:

Less-than-Significant - The impact would cause no substantial change in the existing or projected future environment, therefore, no mitigation is required. Said another way, while there may be some associated impact, it is insignificant or acceptable as defined by the applicable thresholds of significance.

Potentially Significant - May be used to denote an element of speculation. Where used, the applicable circumstances are described.

Significant - Under CEQA, a significant effect is defined as a substantial, or potentially substantial, adverse change in the environment (Public Resources Code 21068). The Guidelines implementing CEQA direct that this determination be made by the decision-making body, and that it be based on scientific and factual data, to the extent possible. As such, the specific criteria for determining the significance of a particular impact for this project are identified prior to the project-specific impact analysis in each section, and are consistent with significance criteria set forth in the guidelines implementing CEQA. The Guidelines go on to state that an "ironclad" definition of significant effect is not possible because the significance of an activity may vary with the setting. Significant impacts can be mitigated to less-than-significant levels by implementation of identified mitigation measures.

Significant and Unavoidable - The impact is one that would cause a substantial effect on the environment and for which no mitigation has been identified as feasible to reduce the impact to a less-than-significant level.

Format of Issue Sections

Each issue section has three parts: (1) Introduction; (2) Setting; and (3) Impacts and Mitigation Measures.

The Introduction describes the purpose of the section, as well as references and other data sources for the analysis. The Setting section describes the existing conditions at the regional, subregional and local level, and applicable plans, policies and regulations.

The Impacts and Mitigation Measures section identifies the potential impacts of the proposed project and each of the alternatives. This section identifies standards for determining impact significance.

The pre-mitigation level of significance for each impact is established. Project-specific mitigation measures and potential impact significance after implementation of the mitigation measures are identified. Each impact and mitigation measure is numbered consecutively for individual sections within the EIR.

Mitigation Measures

Mitigation measures are provided for all significant impacts. The CEQA Guidelines (Section 15370) defines mitigation as:

(a) avoiding the impact altogether by not taking a certain action or parts of an action;

(b) minimizing impacts by limiting the degree or magnitude of the action and its implementation;

(c) rectifying the impact by repairing, rehabilitating, or restoring the impact environment;

(d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and

(e) compensating for the impact by replacing or providing substitute resources or environments.

Except for unavoidable significant impacts, the mitigation measures recommended in this EIR would be sufficient to reduce impacts to less-than-significant levels. Unless otherwise noted, when more than one mitigation measure is recommended for a specific impact, all mitigation measures would be required to reduce the impact to a less-than-significant level.

It should be noted that, pursuant to CEQA and the CEQA Guidelines, the Yolo County Planning Commission and Board of Supervisors may balance the benefits of adoption of the OCMP against the unavoidable environmental impacts in determining whether to approve the project. If the benefits are found to outweigh the impacts, the adverse effects may be considered "acceptable" and any or all of the identified mitigation measures may be rejected.

4.2 LAND USE AND PLANNING

4.2 LAND USE AND PLANNING

INTRODUCTION

This section comparatively examines the issues of land use and planning consistency associated with implementation of the OCMP and project alternatives. The main issues addressed in this section include:

- potential conflicts with general plan designations;
- potential conflicts with applicable plans and policies;
- potential creation of incompatible land uses; and
- potential changes in land use intensity.

The extensive reserves of PCC-grade aggregate resources in the lower Cache Creek basin allows for the development of surface mining and reclamation activities, which would occur under the OCMP. The purpose of this section is to evaluate the cumulative land use effects of all proposed mining that would occur over the term of the OCMP, as well as any planning consistency issues that may be raised.

The following discussion of land use and planning issues is based on a site reconnaissance, prior environmental documentation for short-term mining and reclamation projects in the area, the Technical Studies for the Cache Creek Resource Management Plan (EIP et al., 1995), and the various local, regional and state plans and regulations applicable to the area.

SETTING

Description of Regional Environment

Cache Creek is located in Yolo, Lake and Colusa counties in northern California. Its drainage basin extends from the upper basin highlands north and northeast of Clear Lake, to the Yolo Bypass east of the City of Woodland (see Figure 3.2-1). The 14.5-mile segment of lower Cache Creek that would be subject to the requirements of the OCMP and its implementing ordinances occurs between Capay Dam and the town of Yolo, at the western margin of the Sacramento Valley in central Yolo County (see Figure 3.2-2). Unincorporated communities in the vicinity of the project area include Capay, Esparto, Madison, Yolo, Monument Hills and Willow Oaks. The City of Woodland, the county seat, is several miles to the southeast of the project area. The topography in the lower Cache Creek area consists of low rolling hills and broad alluvial plains formed at the base of the eastern flank of the California Coast Range. The level soils support intensive, irrigated agriculture as the predominant rural land use, giving way to dryland farming and rangeland grazing to the north and west where the slopes are steeper.

Description of Project Area

While intensive agriculture is the dominant land use in the project area, there are also several large aggregate (sand and gravel) extraction operations within and along the creek. The creek boundaries are currently defined by the 1979 In-Channel Mining Boundary established for Cache Creek (Figure 3.4-1). Using this definition, the in-channel area includes approximately 1,600 acres, of which about 70-75 percent is currently being mined. There are currently four mining areas considered off-channel, including: (1) a 17-acre pit permitted to Schwarzgruber and Son, at the northern extension of Road 96; (2) two pits totalling 92 acres operated by Teichert Aggregates, just east of Road 94B (known as the Haller-Muller site); (3) a 57-acre pit operated by Teichert Aggregates, just north of Road 19A (known as the Reiff-Esparto site); and (4) a pit of approximately 100 acres in the process of being reclaimed and a 30-acre area being mined by Solano Concrete, located north of State Highway 16 and east of Interstate 505 (known as Hutson and Farnham West sites). Together, there are about 266 acres permitted for off-channel mining at present.

Regulatory Setting

Surface Mining and Reclamation Act (SMARA) and the State Mining and Geology Board Reclamation Regulations

Yolo County's regulatory efforts are complemented and directed by the California Surface Mining and Reclamation Act (SMARA) of 1975, as amended through January 1, 1996 (Pub. Res. Code, Div. 2, Chp. 9, Sec. 2710 et seq.). The SMARA created a regulatory framework for the mining industry, requiring all new excavations to obtain approval of a reclamation plan describing the methods to be employed in ensuring that the site could be beneficially used once operations had been completed. Over the past five years, substantial amendments have been added to address problems not covered in the original legislation. Lead agencies are required to annually inspect each mine located within their jurisdiction to monitor permit compliance. Each operator is required to put up financial assurances as a guarantee that money will be available to properly reclaim the property, should the mining company abandon the site. In addition, the State Mining and Geology Board has adopted standards to ensure that reclamation work is consistently carried out. The requirements of SMARA must be followed by all lead agencies as a minimum; the County of Yolo, however, is seeking to adopt stricter measures where it deems appropriate, as it may do under SMARA.

One problem that SMARA was designed to address concerns the loss of regionally significant aggregate deposits to land uses, such as urban growth, that preclude mining. Included within SMARA is a requirement for the State Geologist to map out areas of the state which are subject to urban expansion. This is done to detect the presence or absence of significant mineral resources. This information is then transmitted to the lead agency, so that policies can be incorporated into the General Plan. These policies are

intended to protect identified significant mineral deposits from inappropriate uses, so that they may be harvested in the future.

The State Department of Conservation released Special Report 156 in 1988 (as discussed further, below), which identified the extent of sand and gravel deposits along Cache Creek. Section 2662(a) of SMARA requires that the lead agency incorporate mineral resource management policies into its General Plan within twelve months after receiving a mineral land classification report prepared by the State Geologist. These policies must accomplish the following:

1. Acknowledge the information provided by the State Geologist regarding the extent of mineral resources within the jurisdiction.

2. Coordinate the management of land uses within and surrounding areas of statewide and regional significance to restrict the encroachment of incompatible uses.

3. Emphasize the conservation and development of identified mineral deposits.

In addition, Section 3676 of the State Mining and Geology Board Regulations requires that mineral resource management policies incorporate, but not be limited to, the following:

1. A summary of the information provided by the classification study, including, or incorporated by reference, maps of the identified mineral deposits as provided by the State Geologist; and a discussion of state policy as it pertains to mineral resources.

2. Statements of policy as required in Section 2762(a) of SMARA.

3. Implementation of measures that:

    a. Discuss the location of identified mineral deposits and distinguish within those areas between resources designated for conservation and those permitted for future extraction.

    b. Provide appropriate maps to clearly define the extent of identified mineral deposits, including those resources designated for conservation and those permitted for future extraction.

    c. Include at least one of the following:

        i. Adopt appropriate zoning that identifies the presence of identified mineral deposits and restricts the encroachment of incompatible land uses in those resource areas that are to be conserved.

        ii. Require that a notice describing the presence of identified mineral deposits be recorded on property titles within the affected area.

        iii. Impose conditions of approval upon incompatible land uses in and around areas that contain identified mineral deposits, to mitigate any significant land use conflicts.

Section 2774 of SMARA requires that every lead agency adopt ordinances that establish procedures for the review and approval of reclamation plans, financial assurances, and

surface mining permits. Regulations must be periodically reviewed and revised, as necessary to ensure that they remain in accordance with State policy.

Special Report 156

The aggregate deposits within the Sacramento-Fairfield region were formed through the deposition of large volumes of sand, gravels, and cobbles from mountain streams. As these streams enter the flat Sacramento Valley from the adjoining mountain ranges, the abrupt change in slope causes the heavy aggregate to fall out and form alluvial fan deposits. The extent of these deposits was determined using a wide range of information, including: geologic maps, engineering test results, aerial photos, data from the mining industry, interviews, well and drilling records, and field investigations. From this information, the areas along Cache Creek were divided by the Department of Conservation into one of three Mineral Resource Zones (MRZ) as shown in Figure 3.2-3. These zones are used by the State to define areas containing valuable deposits. Once a Mineral Resource Zone has been identified, then the local jurisdiction must take the mineral resources into account when making land use decisions, including the discouragement of uses that would inhibit harvesting, and consideration of the importance of the mineral to the market region as a whole. The guidelines for establishing these MRZs are as follows:

MRZ-1: Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence. This zone is applied where, based upon economic principles and geologic data, it is determined that the likelihood for the occurrence of significant mineral deposits is slight or nonexistent.

MRZ-2: Areas where adequate information indicates that significant mineral deposits are present, or where it is determined that a high likelihood for their presence exists. In addition, there are two economic requirements that must be met if land is to be classified as MRZ-2: (1) the deposit must be composed of material that is suitable as a marketable commodity; and (2) the deposit must meet a threshold value (gross selling price) equal to at least $5,000,000 (1978 dollars).

MRZ-3: Areas containing mineral deposits, the significance of which cannot be evaluated from available data.

The aggregate resources along Cache Creek composed of a high grade sand and gravel called "Portland Cement Concrete" or PCC. Much of this material has not been identified as PCC-grade (Portland Cement Concrete) through formal engineering tests. Where MRZ-2 mineral resources have not been tested, they are believed to be of PCC quality because the materials are of a similar age and composition, and were deposited under similar geologic conditions as those aggregates which have been proved to be of PCC-grade. The use of extrapolation was done only when the unproven deposit extended from a formation where PCC-grade aggregate has been produced.

The Sacramento-Fairfield Production-Consumption Region

Aggregate is a low-value, high-bulk commodity. The relatively inexpensive cost of production, combined with the heavy weight of the material, means that transportation

represents a major component in the price charged for sand and gravel. The shipping costs of aggregate can account for as much as 50 percent of the price of the delivered product. Because transportation costs are critical in determining the price of sand and gravel, the economic feasibility of developing deposits is evaluated on a regional basis.

The Sacramento-Fairfield Production-Consumption Region encompasses portions of El Dorado, Placer, Sacramento, Solano, and Yolo Counties; the greater Sacramento metropolitan area; the Cities of Fairfield, Vacaville, Davis, and Woodland; and the Cache Creek aggregate resource area. The classification study originally focused on the Sacramento metropolitan region. It was assumed that the Sacramento market was largely self-sufficient, relying on the extensive deposits located along the American River. As information became available, however, it was determined that a significant portion of Sacramento's aggregate needs (about 8 percent) was being met by the deposits along Cache Creek. As a result, Cache Creek and the American River were designated as the two primary production districts in the region. The market distribution patterns were then analyzed, to determine the extent of the area in which sand and gravel from these two production districts were being sold. Finally, the production-consumption (P-C) boundary was adjusted to include all existing urban areas with populations in excess of 10,000 people within the region.

California Land Conservation Act of 1965 (The Williamson Act)

The California Land Conservation Act, also known as the Williamson Act, was adopted by the State of California in 1965 to encourage the preservation of the State's agricultural lands. To carry out the Act, a land contract is established, whereby the County Board of Supervisors stabilizes taxes on qualifying lands. In return, the land owner guarantees to provide for the exclusion of uses other than agricultural, and other than those compatible with agricultural uses, for the 10 year duration of the contract. Each year, on its anniversary date, the contract is automatically renewed unless a Notice of Non-Renewal is filed.

The Williamson Act was amended in 1994 to restrict the types of uses allowed on contracted land. All new uses must meet all of the findings described in Section 51238.1 to protect agricultural activities and agricultural land. Section 51238.1 includes the following principles of compatibility:

(a) Uses approved on contracted lands shall be consistent with all of the following principles of compatibility:

(1) The use will not significantly compromise the long-term productive agricultural capability of the subject contracted parcel or parcels or on other contracted lands in agricultural preserves.

(2) The use will not significantly displace or impair current or reasonably foreseeable agricultural operations on the subject contracted parcel or parcels or on other contracted lands in agricultural preserves. Uses that significantly displace agricultural operations on the subject contracted parcel or parcels may be deemed compatible if they relate directly to the

production of commercial agricultural products on the subject contracted parcel or parcels or neighboring lands, including activities such as harvesting, processing, or shipping.

(3) The use will not result in the significant removal of adjacent contracted land from agricultural or open-space use. In evaluating compatibility a board or council shall consider the impacts on noncontracted lands in the agricultural preserve or preserves.

(b) A board or council may include in its compatible use rules or ordinance conditional uses which, without conditions or mitigations, would not be in compliance with this section. These conditional uses shall conform to the principles of compatibility set forth in subdivision (a) or, for non-prime lands only, satisfy the requirements of subdivision (c).

(c) In applying the criteria pursuant to subdivision (a), the board or council may approve a use on non-prime land which, because of on-site or off-site impacts, would not be in compliance with paragraphs (1) and (2) of subdivision (a), provided the use is approved pursuant to a conditional use permit that shall set forth findings, based on substantial evidence in the record, demonstrating the following:

(1) Conditions have been required for, or incorporated into, the use that mitigate or avoid those on-site or off-site impacts so as to make the use consistent with the principles set forth in paragraphs (1) and (2) of subdivision (a) to the greatest extent possible while maintaining the purpose of the use.

(2) The productive capability of the subject land has been considered as well as the extent to which the use may displace or impair agricultural operations.

(3) The use is consistent with the purposes of this chapter to preserve agricultural and open-space land or supports the continuation of agricultural uses, as defined in Section 51205, or the use or conservation of natural resources, on the subject parcel or on other parcels in the agricultural preserve. The use of mineral resources shall comply with Section 51238.2.

(4) The use does not include a residential subdivision. For the purposes of this section, a board or council may define non-prime land as land not defined as 'prime agricultural land' pursuant to subdivision (c) of Section 51201 or as land not classified as 'agricultural land' pursuant to subdivision (a) of Section 21060.1 of the Public Resources Code. Nothing in this section shall be construed to overrule, rescind, or modify the requirements contained in Sections 51230 and 51238 related to non-contracted lands within agricultural preserves.

Section 51238.2 specifically addresses the compatibility of mineral extraction activities on contracted lands, and for the purposes of the OCMP and project alternatives, should be read together with Section 51238.1. It reads as follows:

Mineral extraction that is unable to meet the principles of Section 51238.1 may nevertheless be approved as compatible use if the board or council is able to document that (a) the underlying contractual commitment to preserve prime land as defined in subdivision (c) of Section 51201, or (b) the underlying contractual commitment to preserve non-prime land for open-space use as defined in subdivision (c) of Section 51201, will not be significantly impaired.

Conditions imposed on mineral extraction as a compatible use of contracted land shall include compliance with the reclamation standards adopted by the Mining and Geology Board pursuant to Section 2773 of the Public Resources Code, including the applicable performance standards for prime agricultural land and other agricultural land, and no exception to these standards may be permitted. For purposes of this section, 'contracted land' means all land under a single contract for which an applicant seeks a compatible use permit.

The consistency of the proposed project and alternatives with the Williamson Act is discussed in Section 4.5, Agriculture.

Regional Water Quality Control Board's Basin Plan

The Basin Plan is a regulatory reference for meeting the State and Federal requirements for water quality control in the Central Valley Region. The preparation of basin plans is supported by the Federal Clean Water Act and required by the State's Porter-Cologne Water Quality Control Act. The Central Valley Regional Water Quality Control Board, which is responsible for implementation of the Basin Plan in Yolo County, evaluates discharges that may impact water quality and, if appropriate, issues numerical standards and monitoring requirements for the discharge. This would be relevant to the proposed project in that Cache Creek has been identified as a degraded stream, and the OCMP could affect its water quality, as discussed in Section 4.4, Hydrology and Water Quality.

Yolo County General Plan, Zoning Ordinance and County Code

General Plan

In its final report in 1977, the Aggregate Resources Committee stressed the need for a coordinated approach to resource management, stating that "adoption of a Countywide (resource) management policy and plan should maximize the benefits of an aggregate industry in the County." This recommendation lead to the adoption of Conservation Policies 34 and 35, as follows:

CON 34 Mineral Resources: Yolo County shall adopt a Mining Ordinance to implement these policies as they apply to mineral resources, including sand and gravel.

CON 35 Cache Creek: Yolo County shall adopt a Cache Creek Management Program for the carefully managed use and conservation of Cache Creek and its sand and gravel resource, its riverside environment, its relationship to ground and surface water characteristics and its value as a fishery and recreation resource.

Other General Plan policies with relevance to off-channel surface mining and reclamation are set forth below:

CON 1 Yolo County shall conserve its land and other resources through available means of land use controls, regulations, and advice and guidance, and through coordination with the other elements of [this] General Plan, as amended, and with other agencies.

CON 2 Yolo County shall foster conservation of its resources and avoid natural hazards by planning, encouraging, and regulating the development and use of these resources and the areas where they exist.

CON 4 Yolo County shall adopt a list and maps of the distribution of the natural features, characteristics, and things cited above for use in carrying out these policies.

CON 5 In order to avoid conflict with [this] General Plan, as amended, or to avoid environmental hazards, Yolo County shall require conservation of natural resources, in the development and

managed utilization including: water and its hydraulic force; forests; tree borders along roads and highways; soils; rivers and other surface waters; harbors (marinas); fisheries; wildlife; minerals; other natural resources including as, oil, and geothermal; the reclamation of lands and waters; flood control; prevention and control of the pollution of streams and other waters; regulation of the use of land in stream channels and other areas required for the accomplishment of the conservation plan; prevention, control, and correction of the erosion of soils, beaches, and shores; protection of watersheds; and the location, quantity, and quality of rock, sand, and gravel resources.

CON 6 Yolo County shall plan, encourage, and regulate to ensure that natural resources are maintained for their long-term ecological values as well as for their more direct and immediate benefits.

CON 9 Yolo County shall ensure the protection, maintenance, and wise use of the State's natural resources, especially scarce resources and those that require special control and management.

CON 10 Yolo County shall plan, encourage, and regulate public and private agencies to prevent the wasteful exploitation, destruction, or neglect of the State's resources.

LU 43 In areas designated for industry and commerce, Yolo County shall encourage the initiation and growth of appropriate industry and commerce, with required environmental mitigations, for the purpose of job creation for [our] citizens, development of [our] tax base, and as a foundation for the development and maintenance of a healthy and balanced, diversified economy.

LU 46 Non-urban and resource oriented industrial uses required in specific locations outside of urban communities (such as quarries, mines, gas wells, and similar uses) should be required to control or mitigate hazardous and obnoxious products of those activities to prevent them from impinging upon the adjoining properties and persons.

LU 49 Yolo County shall control encroachment by nearby land uses which would conflict with existing or planned industrial uses or commercial centers.

OS 1 Yolo County shall preserve appropriate open space land through available means of land use controls, regulations, and advice or guidance and through coordination with other elements of [this] General Plan, as amended, and with other agencies.

OS 2 Yolo County shall use the Land Use Element policies, together with Specific Plans, zoning, use permits, site plan review, building permits, subdivision maps, the Agricultural Preserve-Land Conservation Act of 1965, assessment practices, coordination with the Soil Conservation Service, and other available means to preserve all lands defined as Open Space.

Zoning Ordinance

Surface mining operations within Yolo County may only occur within the SG (Sand and Gravel) Zone. The SG Zone may be combined with either the A-1 (General Agriculture) or A-P (Agricultural Preserve) Zones, within the Cache Creek channel boundary, and may only be combined with the A-1 Zone outside of the creek channel (see Figure 3.4-1). The only aggregate extraction currently permitted in the A-P Zone must have creek bank protection and/or erosion control as its primary purpose.

County Code

In-stream surface mining is presently governed by Chapter 3 of Title 10 of the Yolo County Code. The "Interim In-Channel Surface Mining Regulations of Yolo County" apply only to in-stream mining within Cache Creek. They were intended to be a temporary three-year set of regulations, to be revised by the Resource Management Plan being drafted by the Aggregate Technical Advisory Committee in the early 1980s. As subsequent planning efforts resulted in stalemate, however, the interim regulations were never revised. They remain the standards by which in-stream mining is regulated.

Mining areas located outside of the Cache Creek channel are governed by Chapter 2 of Title 8 of the Yolo County Code, which provides procedures for the processing of use permits, including off-channel mining permits.

Chapter 5 of Title 10 is the "Yolo County Surface Mining Reclamation Law" and applies to all surface mines located within the unincorporated areas of the County, both in-channel and off-channel. Like the in-stream regulations, the Reclamation Ordinance has not been substantially updated since the early 1980s and was intended to be revised by the AgTAC Resource Management Plan. The Reclamation Ordinance is now considered long overdue for modification. Over the past five years, SMARA has been extensively amended, especially in the area of reclamation plans. Minimum reclamation standards, interim management plans, annual reporting, and financial assurances have all been added to the state legislation. These are being considered in the update of the County's regulations proposed under the OCMP.

Other Relevant General Plans

Town of Esparto Draft General Plan

In February 1993, Yolo County issued the draft Esparto General Plan, a proposed supplement to the Yolo County General Plan (the plan is expected to be adopted by the end of 1996). It provided specific guidance for allowing limited amounts of development in Esparto, located and designed in such a way as to protect, preserve and perpetuate its small town characteristics and qualities. The Esparto General Plan observes that Cache Creek is a sensitive biological resource that provides habitat for a variety of plant and animal species. It also notes that the creek is an important recreation and open space resource for Esparto and other communities. The General Plan finds that continued or expanded aggregate mining could result in the loss of these values if not properly managed.

The following policies from the Esparto General Plan would apply to the proposed project and alternatives:

Conservation Policy R.6: Prior to approving any proposal to expand existing gravel mining operations or for new such operations, the County shall require submission of a haul road plan including routes and expected traffic volumes.

Conservation Policy R.7: If off-channel mining is deemed acceptable by the County, associated recreation features shall be incorporated into such operations, including, but not limited to, a public trail along Cache Creek. Any off-channel mining proposal shall include a reclamation/restoration plan.

Capay Valley Area General Plan

In May 1982, Yolo County adopted the Capay Valley Area General Plan. Like the Esparto General Plan discussed above, the Capay Valley Area General Plan is a supplement to the Yolo County General Plan; it provides specific guidance for the future distribution and timing of development within the communities of Capay, Guinda, and Rumsey, and for the retention and preservation of agricultural lands in the hills, the foothills and the valley floor. The goal of the Natural Resources Element of the Plan is the protection and preservation of natural resources that possess scenic and/or agricultural productive values. To attain this goal, the element includes the following resource extraction policy:

> Extraction of mineral resources should only be permitted with appropriate environmental controls.

The General Plan includes four implementation strategies to achieve this policy, including:

1) Require existing and proposed mining operations to conform to noise, water, air, soil, and visual pollution standards.

2) Require the restoration of areas affected by mining to standards suitable for agricultural production equal to, or better than, the original state of the area mined. This requires as a minimum, return of the land to its original, long-term productivity or better, and consistent with State law.

3) Enforcement of the State and Federal statutes and County ordinances on Surface Mining Activities and the requirement for reclamation plans prior to commencement of any mining activity.

4) Erosion control measures are to follow the Guidelines contained in the California Regional Water Quality Control Board's Basin Plan for the Sacramento River Basin (5-A).

Yolo County Resource Conservation District

The Yolo County Resource Conservation District (RCD) is empowered by State law (Division IX State Resources Code) to develop and carry out natural resource conservation programs that protect, improve, and sustain the natural resources of Yolo County. The District recognizes the need for land use changes and development, but requires that all new projects must be developed in a manner such that "core resources, including land, water, waterways, and air, are not unduly diminished or permanently damaged." The District is particularly concerned with farmland resources in the County, "not only because it is the foundation for the County's economic health, but [it is our] most valuable, finite, and non-renewable resource."

The following agriculture policies of the RCD would have bearing on the proposed project and alternatives:

- **Policy 5a**: Any change in land-use or designation of land-use which results in the permanent conversion of agricultural land to a non-agricultural land-use will be discouraged.

- **Policy 5f:** Proposals which provide farming-compatible wildlife habitat areas in urban or rural areas are encouraged.

- **Policy 5c**: Proposals for urban growth or proposals requiring a significant increase in water use, losses to groundwater recharge, increased flooding or overall increase in air pollution will be discouraged unless plans for alternate water supplies (through development or conservation) and air pollution reduction are also provided for review, approval, and subsequent implementation.

City of Woodland Draft General Plan

The City of Woodland General Plan was adopted in February 1996 and consists of nine elements: land use, circulation, housing, open space, conservation, noise, safety, parks and recreation, and historic preservation. A comprehensive update of the General Plan has recently been approved. The primary changes between the 1988 General Plan and the updated General Plan include: extending the period of the plan, identifying a higher population and employment holding capacity, redefining the Planning Area, expanding the Urban Limit Line, re-designation of the area north of Kentucky Avenue, and phasing of residential development.

Key principles and policies of the draft plan that would apply to the proposed project and alternatives:

- **Policy 7.A.1**: The City shall cooperate with Yolo County in the conservation of Cache Creek for the protection of its water resources and its open space. To this end, the City shall oppose the introduction of new potential sources of pollution to Cache Creek.

- **Policy 7.A.2**: The City shall cooperate with other jurisdictions in jointly studying the potential for using surface water sources to balance the groundwater supply so as to protect against aquifer overdrafts and water quality degradation.

- **Policy 7.A.3**: The City shall help protect groundwater resources from overdrafts by promoting water conservation and groundwater recharge efforts.

- **Policy 8.B.6**: The City shall continue to work closely with the U.S. Army Corps of Engineers, the Yolo County Resource Conservation District, the Federal Emergency Management Agency, the State Department of Water Resources, and the Yolo County Flood Control and Water Conservation District, in defining existing and potential flood problem areas and solutions.

- **Policy 8.B.7**: The City shall recognize floodplains as a potential public resource to be managed and maintained for the public's benefit and, where possible, shall view flood waters as a resource to be used for waterfowl habitat, aquifer recharge, fishery enhancement, agricultural water supply, and other suitable uses.

Watts-Woodland Airport Comprehensive Land Use Plan

The Watts-Woodland Airport is located at the southeastern margin of the planning area, at County Road 94B and State Highway 16. A portion of one mining/reclamation

application (Teichert-Woodland) is located within the approach/departure and overflight safety zones established by the Watt-Woodland Airport Comprehensive Land Use Plan (CLUP).

The CLUP considers mining and quarrying to be a compatible use within the approach/departure safety zone, subject to the following two conditions:

- Uses [are] compatible only if they do not result in a large concentration of people. A large concentration of people is defined as a gathering of individuals in an area that would result in an average density of greater than 25 persons per acre per hour during any 24 hour period ending at midnight, not to exceed 50 persons per acre at any time.

- Uses [are] compatible only if they do not result in a possibility that a water area may cause ground fog or result in a bird hazard.

IMPACTS AND MITIGATION MEASURES

Standard of Significance

The project would have a significant effect on land use if it would:

- Conflict with general plan designations or zoning.

- Conflict with applicable environmental plans or policies adopted by agencies with jurisdiction over the project.

- Be incompatible with existing land use or planned growth in the vicinity.

- Disrupt or divide the physical arrangement of an established community.

- Substantially alter the present or planned land use of the area.

- Alter the type or intensity of land use within the area.

Impact 4.2-1
Consistency with Yolo County and Other General Plans

Draft OCMP and Implementing Ordinances

The draft OCMP (and the draft CCRMP) has as its genesis in Yolo County General Plan Conservation Policies 34 and 35, and would be consistent with other key policies contained therein. Under the proposed project, Conservation Policies 34 and 35 would be fully implemented.

The draft OCMP would also be consistent with Conservation Policies 1, 2, 4, 5, 6, 9, and 10. These policies call for the conservation and wise use of the County's natural

resources, through a coordinated planning effort involving other responsible resource agencies.

Land Use Policy 43 of the General Plan calls for the County to encourage the development of appropriate industry and commerce provided environmental impacts are mitigated. Land Use Policy 46 requires resource oriented industrial uses to prevent adverse impacts to adjoining properties or persons. And Land Use Policy 49 requires the County to control the encroachment by nearby land uses which would conflict with existing or planned industrial uses or commercial centers. The draft OCMP would be consistent with these land use policies from the Yolo County General Plan.

Chapter 7 of the draft OCMP, Open Space and Recreation Element, sets forth goals, objectives, actions and performance standards that are consistent with the Open Space policies of the Yolo County General Plan, specifically Open Space Policies 1 and 2. This chapter also addresses the recreation requirements set forth under Conservation Policy R.7 of the draft Esparto General Plan, regarding off-channel mining reclamation to recreational uses, including a public trail along Cache Creek.

The Capay Valley Area Plan (a supplement to the Yolo County General Plan), states that extraction of mineral resources should only be permitted with appropriate environmental controls. The purpose of Implementation Strategy #2 in the Capay Valley Area Plan is to reach this goal by requiring restoration of areas affected by mining to standards suitable for agricultural production equal to, or better than, the original state of the area mined. The only activities proposed under the OCMP which would occur within the Capay Valley Area Plan boundaries would be creek maintenance, and these activities would occur on land not currently in agricultural production. Therefore the OCMP would be considered consistent with Implementation Strategy #2.

In summary, the proposed draft OCMP and its implementing ordinances would be consistent with the policies contained in the Yolo County General Plan, and no significant impact is anticipated.

Many relevant Yolo County General Plan policies relate to agriculture, and are evaluated for consistency in Section 4.5 of this EIR.

Alternative 1a: No Project (Existing Conditions)

Under Alternative 1a, no OCMP would be adopted and surface mining would continue based on 1995 actual production levels of each producer. All regulations in place as of December 1, 1995 are assumed to be in effect, including existing "interim" County surface mining regulations, the Williamson Act and SMARA. Since neither the OCMP or the CCRMP would be adopted under this alternative, however, this alternative would be inconsistent with Conservation Policies 34 and 35 from the Yolo County General Plan. This is considered to be a significant impact.

Alternative 1b: No Project (Existing Permits and Regulatory Condition)

Under Alternative 1b, no OCMP would be adopted and surface mining would be allowed based on currently approved maximum annual allocations. All regulations in place as of December 1, 1995 are assumed to be in effect, including existing "interim" County surface mining regulations, the Williamson Act and SMARA. For the same reasons described above for Alternative 1a, this alternative would be inconsistent with the Yolo County General Plan. This is considered a significant impact.

Alternative 2: No Mining (Alternative Site)

Under Alternative 2, no OCMP or CCRMP would be adopted and all existing permits to mine and/or operate plants would be voided. Regional demand for PCC-grade aggregate material would be satisfied from reserves occurring outside Yolo County. Without adoption of the OCMP or CCRMP, the County would be without a comprehensive management policy and plan for off-channel aggregate mining or creek restoration. This alternative would therefore be inconsistent with the Yolo County General Plan. This is considered to be a significant impact.

Alternative 3: Plant Operation Only (Importation)

Under Alternative 3, no OCMP would be adopted and existing mining permits would be voided, but existing plants would continue to operate at approved levels. Without adoption of the OCMP or CCRMP, the County would be without a comprehensive management policy and plan for off-channel aggregate mining or creek restoration. This alternative would therefore be inconsistent with the Yolo County General Plan. This is considered a significant impact.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

Under Alternative 4, the draft OCMP would be modified to allow only shallow mining, and reclamation is assumed to be primarily agricultural (80 percent). The modified OCMP under this alternative would be consistent with the Yolo County General Plan.

Alternative 5a: Decreased Mining (Restricted Allocation)

Under Alternative 5a, the OCMP and its implementing ordinances would be adopted, but mining proposals would be restricted to one-half of the current annual allocation. This alternative would be consistent with the Yolo County General Plan, and no significant impact is expected.

Alternative 5b: Decreased Mining (Shorter Mining Period)

Under Alternative 5b, the OCMP and its implementing ordinances would be adopted, but individual permit and renewal periods would be shortened. This alternative would be

consistent with the Yolo County General Plan. Consequently, no significant impact is expected.

Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed)

Under Alternative 6, all new mining would occur off channel, and a minimum performance standard for individual producers of 80 percent agricultural reclamation would be established. Earth-borrow areas under this alternative would themselves require reclamation to predominantly agricultural uses. The modified OCMP under this alternative would be consistent with the Yolo County General Plan. The General Plan consistency analysis for the proposed project would equally apply to this alternative. Consequently, this alternative would consistent with the Yolo County General Plan.

Mitigation Measure 4.2-1a (OCMP, A-4, A-5a, A-5b, A-6)

None required. However, the amendment to draft OCMP Objective 5.3-1 proposed in Mitigation Measure 4.2-5a would reinforce Implementation Strategy #2 of the Capay Valley Area Plan (as discussed above under "Draft OCMP and Implementing Ordinances") by encouraging the reclamation of land within the Capay Valley Area to agricultural uses (i.e., areas of creek maintenance). This action would enhance the compatibility of the OCMP, A-4, A-5a, A-5b, and A-6 with the Capay Valley Area Plan.

Mitigation Measure 4.2-1b (A-1a, A-1b, A-2, A-3)

In lieu of adopting an OCMP and its implementing ordinances, the County must develop an alternate approach for responding to the requirements of General Plan Conservation Policies 34 and 35. An alternate approach would be to amend the General Plan to include several additional conservation policies, to read as follows:

CON 42 *Yolo County shall recognize the mineral classification study referred to in the California Division of Mines and Geology Special Report 156 and shall consider this information when planning or approving development within the MRZ area.*

CON 43 *The development of land uses which are inherently incompatible with surface mining operations shall be discouraged through the continued maintenance of agricultural zoning within the MRZ area.*

CON 44 *Yolo County shall permit surface mining only within lands designated with the SG (Sand and Gravel) overlay zone, except as otherwise provided for in the A-P (Agricultural Preserve) Zone. Parcels within the MRZ area, which do not have the SG zoning, shall remained zoned for agricultural production and the mineral reserves therein shall be considered as designated for conservation.*

CON 45 *Yolo County shall encourage the conservation and development of identified mineral deposits, while giving consideration to recreation, watershed,*

wildlife, range and forage, aesthetic enjoyment, and other environmental factors.

Implementation of this mitigation measure would not fulfill a Creek Management Program to coordinate fisheries, recreation, and water. General Plan Conservation Policy 35 would still not be met and the resulting inconsistency would be considered a significant and unavoidable impact under A-1a, A-1b, A-2, A-3.

Impact 4.2-2
Consistency with the Yolo County Zoning Ordinance and County Code

Draft OCMP and Implementing Ordinances

Zoning Ordinance

The proposed project would rezone approximately 2,256 acres of land (including a 45-acre borrow area) in lower Cache Creek area with an SG (Sand and Gravel) Zone overlay, and revise the A-P (Agricultural Preserve) Zone to allow for the operation of surface mining on land under Williamson Act contract. This would be a significant impact, reduced to a less-than-significant impact level by implementing the mitigation measure provided below.

Nearly two-thirds of the land proposed for mining over the next 30 years is currently located within the A-P Zone. Rather than require that this acreage be taken out of agricultural preserve, the County is proposing that the A-P Zone be amended (for mined areas only) to allow off-channel mining, consistent with provisions of the Williamson Act. This revision would not only further the goal of the County to retain land under Williamson Act contract, but would also bring the County into conformance with State law and reduce potential regulatory conflict.

Action 5.4-2: Revise the A-P (Agricultural Preserve) Zone to allow for the operation of surface mining on contracted land, in accordance with the provisions of the California Land Conservation (Williamson) Act. The primary purpose of the Williamson Act is to preserve open space, including agriculture, scenic areas, wildlife habitat, and recreational uses. Where surface mining operations propose to reclaim sites to one of the above uses, the land may remain in contract.

Action 5.4-4: Ensure that all proposed surface mining operations that include reclamation to agricultural uses comply with the requirements of the Land Conservation (Williamson) Act and the State Mining and Geology Board Reclamation Regulations.

Action 5.4-2 would revise the A-P (Agricultural Preserve) Zone "to allow for the operation of surface mining on contracted land, in accordance with the provisions of the California Land Conservation (Williamson) Act." As discussed in greater detail in Chapter 4.5, Agriculture, the primary purpose of the Williamson Act is to preserve open space, including agriculture, scenic areas, wildlife habitat, and recreational areas. Under the OCMP, where surface mining operations propose to reclaim sites to one of these uses, the land could remain under contract, in accordance with Section 51238.1 of the Act.

Actions 5.4-2 and 5.4-4 would require that amendments be made to the current Yolo County Zoning Ordinance. It is assumed that the mining ordinance would be self-contained and would not be dependent upon the use permit ordinance. In essence, mining permits would become a separate category of entitlement, so that no changes to the use permit ordinance are anticipated.

Goal 2.2-1: Protect lands containing identified mineral deposits from the encroachment of incompatible land uses so that aggregate resources remain available for future use, as needed.

Obj. 2.3-2: Discourage the encroachment of incompatible land uses into areas designated for future off-channel surface mining operations.

Action 2.4-5: Rezone those lands necessary for the County to meet [regional] aggregate demands for the next fifty (sic)[1]years with an S-G (Sand and Gravel) Zone overlay. The S-G Zone will serve to notify existing and future property owners that mining operations may occur within these properties, in order to discourage the encroachment of incompatible uses.

As described above, Goal 2.2-1, Objective 2.3-2, and Action 2.4-5 are also intended to protect lands containing identified mineral deposits from the encroachment of incompatible land uses, in compliance with SMARA Section 2762(a).

The OCMP would also allow for the designation of 676 acres for future surface mining to meet the aggregate needs of Yolo County and the surrounding region in the 30 to 50 year planning period. As such, this area would be rezoned with the SGR overlay in order to identify the land as being appropriate for mining in the decades to come. The SGR Zone would also serve to notify existing and future property owners, as well as land use decision-making bodies, that mining would likely occur in these areas. Land uses proposed to be located on sites adjoining the SGR-zoned properties could take the likelihood of future mining into account and be designed accordingly. The following section discusses changes that would be required to the Yolo County Zoning Ordinance to implement Actions 5.4-2 and 5.4-4.

Section 8-2.404 sets forth conditional uses that are permitted in the A-P Zone, including rock, sand, and gravel extraction primarily for the purpose of creek bank protection and/or erosion control [subsection 8-2.404(g)]. This would have to be amended to allow commercial rock, sand, and gravel operations as a conditional use within this zone, as long as all necessary findings were met. In addition, ancillary uses associated with sand and gravel mining would be conditionally permitted, including processing facilities, scale houses, batch plants, underground tanks, offices, and other types of facilities. The provision for allowing commercial mining within the A-P Zone would have to specifically state that such activities would only be conditionally allowed within the boundaries of the OCMP.

[1] This should read "thirty" years, not "fifty" years.

Subsection 8-2.404(j) states the following regarding conditional uses permitted in the A-P Zone:

Privately-owned reservoirs and/or water retention basins, with associated water transmission facilities, in conjunction with mining activity or the reclamation plan for such mining activity, other than rock, sand, and/or gravel mining; provided that such reservoir or retention facility is found to have the potential either to provide flood control, fire suppression, water supply, wildlife habitat improvement, or groundwater recharge or enhancement benefits, and that such facilities are compatible with the existing uses in the same agricultural preserve as the proposed facilities. The application for such permit shall detail all uses proposed for the facility, the water stored therein, the applicant's water rights, and the effects thereof on the surrounding agricultural land.

This section would have to be amended to delete the prohibition on banning reservoirs associated with sand and gravel mining, as well as to allow reservoirs that have the potential to provide recreational opportunities. It should be specified that this provision would only apply within the OCMP and CCRMP. In addition, it should be noted that private reservoirs are not currently designated as either an allowed or a conditional use in the A-1 Zone. The amended language within this subsection would also be inserted into Article 6 (A-1 Zone).

A new subsection titled "Land Use Contracts in the A-P Zone", should be added to the ordinance, to incorporate or reference the findings for compatible land uses that were recently added to the Williamson Act.

Section 8-2.604(n) of the Zoning Ordinance sets forth the conditional uses permitted in the A-1 Zone. Subsection 8-2.604(n) states the following:

Mines, quarries, and gravel pits, commercial, after the approval of a Special Sand and Gravel Combining Zone (SG) pursuant to Article 23.1 of this chapter in off-channel locations, or after the issuance of a permit pursuant to Chapter 3 of Title 10 of this Code in areas within a channel as defined in Section 10-3.204 of Article 2 of Chapter 3 of Title 10 of this Code.

This section would have to be amended to require off-channel permits pursuant to Chapter 4 of Title 10 of this Code. References to mining within the channel would be deleted.

Article 23.1 of the Yolo County Zoning Ordinance deals with the Special Sand and Gravel Combining Zone (SG). Section 8-2.2311 states the following as the purpose of the zone:

The Special Sand and Gravel Combining Zone (SG) classification is intended to be combined with the A-1 Zone and with the A-P Zone in the channel as defined by Chapter 3 of Title of this Code so as to indicate land areas in which surface mining operations may be conducted.

This section would have to be amended to allow mining outside of the channel, restricted to the study area of the OCMP.

Section 8-2.2312(a), Land Use Regulations (SG), states the following regarding the SG Zone:

Applicability for in-channel surface mining. The Special Sand and Gravel Combining Zone (SG) may be combined with the existing zoning of any land, including A-1 and A-P zoned land, located within a channel as defined by Chapter 3 of Title 10 of this Code.

The use of any land within a channel and designated by the Special Sand and Gravel Combining Zone (SG) for mining purposes shall be allowed only pursuant to Chapter 3 of Title 10 of this Code entitled 'Interim In-Channel Surface Mining Regulations,' or successors thereto.

Since commercial mining would not be allowed within the channel, and the County is considering rezoning the channel to OS, this subsection would be deleted.

Section 8-2.2312(b), presented below, would have to be amended to allow the SG Zone to be combined with the A-P Zone outside the channel, within the OCMP and CCRMP. It would also have to be changed to allow use permits for commercial mines in lands that are zoned A-P/SG.

Applicability in off-channel locations. The Special Sand and Gravel Combining Zone (SG) may be combined with any A-1 Zone located outside the channel as defined by Chapter 3 of Title 10 of this Code pursuant to the following regulations:

(1) in all areas outside a channel, the SG zone may only be combined with the Agricultural General Zone (A-1) as defined in Article 6 of this Chapter.

(2) No use permits for mines, quarries, and/or gravel pits, commercial, shall be issued pursuant to subsection (n) of Section 8-2.604 of Article 6 of this chapter for any land which is not zoned A-1/SG pursuant to this section.

(3) This article is not intended and shall not be construed as allowing any use inconsistent with the General Plan and all its elements, any specific plan applicable to the site, or the zoning of the site, nor shall this article limit the existing discretion of the Commission or the Board to impose conditions on the granting of a use permit for off-channel mining.

A new article would be added to the Zoning Ordinance, entitled Article 23.8. Special Sand and Gravel Reserve Combining Zone (SGR). This article would describe the purpose and regulations governing areas that would not be mined until some point in the future. The SGR would be a holding zone, to allow long-range planning for lands that have been identified within the OCMP and CCRMP as appropriate for future mining. In order for mining to occur on a parcel zoned SGR, the operator would have to obtain approval of a mining permit and reclamation plan, as well as rezoning to the SG Zone. A focused EIR would also have to be prepared, if the OCMP Program EIR were determined to still be valid. Property not presently studied in the OCMP will also require a General Plan Amendment.

County Code

The County Board of Supervisors approved Minute Order 94-73 in June of 1994, approving the development of an Off-Channel Mining Ordinance, in recognition of the need to accommodate the potential shift of emphasis from mining within the creek to off-channel terrace-pit mining. The Minute Order also provided for the submittal of long-term, off-

channel mining permit applications. A draft Off-Channel Mining Ordinance has been prepared to provide implementation of the OCMP; however, the draft ordinance contains application requirements different from those specified in Minute Order 94-73. As a result, the Minute Order will be rescinded upon adoption of the draft ordinance to avoid any potential conflicts between the two documents.

To simplify the administration of surface mining within Yolo County, off-channel mining regulations have been assigned a separate chapter within the County Code. The reclamation ordinance will continue to govern off-channel mining. The ordinances have been revised to include recent changes in SMARA and the State Reclamation Regulations, and policy directives issued by the State Department of Conservation. Specific performance standards for both mining and reclamation have been included, beyond those already mandated by the State. These standards have been developed through the recommendations of the Technical Studies prepared for Cache Creek, and the experience and practices of other jurisdictions in the regulation of mining.

Alternative 1a: No Project (Existing Conditions)

Under Alternative 1a, no OCMP would be adopted and surface mining would continue based on 1995 actual production levels of each producer. All regulations in place as of December 1, 1995 are assumed to be in effect, including existing "interim" County surface mining regulations, the Williamson Act and SMARA. Under this alternative, existing conditions would persist, consistent with the Yolo County Zoning Ordinance and County Code. This would be a less-than-significant impact, and no mitigation would be required.

Alternative 1b: No Project (Existing Permits and Regulatory Condition)

Under Alternative 1b, no OCMP would be adopted and surface mining would be allowed based on currently approved maximum annual allocations. This alternative would be consistent with the Yolo County Zoning Ordinance and County Code. This would be a less-than-significant impact, and no mitigation would be required.

Alternative 2: No Mining (Alternative Site)

Under Alternative 2, no OCMP would be adopted and all existing permits to mine and/or operate plants would be voided. This alternative would be consistent with the Yolo County Zoning Ordinance and the County Code. This would be a less-than-significant impact, and no mitigation is required.

Alternative 3: Plant Operation Only (Importation)

Under Alternative 3, no OCMP would be adopted, existing mining permits would be voided, but existing plants would continue to operate at approved levels. There would be no inconsistency with the Zoning Ordinance or County Code. This would be a less-than-significant impact, and no mitigation is required.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

Under Alternative 4, the draft OCMP would be modified to allow only shallow mining. This alternative differs from the proposed project in the type of mining that would be allowed, but not in its relationship to current zoning requirements. Therefore, the policy analysis under Impact 4.2-2 for the OCMP and its implementing ordinances would apply equally to this alternative. This would be a significant impact, reduced to a less-than-significant level by implementation of the mitigation measure set forth below.

Alternative 5a: Decreased Mining (Restricted Allocation)

Under Alternative 5a, the OCMP and its implementing ordinances would be adopted, but mining proposals would be restricted to one-half of the current annual allocation. This alternative differs from the proposed project in the amount of mining that would be allowed, but not in its relationship to current zoning requirements. Therefore, the policy analysis under Impact 4.2-2 for the OCMP and its implementing ordinances would apply equally to this alternative. This would be a significant impact, reduced to a less-than-significant level by implementation of the mitigation measure set forth below.

Alternative 5b: Decreased Mining (Shorter Mining Period)

Under Alternative 5b, the OCMP and its implementing ordinances would be adopted, but individual permit and renewal periods would be shortened. This alternative differs from the proposed project in the period during which mining that would be allowed, but not in its relationship to current zoning requirements. Therefore, the policy analysis under Impact 4.2-2 for the OCMP and its implementing ordinances would apply equally to this alternative. This would be a significant impact, reduced to a less-than-significant level by implementation of the mitigation measure set forth below.

Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed)

Under Alternative 6, all new mining would occur off channel, and a minimum performance standard for individual producers of 80 percent agricultural reclamation would be established. Earth-borrow areas under this alternative would themselves require reclamation to predominantly agricultural uses. This alternative differs from the proposed project in its requirements for mining reclamation, but not in its relationship to current zoning requirements, with one exception: additional properties would have to serve as borrow areas to meet the agricultural reclamation minimum standard, so the total area subject to rezoning would be increased as compared to the project. The policy analysis under Impact 4.2-2 for the OCMP and its implementing ordinances would apply equally to this alternative. This would be a significant impact, reduced to a less-than-significant level by implementation of the mitigation measure set forth below.

Mitigation Measure 4.2-2a (OCMP, A-4, A-5a, A-5b, A-6)

The following sections of the Yolo County Zoning Ordinance should be amended to implement the OCMP and its implementing ordinances: Section 8-2.404(g), 8-2.404(j), 8-2.604(n), 8-2.2311, 8-2.2312(a), and 8-2.2312(b). New sections should be added to the Yolo County Zoning Ordinance at Section 8-2.404 (to address land use contracts in the A-P Zone), and at 8-2.23.8 (to address the Special Sand and Gravel Combining Zone (SGR)).

Implementation of this mitigation measure would reduce this impact to a less-than-significant level for the OCMP and Alternatives 4, 5a, 5b, and 6.

Mitigation Measure 4.2-2a (A-1a, A-1b, A-2, A-3)

None required.

Impact 4.2-3
Consistency with the State Mining and Reclamation Act (SMARA) and the State Mining and Geology Board Reclamation Regulations

Draft OCMP and Implementing Ordinances

The State Mining and Geology Board Reclamation Regulations establishes state policy for the reclamation of mined lands and the conduct of surface mining operations in accordance with the Surface Mining and Reclamation Act of 1975. Section 3676 of the Regulations sets forth the minimum content requirements of lead agency mineral resource management policies, which are outlined in the Regulatory Setting section above. The draft OCMP contains all the information required under Section 3676.

The Yolo County OCMP has been prepared in accordance with Sections 2761-2764 of Division 2, Chapter 9, of the Public Resources Code (SMARA). The draft plan is also in conformance with Article 9, Sections 3675-3676 of Division 2, Chapter 9, of the Code of Reclamation Regulations of the State Mining and Geology Board.

Adoption of the OCMP would be consistent with Section 2662(a) of SMARA, which requires the County to incorporate mineral resource management policies into its General Plan after receiving a mineral land classification report from the State Geologist. It would also be consistent with Section 3676 of the State Mining and Geology Board Regulations, which requires adoption of mineral resource management policies by a lead agency.

The proposed Off-Channel Surface Mining Ordinance and Surface Mining Reclamation Ordinance would serve as new and revised ordinances to the Yolo County Code governing off-channel surface mining and reclamation. The ordinances include performance standards to carry out the policies of the OCMP, and procedures for several requirements mandated in recent SMARA amendments. Adoption of these ordinances

would be consistent with the SMARA Section 2774, which requires that such ordinances be adopted.

Prior to adoption of the OCMP, State Mining and Geology Board review and comment is required under Section 2762(a) of SMARA. Any future proposed amendments to the OCMP and its policies must also be sent to the Mining and Geology Board for review and comment, before their adoption. Similarly, Section 2774.3 of SMARA requires the off-channel surface mining and reclamation ordinances be reviewed by the State Mining and Geology Board, and certified as being in accordance with State policy if it meets or exceeds the requirements of SMARA and the Reclamation Regulations.

In summary, the OCMP and its implementing ordinances would be consistent with SMARA and the Reclamation Regulations. This would be a less-than-significant impact and no mitigation is required.

Alternative 1a: No Project (Existing Conditions)

Section 3676 of the State Mining and Geology Board and Reclamation Regulations sets forth the minimum content requirements of lead agency mineral resource management policies; the draft OCMP and its implementing ordinances are intended to satisfy these requirements. Under Alternative 1a, no OCMP would be adopted and the project would be inconsistent with Section 3676.

Over the last five years, SMARA has been extensively amended, especially in the area of reclamation plan requirements. Minimum reclamation standards, interim management plans, annual reporting, and financial assurances have all been added to the state legislation and are needed to be addressed in the County's regulations. Under Alternative 1a, however, the County's existing Reclamation Ordinance would not be amended to take into account recent and significant changes in state law.

The Off-Channel Surface Mining Ordinance and Surface Mining Reclamation Ordinance, the implementing ordinances of the draft OCMP, would not be updated under this alternative. Therefore, this alternative would also be inconsistent with Section 2774 of SMARA, which requires that such ordinances be revised to be in accordance with State policy. This alternative would not be consistent with SMARA or the State Mining and Geology Board Reclamation Regulations for the reasons discussed above. This would be a significant impact.

Alternative 1b: No Project (Existing Permits and Regulatory Condition)

For the same reasons discussed above for Alternative 1a, Alternative 1b would be inconsistent with State Reclamation Regulations Section 3676 and SMARA Sections 2662(a) and 2774. This would be a significant impact.

Alternative 2: No Mining (Alternative Site)

For the same reasons discussed above for Alternative 1a, Alternative 2 would be inconsistent with State Reclamation Regulations 3676. This would be a significant impact.

Alternative 3: Plant Operation Only (Importation)

For the same reasons discussed above for Alternative 1a, Alternative 3 would be inconsistent with State Reclamation Regulations Section 3676. This would be a significant impact.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

Under Alternative 4, the draft OCMP would be modified to allow only shallow mining, and reclamation would be primarily agricultural (80 percent). The approach to mineral resource management under this alternative would differ from that under the proposed project; however, it would still meet all statutory requirements set forth in SMARA and the State Reclamation Regulations. This would be a less-than-significant impact.

Alternative 5a: Decreased Mining (Restricted Allocation)

Under Alternative 5a, the OCMP and its implementing ordinances would be adopted, but mining proposals would be restricted to one-half of the current annual allocation. This alternative would satisfy and be consistent with SMARA and the State Reclamation Regulations. This would be a less-than-significant impact.

Alternative 5b: Decreased Mining (Shorter Mining Period)

Under Alternative 5b, the OCMP and its implementing ordinances would be adopted, but individual permit and renewal periods would be shortened. This alternate approach to OCMP implementation would be consistent with SMARA and the State Reclamation Regulations. This would be a less-than-significant impact.

Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed)

Under Alternative 6, all new mining would occur off channel, and a minimum performance standard for individual producers of 80 percent agricultural reclamation would be established. Earth-borrow areas under this alternative would themselves require reclamation to predominantly agricultural uses. This alternate approach to OCMP implementation would be consistent with SMARA and the State Reclamation Regulations. This would be a less-than-significant impact.

Mitigation Measure 4.2-3a (OCMP, A-4, A-5a, A-5b and A-6)

None required.

Mitigation Measure 4.2-3b (A-1a, A-1b, A-2 and A-3)

In lieu of adopting an OCMP and its implementing ordinances, the County shall amend the mining regulations and ordinances to ensure consistency with SMARA and the State Reclamation Regulations.

Implementation of this mitigation measure would reduce this impact to a less-than-significant level for Alternatives 1a, 1b, 2, and 3.

Impact 4.2-4
Consistency with the Regional Water Quality Control Board's Basin Plan

Draft OCMP and Implementing Ordinances

As discussed under Impacts 4.4-2 and 4.4-3 in the Hydrology and Water Quality section of this EIR, the proposed project has the potential to adversely affect water quality during mining and post-reclamation. Chapter 3.0 of the draft OCMP contains a number of policies and performance standards intended to prevent contamination of surface water and groundwater; these are also examined in the Hydrology and Water Quality section. The analysis finds that, despite the policies it currently contains, the OCMP could potentially be inconsistent with the objectives of the Basin Plan. This would be a significant impact.

Alternative 1a - No Project (Existing Conditions)

Under Alternative 1a, no OCMP would be adopted and surface mining would continue based on 1995 actual production levels of each producer. Discharges of agricultural tailwater directly to Cache Creek are common throughout the planning area and could continue under this alternatives. As discussed further under Impacts 4.4-2 and 4.4-3, this could be potentially inconsistent with the objectives of the Basin Plan. This would be considered a significant impact.

Alternative 1b - No Project (Existing Permits and Regulatory Condition)

Under Alternative 1b, no OCMP would be adopted and surface mining would be allowed based on currently approved maximum annual allocations. This alternative could potentially be inconsistent with the objectives of the Basin Plan, for the reasons described above for Alternative 1a and discussed in greater detail under Impacts 4.4-2 and 4.4-3. This would be a significant impact.

Alternative 2 - No Mining (Alternative Site)

Under this alternative mining would be discontinued within the planning area and no new off-channel wet pits would be created. As described in greater detail under Impacts 4.4-2 and 4.4-3, the requirement for regrading of reclaimed areas to drain toward detention basins and not into Cache Creek, would not be enforceable. The County does not require

drainage controls for other agricultural lands. Agricultural runoff draining into Cache Creek represents a significant impact to water quality, and thus would be potentially inconsistent with the objectives of the Basin Plan.

Alternative 3 - Plant Operation Only (Importation)

Under Alternative 3, no OCMP would be adopted, existing mining permits would be voided, but existing plants would continue to operate at approved levels. The potential impacts of this alternative would be the same as described for Alternative 2, above.

Alternative 4 - Shallow Mining (Alternative Method/Reclamation)

Under Alternative 4, the draft OCMP would be modified to allow only shallow mining, and reclamation is assumed to be primarily agricultural (80 percent). The modified OCMP under this alternative would contain a number of policies intended to prevent contamination of surface water and groundwater; these are also examined in the Hydrology and Water Quality section. The analysis finds that, despite the policies it would contain, the OCMP could potentially be inconsistent with the objectives of the Basin Plan. This would be a significant impact.

Alternative 5a - Decreased Mining (Restricted Allocation)

For reasons described above for the proposed project, this alternative would potentially be inconsistent with the objectives of the Basin Plan. This would be a significant impact.

Alternative 5b - Decreased Mining (Shorter Mining Period)

For reasons described above for the proposed project, this alternative would potentially be inconsistent with the objectives of the Basin Plan. This would be a significant impact.

Alternative 6 - Agricultural Reclamation (with Mining Operations as Proposed)

Under Alternative 6, all new mining would occur off channel, and a minimum performance standard for individual producers of 80 percent agricultural reclamation would be established. Earth-borrow areas under this alternative would themselves require reclamation to predominantly agricultural uses. For reasons described above for the proposed project, this alternative would potentially be inconsistent with the objectives of the Basin Plan. This would be a significant impact.

Mitigation Measure 4.2-4a (OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, A-6)

Implementation of Mitigation Measures 4.4-2a and 4.4-3a would reduce this impact to a less-than-significant level for the OCMP and all alternatives.

Impact 4.2-5
Consistency with the RCD Agriculture Policies

Draft OCMP and Implementing Ordinances

The draft OCMP and its implementing ordinances would allow increased surface mining operations in the lower Cache Creek area over the next 30 years. This would result in the long-term, temporary conversion of approximately 2,000 acres of farmland to surface mining, which would eventually be reclaimed to one of the following uses: lakes; row crops; tree crops; habitat; slopes and maintenance roads; and pasture land.

The RCD's agricultural Policy 5a discourages the permanent conversion of agricultural land to a non-agricultural land-use. Policy 5f encourages proposals which provide farming-compatible wildlife habitat areas in urban and rural areas. Objective 5.3-1 from the OCMP, set forth below, would be consistent with the RCD land preservation and protection policies. It reads:

> Encourage the preservation of prime and important farmland along Cache Creek, while giving consideration to other compatible beneficial uses, such as groundwater storage and recharge facilities, surface mining operations, riparian habitat, and public recreation.

This would be a less-than-significant impact and no mitigation is required.

Alternative 1a: No Project (Existing Conditions)

Under Alternative 1a, no OCMP would be adopted and surface mining would continue based on 1995 actual production levels of each producer. All regulations in place as of December 1, 1995 are assumed to be in effect, including existing "interim" County surface mining regulations, the Williamson Act and SMARA. Existing regulations require off-channel reclamation to agriculture, and this alternative would be consistent with the RCD's agricultural land preservation and protection policies. This would be a less-than-significant impact, and no mitigation is required.

Alternative 1b: No Project (Existing Permits and Regulatory Condition)

Under Alternative 1b, no OCMP would be adopted and surface mining would be allowed based on currently approved maximum annual allocations. All regulations in place as of December 1, 1995 are assumed to be in effect, including existing "interim" County surface mining regulations, the Williamson Act and SMARA. Existing regulations require off-channel reclamation to agriculture, and this alternative would be consistent with the RCD's agricultural land preservation and protection policies. This would be a less-than-significant impact, and no mitigation is required.

Alternative 2: No Mining (Alternative Site)

Under Alternative 2, no OCMP would be adopted and all existing permits to mine and/or operate plants would be voided. Regional demand for PCC-grade aggregate material would be satisfied from reserves occurring outside Yolo County, and thus outside the jurisdiction of the RCD. Existing regulations require off-channel reclamation to agriculture, and this alternative would be consistent with the RCD's agricultural land preservation and protection policies. This would be a less-than-significant impact, and no mitigation is required.

Alternative 3: Plant Operation Only (Importation)

Under Alternative 3, no OCMP would be adopted, existing mining permits would be voided, but existing plants would continue to operate at approved levels. Regional demand for PCC-grade aggregate material would be satisfied from reserves occurring outside Yolo County, and thus outside the jurisdiction of the RCD. Existing regulations require off-channel reclamation to agriculture, and this alternative would be consistent with the RCD's agricultural land preservation and protection policies. This would be a less-than-significant impact, and no mitigation is required.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

Under Alternative 4, the draft OCMP would be modified to allow only shallow mining, and reclamation is assumed to be primarily agricultural (80 percent). This alternative would result in the long-term, temporary conversion of farmland to surface mining, which would eventually be reclaimed to farmland; it would also result in the permanent conversion of farmland to other uses.

Under this alternative, the OCMP would retain Objective 5.3-1 (set forth above), which is consistent with RCD Agricultural Policies 5a and 5f. This would be a less-than-significant impact and no mitigation is required.

Alternative 5a: Decreased Mining (Restricted Allocation)

Under Alternative 5a, the OCMP and its implementing ordinances would be adopted, but mining proposals would be restricted to one-half of the current annual allocation. It is assumed that farmland would be converted to non-agricultural uses during mining, and that some reclamation would be to non-farmland uses, including habitat and open water features.

Under this alternative, the OCMP would retain Objective 5.3-1 (set forth above), which is consistent with RCD Agricultural Policies 5a and 5f. This would be a less-than-significant impact and no mitigation is required.

Alternative 5b: Decreased Mining (Shorter Mining Period)

Under Alternative 5b, the OCMP and its implementing ordinances would be adopted, but individual permit and renewal periods would be shortened. It is assumed that farmland would be converted to non-agricultural uses during mining (despite the shorter period), and that some reclamation would be to non-farmland uses.

Under this alternative, the OCMP would retain Objective 5.3-1 (set forth above), which is consistent with RCD Agricultural Policies 5a and 5f. This would be a less-than-significant impact and no mitigation is required.

Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed)

Under Alternative 6, all new mining would occur off channel, and a minimum performance standard for individual producers of 80 percent agricultural reclamation would be established. Extensive earth-borrows from non-mining areas would be required to generate pit-fill material; these earth-borrow areas themselves would require reclamation to predominantly agricultural uses. This alternative would be consistent with the RCD's agricultural policies, a less-than-significant impact for which mitigation is not required.

Mitigation Measure 4.2-5a (OCMP, A-4, A-5a, A-5b, A-6)

None required. As an improvement measure, however, it is recommended that the following language be added to Objective 5.3-1 of the OCMP:

> *Reclamation of agricultural lands to other uses, however, is discouraged, wherever agricultural reclamation is feasible.*

Mitigation Measure 4.2-5b (A-1a, A-1b, A-2, A-3)

None required.

Impact 4.2-6
Compatibility with Existing and Planned Land Uses

Draft OCMP and Implementing Ordinances

The lower Cache Creek area consists of low rolling hills and broad alluvial plains formed at the base of the eastern flank of the California Coast Range. The level soils support intensive, irrigated agriculture as the predominant rural land use; there are also several large sand and gravel extraction operations located within and along the creek. Unincorporated communities in the vicinity of the project area include Capay, Esparto, Madison, Yolo, Monument Hills and Willow Oaks. The City of Woodland, the county seat, is several miles to the southeast of the project area. As described above in the Setting

section, the project area is expected to sustain a modest level of urban development over the duration of the planning period, but will retain its predominantly rural characteristics.

The draft OCMP contains several goals, objectives, actions and performance standards that are intended to reduce the overall area affected by surface mining and reclamation, and the potential for incompatible land uses. The OCMP estimates that as much as 216 million tons of aggregate material could feasibly be mined from approximately 2,887 acres over the next 50 years. Most of the land that would be mined is currently in agricultural use. Actions 2.4-12 and 5.4-6 from the OCMP (which are duplicate actions and are set forth below) would reduce the total area of mining by encouraging off-channel excavation operations to access additional aggregate reserves using wet pits. The purpose of these actions would be to increase mining efficiency and to reduce the surface land area disturbed by mining, particularly agricultural land. While having a beneficial effect on the area of land disturbance, the use of wet pit mining may have adverse impacts relating to flooding and water quality; these potential impacts are discussed in Section 4.4 of this EIR.

Action 2.4-12 and
Action 5.4-6: Encourage off-channel excavation operations to access additional aggregate reserves through the use of wet pits, in order to increase mining efficiency and to minimize the surface land area disturbed by mining.

Goal 2.2-1 is intended to protect lands containing mineral deposits from the encroachment of incompatible land uses. In this case, an incompatible land use is considered any use of the land, such as residential or commercial development, which would foreclose opportunities for future surface mining and reclamation. Objective 2.3-2 emphasizes this goal by discouraging the encroachment of incompatible land uses into areas designated for future off-channel surface mining operations. This is consistent with SMARA Section 2762(a), which requires a lead agency to incorporate mineral resource management policies into its general plan after receiving a mineral land classification report from the State Geologist. Section 2762(a) further requires that these policies help in coordinating the management of land uses within and surrounding areas designated as of statewide and regional significance for aggregate resources (such as the project area), and that they emphasize the conservation and development of identified mineral resources.

Goal 2.2-1: Protect lands containing identified mineral resource deposits from the encroachment of incompatible land uses so that aggregate resources remain available for future use, as needed.

Obj. 2.3-2: Discourage the encroachment of incompatible land uses into areas designated for future off-channel surface mining operations.

Goal 4.2-2 and Performance Standard 4.4-5 would contribute to reducing the potential incompatibility of land uses that could result from plan implementation.

Goal 4.2-2: Coordinate land uses and improvements along Cache Creek so that the adverse effects of flooding and erosion are minimized.

PS 4.4-5: Manage activities and development within the floodplain to avoid hazards and adverse impacts on surrounding properties. This shall be accomplished through enforcement of the County Flood Ordinance and ensuring that new development complies with the requirements of the State Reclamation Board.

Actions 2.4-1 and 5.4-1 of the OCMP are intended to prevent incompatible land use problems from developing in the future, specifically as related to the spheres-of-influence of the surrounding communities of Esparto, Yolo and Madison (see Figure 4.2-1).

Action 2.4-1: Maintain the existing A-1 (General Agricultural) or A-P (Agricultural Preserve) Zoning within the off-channel planning area, except where it serves as a holding area within community spheres of influence. This will provide a buffer for surface mining operations to discourage the encroachment of incompatible uses.

Action 5.4-1: Maintain the existing A-1 (General Agriculture) or A-P (Agricultural Preserve) Zoning within the off-channel planning area, except where it serves as a holding area within the community spheres of influence for Madison, Esparto and Yolo, so as to preserve the agricultural character of the region.

Goal 2.2-2 of the OCMP encourages the production and conservation of mineral resources, but balances this with the need to give consideration to other County objectives. Objective 5.3-1 compliments Goal 2.2-2, by encouraging the preservation of farmland along Cache Creek, while considering other compatible beneficial uses.

Goal 2.2-2: Encourage the production and conservation of mineral resources, while giving consideration to recreation, watershed, wildlife, agriculture, aesthetics, flood control, and other environmental factors.

Obj. 5.3-1: Encourage the preservation of prime and important farmland along Cache Creek, while giving consideration to other compatible beneficial uses, such as groundwater storage and recharge facilities, surface mining operations, riparian habitat, and public recreation.

In summary, the draft OCMP and its implementing ordinances would discourage land use incompatibility in the project area. This would be consistent with the provisions of SMARA, as well as the anticipated growth scenarios described in the Woodland, Esparto and Capay Valley General Plans. The potential for site-specific land use conflicts will be addressed in the project-level EIRs on the five pending mining applications.

Alternative 1a: No Project (Existing Conditions)

Under Alternative 1a, no OCMP would be adopted and surface mining would continue based on 1995 actual production levels of each producer. No new mining would take place under this alternative, and no new land uses would be introduced into the area which could be incompatible with existing or planned land uses. This would therefore be a less-than-significant impact.

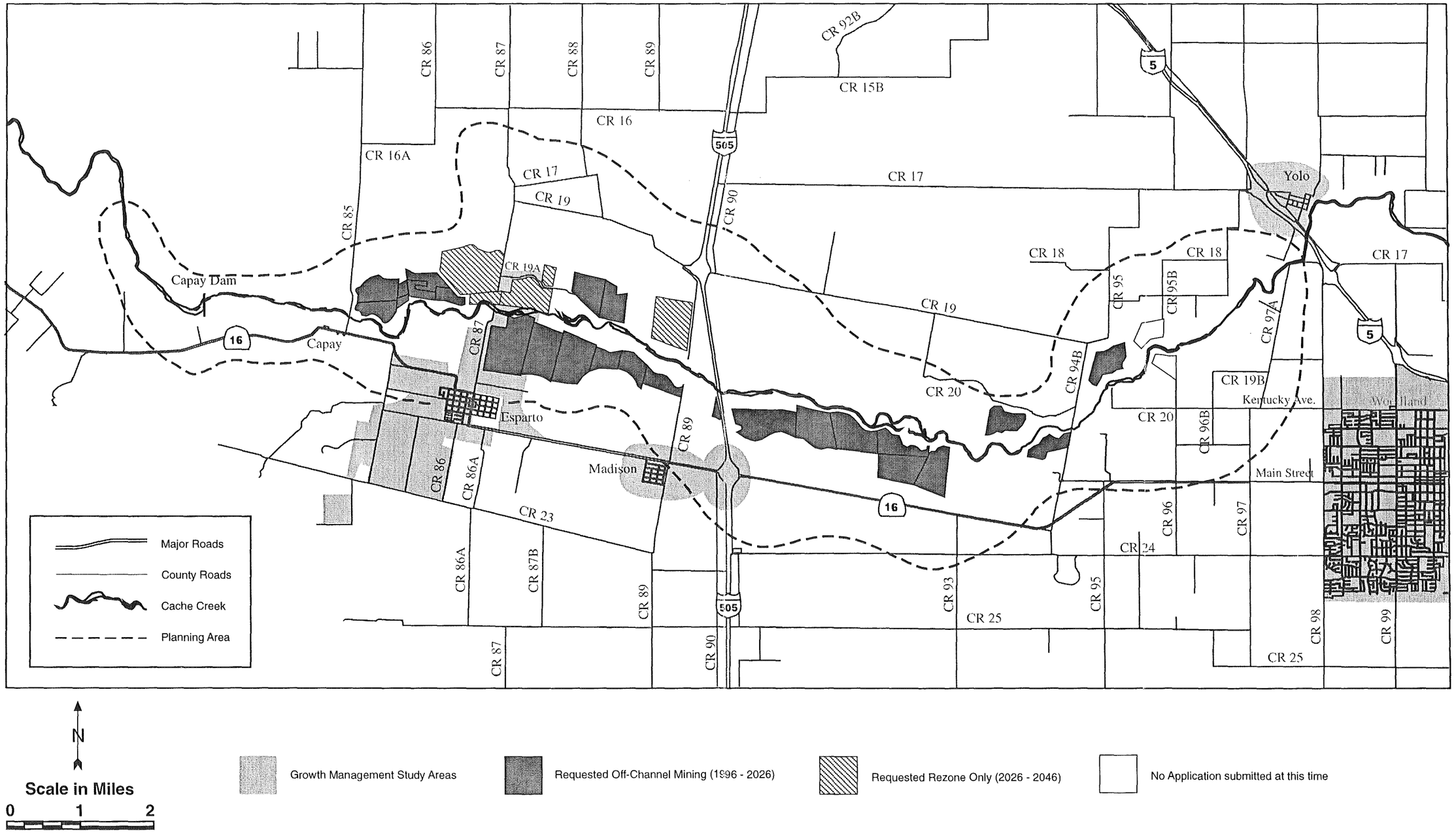


Figure 4.2-1 Relevant Community Spheres of Influence

SOURCE: YOLO COUNTY LAFCo; CITY OF WOODLAND GENERAL PLAN DRAFT EIR

Alternative 1b: No Project (Existing Permits and Regulatory Condition)

Under Alternative 1b, no OCMP would be adopted and surface mining would be allowed based on currently approved maximum annual allocations. No new mining would take place under this alternative, and no new land uses would be introduced into the area which could be incompatible with existing or planned land uses. This would therefore be a less-than-significant impact.

Alternative 2: No Mining (Alternative Site)

Under Alternative 2, no OCMP would be adopted and all existing permits to mine and/or operate plants would be voided. No new mining would take place under this alternative, and no new land uses would be introduced into the area which could be incompatible with existing or planned land uses. This would therefore be a less-than-significant impact.

Alternative 3: Plant Operation Only (Importation)

Under Alternative 3, no OCMP would be adopted, existing mining permits would be voided, but existing plants would continue to operate at approved levels. No new mining would take place under this alternative, and no new land uses would be introduced into the area which could be incompatible with existing or planned land uses. This would therefore be a less-than-significant impact.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

Under Alternative 4, the draft OCMP would be modified to allow only shallow mining, and reclamation is assumed to be primarily agricultural (80 percent), with some open water (15 percent) and habitat restoration (5 percent). The modified draft OCMP and its implementing ordinances would discourage land use incompatibility in the project area, consistent with SMARA Section 2762(a). The potential for site-specific land use conflicts will be addressed in the project-level EIRs on the five pending mining applications.

Alternative 5a: Decreased Mining (Restricted Allocation)

Under Alternative 5a, the OCMP and its implementing ordinances would be adopted, but mining proposals would be restricted to one-half of the current annual allocation. The modified draft OCMP and its implementing ordinances would discourage incompatible land uses, consistent with SMARA Section 2762(a); the potential for site-specific land conflicts will be addressed at the project level.

Alternative 5b: Decreased Mining (Shorter Mining Period)

Under Alternative 5b, the OCMP and its implementing ordinances would be adopted, but individual permit and renewal periods would be shortened. The modified draft OCMP and its implementing ordinances would discourage incompatible land uses, consistent with

SMARA Section 2762(a); the potential for site-specific land conflicts will be addressed at the project level.

Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed)

Under Alternative 6, all new mining would occur off channel, and a minimum performance standard for individual producers of 80 percent agricultural reclamation would be established. Earth-borrow areas under this alternative would themselves require reclamation to predominantly agricultural uses. The modified draft OCMP and its implementing ordinances would tend to discourage incompatible land uses (consistent with SMARA Section 2762(a)); however, the extensive earth-borrows required under this alternative could result in some incompatible land uses in the project area. The potential for site-specific land conflicts will be addressed at the project level.

Mitigation Measures 4.2-6a (OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, A-6)

None required.

Impact 4.2-7
Change in Land Use Intensity

Draft OCMP and Implementing Ordinances

The draft OCMP and its implementing ordinances would increase the intensity of land uses in the project area, allowing large agricultural areas to be mined for sand and gravel. The increased intensity of land use activity would correspond with the phasing-in of mining. As reclamation activities are phased in, the level of intensity would diminish as land is returned to agriculture, open water, or habitat use (see Figures provided under Impact 4.2-9 discussion). The primary result of the intensification of land use activity during mining would be a substantial increase in the number of truck trips on local County roads, and the corresponding impacts to roadway levels of service, ambient noise levels, and air quality. The physical effects associated with land use changes in the project area are analyzed in the corresponding sections of this EIR; site specific effects of proposed mining and reclamation activities will be addressed in the project level EIRs. This would not be a significant impact at the program level.

Alternative 1a: No Project (Existing Conditions)

Under Alternative 1a, no OCMP would be adopted and surface mining would continue based on 1995 actual production levels of each producer. The intensity of land use activity in the project area would increase under this alternative during mining activities, and would decrease as reclamation plans were implemented. The physical effects associated with land use changes in the project area under this alternative, including truck traffic, noise and air quality, are analyzed in the corresponding sections of this EIR; site specific effects of

proposed mining and reclamation activities will be addressed in the alternatives section of the project level EIRs. This would not be a significant impact at the program level.

Alternative 1b: No Project (Existing Permits and Regulatory Condition)

Under Alternative 1b, no OCMP would be adopted and surface mining would be allowed based on currently approved maximum annual allocations. The potential change in land use intensity under this alternative would be similar to that described for Alternative 1a. This would not be a significant impact at the program level.

Alternative 2: No Mining (Alternative Site)

Under Alternative 2, no OCMP would be adopted and all existing permits to mine and/or operate plants would be voided. This alternative would result in a general reduction in land use intensity in the planning area, as mining operations are terminated and reclamation activities are established. This would not be a significant impact at the program level.

Alternative 3: Plant Operation Only (Importation)

Under Alternative 3, no OCMP would be adopted, existing mining permits would be voided, but existing plants would continue to operate at approved levels. The level of land use intensity in the planning area would decrease over time as mining areas are reclaimed. This would not be a significant impact at the program level.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

Under Alternative 4, the draft OCMP would be modified to allow only shallow mining, and reclamation is assumed to be primarily agricultural (80 percent). The potential changes in land use intensity under this alternative would be similar to that for the proposed project. This would not be a significant impact at the program level.

Alternative 5a: Decreased Mining (Restricted Allocation)

Under Alternative 5a, the OCMP and its implementing ordinances would be adopted, but mining proposals would be restricted to one-half of the current annual allocation. The potential changes in land use intensity under this alternative would be similar to that for the proposed project; the total area where increases and decreases in activity would occur, however, would generally be smaller under this alternative. This would not be a significant impact at the program level.

Alternative 5b: Decreased Mining (Shorter Mining Period)

Under Alternative 5b, the OCMP and its implementing ordinances would be adopted, but individual permit and renewal periods would be shortened. The potential changes in land use intensity under this alternative would be similar to that for the proposed project; the

timeframes when increases and decreases in activity, however, would generally be of shorter duration under this alternative. This would not be a significant impact at the program level.

Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed)

Under Alternative 6, all new mining would occur off channel, and a minimum performance standard for individual producers of 80 percent agricultural reclamation would be established. Earth-borrow areas under this alternative would themselves require reclamation to predominantly agricultural uses. The potential changes in land use intensity would generally be the same as under the proposed project. This would not be a significant impact at the program level.

Mitigation Measure 4.2-7a (OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, A-6)

None required at the program level.

Impact 4.2-8
Land Use Incompatibility Due to Changes in the Creek Boundary

Draft OCMP and Implementing Ordinances

Adoption of the new creek boundary is not expected to result in incompatible land uses. The new creek boundary would be a more accurate measure of delineating the boundary between in-channel and off-channel uses. The new boundary would reflect the nature of the Creek as it currently exists. The only permanent structures within the new creek boundary would be limited to existing power line towers and access roads (which would be protected) and levees (which may be removed or breached to restore the floodplain). Decision-making would be improved by allowing the County to regulate the creek in a more systematic and responsive manner. Activities and development within the channel would be better managed to avoid hazards and adverse land use impacts on surrounding properties. The in-channel boundary (and other concepts such as the Test 3 Run Boundary) would provide initial starting points for repairing the creek. Off-channel excavations would need to take the boundary changes into account. Furthermore, the boundary would be revised based on information provided by recommended monitoring programs and will account for habitat restoration and channel stabilization efforts which are expected to occur. Therefore, no significant impacts are anticipated and no mitigations are required.

Alternative 1a: No Project (Existing Conditions)

Under Alternative 1a, no OCMP or Cache Creek Resources Management Plan (CCRMP) would be adopted and surface mining would continue based on 1995 actual production levels of each producer. This alternative would not realign the in-channel/off-channel boundary, and existing conditions would persist. Decisions based on current regulations would not reflect the existing hydrologic nature of the creek, and management of the

creek's resources would not occur in a comprehensive and integrated manner. However, activities and development would be managed under existing requirements to avoid hazards and adverse impacts on surrounding properties. This would not be a significant impact.

Alternative 1b: No Project (Existing Permits and Regulatory Condition)

Under Alternative 1b, no OCMP or CCRMP would be adopted and surface mining would be allowed based on currently approved maximum annual allocations. This alternative would not realign the in-channel/off-channel boundary, and existing conditions would persist. This alternative would not realign the in-channel/off-channel boundary, and existing conditions would persist. Decisions based on current regulations would not reflect the existing hydrologic nature of the creek, and management of the creek's resources would not occur in a comprehensive and integrated manner. However, activities and development would be managed under existing requirements to avoid hazards and adverse impacts on surrounding properties. This would not be a significant impact.

Alternative 2: No Mining (Alternative Site)

Under Alternative 2, no OCMP or CCRMP would be adopted and all existing permits to mine and/or operate plants would be voided. Regional demand for PCC-grade aggregate material would be satisfied from reserves occurring outside of Yolo County. This alternative would not realign the in-channel/off-channel boundary, and existing conditions would persist. This alternative would not realign the in-channel/off-channel boundary, and existing conditions would persist. Decisions based on current regulations would not reflect the existing hydrologic nature of the creek, and management of the creek would occur in a piecemeal manner. This would not be a significant impact.

Alternative 3: Plant Operation Only (Importation)

Under Alternative 3, no OCMP would be adopted, existing mining permits would be voided, but existing plants would continue to operate at approved levels. This alternative would not realign the in-channel/off-channel boundary, and existing conditions would persist. This alternative would not realign the in-channel/off-channel boundary, and existing conditions would persist. Decisions based on current regulations would not reflect the existing hydrologic nature of the creek, and management of the creek would occur in a piecemeal manner. This would not be a significant impact.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

Under Alternative 4, the draft OCMP would be modified to allow only shallow mining, and reclamation is assumed to be primarily agricultural (80 percent). The OCMP under this alternative would contain the same provisions for realignment of the in-channel/off-channel boundary as the proposed project, and the issue of land use compatibility would be the same. This would therefore be considered a less-than-significant impact.

Alternative 5a: Decreased Mining (Restricted Allocation)

Under Alternative 5a, the OCMP and its implementing ordinances would be adopted, but mining proposals would be restricted to one-half of the current annual allocation. The OCMP under this alternative would contain the same provisions for realignment of the in-channel/off-channel boundary as the proposed project, and the issue of land use compatibility would be the same. This would therefore be considered a less-than-significant impact.

Alternative 5b: Decreased Mining (Shorter Mining Period)

Under Alternative 5b, the OCMP and its implementing ordinances would be adopted, but individual permit and renewal periods would be shortened. The effects on land use compatibility under this alternative would be the same as the proposed project. This would therefore be considered a less-than-significant impact.

Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed)

Under Alternative 6, all new mining would occur off channel, and a minimum performance standard for individual producers of 80 percent agricultural reclamation would be established. Earth-borrow areas under this alternative would themselves require reclamation to predominantly agricultural uses. The effects on land use compatibility under this alternative would be the same as the proposed project. This would therefore be considered a less-than-significant impact.

Mitigation Measures 4.2-8a (OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, A-6)

None required.

Impact 4.2-9
Land Disturbance During Mining

Draft OCMP and Implementing Ordinances

Over the 30-year life of the OCMP, a total of approximately 2,211 acres would be mined; Table 3-1 in the Project Description section of this EIR outlines the reasonably foreseeable mining operations that would occur under the OCMP, based on the five individual mining applications. Each application proposes its own phasing scheme: Teichert-Woodland would be mined/reclaimed in three phases; Teichert-Esparto would be mined/reclaimed in four phases; Syar would be mined/reclaimed in six phases; and Solano and R.C. Collet would be mined/reclaimed in seven phases.

Figures 4.2-2 through 4.2-8 show the anticipated status of all phased mining activities in five-year increments, for the years 2001, 2006, 2011, 2016, 2021, 2026, and 2031.

Due to the phased implementation of mining and reclamation that would occur under the OCMP, only a small fraction of the total acreage to be mined might be disturbed in any given year. This would not be a significant impact.

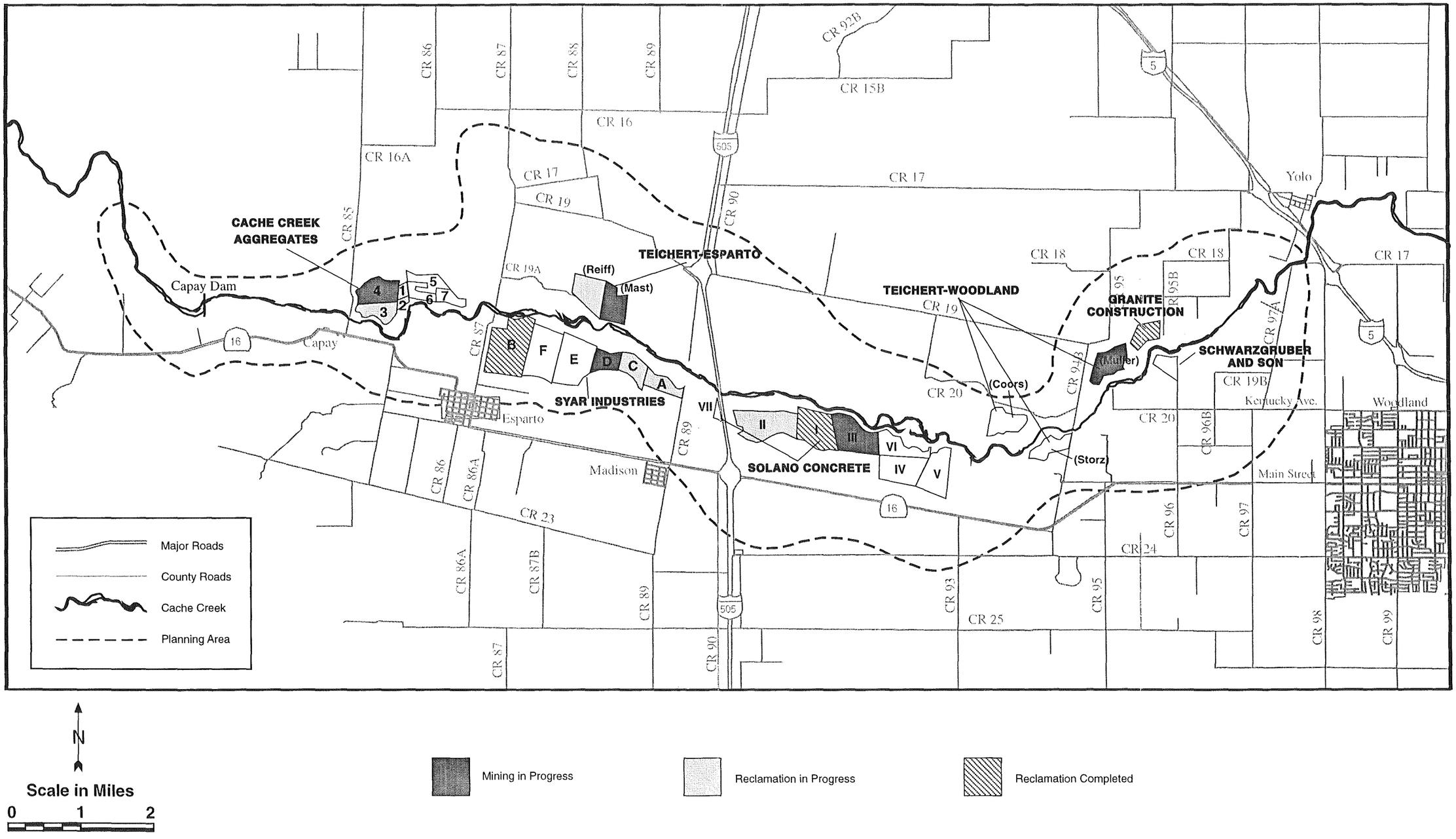


Figure 4.2-3 Mining and Reclamation Phasing under the OCMP - Year 2006

SOURCE: INDIVIDUAL MINING APPLICATIONS

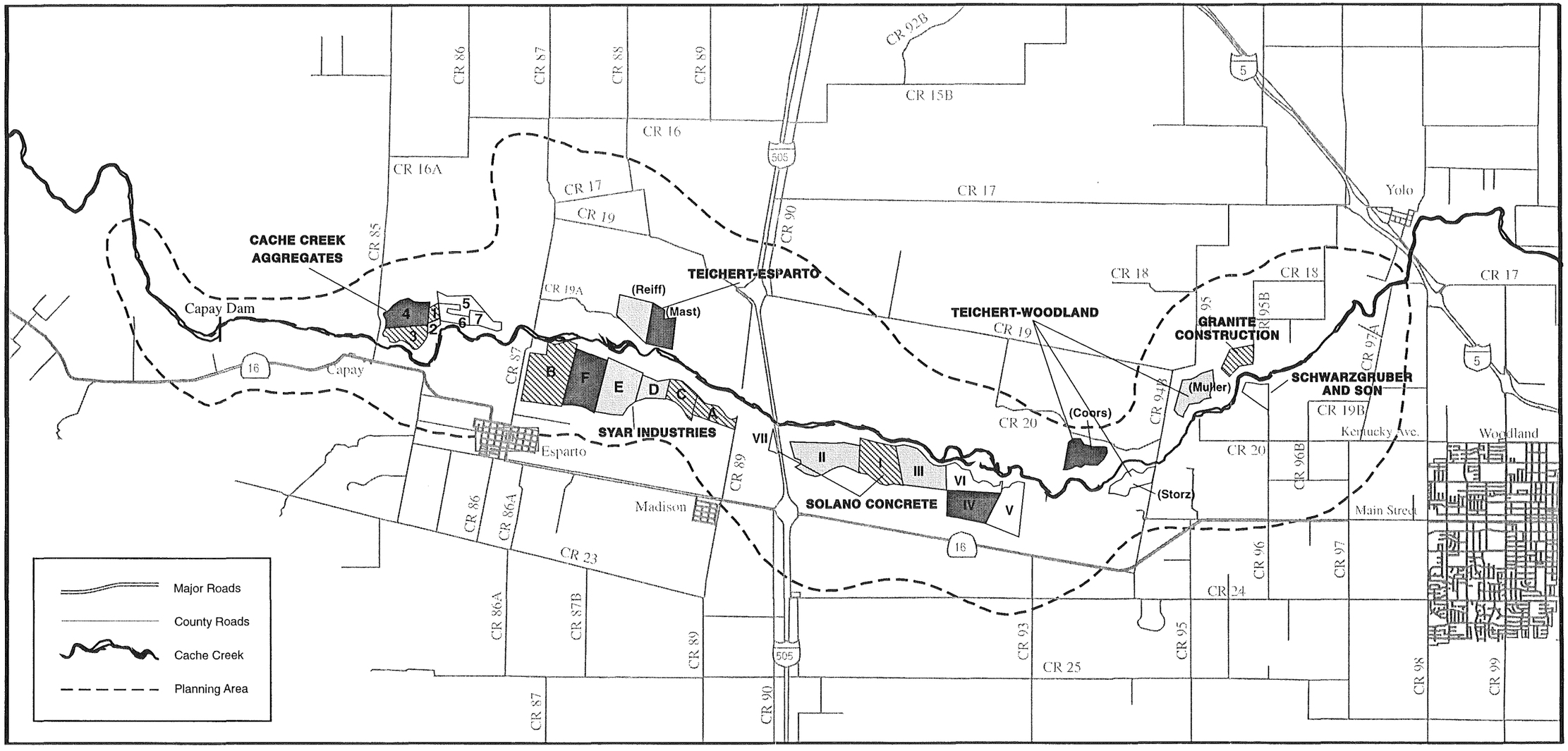


Figure 4.2-4 Mining and Reclamation Phasing under the OCMP - Year 2011

SOURCE: INDIVIDUAL MINING APPLICATIONS

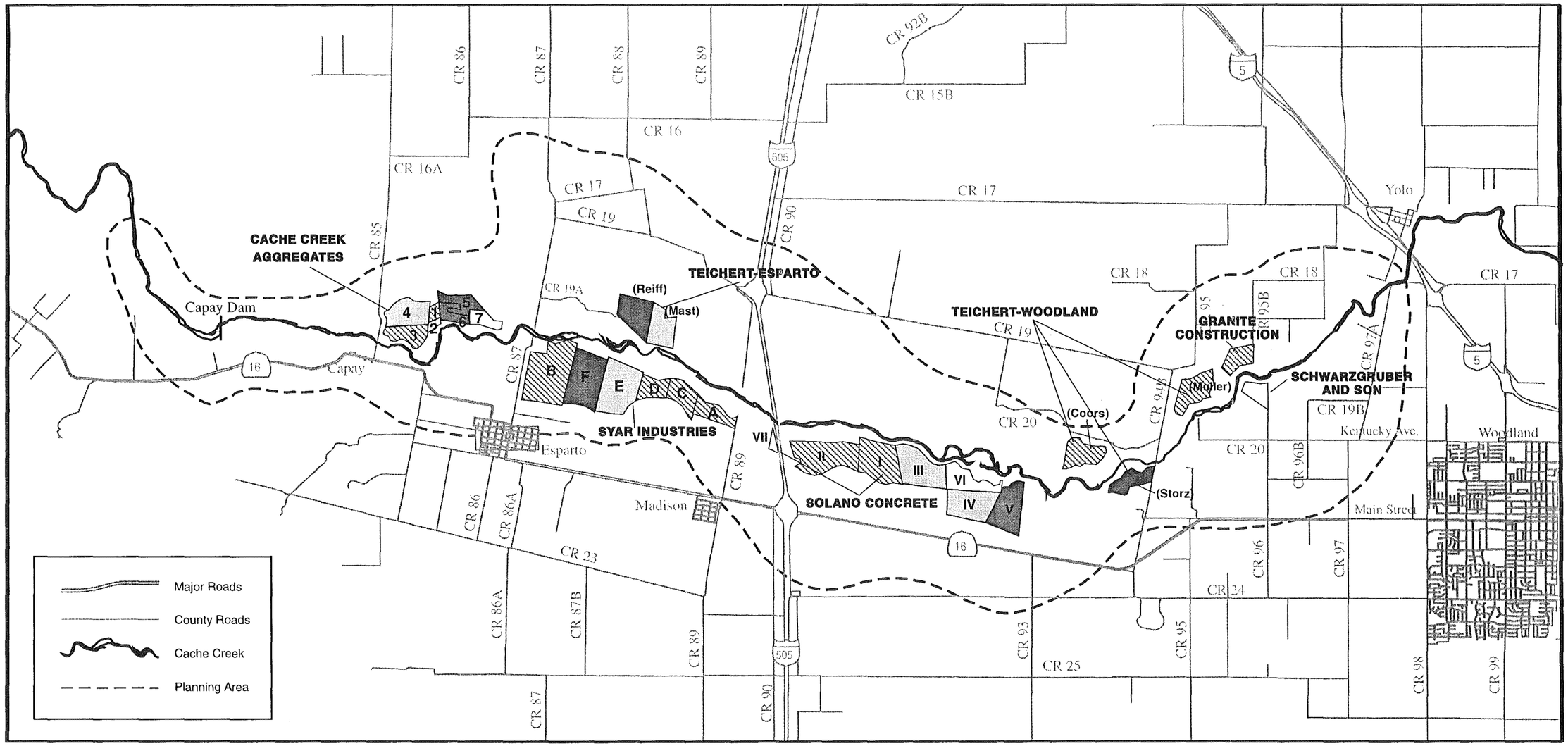


Figure 4.2-5 Mining and Reclamation Phasing under the OCMP - Year 2016

SOURCE: INDIVIDUAL MINING APPLICATIONS

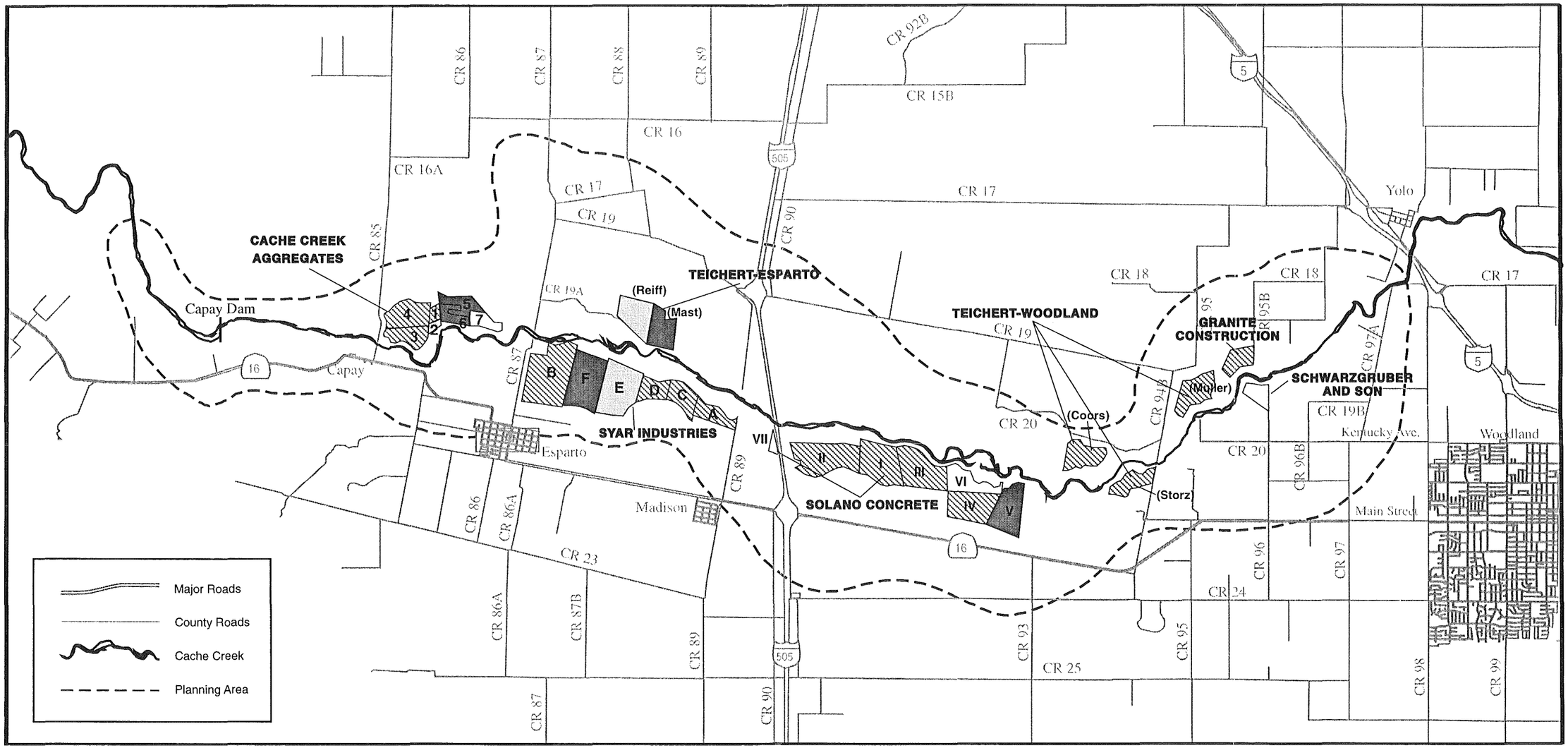


Figure 4.2-6 Mining and Reclamation Phasing under the OCMP - Year 2021

SOURCE: INDIVIDUAL MINING APPLICATIONS

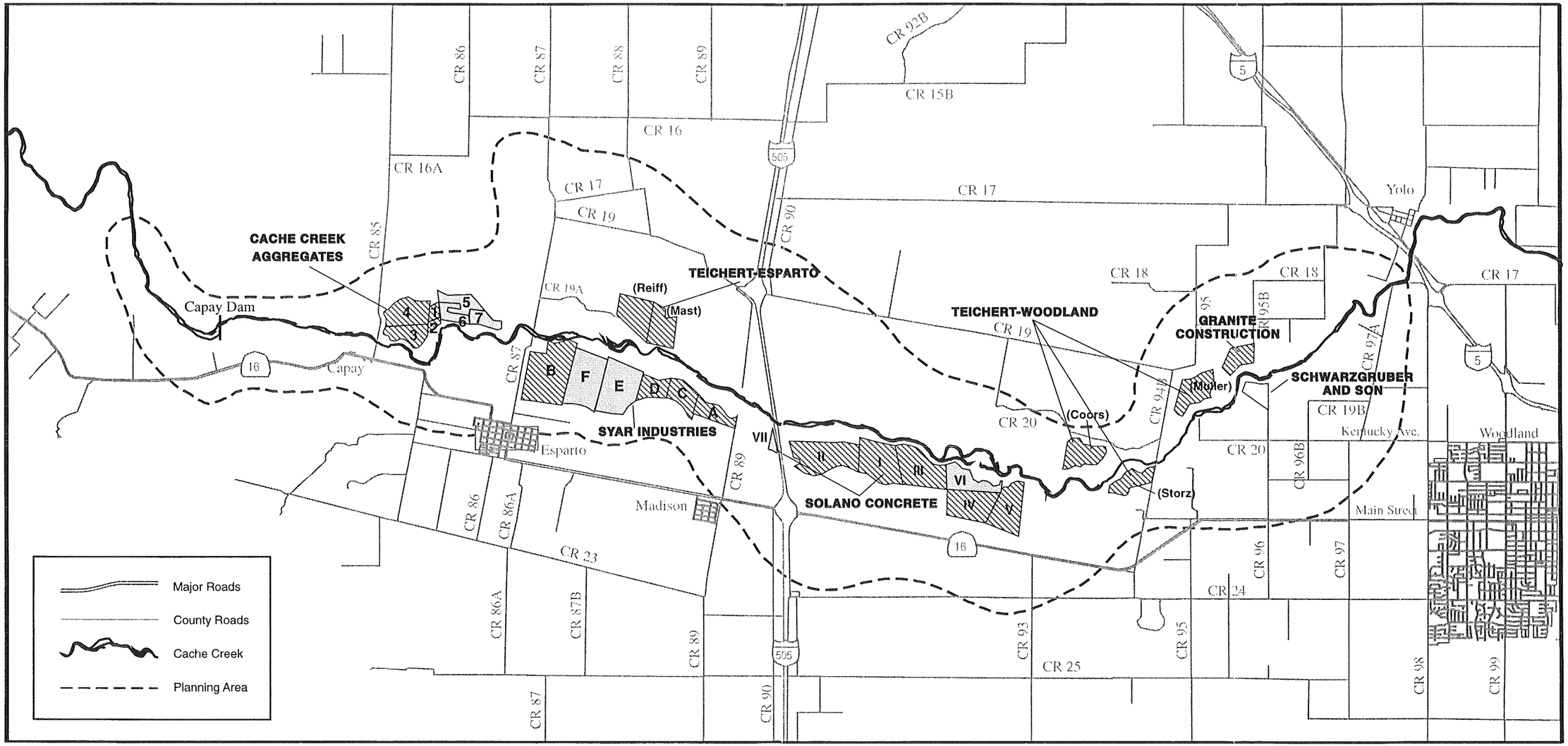


Figure 4.2-7 Mining and Reclamation Phasing under the OCMP - Year 2026

SOURCE: INDIVIDUAL MINING APPLICATIONS

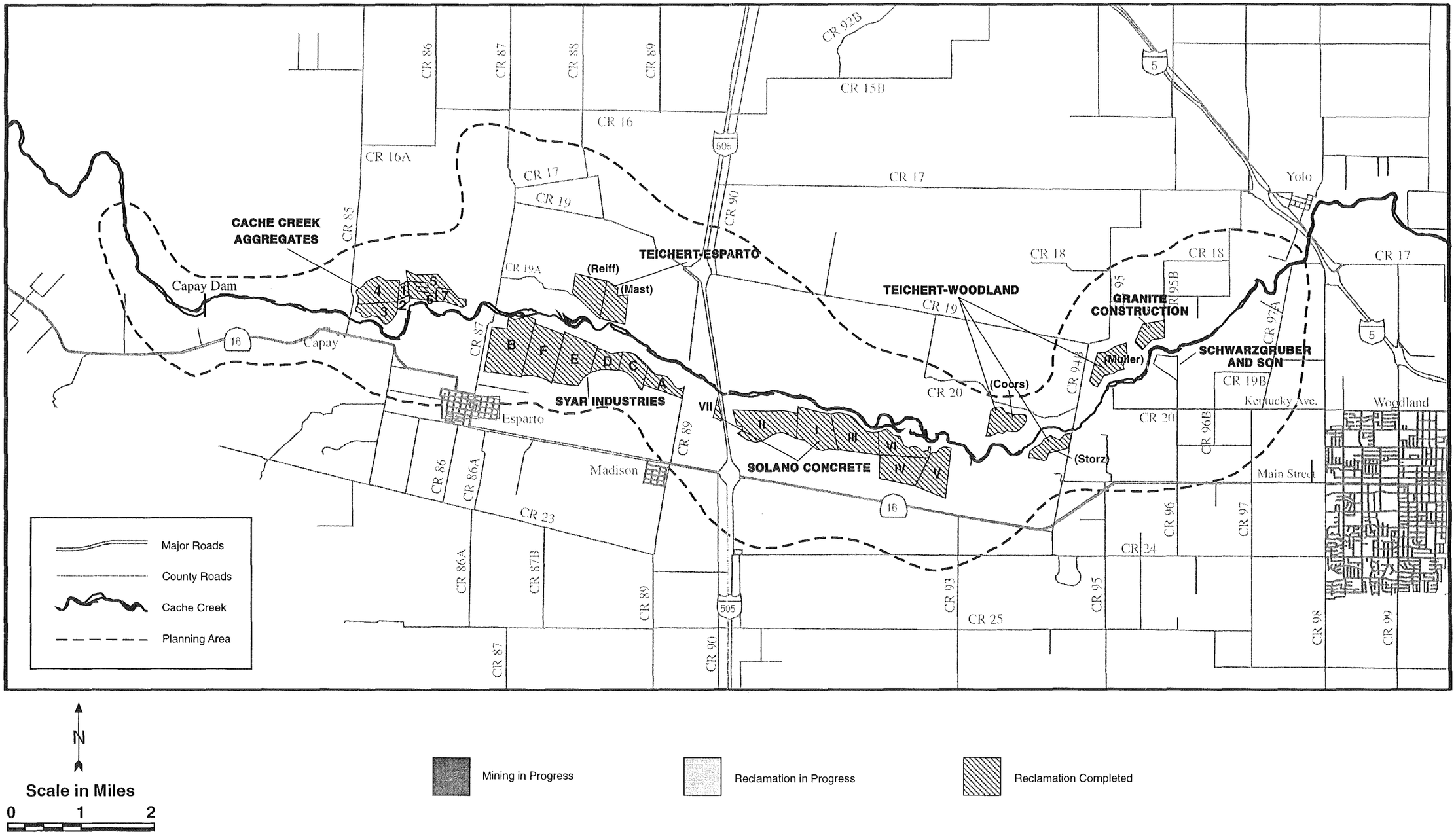


Figure 4.2-8 Mining and Reclamation Phasing under the OCMP - Year 2031

SOURCE: INDIVIDUAL MINING APPLICATIONS

Alternative 1a: No Project (Existing Conditions)

Under Alternative 1a, no OCMP would be adopted and land disturbance from surface mining would continue based on 1995 actual production levels of each producer. Approximately 543 acres of land would be disturbed under this alternative over a period of approximately 7.6 years. Surface mining and reclamation activities under this alternative would occur in phases. This would be a less-than-significant impact.

Alternative 1b: No Project (Existing Permits and Regulatory Condition)

Under Alternative 1b, no OCMP would be adopted and land disturbance would result from surface mining based on currently approved maximum annual allocations. A total area of approximately 543 acres would be disturbed over a period of approximately 4.25 years. Surface mining and reclamation activities under this alternative would occur in phases, modified to fit the shortened timeframe and maximum allocations. This would be a less-than-significant impact.

Alternative 2: No Mining (Alternative Site)

Under Alternative 2, no OCMP would be adopted and all existing permits to mine and/or operate plants would be voided. Regional demand for PCC-grade aggregate material would be satisfied from reserves occurring outside of Yolo County. Under this alternative, land disturbance from mining would occur outside the County, in the alternative site locations. This would be a less-than-significant impact.

Alternative 3: Plant Operation Only (Importation)

Under Alternative 3, no OCMP would be adopted, existing mining permits would be voided, but existing plants would continue to operate at approved levels. Under this alternative, land disturbance from mining would occur outside the County, in locations where raw materials were mined for importation to lower Cache Creek plants. This would be a less-than-significant impact.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

Under Alternative 4, the draft OCMP would be modified to allow only shallow mining, and reclamation is assumed to be primarily agricultural (80 percent). A total of approximately 2,211 acres would be disturbed under this alternative over a 30-year period; however, the phasing of disturbance would be different than that depicted in Figures 4.2-2 through 4.2-8. This would be a less-than-significant impact.

Alternative 5a: Decreased Mining (Restricted Allocation)

Under Alternative 5a, the OCMP and its implementing ordinances would be adopted, but mining proposals would be restricted to one-half of the current allocation. A total of

approximately 1,105 acres would be disturbed over a 30-year period, and phasing plans would be revised. This would be a less-than-significant impact.

Alternative 5b: Decreased Mining (Shorter Mining Period)

Under Alternative 5b, the OCMP and its implementing ordinances would be adopted, but individual permit and renewal periods would be shortened. A total of approximately 1,105 acres of land would be disturbed over a 15-year period. Mining phasing plans would be revised to fit the shortened mining period. This would be a less-than-significant impact.

Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed)

Under Alternative 6, all new mining would occur off channel, and a minimum performance standard for individual producers of 80 percent agricultural reclamation would be established. A total area of approximately 5,250 acres would be temporarily disturbed (including extensive earth-borrow areas), and phasing plans contained in the individual applications would be revised. This would be a less-than-significant impact.

Mitigation Measures 4.2-9a (OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, A-6)

None required.

Impact 4.2-10
Potential for Additional Mining above that which is Currently Known

Draft OCMP and Implementing Ordinances

Based on the applications received and the draft OCMP and CCRMP, the County has identified that the reasonably foreseeable implementation of the OCMP over 50 years would result in mining on approximately 2,887 acres for 216 million tons of aggregate. The OCMP alone, however, covers a land area of 23,174 acres where mining theoretically could occur given an interested party and County approval. This would require an SG Overlay Zone, a mining permit, and appropriate project-level environmental review. This potential of substantial amounts of additional mining could pose a significant adverse impact.

Alternative 1a: No Project (Existing Conditions)

Under Alternative 1a, no OCMP would be adopted and surface mining would continue based on 1995 actual production levels of each producer. This alternative would not have the potential for additional mining above that which is currently known. This would be a less-than-significant impact.

Alternative 1b: No Project (Existing Permits and Regulatory Condition)

Under Alternative 1b, no OCMP would be adopted and surface mining would be allowed based on currently approved maximum annual allocations. This alternative would not have the potential for additional mining above that which is currently known. This would be a less-than-significant impact.

Alternative 2: No Mining (Alternative Site)

Under Alternative 2, no OCMP would be adopted and all existing permits to mine and/or operate plants would be voided. Regional demand for PCC-grade aggregate material would be satisfied from reserves occurring outside of Yolo County. This alternative would not have the potential for additional mining above that which is currently known within the planning area. This would be a less-than-significant impact.

Alternative 3: Plant Operation Only (Importation)

Under Alternative 3, no OCMP would be adopted, existing mining permits would be voided, but existing plants would continue to operate at approved levels. This alternative would not have the potential for additional mining above that which is currently known within the planning area. This would be a less-than-significant impact.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

Under Alternative 4, the draft OCMP would be modified to allow only shallow mining, and reclamation is assumed to be primarily agricultural (80 percent). While the mining applications received by the County would likely be revised under this alternative, the reasonably foreseeable implementation of the modified OCMP would result in mining on approximately 2,887 acres for 216 million tons of aggregate. The modified OCMP covers a land area of 23,174 acres where mining theoretically could occur, however, given an interested party and County approval. This would require an SG Overlay Zone, a mining permit, and appropriate project-level environmental review. This potential of substantial amounts of additional mining could pose a significant adverse impact.

Alternative 5a: Decreased Mining (Restricted Allocation)

Under Alternative 5a, the OCMP and its implementing ordinances would be adopted, but mining proposals would be restricted to one-half of the current allocation. This alternative would have the potential for additional mining once the reduced amounts proposed for extraction are exhausted. This would be a significant impact.

Alternative 5b: Decreased Mining (Shorter Mining Period)

Under Alternative 5b, the OCMP and its implementing ordinances would be adopted, but individual permit and renewal periods would be shortened. This alternative would have

the potential for additional mining once the reduced amounts proposed for extraction are exhausted. This would be a significant impact.

Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed)

Under Alternative 6, all new mining would occur off channel, and a minimum performance standard for individual producers of 80 percent agricultural reclamation would be established. Earth-borrow areas under this alternative would themselves require reclamation to predominantly agricultural uses. While the mining applications received by County would likely be revised under this alternative, the reasonably foreseeable implementation of the modified OCMP would result in mining on approximately 2,887 acres for 216 million tons of aggregate. An additional 2,994 acres would be required for sufficient borrow material to carry out agricultural reclamation. The modified OCMP covers a land area of 23,174 acres where mining theoretically could occur, however, given an interested party and County approval. This would require an SG Overlay Zone, a mining permit, and appropriate project-level environmental review. This potential of substantial amounts of additional mining could pose a significant adverse impact.

Mitigation Measure 4.2-10a (OCMP, A-4, A-5a, A-5b, A-6)

The final OCMP boundaries shall be defined as including only those 2,932 acres (including a 45-acre borrow area) presently under consideration for rezoning.

Implementation of this mitigation measure would reduce this impact to a less-than-significant level for the OCMP and Alternatives 4, 5a, 5b, and 6.

Mitigation Measure 4.2-10b (A-1a, A-1b, A-2, A-3, A-4,)

None required.

Impact 4.2-11
Potential Impacts from the Future Sale or Transfer of Property Included within a Current Mining/Reclamation Application

Draft OCMP and Implementing Ordinances

The OCMP does not speak specifically to the issue of transferability of mining approvals, should they be granted. Conditional permits for other land uses in the County are understood to run with the land. As long as a new owner operates a particular use within the conditions of approval, the fact that ownership has changed is irrelevant. Applying a similar logic to mining permits issued under the OCMP would be an appropriate means of ensuring that unanticipated environmental impacts are avoided. The potential for conflict regarding allocation of maximum allowable mining tonnage, however, could result in a significant impact. For example, while the existing operators have plant facilities to process mined materials, a new operator would need an agreement with the previous operator to

utilize their plant for processing. Otherwise, the importation of those materials to another plant location, or the need for a new plant would both trigger the need for re-analysis because the original conditions would not have addressed these concerns. This would be a significant impact.

Alternative 1a: No Project (Existing Conditions)

Under Alternative 1a, no OCMP would be adopted and surface mining would continue based on 1995 actual production levels of each producer. Current mining/reclamation applications would not be given further consideration under this alternative. This would be a less-than-significant impact.

Alternative 1b: No Project (Existing Permits and Regulatory Condition)

Under Alternative 1b, no OCMP would be adopted and surface mining would be allowed based on currently approved maximum annual allocations. Current mining/reclamation applications would not be given further consideration under this alternative. This would be a less-than-significant impact.

Alternative 2: No Mining (Alternative Site)

Under Alternative 2, no OCMP would be adopted and all existing permits to mine and/or operate plants would be voided. Regional demand for PCC-grade aggregate material would be satisfied from reserves occurring outside of Yolo County. Current mining/reclamation applications would not be given further consideration under this alternative. This would be a less-than-significant impact.

Alternative 3: Plant Operation Only (Importation)

Under Alternative 3, no OCMP would be adopted, existing mining permits would be voided, but existing plants would continue to operate at approved levels. Current mining/reclamation applications would not be given further consideration under this alternative. This would be a less-than-significant impact.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

Under Alternative 4, the draft OCMP would be modified to allow only shallow mining, and reclamation is assumed to be primarily agricultural (80 percent). It is likely that current applications for mining and reclamation would be amended to satisfy the requirements of the modified OCMP under this alternative. However, there would still be potential impacts from the future sale or transfer of property included within those applications, as described above for the proposed project. This would be a significant impact.

Alternative 5a: Decreased Mining (Restricted Allocation)

Under Alternative 5a, the OCMP and its implementing ordinances would be adopted, but mining proposals would be restricted to one-half of the current allocation. It is likely that current applications for mining and reclamation would be amended to satisfy the requirements of the modified OCMP under this alternative. However, there would still be potential impacts from the future sale or transfer of property included within those applications, as described above for the proposed project. This would be a significant impact.

Alternative 5b: Decreased Mining (Shorter Mining Period)

Under Alternative 5b, the OCMP and its implementing ordinances would be adopted, but individual permit and renewal periods would be shortened. It is likely that current applications for mining and reclamation would be amended to satisfy the requirements of the modified OCMP under this alternative. However, there would still be potential impacts from the future sale or transfer of property included within those applications, as described above for the proposed project. This would be a significant impact.

Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed)

Under Alternative 6, all new mining would occur off channel, and a minimum performance standard for individual producers of 80 percent agricultural reclamation would be established. Earth-borrow areas under this alternative would themselves require reclamation to predominantly agricultural uses. It is likely that current applications for mining and reclamation would be amended to satisfy the requirements of the modified OCMP under this alternative. However, there would still be potential impacts from the future sale or transfer of property included within those applications, as described above for the proposed project. This would be a significant impact.

Mitigation Measure 4.2-11a (OCMP, A-4, A-5a, A-5b, A-6)

The OCMP and its implementing ordinances shall be expanded and clarified to address the issue of transferability of mining permits. The clarification shall indicate that if a property is sold or transferred, the tonnage attributed to that property transfers as well. If that tonnage is still processed at the original plant site pursuant to the original permit approval, no additional environmental assessment or permits would be required. If that transferred tonnage is processed elsewhere, additional analysis and approvals would be required.

Implementation of this mitigation measure would reduce this impact to a less-than-significant level of the OCMP and Alternatives 4, 5a, 5b, and 6.

Mitigation Measure 4.2-11b (A-1a, A-1b, A-2, A-3)

None required.

Impact 4.2-12
Compatibility with Watts-Woodland Airport Comprehensive Land Use Plan

Draft OCMP and Implementing Ordinances

Portions of the OCMP planning area and the Watts-Woodland Airport CLUP area overlap in the vicinity of the airport. The OCMP and its implementing ordinances would allow deep, wet pit mining (below the water table), and reclamation to open water uses such as recreation, and wetland habitat. While these types of water areas have the potential to cause ground fog or attract birds, it does not appear that they would have any different effect than existing habitat and water bodies in the area. Therefore, the OCMP would not generally result in a hazard or be inconsistent with the CLUP.

Teichert-Woodland, one of the five mining/reclamation permit applications being processed by the County under the OCMP, is located within the approach/departure and overflight safety zones established by the Watt-Woodland Airport CLUP. It would therefore be subject to land use compatibility provisions contained in that plan. Teichert-Woodland is proposing wet pit mining of approximately 180 acres, and open water reclamation of approximately 154 acres. Compatibility of the specific Teichert application with the airport safely zones will be addressed in the project-level EIR for that application.

Alternative 1a: No Project (Existing Conditions)

Under Alternative 1a, no OCMP would be adopted and surface mining would continue based on 1995 actual production levels of each producer. This alternative would be compatible with the Watts-Woodland Airport CLUP.

Alternative 1b: No Project (Existing Permits and Regulatory Condition)

Under Alternative 1b, no OCMP would be adopted and surface mining would be allowed based on currently approved maximum annual allocations. This alternative would be compatible with the Watts-Woodland Airport CLUP.

Alternative 2: No Mining (Alternative Site)

Under Alternative 2, no OCMP would be adopted and all existing permits to mine and/or operate plants would be voided. Regional demand for PCC-grade aggregate material would be satisfied from reserves occurring outside of Yolo County, and thus outside the area covered under the Watts-Woodland Airport CLUP. The alternate site would, however, be within the jurisdiction of the Airport Land Use Commission, which oversees airport operations in Sacramento, Sutter, Yolo and Yuba Counties.

Alternative 3: Plant Operation Only (Importation)

Under Alternative 3, no OCMP would be adopted, existing mining permits would be voided, but existing plants would continue to operate at approved levels. The compatibility of this alternative with local and regional airports would be the same as described above for Alternative 2.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

Under Alternative 4, the draft OCMP would be modified to allow only shallow mining, and reclamation is assumed to be primarily agricultural (80 percent). Under this alternative the Teichert-Woodland mining application would likely be revised. A determination of project-specific compatibility with the CLUP will be made in the project-level EIR for that application.

Alternative 5a: Decreased Mining (Restricted Allocation)

Under Alternative 5a, the OCMP and its implementing ordinances would be adopted, but mining proposals would be restricted to one-half of the current annual allocation. Under this alternative the Teichert-Woodland mining application would likely be revised. A determination of project-specific compatibility with the CLUP will be made in the project-level EIR for that application.

Alternative 5b: Decreased Mining (Shorter Mining Period)

Under Alternative 5b, the OCMP and its implementing ordinances would be adopted, but individual permit and renewal periods would be shortened. Teichert-Woodland would be subject to land use compatibility provisions contained in that plan. The Teichert-Woodland proposal for wet pit mining and open water reclamation could occur under this alternative. A determination of project-specific compatibility with the CLUP will be made in the project-level EIR for that application.

Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed)

Under Alternative 6, all new mining would occur off channel, and a minimum performance standard for individual producers of 80 percent agricultural reclamation would be established. Earth-borrow areas under this alternative would themselves require reclamation to predominantly agricultural uses. Under this alternative, the Teichert-Woodland mining application would likely be revised. A determination of project-specific compatibility with the CLUP will be made in the project-level EIR for that application.

Mitigation Measure 4.2-12a (OCMP, A-4, A-5a, A-5b, A-6)

None required at the program level. The OCMP Alternatives 4, 5a and 5b would generally be compatible with the Watts-Woodland Airport Comprehensive Land Use

Plan. The one exception could occur at the Teichert-Woodland site, where water bodies created during mining and reclamation could be incompatible with the airport safety zones. This determination will be made at the project level in the Teichert-Woodland EIR.

Mitigation Measure 4.2-12b (A-1a, A-1b, A-2, A-3)

None required.

4.3 GEOLOGY AND SOILS

4.3 GEOLOGY AND SOILS

INTRODUCTION

This section comparatively examines the potential for geological and soils impacts associated with implementation of the OCMP and project alternatives. The main issues addressed in this section include:

- potential for damage from seismic shaking;
- impacts related to slope stability, erosion, and sedimentation;
- potential for erosion from surface water discharge, including "pit capture"; and
- decreased availability of aggregate resources.

The geologic and soils conditions within the lower Cache Creek basin present important controls on the feasibility of the mining and reclamation plans developed under the OCMP. The geologic setting of the area provides the opportunity for sand and gravel deposition and, therefore, aggregate mining. The transport and deposition of high-quality aggregate by Cache Creek result from a complex fluvial system that is influenced by active tectonics and geologic structure. The same system is responsible for the deposition of fine-grained overbank deposits on which valuable agricultural soils are developed.

The following summary of geologic and soils information is based on published geologic reports and maps for the region, a site reconnaissance, site-specific reports prepared by consultants for mining projects within the lower Cache Creek basin, and the Technical Studies for the Cache Creek Resource Management Plan (EIP et al., 1995). The available geologic and geomorphic data were reviewed by the Draft EIR preparers and were found to be generally consistent with appropriate engineering and geologic methods and standards.

SETTING

Description of Regional Environment

Geology

The planning area is located on the western margin of the Sacramento Valley, the northern portion of the Great Valley Geomorphic Province of California. The Sacramento Valley is a large structural trough formed between the Coast Ranges to the west and the Sierra Nevada to the east. The Valley is filled with a thick sequence of sedimentary rocks and sediments that range from Upper Jurassic age (150 million years old) marine rocks through

modern alluvial deposits. The sedimentary sequence was apparently deposited on igneous and metamorphic basement[1] rocks of the Sierran structural block.

The Coast Ranges are actively being deformed by compressional forces related to relative movements of the Pacific and North American tectonic plates. These forces resulted in development of major faults and folds (oriented N30W) in the Cache Creek basin. The Coast Ranges began uplifting about 3.4 million years ago, resulting in a eastward tilting and erosion of Cretaceous Great Valley Formation, and younger Tertiary sedimentary rocks overlying the Franciscan basement bedrock. Sedimentary rocks eroded from these uplifted ranges were deposited as the Tehama Formation until about one million years ago, when continued eastward tilting uplifted the Tehama Formation (NHC, 1995).

The western margin of the Sacramento Valley represents a major geologic boundary between the Coast Range structural block to the west and the Sierran structural block to the east. This regional boundary, typically referred to as the Coast Range-Sierran Block Boundary Zone (CRSBBZ), has been the subject of recent geologic and seismic research; it is interpreted to represent not only a regional geologic and geomorphic boundary but a regional fault or suture zone (Wong and others, 1988).

The higher mountains that define the modern (i.e., current) range front of the Coast Ranges are separated from the Sacramento Valley by a northwest-trending set of low hills. The hills include the Dunnigan Hills, which extend from near the town of Dunnigan to the north to just south of Cache Creek. The relatively lower southward extension of the Dunnigan Hills is referred to as the Plainfield Ridge. The low hills have long been recognized as representing a block of older alluvial deposits uplifted above the surrounding younger alluvial deposits (Bryan, 1923).

Recent research (Unruh and Moores, 1992) indicates that the low hills east of the Coast range front have formed as the result of active folding and thrust faulting caused by compression across the Coast Range-Sierran Block Boundary. The folding and faulting deform the Tehama Formation indicating that the deformation is middle Pleistocene (approximately one million years ago) or younger in age.

The position of ranges of hills in the region generally correspond to upward folds called anticlines. The folding has also resulted in the formation of structural valleys (called synclines). Within the study area, Cache Creek crosses the Madison Syncline, the Dunnigan Hills Anticline, and their associated faults. Active folding at the Madison Syncline and Dunnigan Hills Anticline have contributed to the historic channel profile of Cache Creek and may affect the elevation and gradient of subsurface groundwater. The Dunnigan Hills have been uplifted approximately 90 meters (297 feet) since the beginning of compressional deformation 200,000 to 400,000 years ago. The average rate of uplift, therefore, has been approximately 0.2 to 0.5 millimeter (0.008 to 0.018 inch) per year

[1]"Basement" rock is a general geologic term for the deepest known bedrock.

(Munk, 1993). Subsidence of the ground surface has been observed east of the Dunnigan Hills in the vicinity of the City of Woodland. The subsidence is likely related to high rates of groundwater withdrawal from the underlying aquifer. The approximate amount of subsidence measured in this area during the period 1942 to 1987 was -2.25 feet (NHC, 1995).

The Madison Syncline comprises the northwest-trending structural valley, Hungry Hollow, separating the Dunnigan Hills-Plainfield Ridge from the Capay Hills. This structural valley is filled with Pleistocene and younger alluvial sediments that are up to 150 feet thick. The sediments that fill Hungry Hollow were transported to the area and deposited by Cache Creek.

The headwaters (source) of Cache Creek are located in the upland area of the Coast Ranges to the northwest. The upstream reaches along Cache Creek contain areas of active erosion that are the primary sources of sediment supply, which are transported and deposited downstream. The Creek flows southeastward through the Capay Valley to the southern end of the Capay Hills. From the town of Capay, the Creek flows eastward across Hungry Hollow. Through this reach, the Creek is a wide, braided stream with a relatively low gradient. At the eastern margin of Hungry Hollow, the Creek flows in a more constricted, higher-gradient reach through the southern Dunnigan Hills. The Creek then widens and the bed slope decreases as it emerges onto the Sacramento Valley near the town of Yolo.

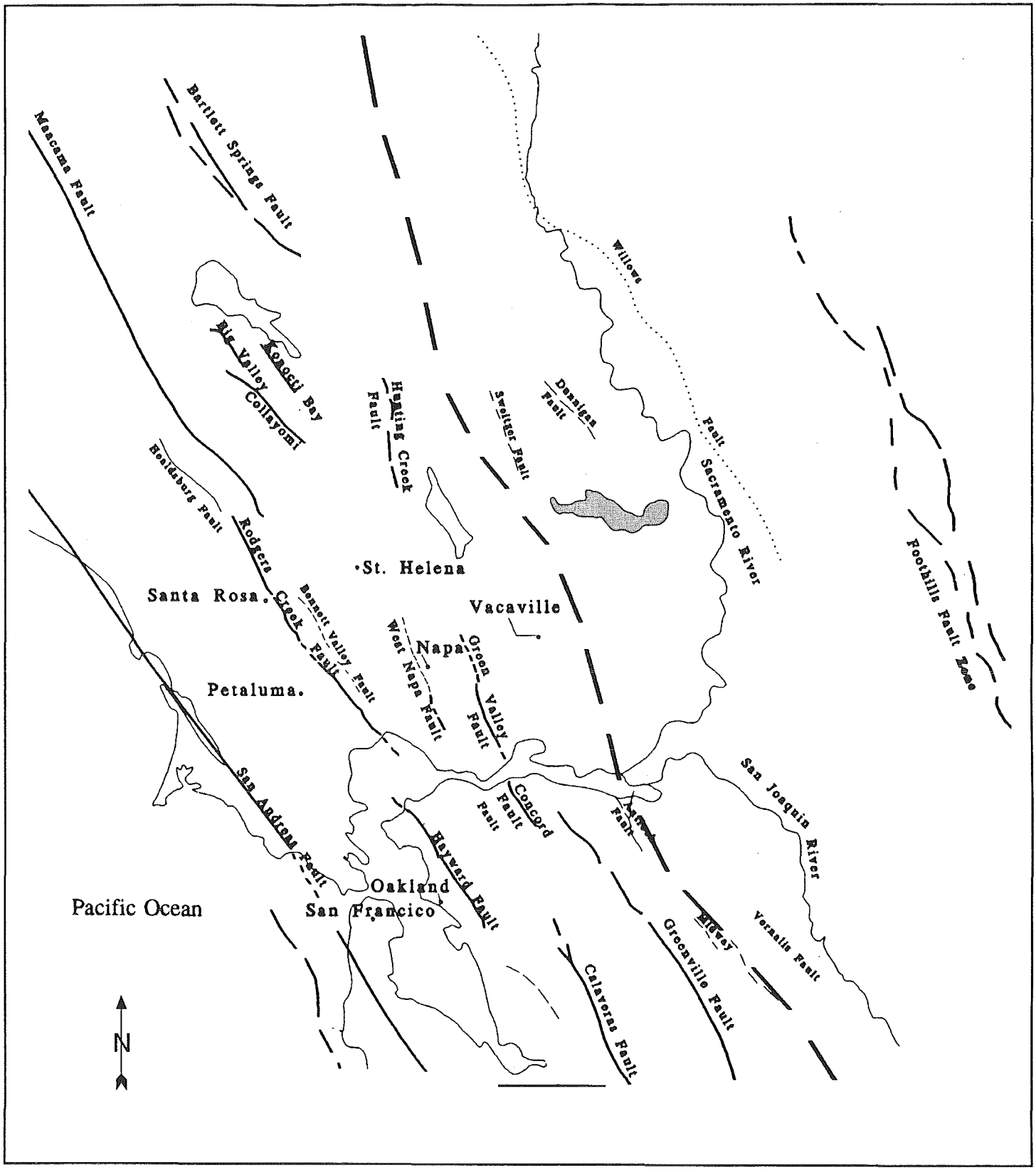
Seismicity

The tectonic setting of western California creates a relatively high potential for the occurrence of moderate to large earthquakes. Large earthquakes can cause damaging ground shaking throughout a large area. The active and potentially active faults potentially affecting the planning area are shown on Figure 4.3-1. The characteristics of these faults are summarized in Table 4.3-1.

In general, the regional fault zones, including the San Andreas, Hayward, Calaveras, and Rodgers Creek fault zones, are typically characterized as strike-slip faults with the major component of movement being horizontal and right-lateral.[2] Moderate to large earthquakes (M 5[3] or greater) are considered capable of causing rupture of the ground surface. Major right-lateral strike-slip earthquakes (M 7 or greater) within the region in historic time have occurred on the San Andreas (1838, 1906, 1989) and on the Hayward faults (1836, 1868). These earthquakes were felt over large areas. Western Yolo County experienced

[2]Right-lateral motion is a convention defined by the observation of the direction of movement across the fault when looking across the fault. Within the San Andreas Fault Zone, the observer would recognize that the western side of a fault has moved northward after right-lateral displacement along the fault.

[3]M 5 denotes Richter Magnitude 5.



Active Fault - Fault has evidence of surface displacement within the last 11,000 years

Potentially Active Fault - Fault has evidence of surface displacement within the last 2 million years

Coast Range-Sierran Block Boundary

Project Site

Figure 4.3-1 Regional Fault Map

SOURCE: JENNINGS, 1994; MUALCHIN AND JONES, 1992

TABLE 4.3-1: Major Faults Potentially Affecting the Project

Fault	Approximate Distance from Planning Area (miles)	Maximum Credible Earthquake[1,2] (M_L)	Recurrence Interval[3] (years)	Expected Maximum Peak Ground Acceleration during MCE[4] (g)	Expected Ground Shaking Intensity at the Site (MMI)
Bartlett Springs	49	6.75	NA	0.04	VI
Big Valley Fault	50	6.25	2,675	0.04	VI
Konocti Bay Fault Zone	41	6.25	NA	0.05	VI
Maacama Fault Zone	41	7.25	696	0.08	VII
Hunting Creek	22	6.75	NA	0.12	VII
Rodgers Creek-Healdsburg	43	7.0	255	0.07	VII
Hayward Fault	50	7.5	264-556	0.08	VII
West Napa	30	6.5	NA	0.07	VII
Foothills	43	6.5	NA	0.05	VI
Green Valley	25	6.75	424	0.10	VII
Coast Range-Sierran Block Boundary Zone	8	7.0	600-1200[5]	0.31	VIII

Notes: NA = Data not available.
MMI = Modified Mercalli Intensity.
g = acceleration of gravity.

1 The maximum credible earthquake (MCE) is the largest earthquake expected under the present geologic framework.
2 Estimated magnitude of MCE from Mualchin and Jones (1992), except where noted.
3 Recurrence interval, or repeat time, is the estimated interval of time between maximum credible earthquakes (Wesnousky, 1986).
4 Expected maximum peak ground accelerations are based on seismic shaking attenuation curves presented in Mualchin and Jones (1992).
5 Estimate by Wakabayashi and Smith (1994).

moderate ground shaking (up to MMI[4] VII) during large earthquakes generated on these major fault zones to the west. The combined probability of a major earthquake (M 7 or greater) occurring on the major strike-slip faults of the San Francisco Bay region is estimated to be 67 percent (USGS, 1990). This probability represents a minimum because not all faults capable of generating a large earthquake (including the Calaveras and San Gregorio-Seal Cove fault zones) were included in the development of the estimate.

[4]MMI denotes Modified Mercalli Intensity Scale.

The northern San Andreas fault system includes additional fault zones that could generate earthquakes, which could cause moderate to strong ground shaking within the planning area. The Maacama fault zone, extending from central Sonoma County to northwestern Mendocino County, is capable of generating a M 7.25 earthquake. The Bartlett Springs and Hunting Creek fault zones within the eastern Coast Range are additional seismic sources with the potential to generate M 6.75 earthquakes (Mualchin and Jones, 1992).

In the regional area, seven distinct segments of the CRSBBZ at the western edge of the Sacramento Valley have been identified as being capable of generating M 6 or greater earthquakes (Wakabayashi and Smith, 1994). These potential seismic sources include the North and South Dunnigan Hills fault segments identified in the region.

Interpretation of historic records for earthquakes affecting central California indicates that possibly eleven earthquakes of M 6 or greater have been generated along the CRSBBZ (Wakabayashi and Smith, 1994). An evaluation of more recent earthquakes (recorded by seismographs) indicate that the earthquakes of the southwestern Sacramento Valley region are characteristically caused by reverse or thrust faulting. Wong and others (1988) suggest that clusters of seismicity recorded within the western Sacramento Valley near Williams in Colusa County during the period 1980 to 1985 are representative of earthquakes on reverse faults. Their evaluation of recorded earthquakes for the period 1969 to 1985 also indicates clusters of seismicity beneath the Dunnigan Hills and in the area southwest of Madison. An M 4.2 earthquake near Madison in 1978 was also characterized as a reverse fault earthquake.

The maximum expected earthquake for the CRSBBZ is estimated to be an approximate M 7 event (Mualchin and Jones, 1992), which could occur on numerous known, suspected, or unidentified faults within the zone. The average recurrence interval (i.e., period between characteristic earthquakes) within the CRSBBZ is estimated to be 360 to 440 years. The North and South Dunnigan Hills fault segments are expected to generate M 6.1 and M 5.8 earthquakes. The estimated MCE for the potentially active Sweitzer Fault is M 6.5 (Unruh, et al., 1993).

In addition to the potential for earthquakes within the San Andreas fault system and the CRSBBZ, earthquakes along the Sierran Nevada Frontal fault system could occur. This fault system, developed along the western flank of the Sierra Nevada, includes the Foothills and Melones fault zones; that system has an estimated maximum credible earthquake of M 7.8 (Mualchin and Jones, 1992).

Description of Local Environment

Geology

The planning area is located on alluvial terraces along Cache Creek within Hungry Hollow and south of the Dunnigan Hills. These terraces have formed on a broad alluvial fan that has been deposited as Cache Creek emerged into the Sacramento Valley from the

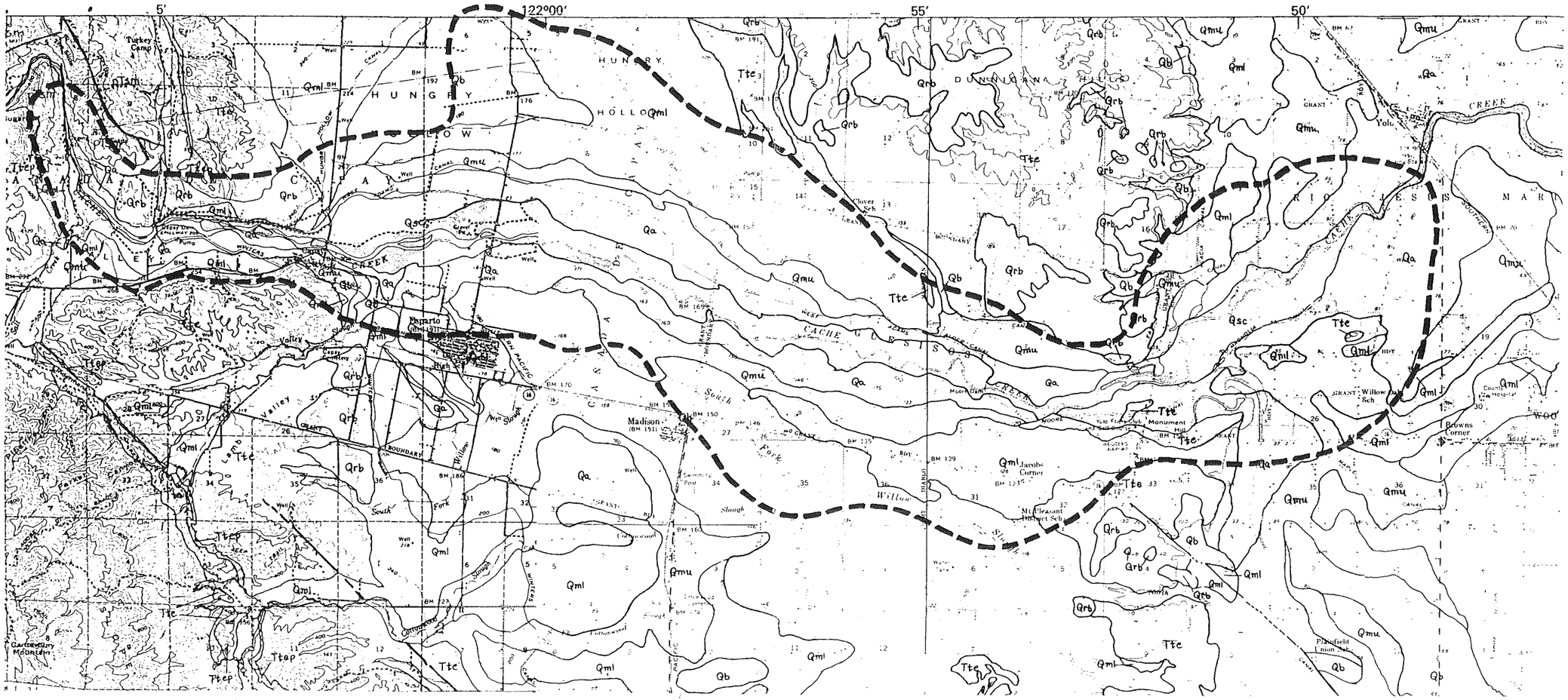
uplands to the east. The planning area is mapped (Helley and Harwood, 1985) primarily as active stream channel (Qsc) deposits (Figure 4.3-2), defined roughly as lying within the banks of the active channel, and young alluvium (Qa). Portions of the Planning area are underlain by basin deposits (Qb) and older alluvial terraces and fans of the Modesto Formation (Qmu). These deposits and related land forms are the result of incision of the Cache Creek channel into its own alluvial fan (Figure 4.3-2).

The thickness of Quaternary alluvial deposits overlying the Tehama Formation within the planning area is variable. Information from the boring logs for wells in the area provide information on the subsurface conditions (Luhdorff and Scalmanini, 1992). At the western end of the planning area, in the vicinity of the Capay Dam, the deposits are relatively thin (10 to 50 feet thick). The thickness increases westward to over 150 feet near the Capay bridge. The contact between the alluvial deposits and the Tehama Formation slopes upward in a downstream direction and the thickness of the deposits is reduced. As the creek traverses the Dunnigan Hills-Plainfield Ridge anticline, the alluvium is typically less than 25 feet. Downstream of the Dunnigan Hills, the thickness increases eastward to more than 300 feet in the vicinity of Interstate I-5. In general, the alluvium is more coarse-grained, comprised primarily of sand and gravel between Capay and the Dunnigan Hills. The alluvium east of the Dunnigan Hills becomes finer-grained.

Subsurface information available from borings and mining excavations made within the vicinity of central portion of the planning area provide more detail on the stratigraphy (i.e., layering) of the near-surface aggregate deposits. The uppermost overbank deposits are clayey silts and silty clays that extend from the surface to an average depth of six feet. The thickness of the fine-grained overbank deposits reportedly increases to the south, away from the Creek, to more than 20 feet (BASELINE, 1995). The fine-grained surficial deposits are directly underlain by two feet or more of sands and clayey sands,[5] which change gradationally downward to sandy gravels and gravels. These deposits are informally called the "shallow sand and gravel" and are, in some areas, underlain by a "middle clay." The top of the middle clay has been encountered at depths ranging from 21 to 38 feet south of Cache Creek. The thickness of the clay, where present, ranges from 8 to 13 feet.

The middle clay is underlain by the "lower sands and gravels." These coarse-grained sediments range in thickness from 12 to 30 feet. Where the middle clay is absent, the total thickness of sand and gravel deposits (including minor silt and clay layers or lenses) measured south of Capay Creek is 50 to 58 feet. The lower sands and gravels overlie the "bottom clay," where present. The depth to the top of the bottom clay ranges from less than 35 feet in some areas to greater than 65 feet in others.

[5]The fine-grained silty, clayey, and sandy overbank deposits are not marketable aggregate products and are collectively called overburden, distinguishing them from deeper well-graded sand and gravel aggregate resources.



Holocene
- Qsc STREAM CHANNEL DEPOSITS: Deposits of open, active stream channels
- Qa ALLUVIUM: Unweathered gravel, sand, and silt
- Qb BASIN DEPOSITS, UNDIVIDED: Fine-grained silt and clay

Pliocene
- Qmu MODESTO FORMATION Upper Member: Unconsolidated, unweathered gravel, sand, silt, and clay
- Qml MODESTO FORMATION Lower Member: Unconsolidated, slightly weathered gravel, sand, silt, and clay
- Qrb RED BLUFF FORMATION: Thin veneer of distinctive, highly weathered gravels

Pliocene Pre-Tertiary
- Tte - Ttep TEHAMA FORMATION: Sandstone and siltstone with lenses of crossbedded pebble and cobble conglomerates. Putal Tuff Member: Poorly to well-sorted, moderately consolidated, vitric pumiceous tuff.
- Ptsm METAMORPHIC, INTRUSIVE, AND SEDIMENTARY ROCKS

N

Figure 4.3-2 Generalized Geology Map

SOURCE: HELLEY, AND HARWOOD, 1985

The fine-grained surficial deposits, middle clay, and bottom clay represent overbank deposition from low-energy (slow-moving) water during and after flood events. These overbank sediments consist of clays, silts, and fine sands deposited on the margins of a stream. The sand and gravel sediments are higher-energy stream channel deposits. Migration, or shifting, of the channel can result in burial of overbank deposits (e.g., areas of where the middle clay or bottom clay is present) or removal (erosion) of these deposits.

The surficial Quaternary alluvial and stream channel deposits are composed of sediments primarily eroded from Franciscan, Great Valley, Tehama, and Cache Formations. The Franciscan Formation is located in the upper reaches of Cache Creek basin and constitutes a heterogeneous assemblage of rock types consisting of deformed volcanic and marine sediments. The important rock types of the Franciscan Formation that comprise gravels within Cache Creek include metamorphosed volcanic rocks, chert, greywacke (sandstone), and quartz. The Great Valley Formation is composed of various layers of greywacke sandstone, shale or siltstone, and conglomerate. The less abundant sandstones and conglomerates constitute important lithologies in the gravels of Cache Creek. The Tehama Formation consists of weakly cemented conglomerates and sandstones. The rock types of the pebbles in the conglomerates are comprised primarily of those of the Franciscan Formation. The Tehama Formation is exposed in the bed and banks of Cache Creek, most notably near Capay and Dunnigan Hills. The Cache Formation is similar to the Tehama Formation and is a likely an important contributor of gravel to Cache Creek. Tertiary to Recent volcanic rocks, common around Clear Lake, also may constitute 5 to 20 percent of the gravels in lower Cache Creek (NHC, 1995).

The surficial deposits of the Dunnigan Hills, located north of the planning area, are mapped primarily as the Pliocene Tehama Formation and the younger Red Bluff Formation. The Tehama Formation overlies the Great Valley Formation and as mentioned above is comprised of sandstones, siltstones, and conglomerates eroded from the Coast Ranges to the west. The Red Bluff Formation consists of a thin veneer of highly weathered gravels overlying the Tehama Formation (Helley and Harwood, 1985).

Soils

Soil, as described in this section, is the natural formation on the surface of the earth consisting of mineral and organic material. Soils can develop on unconsolidated sediments and weathered bedrock. The development of a soil is typically dependent on five major influences: climate, topography, biologic activity, parent material, and time. Differences in soil types are, therefore, caused by changes in these influences. Within the planning area, 33 different soils have been identified by the U.S. Soil Conservation Service (USDA, 1972) on the basis of characteristics that reflect relatively subtle but important changes in the soil formation factors. In general, the topography is relatively flat, the climate is similar, and biological activity is comparable. The major difference in the soils of the area is the topographic position relative to the active channel of Cache Creek and the associated differences in the consistency and age of the alluvial deposits. Mapping of the soil types, or mapping units, for the planning area is presented in Figure 4.3-3. The following

discussion focuses on soil associations identified at the project site. Characteristics of soils and other soil mapping units, shown on Figure 4.3-3, are summarized in Table 4.3-2.

The surface soils that mantle the planning area are generally well drained to poorly drained soils on alluvial fans, basin rims, terraces, and in basins. The soils form in alluvium derived from sedimentary rock. Slopes range from zero to two percent. Soils in the planning area that are characterized by finer grained deposits such as silty clayey loam soils generally have a moderate to high shrink-swell potential and slow to moderate permeabilities. Coarser grained deposits that contain sands and gravels generally have a low shrink-swell potential and higher permeabilities. The soils in the planning area generally have a low or negligible erosion hazard if undisturbed (USDA, 1972).

The primary soil associations in the planning area are those of the Yolo-Brentwood association. These soils are generally well-drained, nearly level silt loams to silty clay loams on alluvial fans. Minor soils within the Yolo-Brentwood Association include Myers, Reiff, Sycamore, and Zamora. To a lesser extent, the planning area also contains soils of the Rincon-Marvin-Tehama and the Capay-Clear Lake association. The Rincon-Marvin-Tehama association soils are loams and silty clay loams that form on alluvial fans and basin rims; minor soils of this association include the Capay, Clear Lake, and Hillgate. The Capay-Clear Lake association soils consist of nearly level silty clays and clays that form on basin rims and in basins. The Sycamore soils occur to a minor extent in the Capay-Clear Lake association (USDA, 1972). The Storie Indexes for these soil associations are typically high, indicating relatively high agricultural productivity of the soils in the planning area.

Aggregate Resources

The Quaternary alluvial deposits of the Cache Creek area are recognized as a major source of aggregate for the production of concrete, asphaltic concrete, and road base materials. Aggregate mining has occurred in and along Cache Creek since the early 1900s. An estimated 80 to 90 million tons of aggregate have been removed from Cache Creek since the beginning of mining (Collins and Dunne, 1990). The majority of aggregate mined from the lower Cache Creek basin is suitable for the production of Portland Concrete Cement (PCC). The specifications for PCC-grade aggregate are more restrictive than specification for other aggregate products, criteria that increase the usefulness and marketability of these deposits.

A mineral land classification of aggregate materials in the Sacramento-Fairfield region conducted by the California Division of Mines and Geology (CDMG) (Dupras, 1988) presents an evaluation of the availability of aggregate resources within the lower Cache Creek watershed. Evaluation of aggregate resources throughout the State is required by the California Surface Mining and Reclamation Act (SMARA). Provisions of SMARA require that the CDMG determine the boundaries of major aggregate Production-Consumption (P-C) regions, identify aggregate resource areas within the regions, and evaluate the availability and supply of those resources. Assessment of the aggregate

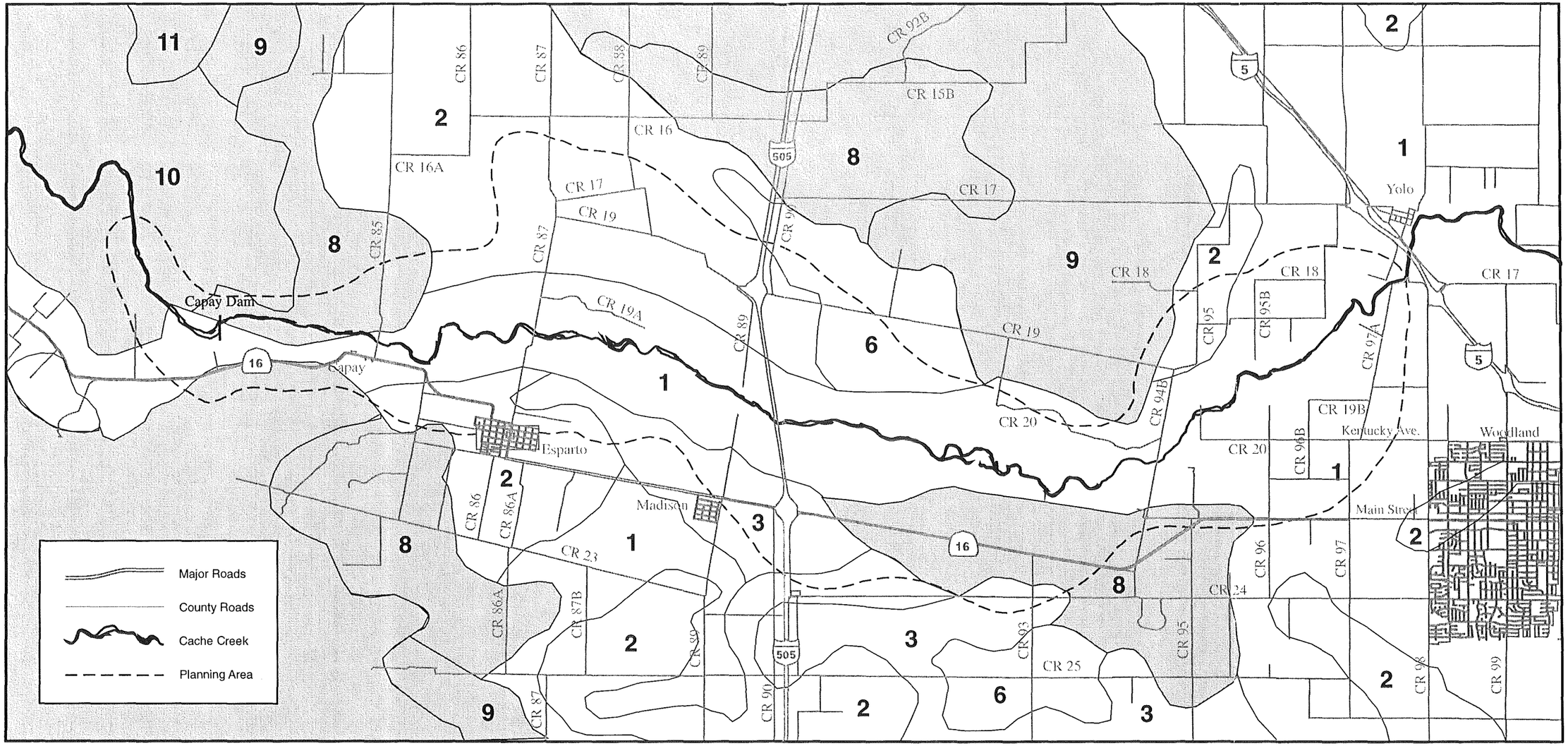


Figure 4.3-3 Generalized Soils Map

SOURCE: USDA, 1972

TABLE 4.3-2: Soil Types - Physical Properties					
Map Symbol	**Soil Series Name**	**Shrink/Swell Potential[1]**	**Permeability[2] (inches/hour)**	**Erosion Hazard[3]**	**Corrosivity[4]**
Most Common Soils:					
BrA	Brentwood silty clay loam	High	0.06-0.20	Slight to none	High
Ca	Capay silty clay	High	0.06-0.20	Slight to none	High
CtD2	Corning gravelly loam	Low to High	<0.06-2.0	Moderate	Low to High
HcA	Hillgate loam	Moderate to High	0.06-0.63	Slight to none	Moderate to High
Lm	Loamy alluvial land	N/A	N/A	Slight to none	N/A
Mf	Marvin silty clay loam	Moderate to high	0.06-0.63	Slight to none	High
Rg	Rincon silty clay loam	Moderate	0.2-0.63	Slight to none	Moderate
Rh	Riverwash	N/A	N/A	N/A	N/A
Sh	San Ysidro loam	Moderate to high	<0.06-2.0	Slight to none	Moderate to High
SmF2	Sehorn-Balcom complex	Moderate	0.2-0.63	Slight to Moderate	Moderate
Sn	Soboba gravelly sandy loam	Low	>20	Slight to none	Low
So	Sycamore silt loam	Moderate to high	0.2-2.0	Slight to none	High
TaA	Tehama loam	Moderate	0.06-2.0	Slight to none	Low to Moderate
Wm	Willows clay	Moderate	0.06-0.63	Slight to none	High
Ya	Yolo silt loam	Moderate	0.63-2.0	Slight to none	Low
Least Common Soils:					
BaF2	Balcom silty clay loam	Moderate	0.2-0.63	High	Moderate
BaE2	Balcom silty clay loam	Moderate	0.2-0.63	High to Moderate	Moderate
BdF2	Balcom-Dibble complex	Moderate	0.2-0.63	High	Moderate

TABLE 4.3-2: Soil Types - Physical Properties

Map Symbol	Soil Series Name	Shrink/Swell Potential[1]	Permeability[2] (inches/hour)	Erosion Hazard[3]	Corrosivity[4]
CtE2	Corning gravelly loam	Low to High	0.63-2.0	High to Moderate	Low
DbF2	Dibble clay loam	High	0.06-0.2	High	High
HdA	Hillgate loam	Moderate to high	0.2-0.63	Slight to none	Low to high
Ms	Myers clay	High	0.06-0.2	Slight to none	High
Pb	Pescadero silty clay	High	0.06-0.10	Slight to none	High
Rb	Reiff gravelly loam	Low	2.0-6.3	Slight to none	Low
SkD	Sehorn clay	High	0.06-0.2	Moderate to slight	High
SmD	Sehorn-Balcom complex	Moderate	0.2-0.63	Slight to moderate	Moderate
Sv	Sycamore complex	Moderate	0.06-0.63	Slight to none	High
S1D	Sehorn cobbly clay	High	0.06-0.2	Slight to none	High
TaB	Tehama loam	Moderate	0.06-2.0	Slight to none	Low to high
Wn	Willows clay, marly variant saline-alkali	Moderate to high	0.06-0.63	Slight to none	High
Yb	Yolo silty clay loam	Moderate	0.2-2.0	Slight to none	Moderate
Za	Zamora loam	Moderate	0.63-2.0	Slight to none	Low to moderate

Source: U.S. Department of Agriculture, Soil Conservation Service, 1972, Soil Survey of Yolo County, California.

1 Shrink-swell potential is the extent to which the soil shrinks as it dries or swells when wet. A high shrink-swell rating indicates a hazard to structures.
2 Permeability is the ability of a soil to transmit air or water.
3 Erosion hazard is the propensity of a soil to erode when tilled or exposed.
4 Corrosivity pertains to the potential for soil-induced chemical action that dissolves or weakens uncoated steel.

resources includes the classification of Mineral Resource Zones (MRZs) on the basis of existing geologic data. Identified zones, where sufficient data indicate the likelihood for occurrence of significant aggregate deposits is high, are designated MRZ-2. If land uses within MRZ-2 zones are compatible with aggregate mining, the zones are classified as "sectors." Under the State mineral lands classification system, the available tonnage of aggregate resources within sectors is then estimated.

The planning area is delineated on the basis of the boundaries of the MRZs recognized in the CDMG classification report (Dupras, 1988), exclusive of the area defined by the in-channel boundary. The area covered by all of the Mineral Resource Zone boundaries is approximately 28,130 acres. Areas for which existing evidence does not indicate that significant aggregate deposits are present, MRZ-1, comprise approximately five percent of the planning area. Areas that were determined by CDMG to contain mineral resources but the significance of the deposits could not be determined (MRZ-3) comprise 29 percent of the planning area. The MRZ-1 and MRZ-3 areas are located along the perimeter of the planning area (Figure 3.2-3).

Approximately 66 percent of the planning area is designated as MRZ-2, areas in which adequate information indicates that significant aggregate deposits are available. The MRZ-2 areas are located in the central portion of the planning area and were estimated in 1982 by CDMG to contain approximately 838 million tons of PCC-grade aggregate resources at the time of the evaluation (Dupras, 1988). Of this total, 111 million tons of aggregate were estimated to be located under the Cache Creek channel at elevations below the current in-channel mining depth limit imposed by Yolo County. Based on aggregate production records, an additional 31 million tons of aggregate have been excavated from 1982 to 1995.

The CDMG report classifies most of the MRZ-2 areas within the project site as resource sectors that meet or exceed the State thresholds for designation of resources as of regional or statewide significance. The planning area is divided into four sectors (A through D) on the basis of location; each sector is divided into subsectors. The sectors of the MRZ-2 areas of the lower Cache Creek basin have not been formally designated by the State Mining and Geology Board (SMGB).

Cache Creek Morphology and Processes

Stream Morphology

The shape, or morphology, of a stream channel is a function of the characteristics of the flow (volume and velocity) carried by the stream and the composition of sediments forming its banks and stream bed. Cache Creek, its channel and adjacent floodplain, is the central geomorphic feature of the planning area. The creek and its principal tributaries have a drainage area of over 1,100 square miles, extending from its headwaters at Clear Lake to its terminus at the Yolo By-Pass. Major physiographic provinces have developed along the course of the creek, which are functions of topography, geology, hydrology, and

vegetation. The upper portion of the watershed is characterized by relatively flat valleys. Eastward of this region, the creek becomes very steep and incised, flowing through mountainous terrain. Within this province, high sediment yields are produced that are transported downstream by the creek. The creek then emerges into the Capay Valley, a broader alluvial valley. Although sediment is transported fairly efficiently through this province, some deposition and temporary storage of sediment occurs. Near the town of Capay, the creek turns eastwardly and flows into the Sacramento Valley. Emerging from the mountains, the gradient (slope) of the creek decreases dramatically and significant deposition occurs. This depositional province is the setting of the planning area.

Within the planning area, Cache Creek is a broad alluvial stream. The morphology of the creek is variable and could be characterized as a low-gradient, entrenched meandering stream. The slope of the channel (0.13 to 0.23 percent) is low for most natural meandering rivers. The low gradient could be related to both the tectonic setting of the creek and influences imposed by human activity. In its natural condition, the creek flowed out onto a large, gently sloping alluvial fan. The fan was formed in a predominantly depositional setting. In this condition, the channel was probably a shallow, wide system of channels characteristic of a braided stream. However, the channel of Cache Creek migrated across the fan, occupying numerous channels. It was the formation and abandonment of these numerous "distributary channels," which built the alluvial fan. Under current conditions, the channel has incised into the fan and has occupied the same general position on the fan throughout historical times. Evidence of former channel positions, which have been abandoned by the stream are expressed by coarse sand and gravel deposits found throughout the planning area. Surface expression of the abandoned channels have largely been obliterated by agricultural grading. Although the channel may have migrated significantly, the positions of emergence of the creek onto the valley at Capay and the well-established channel through the Dunnigan Hills constrain the creek's location at these points.

Nine geomorphic subreaches from Capay Valley to the Settling Basin have been identified along Cache Creek within the planning area (NHC, 1995). Each subreach was identified on the basis of distinctive differences in channel morphology when compared to areas upstream or downstream. The subreaches identified from the western (upstream) boundary of the planning area to the eastern (downstream) boundary include: Subreach 8 - Capay; Subreach 7 - Hungry Hollow (Capay Bridge to one mile downstream of Esparto Bridge); Subreach 6 - Madison; Subreach 5 - Guesisosi; Subreach 4 - Dunnigan Hills; Subreach 3 - Hoppin; and Subreach 2 - Rio Jesus Maria. The location of each subreach is shown on Figure 4.3-4.

The morphology of the Cache Creek channel within the planning area has been significantly influenced by human activities. The sediment supply has been significantly reduced by the installation of the Indian Valley and Capay dams located upstream of the project site. The width of active channel has been controlled and generally reduced through influences of agricultural land reclamation, construction of bridges across the creek and irrigation canals along the creek. Significant aggregate mining, in operation since the

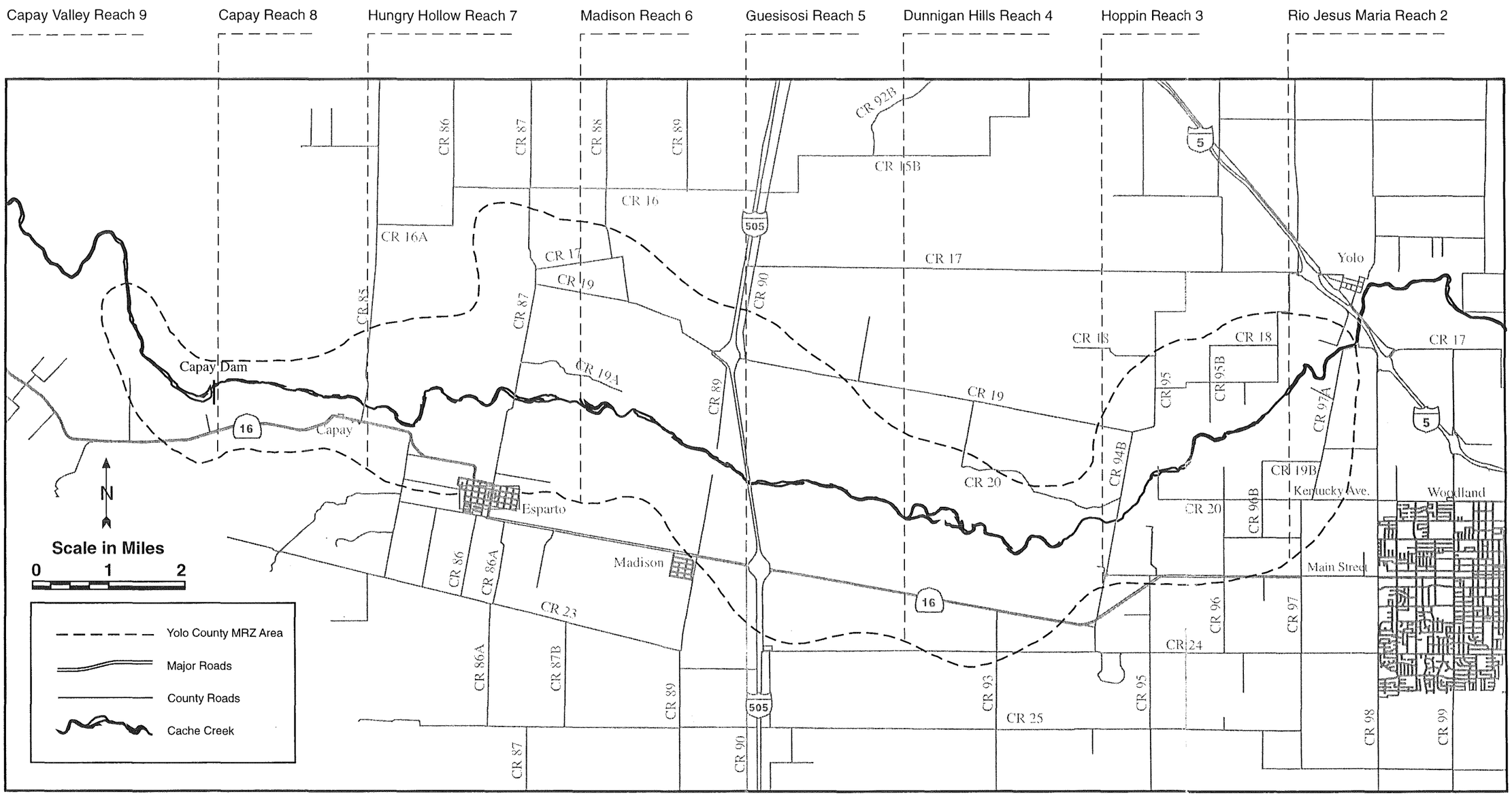


Figure 4.3-4 Geomorphic Reaches of Cache Creek

SOURCE: NHC, 1995

beginning of the 20th century, in the active channel has presented another significant control on the position of the channel. The Technical Studies (NHC, 1995) document that overall the channel width has been dramatically reduced over the period 1937 to present, with the width of some reaches of the creek reduced by 85 percent. Excavation of aggregate from the channel in excess of natural replenishment has also caused localized oversteepening of the channel. Reduction of the channel width has resulted in increased flow velocities. Localized restrictions of the channel, particularly those associated with bridges, have further increased flow velocities at these locations. The documented response of the creek to these changes has been degradation of the channel bed and straightening of the channel.

Flows

The climate and topographic conditions of the Cache Creek drainage basin present conditions that produce widely variable annual and seasonal fluctuations in flows within the creek. Under natural and current conditions, winter (rainy season) flows in the creek significantly exceed summer flows but have a wide range of annual peak flow values. Winter and spring rainfall can produce rapid changes in stream flow (discharge) over short periods of time. This potential for variability characterizes the flows in the creek as "flashy" or "episodic." Annual peak flows have ranged from near zero during drought years such as 1976 and 1977 to over 40,000 cubic feet per second (cfs) in 1958 and 1995 (NHC, 1995).

Sediment Load/Budget

The current estimated total (suspended and bed load) annual sediment load for Cache Creek near western margin of the planning area is 927,600 tons per year (NHC, 1995). The major portion of the sediment carried by the creek is fine-grained sediment transported as suspended load. Approximately 23 percent (210,100 tons per year) of the sediment load is sand and gravel transported as bed load. The annual sediment delivered to the planning area is greatly reduced in comparison to the sediment loads that were carried to the area prior to the installation of the dams upstream of the planning area.

Channel Stability

Substantial incision, or stream bed lowering, has been documented during historic times along Cache Creek. During the period from 1959 to 1980, the stream bed was lowered by an average of 15 feet (Collins and Dunne, 1990). The incision has resulted in increased cross-sectional area of the stream and a corresponding increase in floodwater storage. Collins and Dunne (1990) have suggested that the potential for overbank flooding has been eliminated due to the increased flood conveyance capacity. Hydraulic analyses prepared for the proposed projects within the planning area (Cunningham Engineering, 1993) indicate that the 100-year flood flows would be contained within the channel of Cache Creek throughout most of the planning area.

Streams are natural systems in dynamic equilibrium that adjust continually to changes in sediment supply, volume or velocity of flow, and irregularities within the channel. Channel incision on Cache Creek has been directly linked to the effects of gravel extraction caused by historic in-stream mining (summarized by Collins and Dunne, 1990). However, incision can also be related to reduced sediment supply in Cache Creek caused by interception of sediment by dammed reservoirs upstream of the subject reach. Although the dams also reduce the peak of some flood flows, the Creek is clearly capable of transporting sand and gravel bed load. If sediment supply is not provided to a stream capable of transporting these materials, the stream will erode its banks or bed.

Regulatory Setting

SMARA and Related Regulations

The California Surface Mining and Reclamation Act (SMARA) was enacted in 1975 to provide a means of identifying potential mineral resources throughout the State and to provide for reclamation of mined lands. The stated intent (Section 2712) of SMARA is to ensure that:

a) Adverse environmental effects are prevented or minimized and that all mined lands are reclaimed to a usable condition which is readily adaptable for alternative land uses;

b) The production and conservation of minerals are encouraged, while giving consideration to recreation, watershed, wildlife, range and forage, and aesthetic enjoyment;

c) Residual hazards to the public health and safety are eliminated.

The classification of an area as a source of significant mineral deposits requires lead agencies to establish resource management policies that will emphasize the conservation and development of identified mineral deposits (Section 2762). SMARA also requires (Section 2774) the development and adoption of ordinances in accordance with the policies of SMARA that establish procedures for the review and approval of reclamation plans for permitted mining areas. Yolo County has prepared the OCMP and its implementing ordinances to replace existing mining and reclamation ordinances and establish controls on mining that are consistent with the most recent amendments to SMARA and the State Mining an Geology Board Reclamation Regulations. The Impacts and Mitigation Measures section of this DEIR will evaluate the consistency of the OCMP and its implementing ordinances with SMARA.

As required by SMARA (Section 2755), the State Mining and Geology Board (SMGB) regulations for surface mining and reclamation practice and performance standards for reclamation (CCR Title 14, Chapter 8, Subchapter 1) are applicable to the off-channel mining operations proposed under this project. The regulations (Sec. 3502) present objectives and required elements for reclamation plans. Required elements of the reclamation plan for addressing the environmental setting, public health and safety, steepness of excavated and filled slopes, and backfilling and grading of disturbed areas

have been included in the OCMP. Public health and safety issues are further discussed in Section 4.12 of this DEIR. The regulations also include minimum acceptable practices (Sec. 3503) for erosion control, backfilling and grading, and topsoil salvage, maintenance, and redistribution.

Yolo County General Plan

Mining and reclamation activities are addressed in several goals and policies contained in the Yolo County General Plan. The general goals that relate to aggregate mining include:

- Provide for industrial growth in the County to provide employment, services, and tax base while minimizing hazards and nuisances and while conserving resources and agricultural lands;
- Provide for seismic safety;
- Control erosion and practice soil management;
- Conserve natural resources.

The General Plan also includes the following safety (S) and conservation (CON) policies that relate to aggregate mining:

S 1 Yolo County shall regulate, educate, and cooperate to reduce death and injuries or damage to property and to minimize the economic and social dislocation resulting from ... geologic hazards.

CON 2 Yolo County shall foster conservation of its resources and avoid natural hazards by planning, encouraging, and regulating the development and use of these resources.

CON 3 Plans, projects, and programs shall treat land as a resource rather than as a commodity.

CON 9 Yolo County shall ensure the protection, maintenance, and wise use of the State's natural resources, especially scarce resources and those that require special control and management.

CON 10 Yolo County shall plan, encourage, and regulate public and private agencies to prevent wasteful exploitation, destruction and/or neglect of the State's resources.

CON 34 Yolo County shall adopt a Mining Ordinance to implement these policies as they apply to mineral resources, including sand and gravel.

The proposed project is generally in compliance with each of these goals of the General Plan. The inconsistency or incompatibility of specific items related to geology and soils in the OCMP with the General Plan is addressed below.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

The project would have a significant effect on geology and soils if it would result in:

- Exposure of people or property to geologic hazards, including but not limited to:
  - Fault rupture on active faults;
  - Seismic shaking (accelerations greater than 0.1g);
  - Seismically-induced ground failure, including liquefaction;
  - Landslides or mudflows (includes excavated slopes);
  - Erosion, changes in topography or unstable soil conditions from excavation, grading, or fill;
  - Subsidence of the land; or
  - Expansive soils.
- Destruction, covering, or modification of unique geologic or physical features.
- Result in the loss of availability of a known mineral resource that would be of future value to the region.

Impact 4.3-1
Potential for Damage from Seismic Shaking

In general, the low relief topography and alluvial sediments within the planning area are relatively stable and do not present hazards associated with failure under static (aseismic) conditions. However, proximity of the planning area to the Coast Range-Sierran Block Boundary Zone suggests that expected earthquakes on faults within the zone could cause strong ground shaking within the planning site. Seismic shaking at the expected levels can cause failure of unstable slopes or liquefaction. The potential for slope failure during seismic shaking is addressed in Impact 4.3-2.

Liquefaction is a condition caused by seismic shaking that results in the loss of strength of saturated, loose, unconsolidated granular sediments. Liquefied sediments can flow to a free face (e.g., stream channel cutbank or submerged mining pit slope) resulting in lateral spreading or settlement of the ground surface. In general, Quaternary alluvial sediments similar to those that underlie most of the planning area are sufficiently dense and well-graded[6] to resist liquefaction (Kleinfelder, 1995a, 1995b). Although groundwater occurs at relative shallow depths (10 to 35 feet below ground surface) throughout most of the

[6]A well-graded sediment has a well-mixed, wide range of sediment sizes including fine- and coarse-grained sediments.

planning area, the sand and gravel aquifer underlying the area is generally unconfined and high pore water pressures required for liquefaction are unlikely to develop.

Some of the younger, less dense sediments that occur in the planning area may include saturated, loose sediment that could be subject to liquefaction. Existing or future aggregate mining pits may be partially backfilled with the processing fines[7] produced by the washing of aggregate at the processing plants. These materials, when loose and saturated, have a high potential for liquefaction. The method of placement of these sediments (natural settlement out of processing water returned to the mining pits) beneath the groundwater table indicates that these sediments would be loose and saturated during and after reclamation. Overburden materials placed as fill in pits below the groundwater level may also be susceptible to liquefaction.

Liquefaction could result in settlement of the ground surface that could affect improvements constructed in areas underlain by liquefiable sediments. The potential effects of settlement could include damage to buildings or disruption of drainage. The backfilled material in mining pits could also be subject to settlement or consolidation under static (non-seismic) conditions if loads (e.g., buildings) are placed on these fills.

Draft OCMP and Implementing Ordinances

The OCMP would allow the excavation and reclamation of off-channel mining pits within the planning area. The OCMP does not limit the types of post-reclamation uses for formerly mined areas. Five long-term mining applications have been submitted to Yolo County and are currently under environmental review; a sixth mining application is reasonably foreseeable in the next five years. Reclamation plans submitted with the applications indicate that of the 2,211 acres proposed to be mined, 988 acres would be reclaimed to agricultural uses. This reclamation would require that the mined areas are backfilled. Mining pits are typically backfilled with processing fines and overburden. The placement of the fill is not usually controlled by soil engineering specifications (i.e., the fills are non-engineered).

The drainage of reclaimed mining pits backfilled with non-engineered fill could be affected by settlement of the fills. Settlement could occur as the result of compaction or consolidation of the sediment over time. Compaction could also result from liquefaction of some of the sediments within the alluvium during strong seismic shaking. Structures constructed on the fills could be damaged by effects of settlement. The following OCMP Performance Standard addresses the potential of land surface settlement of mined areas reclaimed to agricultural use:

[7]Processing fines are the clay, silt, and fine sand particles washed from the aggregate during processing.

PS. 5.5-3: The operator shall resurvey any areas reclaimed to agricultural usage after the first two (2) crop seasons have been completed. Any areas where settling has occurred shall be re-leveled to the field grade specified in the approved reclamation plan.

This standard provides mitigation for the potential for settlement of reclaimed agricultural fields. The standard is consistent with the intent of Section 3704 of the SMGB Reclamation Regulations to provide monitoring of the performance of lands backfilled for resource conservation purposes. However, the construction of improvements sensitive to settlement in backfilled reclaimed areas could be damaged by settlement. The standard does not address inspection of the fills following potential earthquakes which could cause strong ground shaking within the planning area. Reclamation plans for mining projects should be required to include a source of backfill material for releveling fill areas which have settled.

Alternative 1a: No Project (Existing Conditions) and
Alternative 1b: No Project (Existing Permits and Regulatory Condition)

Under these alternatives, current off-channel aggregate mining would be allowed to continue. Agricultural land use would continue throughout most of the planning area. The current in-channel mining conducted along Cache Creek would occur outside the planning area. The current off-channel mining would be performed under the requirements of SMARA, the existing "interim" Yolo County Mining and Reclamation Ordinances and the conditions for mining permits. Specific requirements of these regulations address the stability of reclaimed lands with respect to the intended post-reclamation use. However, the existing requirements do not address potential changes in post-reclamation use that could be more sensitive to unstable fill. This is considered to be a significant impact.

Alternative 2: No Mining (Alternative Site) and
Alternative 3: Plant Operation Only (Importation)

No mining would occur in the planning area under these alternatives. The potential impacts associated with unstable fills in reclaimed mining pits would not occur within the planning area. Mining and reclamation required to produce aggregate materials for importation to aggregate processing plants within the planning area could result in the placement of non-engineered fills outside the planning area. Although, the State Mining and Geology Board Reclamation requirements present minimum standards for backfilling, it is possible that settlement of fills could result in damage to land or structures during the post-reclamation period. This is a significant impact.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

This alternative would limit the depth of mining such that mining pits would not extend to depths below the seasonal high groundwater level; no wet pit mining would occur. The shallow mining could, however, require backfilling of mined areas to raise the reclamation surface to ten feet above seasonal high groundwater level. Mining pits would likely be filled

with non-engineered fill, including processing fines and overburden sediments. These fills could be placed below the seasonal groundwater table if sufficient volumes of backfill were available. The potential for settlement of the fills would be a potential significant impact on future drainage or stability of structures.

Alternative 5a: Decreased Mining (Restricted Allocation)

This alternative would restrict the rate of aggregate production but could result in the excavation of off-channel mining pits. The mining methodologies could include deep, wet pit mining. Under this alternative, all potential impacts related to potential unstable fills could occur.

Alternative 5b: Decreased Mining (Shorter Mining Period)

Under this alternative, individual off-channel mining permits for mining in the planning area would be limited to 15- to 25-year permits. Under these conditions, it would be expected that mining of aggregate in the planning area would include deep pit mining. The potential impacts related to unstable fills within reclaimed pits could occur.

Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed)

This alternative would require that a minimum of 80 percent of the mining areas be reclaimed for agricultural use. The alternative does not limit mining methodologies and implies that deep mining would be expected. For mining areas that extend to depths below seasonal high groundwater, additional fill materials would be necessary to construct agricultural surfaces that are sufficiently elevated above the groundwater table. The potential impacts of unstable fills on structures would be limited by the requirement to convert the majority of the mining areas to agricultural use.

Mitigation Measure 4.3-1a (OCMP, A-4, A-5a, A-5b, A-6)

The following performance standards shall be added to the OCMP and its implementing ordinances and existing ordinances:

Performance Standard 2.5-25: Improvements, including the construction of buildings, roadways or other public facilities proposed for construction in reclaimed mining pits shall require a geotechnical investigation of the stability of fills conducted by a qualified and licensed geotechnical engineer. A report on the results and recommendation of the investigation shall be submitted to the Yolo County Community Development Agency prior to the issuance of building permits.

Performance Standard 2.5-26: Backfilled mining areas and slopes shall be inspected by the landowner following strong seismic shaking events. Observable damage shall be reported to the Yolo County Community Development Agency. If, upon inspection of the reported damage, the YCCDA determines that the damage requires repair to meet the intended use of the reclaimed land, the landowner shall perform the required repairs.

Performance Standard 2.5-27: The cost of implementing recommendations for repair of reclaimed land caused during earthquakes or other natural events shall be met through application of contingency costs provided for by the project's financial assurances as required by SMARA.

Implementation of the this mitigation measure would reduce this impact to a less-than-significant level for the OCMP and Alternatives 4, 5a, 5b, and 6).

Mitigation Measure 4.3-1b (A-1a, A-1b, A-2, A-3)

Existing mining ordinances shall require a geotechnical investigation of the stability of fills conducted by a qualified and licensed geotechnical engineer for improvements proposed for construction in reclaimed mining pits, including the construction of buildings, roadways, or other public facilities. A report on the results and recommendation of the investigation shall be submitted to the Yolo County Community Development Agency (or other similar authority in areas outside Yolo County) prior to the issuance of building permits.

Implementation of the this mitigation measure would reduce this impact to a less-than-significant level for Alternatives 1a, 1b, 2, and 3.

Impact 4.3-2
Potential Impacts Related to Slope Stability, Erosion, and Sedimentation

The lower Cache Creek basin contains extensive sand and gravel aggregate resources. Mining of these resources is expected to continue in response to regional demand for high quality aggregate materials. Off-channel mining operations would create cut slopes in the existing topography as aggregate is mined and a depression is created. The constructed slopes could be subject to slope failure or increased erosion. The identified off-channel aggregate resources in the lower Cache Creek basin are located on relatively flat or gently sloping alluvial terrace surface. The underlying geologic materials are recently deposited alluvial sediments that are unconsolidated to poorly consolidated. Slopes excavated within these types of materials can be prone to slope failure if inappropriately designed and constructed.

Under existing conditions, the erosion hazard for the surface soils of the lower Cache Creek basin is slight to negligible. However, the excavation of pits would significantly increase the slope of the land surface. The potential for erosion is raised with increased slope angle as storm water runoff velocity is correspondingly increased. Exposed soils and sediments can be subject to erosion if not protected with vegetative cover. If surface runoff from outside mining areas is directed into excavations, the incision of runoff drainage channels could occur. The incision could result in gullying or oversteepened channel banks that could be unstable and prone to slope failure.

The erosion of soil at mining areas and adjacent lands could result in the transportation of the sediment away from affected areas. Deposition of eroded soil could occur in places

(e.g., in the bottom of deep lakes formed in mining pits) where retrieval and reuse of these soils would not be possible. Sediment generated by erosion could adversely affect water quality by raising turbidity, or cause drainage problems that could result in localized flooding.

Draft OCMP and Implementing Ordinances

The OCMP would allow for the extraction of aggregate resources at off-channel locations, increasing the possibility of excavation on the alluvial terraces along Cache Creek. The excavation of the mining pits would expose soil to increased erosion hazards. The potential for erosion would be greatest during the rainy season while mining occurs; the erosion potential would be relatively reduced following vegetation of slopes during and after reclamation.

The OCMP includes the following policies that are intended to reduce the potential impacts of slope instability, erosion, and sedimentation during the mining and reclamation periods:

Obj. 2.3-3: Provide standards and procedures for regulating surface mining operations so that hazards are eliminated or minimized and potential adverse environmental effects are reduced or prevented.

With regard to the potential impact associated with slope instability, erosion, and sedimentation, this objective is supported by the following Performance Standards:

PS. 2.5-4: During operations, a series of benches may be excavated in a slope. The maximum vertical height of the benches shall not exceed ten (10) feet, and all banks shall not exceed 1:2 (horizontal to vertical). Slopes shall not exceed 1:1 (horizontal to vertical) below the summer low water level of exposed groundwater in water filled excavations.

This standard does not meet the minimum design guidelines for slope construction contained in the California Code of Regulations (Title 8, Article 6). These regulations apply to the protection of people working within excavated areas. The topsoil and overburden sediments typical of the alluvial deposits in the Mineral Resource Zones within the lower Cache Creek basin range in textural class from silty clay to gravelly sandy loam and would be classified as Type B soil under the Article. The sand and gravel aggregate resources would be classified as Type C soils. The regulations under the Article set maximum allowable slopes for Type B soil at 1:1 and for Type C soil at 1.5:1. Benching of slopes in Type B soils is allowed only in "cohesive soil" (i.e., soil with high clay content and cohesive strength). The maximum allowable height of the bench is four feet. The requirements of the CCR would presumably only apply to soil and sediments above the groundwater table because people would not be exposed to slope failure hazards below water level.

The provisions of Performance Standard 2.5-4 allow for the construction of slopes that could be unstable during and following excavation. Therefore, Performance Standard 2.5-4 should be eliminated from the OCMP or modified to comply with State excavation standards.

PS. 2.5-16: Except where benches are used, all banks above groundwater level shall be sloped no steeper than 2:1 (horizontal:vertical). Proposed steeper slopes shall be evaluated by a slope stability study, prepared by a qualified engineer. Slopes below the groundwater level shall be no steeper than 1:1 (horizontal:vertical).

Performance Standard 2.5-16 is generally consistent with the requirements of SMARA for maximum mining slopes. The maximum cut slope for final pit slope is required by SMARA (Section 3704(f)) to have a minimum slope stability factor of safety that is suitable for the proposed end use and conform with the surrounding topography and/or approved end use. Slope stability analysis performed on proposed mining slopes within the Cache Creek basin indicate that slopes of 2:1 are generally appropriate for the typical profile of surface materials found in the basin. Given the availability of slope stability analyses performed at locations that can be considered representative of the subsurface conditions within the basin, this maximum slope gradient is supportable. The performance standard does not, however, specify the acceptable factor of safety for the various end uses allowed by the OCMP. However, the acceptable factor of safety is addressed in Performance Standard 2.5-18. The standard also implies that steeper slopes may be allowed if slopes are analyzed by a slope stability analysis. The long-term stability of steeper slopes, particularly those excavated in the fine-grained overburden materials is questionable. The steepness of slopes with regard to public health and safety (falling and drowning) is discussed in the Hazards section of this EIR.

PS. 2.5-17: Upon the completion of operations, grading and revegetation shall minimize erosion and convey surface runoff to natural outlets or interior basins. The condition of the land shall allow sufficient drainage to prevent water pockets or undue erosion. Natural and storm water drainage shall be designed so as to prevent flooding on surrounding properties and County rights-of-way.

Silt basins which will store water during periods of surface runoff shall be equipped with sediment control and removal facilities and protected spillways designed to minimize erosion when such basins have an outlet to lower ground and/or Cache Creek.

This standard presents goals of minimizing erosion, efficient conveyance of storm water runoff, and appropriate design of silt basins. Achieving these goals would reduce the potential impacts of erosion and sedimentation on receiving waters such as Cache Creek. The standard does not, however, present specific design criteria or design options for meeting the standard. The standard requires that final grading promote conveyance of runoff to natural outlets or interior basins. The standard does not specifically exclude mining pits as interior basins. Runoff, with the exception of sheetflow generated on the slopes surrounding mining areas, should not be directed into active mining pits or reclaimed lakes. The standard does not specifically address the potential for erosion during the mining period. Significant erosion could occur during mining, particularly on slopes with exposed soil. Erosion of topsoil and overburden sediment and transportation into the mining pits could reduce the amount of soil materials available to meet reclamation needs. The standard should be modified to more specifically address erosion hazard mitigation.

PS. 2.5-18: All final reclaimed slopes shall have a minimum safety factor equal to or greater than the critical gradient as determined by an engineering analysis of the slope stability. Final slopes less than five (5) feet below groundwater shall be designed in accordance with the reclaimed use. Reclaimed wet pit slopes located five (5) feet or more below groundwater level shall not exceed 1:1 (horizontal:vertical), in order to minimize the effects of sedimentation and biological clogging on groundwater flow and to prevent stagnation.

The standard indicates that the minimum factor of safety for final reclaimed slopes shall be determined by engineering analysis but does not specify the slope stability analysis required. The standard also indicates that slopes at elevations that could be affected by groundwater fluctuations should be designed in accordance with the reclaimed uses of these areas. The standard should be modified to include specific design guidelines for maximum slopes that address the subsurface conditions (i.e., soil type and groundwater conditions) and alternative reclaimed uses.

PS. 2.5-21: The grading of final slopes, the replacement soil, and associated erosion control measures shall take place prior to November 1 in areas where mining has been completed. To minimize erosion, all slopes above the groundwater level shall be seeded with a drought-tolerant mix of native and non-native grass species, as soon as is practical after grading and prior to November 1. The grass seed mix shall be weed-free.

This standard partially mitigates the potential erosion of soil exposed during off-channel mining and reclamation activities. The standard provides an annual schedule for grading of final slopes, replacement of soil, and associated erosion control measure. The standard does not address the potential for erosion of non-reclaimed slopes or define a relative schedule for reclamation mining pit slopes. This standard should be supplemented with a standard that minimizes the amount of unreclaimed slopes exposed to rainy season conditions, which promote erosion, and that addresses the control of erosion of active mining slopes.

PS. 2.5-22: Permanent piles of mine waste and/or overburden shall be stabilized and contoured to conform visually and functionally with the surrounding topography. Berms and swales shall generally parallel and angle downstream towards the creek, instead of perpendicular to it.

PS. 5.5-2: Topsoil stockpiles shall not exceed forty (40) feet in height, with slopes no steeper than 2:1 (horizontal:vertical). Stockpiles shall be seeded with a vegetative cover to prevent erosion and leaching. The use of topsoil for purposes other than reclamation shall not be allowed without the prior approval of the Community Development Director.

Performance Standard 2.5-22 does not provide specific guidelines for control of erosion of soil and sediment stockpiles. However, the OCMP includes Performance Standard 5.5-2, which limits the maximum height of stockpiles, specifies a maximum slope angle for their side slopes, and requires vegetative cover for the piles. These standards provide appropriate mitigation of the potential for erosion of the sediment stockpiles.

The provision of Performance Standard 2.5-22 to orient berms and swales in a particular direction would likely conflict with Performance Standard 3.5-3, which requires berms and swales to prevent storm water runoff from entering mining pits. The orientation of the

berms and swales for this purpose would be dictated by the orientation of the pits and the topography of surrounding lands. Performance Standard 2.5-22 shall be eliminated from the OCMP as the provisions of this standard are covered by other standards.

Alternative 1a: No Project (Existing Conditions)

Under this alternative, current off-channel aggregate mining would be allowed to continue. Agricultural land use would continue throughout most of the planning area. The current off-channel mining would be performed under the requirements of SMARA, Yolo County Mining and Reclamation Ordinances and the conditions for mining permits. The requirements of these regulations address control of erosion and slope stability impacts. SMARA includes the SMGB Reclamation Regulations, which present specific reclamation standards that specify erosion and slope stabilization requirements for reclamation. Neither SMARA nor the County Mining and Reclamation Ordinances present specific controls for erosion and slope stability for the mining period. However, erosion and slope stability controls provided in the conditions of approval for the currently permitted off-channel mining projects would mitigate the impacts related to slope stability, erosion, and sedimentation. Erosion related to in-channel mining operations is also controlled by existing mining and reclamation requirements. The existing controls on erosion during mining would reduce the impact to a less-than-significant level.

Alternative 1b: No Project (Existing Permits and Regulatory Condition)

The controls on erosion and slope stability described for Alternative 1a would apply to mining projects under this alternative and would mitigate impacts to a less-than-significant level.

Alternative 2: No Mining (Alternative Site)

Under this alternative, no aggregate mining would be performed in the planning area. Therefore, impacts related to erosion and slope stability caused by mining and reclamation activities would not occur. Changes in topography that could occur under this alternative could result in erosion and slope stability problems caused by agricultural operation or development projects. The potential effects of development projects would be addressed by the applicable local development review process and the statewide General Construction Activity Storm Water Permit. Under this alternative, the slope stability, erosion, and sedimentation impacts within the planning area would be less-than-significant. However, aggregate mining in areas away from the project could be significant depending on the location mining and methodologies for mining and reclamation. All large scale earthworks projects, such as surface mining operations, typically produce potential slope stability and erosion impacts.

Alternative 3: Plant Operation Only (Importation)

No mining would occur in the planning area under this alternative. The impacts related to erosion and sedimentation potential caused during the mining and reclamation of mining pits would not occur within the planning area. The importation of aggregate materials to maintain operation of aggregate processing plants implies mining and reclamation of aggregate resources in an area outside the planning area. Aggregate mining in areas away from the project could be significant depending on the location of the mining and methodologies for mining and reclamation. All large scale earthworks projects, such as surface mining operations, typically produce potential slope stability and erosion impacts.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

This alternative would limit the depth of mining such that mining pits would not extend to depths below the seasonal high groundwater level; no wet pit mining would occur. The shallow mining would, however, create excavation that would disrupt the topography and would create slopes that could be potentially subject to unstable conditions and erosion. Slope stability could be maintained by limiting the steepness of the mining and reclamation slopes and by providing protection against erosion. Relative to open pits, the potential for water quality impacts related to erosion would not occur as sediment washed from pit side slopes would be transported to and deposited in a dry environment instead of a surface water body.

Alternative 5a: Decreased Mining (Restricted Allocation)

This alternative would restrict the rate of aggregate production but would result in the excavation of off-channel mining pits. The mining methodologies would include deep, wet pit mining. Under this alternative, all potential impacts related to erosion and slope stability related to the excavation of pits could occur.

Alternative 5b: Decreased Mining (Shorter Mining Period)

Under this alternative, individual off-channel mining permits for mining in the planning area would be limited to 15- to 25-year permits. Under these conditions, it would be expected that mining of aggregate in the planning area would include deep pit mining. All potential impacts related to erosion and slope stability related to the excavation of pits could occur.

Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed)

This alternative would require that a minimum of 80 percent of the mining areas be reclaimed for agricultural use. The alternative does not limit mining methodologies and implies that deep mining would be expected. For mining areas that extend to depths below seasonal high groundwater, additional fill materials would be necessary to construct agricultural surfaces that are sufficiently elevated above the groundwater table. The excavation of fill materials would expand the area disturbed for mining and reclamation

activities. Erosion and slope stability impacts under this alternative would be similar to those related to pit excavation. If all other factors affecting erosion are held constant, a proportional increase in erosion would be expected with the expansion of disturbed areas.

Mitigation Measure 4.3-2a (OCMP, A-4, A-5a, A-5b, A-6)

To address the potential impacts of slope instability, erosion, sedimentation, and public safety during aggregate mining, mined land reclamation, and post-reclamation use of mined lands, the following performance standards of the OCMP shall be modified as follows:

Performance Standard 2.5-4: During mining operations, a series of benches may be excavated in a slope. The vertical height and slope of the benches shall not exceed ~~ten (10) feet, and all banks shall not exceed 1:2 (horizontal to vertical)~~ maximum standards for the specific soil types presented in California Code of Regulations, Title 8, Article 6. In general, vertical cutslopes between benches shall not exceed four feet in height in topsoil and overburden sediments. Benching shall be allowed in cohesive soil (clay, sandy or silty clay, clayey silt) only. Slopes above the elevation of groundwater (determined at the time of excavation by the level of exposed water in the excavation) that exceed the maximum vertical height shall be excavated and maintained at slopes of not greater than 2:1. Slopes located five (5) feet or less below the average summer low groundwater level shall not be steeper than 2:1. Slopes located more than five (5) feet below the average summer low groundwater level shall not ~~exceed~~ be steeper than 1:1 (horizontal to vertical). ~~below the summer low water level of exposed groundwater in water-filled excavations.~~

Performance Standard 2.5-16: Except where benches are used, all banks above groundwater level shall be sloped no steeper than 2:1 (horizontal:vertical). Proposed steeper slopes shall be evaluated by a slope stability study, prepared by a qualified engineer. Slopes below the groundwater level shall be no steeper than 1:1 (horizontal:vertical). Slopes located five feet or less below the summer low groundwater level shall not be steeper than 2:1.

Performance Standard 2.5-17: Upon the completion of operations, grading and revegetation shall minimize erosion and convey surface runoff to natural outlets or interior basins. The condition of the land shall allow sufficient drainage to prevent water pockets or undue erosion. Natural and storm water drainage shall be designed so as to prevent flooding on surrounding properties and County rights-of-way.

Storm water runoff from mining areas shall be conveyed to lowered areas (detention basins) to provide detention of runoff generated during a 20-year, one-hour storm event. All drainage conveyance channels or pipes (including spillways for detention areas) shall be designed to ensure positive drainage and minimize erosion. The drainage conveyance system and storm water detention areas shall be designed and maintained in accordance with Best Management Practices for the reduction of pollutants associated with runoff from mined areas. The design and maintenance procedures shall be documented in the Storm Water Pollution Prevention Plan required for mining operations. The drainage system shall be inspected annually to ensure that the drainage system is functioning effectively and that adverse erosion and sedimentation are not occurring. The annual inspection shall be documented in the Annual Mining and Reclamation Report.

Performance Standard 2.5-18: All final reclaimed slopes shall have a minimum safety factor equal to or greater than the critical gradient as determined by an engineering analysis of the slope stability. Final slopes less than five (5) feet below the average summer low groundwater level be

designed in accordance with the reclaimed use and shall not be steeper than 2:1. Reclaimed wet pit slopes located five (5) feet or more below the average summer low groundwater level shall not ~~exceed~~ be steeper than 1:1 (horizontal:vertical), in order to minimize the effects of sedimentation and biological clogging on groundwater flow and to prevent stagnation and to protect the public health.

The maximum slope angle for all final reclaimed slopes shall be determined by slope stability analysis performed by licensed and qualified civil or geotechnical engineer and submitted with any mining and reclamation application for review by the Yolo County Community Development Agency (YCCDA). The slope stability analysis shall conform with industry standard methodologies rotational slope failures under static and pseudostatic (seismic) conditions. The minimum factor of safety for all design reclamation slopes located adjacent to levees or below existing structures shall not be less than 1.5 for static and 1.1 for pseudostatic (seismic) conditions. Other reclamation slopes shall meet a minimum factor of safety that is consistent with the post-reclamation use proposed for the mining area.

Performance Standard 2.5-21: The grading of final slopes, the replacement soil, and associated erosion control measures shall take place prior to November 1 in areas where mining has been completed. To minimize erosion, the finish grading of mining pit slopes above the average seasonal high groundwater level, with the exception of the location of designated haul roads, shall be performed as soon as practical after the completion of mining of overburden and unsaturated aggregate resources. A drought-tolerant, weed-free mix of native and non-native grass species shall be established on slopes prior to November 1 or alternate erosion control (mulch or netting) shall be placed on exposed soil on the slopes prior to this date. Phasing of mining to minimize the length of exposed mining slopes during the rainy season is encouraged. ~~all slopes above the groundwater level shall be seeded with a drought-tolerant mix of native and non-native grass species, as soon as is practical after grading and prior to November 1. The grass seed mix shall be weed-free.~~

Implementation of the this mitigation measures would reduce this impact to a less-than-significant level for the OCMP and Alternatives 4, 5a, 5b, and 6.

Mitigation Measure 4.3-2b (A-2, A-3)

Local mining and reclamation regulations for mining operations outside the OCMP planning area shall adopt standards similar to Performance Standards 2.5-4, 2.5-17, 2.5-18, and 2.5-21 to control erosion during mining activities.

Implementation of this mitigation would reduce this impact to a less-than-significant level for Alternatives 2 and 3.

Mitigation Measure 4.3-2c (A-1a, A-1b)

None required.

Impact 4.3-3
Potential for Erosion from Surface Water Discharge, Including "Pit Capture"

The quality of the aggregate resources within and near the active channel of the creek and the relatively low cost of extraction has promoted in-channel mining within the planning area. These factors are likely to influence the prospecting for and development of off-channel mining. Applications for off-channel aggregate mining operations are likely to propose mining areas in positions as close to the creek channel as are permissible. The extraction of sand and gravel deposits during off-channel mining generally results in removal of a volume of subsurface materials that cannot be reasonably replaced. Therefore, the reclamation of mining pits usually results in a net lowering of the existing ground surface or creation of an open water lake if pits are excavated below and not filled to elevations above the groundwater table.

The modified topography associated with off-channel mining in areas adjacent to active creek channels can be affected by the creek processes, including flooding and erosion. Overbank flow during flooding can result in inundation of mining areas or reclaimed lands. The mined areas would fill to the elevation of the flood waters, resulting in localized, deeper flooding. Post-reclamation uses such as agriculture or habitat could be adversely affected by such flooding. Lowered reclamation areas, whether lakes or filled areas, would be surrounded by slopes that would cause increased flow velocity of flood waters. Under these conditions, significant erosion of the slopes can occur, potentially damaging reclamation features.

The erosion of slopes surrounding mined lands during flooding could potentially result in breaching of land separating the mined areas from the creek channel. If the separating land is eroded to an elevation similar to that of the creek bed, the channel flow in the creek could be diverted into the mined areas. The breaching of the separator could also result from slope failure or channel flow erosion of the separating land.

The instability of the channel of Cache Creek within the planning area was described in the Setting discussion. The channel bed has, throughout the planning area, incised between 10 to 20 feet below the position of the channel in 1905. The channel banks adjacent to the planning area are, in some areas, in excess of 25 feet high. In general, the stream banks are unstable, except in areas where slope grading or slope protection have been placed to improve stability and reduce erosion. The effectiveness of existing bank protection is variable, depending on the quality of the design and materials and the local hydraulic conditions. The major influence on the incision of the channel over this period has been reduction of channel width caused by construction of bridges, reclamation of in-channel areas for agriculture, excavation of the channel during aggregate mining, and construction of irrigation diversion structures.

Existing hydraulic conditions and historic trends indicate that some reaches of the creek currently have a high susceptibility for lateral migration and erosion of channel banks. Erosion of channel banks could remove or destabilize the land separating off-channel

mining areas from the active creek channel. The creekside slopes of the separators or levees constructed on the separators could be oversteepened by erosion causing slope failure. Failed slope materials (landslide deposits) could be readily transported by the stream. A continued cycle of erosion and slope failure could eventually lead to total removal of the separator. In this situation, the creek could permanently "capture" the mined areas. This condition, referred to here as "pit capture" could cause significant channel bed destabilization. It should be noted that this type of uncontrolled pit capture resulting from an erosional event and/or slope failure differs from controlled pit capture. It is possible, with proper engineering design and construction, that levee segments could be modified to allow controlled pit capture during flood events.

If the creek channel were to migrate into and remain located in the captured pit, a localized overly steepened bed gradient, or nickpoint, would develop. Adjustment of the stream to this condition would result in erosion that would cause the nickpoint to migrate upgradient until a stabilized channel form developed. The migration of the nickpoint could cause erosion of important in-channel structures, such as bridges or irrigation diversion structures. Adjustments of the stream could also result in channel migration that could cause unexpected lateral erosion. Bank erosion could potentially result in loss of agricultural land or damage to creekside structures such as bridge abutments, habitat restoration projects, or, under some conditions, buildings, roadways, or irrigation canals.

The velocity and erosive power of the channel flow is controlled by the slope of the water surface. When confined to the channel, the slope of the channel flow is controlled by the slope of the channel bed and the geometry of the channel. At a given discharge, measured as flow volume per unit of time (e.g., cubic feet per second), a narrow, steep channel will create a higher flow velocity relative to a wide, gently sloping channel. As the channel flow, or a portion of the channel flow, is redirected into a lowered mined area, the velocity of the flow would be reduced as it spreads across and fills the flooded off-channel area. Once the flooded area is filled, the flood waters could flow to areas that are lower than the flood elevation. The flood water could be concentrated in existing stream channels or irrigation canals in the off-channel areas that have beds lower than the flood elevation. Under extreme conditions, the redirection of channel flow into mined areas could result in a permanent change in the position of the channel, or "stream capture." The potential for "stream capture" to be caused or initiated by the excavation of off-channel mining pits is remote due to the elevation of the terrace surfaces above the existing channel.

Draft OCMP and Implementing Ordinances

The Floodway and Channel Stability Element of OCMP acknowledges that instability of the Cache Creek channel could present conflicts with off-channel mining operations. The following policies relate to the compatibility of off-channel mining with the dynamic nature of Cache Creek:

Goal 4.2-1: Recognize that Cache Creek is a dynamic stream system that naturally undergoes gradual and sometimes sudden changes during high flow events.

Goal 4.2-2: Coordinate land uses and improvements along Cache Creek so that the adverse effects of flooding and erosion are minimized.

Goal 4.2-3: Establish a more natural channel floodway capable of conveying flood waters without damaging essential structures, causing excessive erosion, or adversely affecting adjoining land uses.

These Goals are supported in the OCMP by Actions 4.4-2, 4.4-3, and 4.4-6, and Performance Standards 4.5-1, 4.5-2, and 4.5-3, discussed below.

Action 4.4-2: Designate the streamway influence boundary described in the Technical Studies as part of the Off-Channel Mining Plan. The boundary describes the general area of the creek subject to meandering, as defined by the historic activities of the channel. The streamway influence boundary also defines the area where in-stream and off-channel issues overlap and are addressed in both plans.

This Action acknowledges the important relationship between the present boundaries of Cache Creek and the former historic positions of the creek. When the Streamway Influence Boundary (Figure 3.3-1) is compared to the present channel boundary (Figure 3.2-4), it is clear that over the historic period, the active channel of Cache Creek has been significantly narrowed and straightened. The general response of the creek has been to incise its bed, altering the hydraulics of the creek. This adjustment has resulted in changes in the hydraulic geometry (cross-section) and gradient of the stream. Continual adjustment of the stream is expected until a more stable channel configuration is established. This Action should be modified to acknowledge that any comparison of historic and current channel morphology should consider the longitudinal profile and cross-sections as well as the mapped position of the channel.

Action 4.4-3: Use the data and assumptions provided in the Technical Studies, when evaluating significant modifications to the flood plain. This will ensure a consistent frame of reference and will update the model to account for changing future conditions.

Action 4.4-3 is unclear with respect to what aspects of the Technical Studies' data and assumptions are being referred to or what types of modifications to the floodplain would be considered significant. The "model" referred to in the Action is not specified. The companion document to the OCMP, the Cache Creek Resource Management Plan, proposes a comprehensive program for the development of a more stable creek channel. The Technical Studies presented a conceptual model, referred to as the Test 3 Run, which identifies an area that should be considered in the development of a more stable channel configuration for the Cache Creek channel (Figure 4.3-5). The Technical Studies and the text of the OCMP acknowledge that an effective management strategy for development of a more stable channel will require periodic adjustments to the channel in response to changes along the creek. The Action shall be modified to specifically link consideration of off-channel mining within the CCRMP.

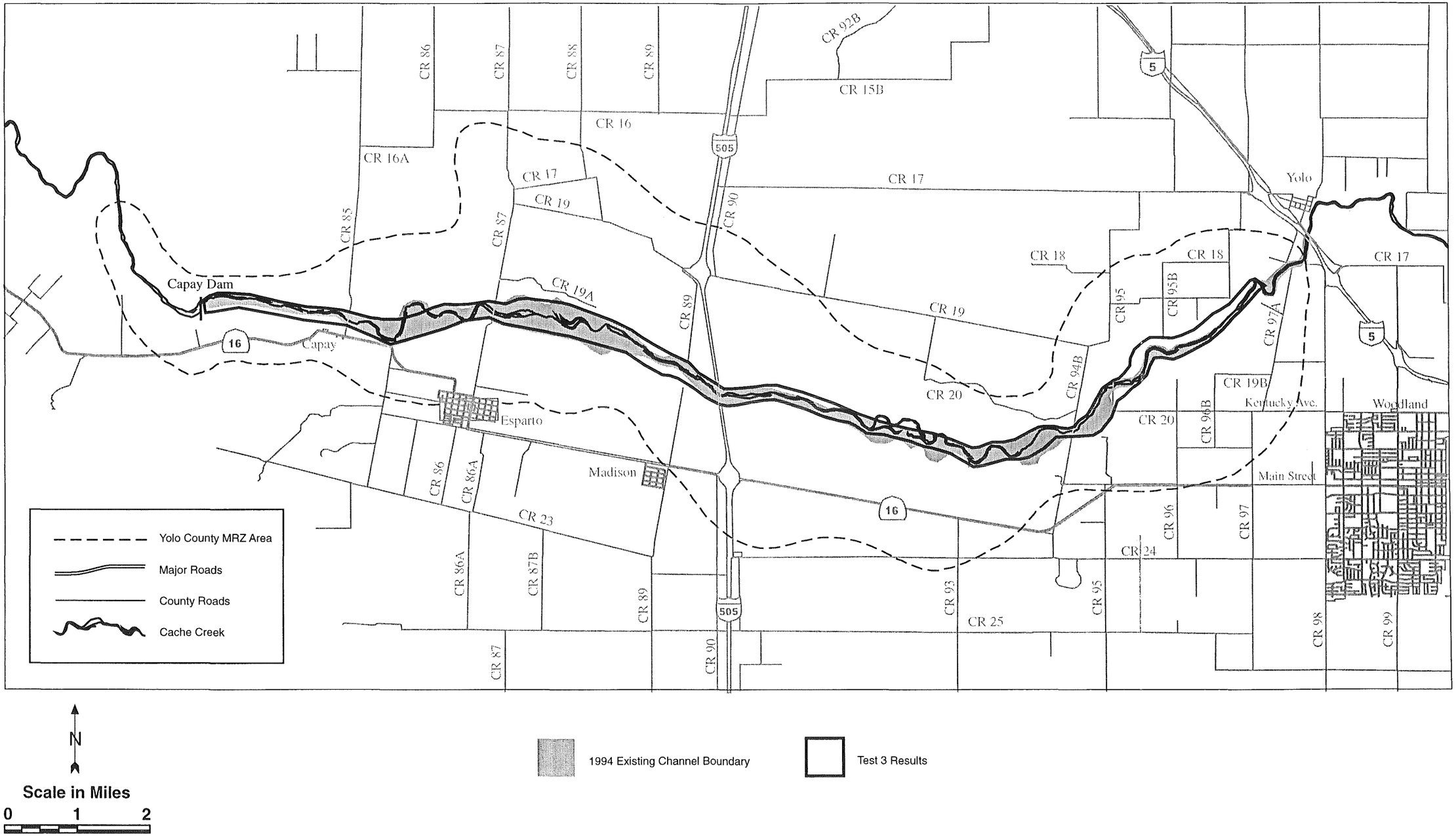


Figure 4.3-5 Test 3 Mobile Sediment Modeling Results

SOURCE: YOLO COUNTY COMMUNITY DEVELOPMENT AGENCY

Action 4.4-6 Allow for the design of spillways or other engineered features that provide controlled pit capture during a catastrophic flood event.

PS. 4.5-1: All off-channel surface mining operations shall be provided with a minimum one-hundred (100) year flood protection. Off-channel excavations that extend below the existing streambed elevation of Cache Creek shall be designed to minimize the possibility of levee breaching and/or pit capture, except under controlled circumstances.

Action 4.4-6 and Performance Standard 4.5-1 implicitly acknowledge that flood flow into pits during extreme high flow events could occur. The off-channel mining areas are required by Performance Standard 4.5-1 to be provided with 100-year flood protection. Mitigation of the potential of breaching of the separators and pit capture are provided by protection of inundation up to the level of a 100-year event and requirements for minimum setbacks from the channel for pits provided in Performance Standards 4.5-2 and 4.5-3. This level of protection assumes a reasonable level of risk (one percent) that the pits could be inundated. However, the potential for flooding during events larger (less frequent) than the 100-year event could cause erosion and possible breach of the separators between the pits and the creek, or between pits.

An important distinction should be made between allowing controlled pit capture and allowing flooding of mining pits. Pit capture, as defined earlier, would result in permanent connection between the pit and the creek. The consequences of this condition would be significant and could possibly cause destabilization of the creek channel. Controlled flooding of the pits during extreme events could help to prevent pit capture. Action 4.4-6 and Performance Standard 4.5-1 shall be modified to clarify this important point.

PS. 4.5-2: All off-channel excavations shall maintain a minimum two-hundred (200) foot setback from the existing active channel bank of Cache Creek.

PS. 4.5-3: Proposed off-channel excavations within the streamway influence boundary shall be set back a minimum of seven-hundred (700) from the existing channel bank, unless it is demonstrated in a manner consistent with the Technical Studies that a smaller distance will not adversely affect channel stability. Under no circumstances shall the setback be less than two-hundred (200) feet.

These performance standards set the minimum setback for off-channel mining areas from the active channel of Cache Creek. Performance Standard 4.5-2 could be eliminated because it is reiterated in Performance Standard 4.5-3. The 700-foot setback for areas within the streamway influence boundary is consistent with data presented in the Technical Studies indicating that large historic bank erosion events along Cache Creek during high flow events have been on the order of 200 to 800 feet. This magnitude of erosion could be expected in areas of adverse hydraulics and/or unstable and unprotected stream banks. The setback of 700 feet is appropriately conservative for most areas of the creek.

The Performance Standards imply that appropriate design of off-channel mining projects could provide sufficient protection against bank erosion to mining sites within 200 feet of the active channel. The magnitude of bank protection required to provide bank stability could vary significantly along the creek depending on the hydraulics of the stream in the

vicinity of the stream. Bank protection solutions for individual off-channel mining projects could result in adverse hydraulic changes in areas of the stream in upstream or downstream position relative to those projects. The performance standard is unclear as to the specific analyses required for demonstrating that a project proposing mining within 700 feet and less than 200 feet of the active channel would not adversely affect channel stability. The Technical Studies present critical information regarding the current hydraulic conditions along the creek but do not present guidelines for design of bank protection. This performance standard shall be modified to define the level of analysis that should be presented for the design of these projects. In addition, a performance standard that establishes a means for maintaining adequate bank protection shall be added to the OCMP.

Alternative 1a: No Project (Existing Conditions) and
Alternative 1b: No Project (Existing Permits and Regulatory Condition)

Off-channel and in-channel mining would continue to occur under these alternatives and would be regulated by existing ordinances and regulations. The potential for erosion of the separators between mined off-channel pits is not specifically addressed by these regulations. However, the potential for failure of the separators was addressed in technical studies prepared for the currently permitted operations and in the environmental review of these projects. Therefore, the potential impact of pit capture was mitigated for these projects and no further mitigation is required.

Alternative 2: No Mining (Alternative Site) and
Alternative 3: Plant Operation Only (Importation)

Under these alternatives no off-channel mining would occur in the planning area. Therefore mitigation of the potential impacts of pit capture on off-channel mining areas would not occur and mitigation of the impact would not be necessary.

Alternative 4: Shallow Mining (Alternative Method/Reclamation),
Alternative 5a: Decreased Mining (Restricted Allocation),
Alternative 5b: Decreased Mining (Shorter Mining Period), and
Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed)

Under each of these alternatives, off-channel mining to depths below the bed of Cache Creek could occur. The potential impact of bank erosion and failure of separators could occur. The number of pits potentially affected by the impact could be reduced under these alternatives, however, the impact for pit capture would remain significant.

Mitigation Measure 4.3-3a (OCMP, A-4, A-5, A-6)

The following text shall be added to Action 4.4-2:

Action 4.4-2: Designate the streamway influence boundary described in the Technical Studies as part of the Off-Channel Mining Plan. The boundary describes the general area of the creek subject to meandering, as defined by the historic activities of the channel. The streamway influence boundary also defines the area where in-stream and off-channel issues overlap and are addressed in each both plans. Whereas the streamway influence boundary shall be recognized as representative of historic conditions, the current hydraulic conditions of creek shall be considered in decision-making regarding channel and floodplain management.

Action 4.4-3 from the OCMP shall be replaced by the following action:

Action 4.4-3: Evaluation of proposed significant modifications to the flood plain, including off-channel mining areas, shall be made with reference to the channel improvement strategy and guidelines presented in the Cache Creek Resource Management Plan. This will ensure a consistent frame of reference and allow consideration of such modifications in the context of an integrated creek management program.

Action 4.4-6 shall be amended as follows:

Action 4.4-6: Allow for the design of spillways or other engineered features that provide controlled ~~pit capture during a catastrophic flood event~~ flooding of off-channel mining pits during flood events which exceed the 100-year flood event.

Performance Standard 4.5-1 shall be amended as follows:

Performance Standard 4.5-1: All off-channel surface mining operations shall be provided with a minimum one-hundred (100) year flood protection. Off-channel excavations that extend below the existing streambed elevation of Cache Creek shall be designed to minimize the possibility of levee breaching and/or pit capture~~, except under controlled circumstances~~.

Performance Standard 4.5-2 shall be deleted from the OCMP.

Performance Standard 4.5-3 shall be amended as follows:

Performance Standard 4.5-3: Proposed off-channel excavations within the streamway influence boundary shall be set back a minimum of seven-hundred (700) from the existing channel bank, unless it is demonstrated ~~in a manner consistent with the Technical Studies~~ that a smaller distance will not adversely affect channel stability. Under no circumstances shall the setback be less than two-hundred (200) feet. The evaluation of the potential for adverse effects of bank erosion or failure of the land separating pits located less than 700 feet from the active channel shall include, at minimum, the following analyses:

- *The 200-foot setback area shall not include portions of the former historic active floodplain or formerly mined lands separated from the active channel by levees or unmined areas less than 200 feet wide (measured perpendicular to the active channel).*

- *Identification of the former historic positions of the Cache Creek channels as delineated in the CCRMP Technical Studies, and determination if proposed project is located within the limits of the historic channel;*

- *Description of current channel hydraulic conditions (based on existing or site-specific hydraulic models) for the Cache Creek channel adjacent to the site and extending not less than 1,000 feet upstream and downstream of the site;*

- *Determination of erosion potential of stream bank adjacent to the site made on the basis of stream flow velocity and estimated shear stress on bank materials during 100-year flood flows and historic patterns of erosion;*

- *Analytical slope stability analysis in conformance with Performance Standards 2.5-16 and 2.5-18. This slope stability analysis of the slopes separating the mining area from the creek channel shall include evaluation of stability conditions during 100-year flood flows in the channel;*

- *Future proposed bank stabilization designs, if recommended, shall not conflict with channel design recommendations of the Cache Creek Resource Management Plan unless approved by the Technical Advisory Committee.*

The following Performance Standards shall be added to the OCMP and implementing ordinances:

> *Performance Standard 4.5-8: Financial assurances for off-channel mining operations which include mining within 700 feet of the active channel of Cache Creek shall include adequate funding for maintenance during the mining and reclamation period of any bank stabilization features approved for the mining permit. Maintenance of the bank stabilization features following the completion of reclamation shall be the responsibility of the property owners under the Cache Creek Resource Management Plan.*

Implementation of these mitigation measures would reduce this impact to a less-than-significant level for the OCMP and Alternatives 4, 5a, 5b, and 6.

Mitigation Measure 4.3-3b (A-1a, A-1b, A-2, A-3)

None required.

Impact 4.3-4
Decreased Availability of Aggregate Resources

The availability and quality of recognized aggregate resources with the lower Cache Creek basin would likely encourage commercial interest in in-channel and/or off-channel aggregate resource extraction. Continued sand and gravel extraction in the lower Cache Creek basin would result in depletion of the remaining raw aggregate resources. Mining of in-channel resources at historic or current rates would exceed the replenishment rate for these resources. The in-channel resources are replenished by the transportation and deposition of aggregate by Cache Creek. The current sand and gravel sediment yield along the creek within the reach of Cache Creek surrounded by the planning area has

been estimated to be 210,000 tons per year (NHC, 1995). This estimate represents only the amount of sediment that enters this area of the creek, not necessarily the amount of sediment deposited annually.

Off-channel mining would result in extraction of resources that would not be replenished within normal planning horizons (less than 100 years). Under current conditions, the creek in this area is incised below the valley floor. Therefore, sand and gravel deposition within the planning area would be negligible. Although sand and gravel are produced continually through the process of erosion, the sand and gravel resources removed from off-channel mining pits on the alluvial terraces within the planning area are not expected to be replaced in the foreseeable future.

SMARA includes provisions for the development and conservation of mineral resources. The development of aggregate materials includes mining, processing, and distribution of mineral resources. The concept of conservation is not clearly defined by SMARA. The Act provides for protection of identified aggregate resources from incompatible land uses. However, SMARA does not specify that the extraction of the resources be required or controlled to extend the availability of the resource.

Aggregate resources are not "non-renewable" in that the production of aggregate products, such as concrete, asphaltic concrete, and road base, does not generally result in the destruction of the aggregate. The aggregate resources in these products remain durable during most types of uses and are potentially reusable through recycling. In addition, mining and processing of other rock sources, including rock produced through mining of bedrock in quarries or mining of lower quality alluvial deposits, can provide aggregate for similar uses. However, the processing necessary to produce the appropriate physical properties (suitable grain sizes and rock fragment shapes) for use of these sources as PCC-grade aggregate is relatively expensive compared to use of alluvial sand and gravel, such as those within the OCMP planning area. In addition, no suitable sources of quarry rock have been identified within Yolo County.

Aggregate resources are necessary for construction materials for buildings, bridges, canals, and pavements. The demand for aggregate within the Sacramento-Fairfield Production-Consumption Region (S-FP-CR) that includes Yolo County for the period 1983 to 2033 was estimated by CDMG to be 888.6 million tons (17.7 million tons per year) to meet all aggregate needs. Approximately 40 percent (355.2 million tons) of the total aggregate demand was historically used as PCC-grade aggregate. The Yolo County OCMP estimates that the production of aggregate within the planning area over the period 1997 to 2047 would be 289 million tons if the area were to continue to meet 26 percent of the regional demand.

If extraction of aggregate in the planning area were to meet the this demand for aggregate, the rate of extraction would be approximately 5.8 million tons per year. Production at this rate, assuming an aggregate replenishment rate of 210,000, would exhaust the known reserves in the project site in approximately 140 years. The aggregate

extraction rate could be reduced and the period over which the resource would remain available could be extended by:

- recycling of aggregate products;
- supplementing aggregate resources with other recycled products, such as glass;
- conservation of PCC-grade aggregate for PCC production only.

Although these measures could be partially effective in reducing the demand for raw aggregate, Yolo County does not have the authority to control the products or types of products made available by the aggregate industry that are safe and meet current standard specifications.

Draft OCMP and Implementing Ordinances

The OCMP promotes a shift in the emphasis of aggregate resources from in-channel mining operations to off-channel operations to provide for more stable conditions along the Cache Creek channel while allowing development of the valuable aggregate resources. The effect of eliminating commercial in-channel mining would result in the continued preservation of approximately 111 million tons of PCC-grade aggregate located below the creek channel. The Cache Creek Resource Management Plan proposes the only extraction of aggregate within the channel will be related to maintenance of a more stable channel. These activities would not be expected to excavate a significant amount of aggregate from below the theoretical thalweg. Although the availability of these deposits may be limited by competing or conflicting land use values, such as protection of stream stability or habitat resources, future use of the resources for production of aggregate products is not precluded.

The mining of off-channel resources that could be permitted under the OCMP will result in a decrease in the availability of aggregate resources in the future. The aggregate mining operations currently identified as foreseeable under the period considered under the OCMP could result in the extraction of approximately 179 million tons. Under the OCMP, the County has also been requested to designate an additional 676 acres of land within the MRZ-2 zones in the planning area with a Sand and Gravel Reserve (SGR) overlay. Mining of these areas could result in extraction of an additional 136.5 million tons in the period 30 to 50 years in the future. If approved, the requested projects (including in-channel gravel extracted for channel stability improvements under the CCRMP) and rezoning and assumed extraction at the Schwarzgruber site could result in extraction of a total of 216 million tons of aggregate from the project within the next 50 years. This amount represents approximately 24 percent of the combined estimated 807 million tons of off-channel aggregate and 111 million tons of in-channel aggregate (918 million tons total) available within the planning area. The remaining 702 million tons of aggregate could be used if needed and made available to provide aggregate resource for an additional 121 years (assuming a production rate of 5.8 million tons per year).

The potential availability of existing aggregate resources that would not be mined under the OCMP and the potential reuse and supplementation of aggregate resources indicate that the impact of decreased availability of aggregate due to potential mining under the OCMP is a less-than-significant impact of the proposed project.

Alternative 1a: No Project (Existing Conditions) and
Alternative 1b: No Project (Existing Permits and Regulatory Condition)

Under these alternatives, a maximum of approximately 19 million tons of aggregate would be extracted from the planning area over the next 8 years. This total tonnage represents approximately 2 percent of the estimated total resources (918 million tons) within the planning area. The remaining unmined tonnage, 844 million tons would be available, if needed, for future use. The potential for depletion of the aggregate reserves under this alternative is a less-than-significant impact.

Alternative 2: No Mining (Alternative Site) and
Alternative 3: Plant Operation Only (Importation)

No mining would occur within the planning area under these alternatives. Therefore, the potential for depletion of the aggregate reserves in the lower Cache Creek basin would be a less-than-significant impact. It is assumed under Alternative 2 that 65 million tons of processed materials would need to be imported from elsewhere to satisfy demand. It is assumed under Alternative 3 that 113 million tons of raw materials would likely be imported for processing at local plants. Depletion of resources under these two alternatives would occur outside the OCMP planning area.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

Under this alternative, approximately 34 million tons of aggregate would be extracted in shallow mining operations from the planning area over the next 30 years. This total tonnage represents less than 4 percent of the estimated total resources (918 million tons) within the planning area. The remaining unmined tonnage, 884 million tons would be available, if needed, for future use. The potential for depletion of the aggregate reserves under this alternative is a less-than-significant impact.

Alternative 5a: Decreased Mining (Restricted Allocation)

Under this alternative, the extraction of aggregate would be limited to 2.3 million tons per year for the next 30 years. The maximum total extraction (66 million tons) would be approximately 7 percent of the total resources in the planning area. Approximately 852 million tons would be available for future use and the impact of depletion would be less than significant.

Alternative 5b: Decreased Mining (Shorter Mining Period)

The extraction of aggregate within the planning area under this alternative would be 110 million tons or 12 percent of the total estimated resources within the planning area. This alternative would present a less-than-significant potential impact of depletion of the aggregate resources.

Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed)

The total tonnage of aggregate removed under this alternative would be approximately 180 million tons over 30 years or 20 percent of the total estimated reserves within the planning area. Similar to the proposed project, the impact of the extraction would be less than significant.

Mitigation Measure 4.3-4a (OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5, A-6)

None required.

4.4 HYDROLOGY AND WATER QUALITY

4.4 HYDROLOGY AND WATER QUALITY

INTRODUCTION

This section comparatively examines potential impacts on hydrology and water quality associated with implementation of the OCMP and the project alternatives. The main issues addressed in the section are:

- potential impacts to groundwater levels, and the rate and direction of groundwater flow;
- potential degradation of water quality after reclamation;
- potential loss of water from aquifer storage due to evaporation;
- potential impacts associated with groundwater recharge;
- potential impacts from flooding related to potential dam failure;
- potential impacts associated with inundation of dry pits or lowered reclaimed surfaces by high groundwater conditions; and
- potential impacts associated with mercury in sand and gravel deposits.

The following summary of hydrology and water quality issues is derived from the extensive hydrologic data collected and documented in reports prepared on the hydrology of the Cache Creek basin. The model of the hydrologic cycle (Figure 4.4-1) is used as a framework for presenting this information. In a simplified manner, the model of the hydrologic cycle demonstrates how water continuously moves through the environment. The cycle encompasses numerous hydrologic processes that can be impacted by the activities of society. Each major process within the cycle is discussed with regard to the potential for the proposed project to affect the movement or quality of water within that process.

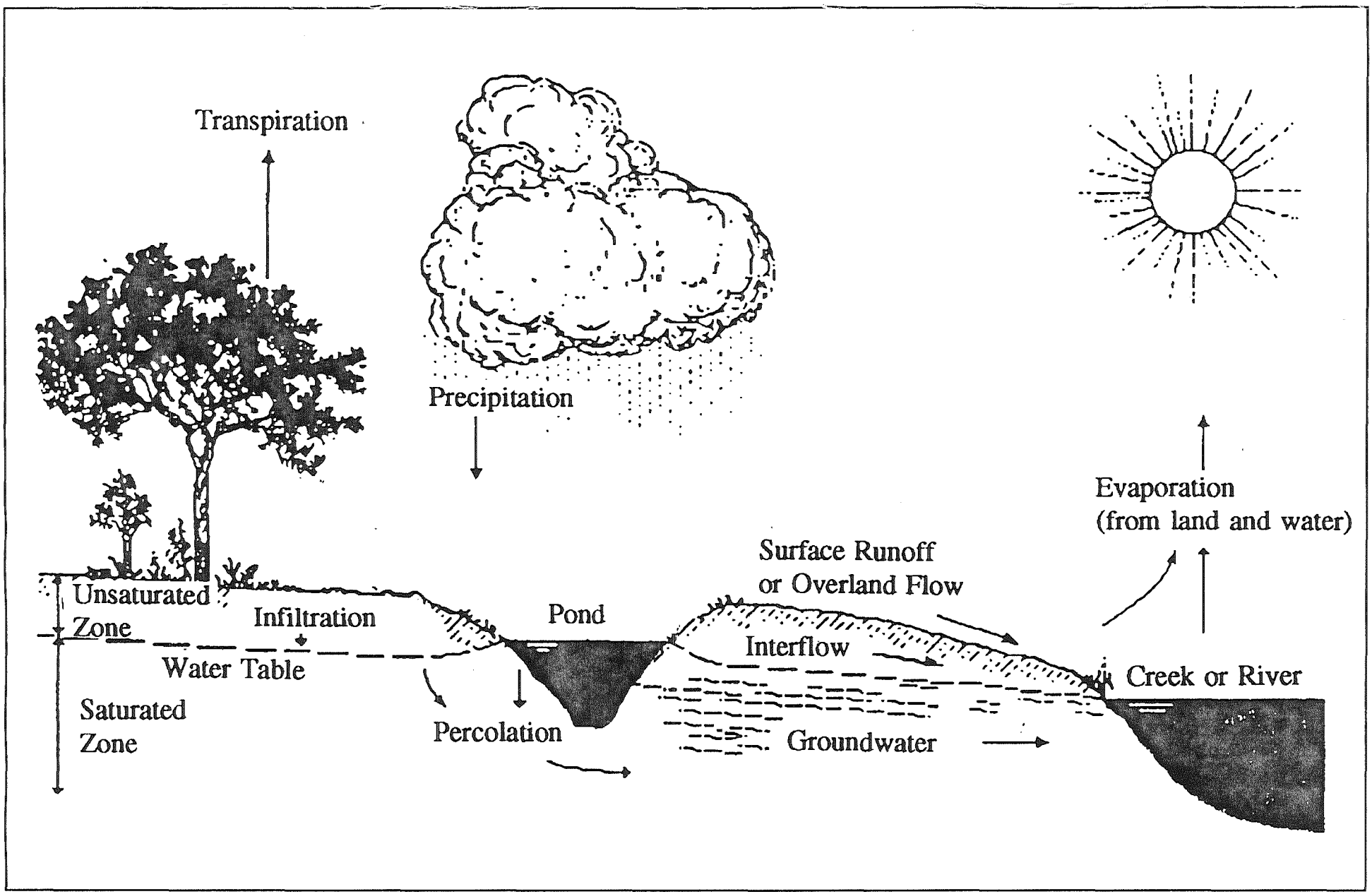
SETTING

Description of Regional Environment

Climate

The climate in the vicinity of the planning area is characterized as Mediterranean; warm to hot dry summers and moist winters. The orographic[1] effects of the Coast Ranges greatly influence rainfall distribution patterns in the area. Most of the precipitation in the region results from storms that originate over the Pacific Ocean and travel eastward over the Coast Ranges to the Sacramento Valley. Much more rain typically falls on the foothills

[1] The physical geography of mountains and mountain ranges.



Note: The hydrologic cycle is the cycle through which water passes from open water bodies through evaporation to the atmosphere, to precipitation, to infiltration and runoff and return to open water.

Figure 4.4-1 The Hydrologic Cycle

SOURCE: MODIFIED FROM GORDON, N.D., McMAHON, T.A., FINLAYSON, B.L., 1992

and uplands of the Coast Ranges (24 inches per year) than the valley floor (19 inches per year) (US Department of Commerce, 1992). Most of the rainfall occurs between the months of November and March; and virtually none falls between June and September. Snowfall and snowpack are negligible in the Coast Ranges uplands of Yolo County. Analysis of long-term precipitation records indicates that wetter and drier cycles lasting several years are common in the region. Severe, damaging rainstorms occur at a frequency of about once every three years in the central California region (Brown, 1988).

The average annual temperature in Yolo County is 62 degrees Fahrenheit (°F). The average daytime high temperature in the summertime is 100°F. Summertime temperatures have been recorded in excess of 115°F in Yolo County (Scott and Scalmanini, 1975).

Surface Water

The planning area contains portions of two drainage basins: the Cache Creek basin and the Willow Slough Basin (Figure 4.4-2). The Putah Creek Basin is also a major drainage basin in the region, but does not directly affect hydrology and/or water quality in the planning area.

Cache Creek is the principal drainage feature within the Cache Creek basin, and drains an area of over 1,140 square miles (NHC, 1995). Cache Creek originates at Clear Lake in the Coast Ranges (approximately 35 miles northwest of the planning area) and flows easterly to the Sacramento Valley. The topography of the Cache Creek basin varies from the steep uplands of the Coast Ranges between Clear Lake and the town of Capay, to the relatively gentle slopes of the valley downstream of Capay.

Diversions of Cache Creek occur at the Indian Valley Dam (on the North Fork of Cache Creek), an earthen dam at Rumsey, and the Capay Dam (located at the western margin of the planning area). The dam at Capay diverts nearly all summertime flows to the Adams and Winters Canals for agricultural use. The mean annual runoff[2] within Cache Creek is estimated at 577,000 acre-feet at Capay and 374,000 at Yolo (NHC 1995).

Indian Valley Reservoir, located on the North Fork of Cache Creek, has a storage capacity of about 300,000 acre-feet, of which 40,000 acre-feet is for flood control storage. The dam was built in 1975 by the Yolo County Flood Control and Water Conservation District (YCFCWCD). If the Indian Valley Dam were to fail, the planning area could be inundated by up to 17 feet of water, depending on the location. The first wave would reach the western portion of the planning area in approximately 4.0 hours (YCFCWCD, 1996).

Willow Slough is the principal drainage feature within the Willows Slough Basin, which flows in an easterly direction. Willow Slough Basin (which includes Dry Creek Slough, Lamb Valley Slough, Cottonwood Slough, and Union School Slough) drains an area of

[2] The mean annual runoff is the average total volume of surface water that passes in a single year a given location (such as a gauging station) on a creek or river each year

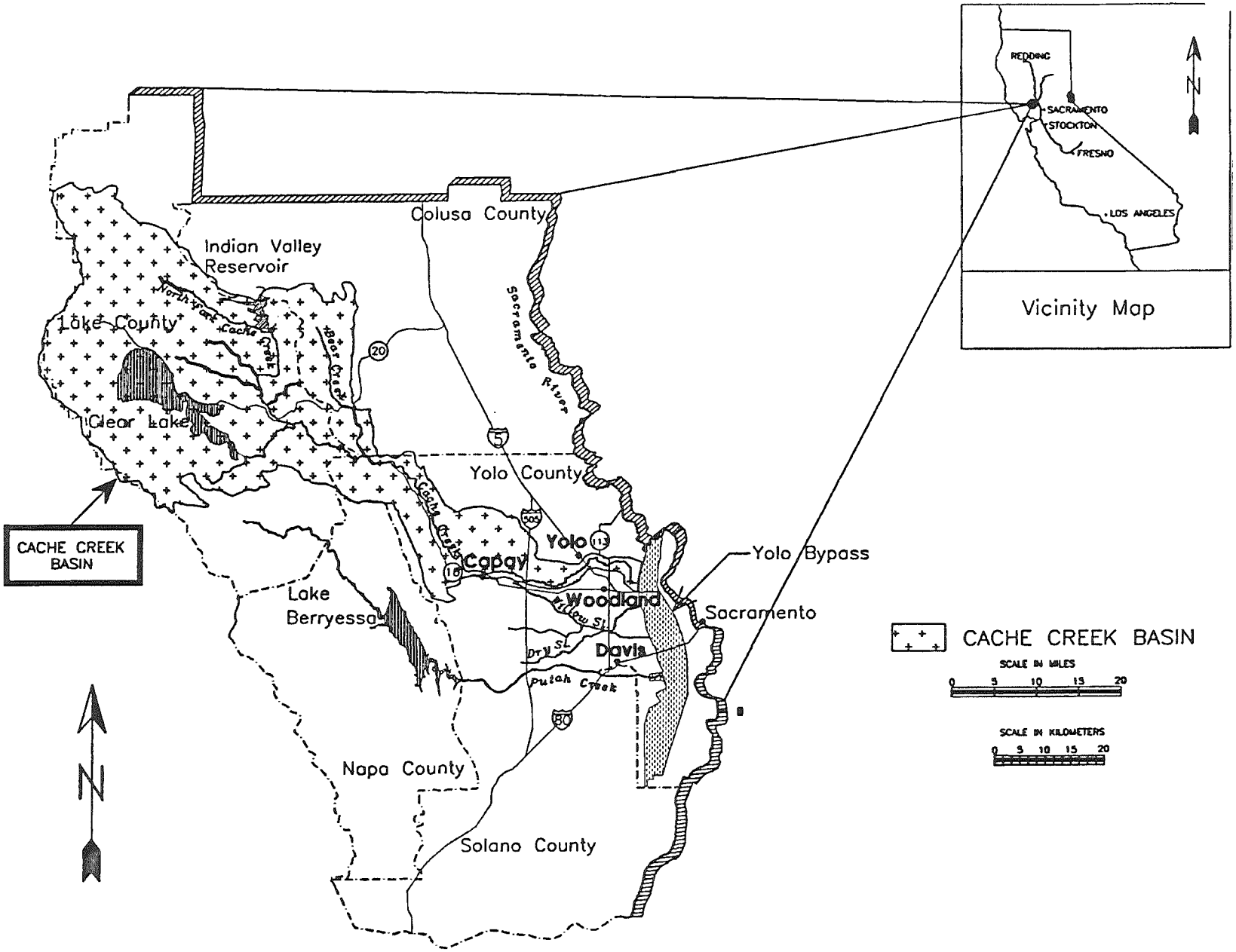


Figure 4.4-2 Regional Drainage

SOURCE: USACOE, 1995

approximately 200 square miles (USACOE, 1994). The Slough receives storm water runoff and agricultural tailwater from the entire central portion of Yolo County. Willow Slough also receives water from several canals, irrigation ditches, and small tributaries; flow within the Slough is often sporadic.

Flooding

Flooding results from short-duration high intensity rainfall, long-duration low intensity rainfall, failure of a dam or levee, or a combination of these conditions. Overtopping of the channel banks of Cache Creek or the drainage within Willow Slough could cause flooding within the planning area.

The flood of record (maximum recorded discharge) for Cache Creek (recorded at the town of Yolo[3]) was 41,800 cubic feet per second (cfs) 9 March 1995 (NHC, 1995). The second highest flood of record occurred on 25 February 1958 and was measured at 41,400 cfs, as compared to mean annual flows of 515 cfs between 1903 and 1992 (USGS, 1992). The calculated flood discharges corresponding to the 10-year and 100-year flood events for Cache Creek at Capay Dam are 30,000 cfs and 64,000 cfs, respectively (USACOE, 1994). The majority of the Cache Creek system is characterized by short stream reaches with steep gradients, and therefore peak flood flows usually pass through the basin within a 24-hour period.

Existing levees along Cache Creek in the vicinity of Yolo and Woodland, east of the planning area, are overtopped by floods greater than the 10-year event. Floods greater than the 10-year event threaten the town of Yolo and the City of Woodland. The U.S. Army Corps of Engineers (USACOE) has completed a preliminary review of the problem and has recommended that feasibility-level studies be prepared to further evaluate the appropriateness of structural improvements (setback levees and channel improvements) (USACOE, 1994).

Drainage within Willow Slough results in frequent overtopping of banks (as recently as January 1995, but also in 1958, 1963, 1983, and 1986) and flood areas near SR 16 and the southern portion of the planning area (USACOE, 1994; Russo, 1995).

Groundwater

Groundwater in the Cache Creek and Willow Slough basins occurs in both the Tehama formation[4] and the overlying younger alluvial deposits. The overlying younger alluvial deposits, which consist primarily of sand and gravel with intermittent layers of silt and clay,

[3]The river gauging station at Yolo on Cache Creek (No. 11452500) is located at the eastern end of the project area, and is the nearest USGS gauging station.

[4]The Tehama formation consists of poorly sorted sediments comprised of thick-bedded, sandy silt and clay. Gravel and sand deposits are usually thin and discontinuous (DWR, 1978).

comprise the more important groundwater producing unit because yields to wells are significantly higher. The thickest sand and gravel deposits occur nearest to Cache Creek. Along the Creek, the thickest deposits occur west of the Plainfield Ridge. The Plainfield Ridge is an uplifted portion of the Tehama formation which acts as a subsurface restriction to the flow of groundwater. The ridge tends to cause the accumulation of sediments on the upstream (west) side.

Uppermost groundwater is unconfined[5] and typically encountered between 10 and 75 feet below the ground surface in the region, depending on the local topography and seasonal recharge. At a particular site, seasonal fluctuations of groundwater levels can exceed 25 feet (David Keith Todd, 1995). The regional groundwater flow direction is consistently to the east/southeast and relatively parallel to Cache Creek (Figures 4.4-3 and 4.4-4). Depressions in the water table form around pumping wells, particularly during drought periods, which can alter local groundwater flow directions.

The YCFCWCD manages surface water storage and diversion in Yolo County. There is currently no regional groundwater management program. Private and public property owners may, at their discretion, install and operate groundwater supply wells. Pumping and use of groundwater is the right of each property owner. Disputes over uses of groundwater within a basin or subregion are generally resolved through adjudication. The YCFCWCD has released a conceptual plan for Cache Creek Groundwater Recharge Project (1991) which would divert surface waters (that may, if not diverted, flow out of the basin) into temporary groundwater storage via infiltration into recharge basins. It is not known when or if a comprehensive final plan will be developed and implemented.

Evaporation and Evapotranspiration

Evaporation[6] from open water and evapotranspiration[7] from agricultural and habitat areas accounts for a significant amount of water lost from the surface and shallow subsurface in arid environments. Evaporation rates from open water bodies (i.e., lakes) in the area are estimated at 47 inches per year (Table 4.4-1).

Evapotranspiration rates of various crops has been quantified for the Sacramento Valley. Annual evapotranspiration rates for irrigated pasture grass have been estimated at 43.7 inches. Other crops, such as beets, tomatoes, beans, and barley, generally transpire less than uncut grasses, with a range of 11 to 30 inches annually (DWR, 1975).

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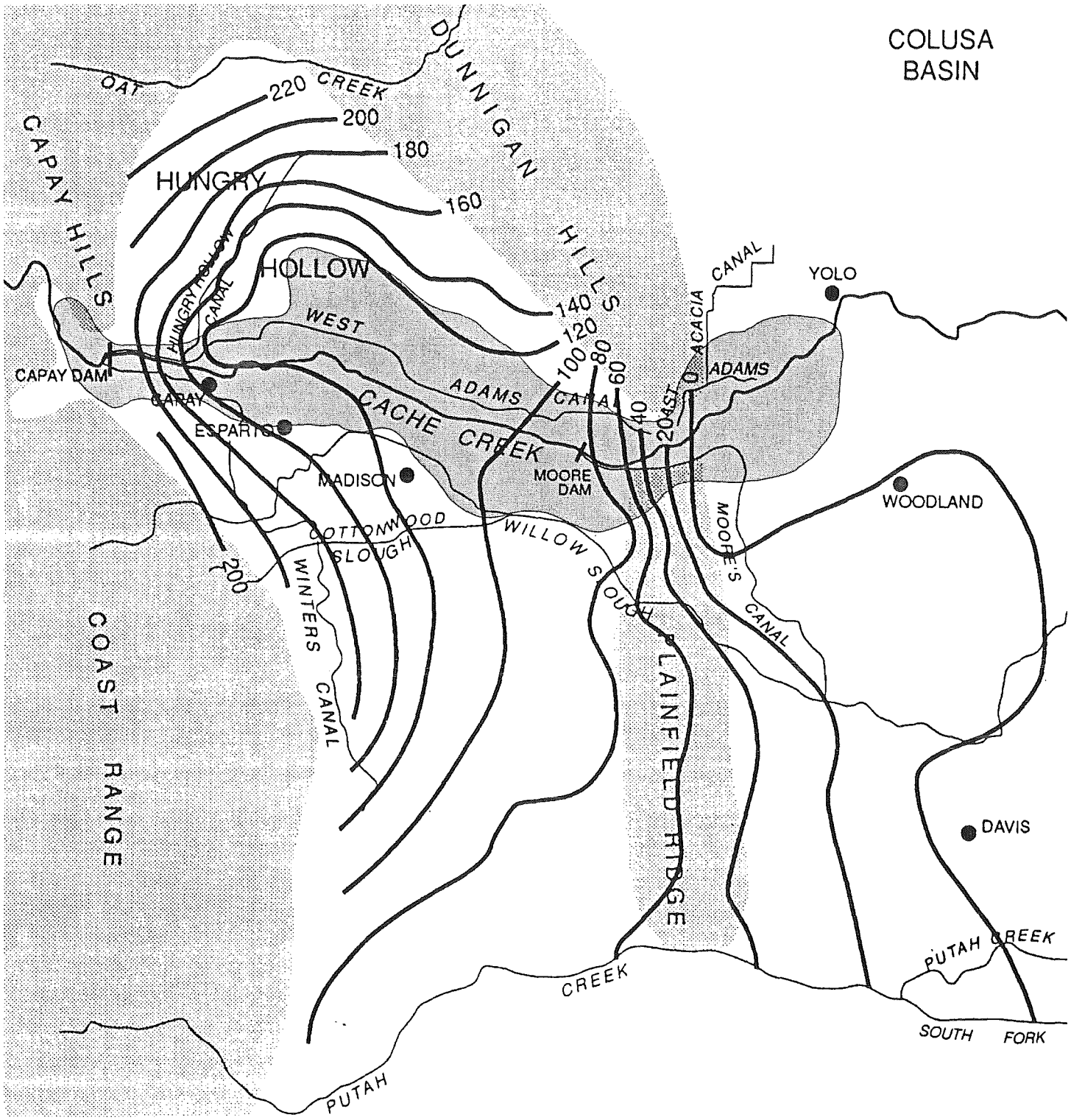
[5]An aquifer is "unconfined" when the uppermost water table surface is free to move up and down.

[6]The conversion of liquid water to vapor.

[7]The sum of evaporation and transpiration. Transpiration is the process by which plants give off water vapor through their leaves.



Planning Area

140 Groundwater contour above MSL

SOURCE: ADAPTED FROM LUHDORFF AND SCALMANINI (1992), AND DAVID KEITH TODD (1995)

Figure 4.4-3 Groundwater Elevation Contour Map, Fall 1991

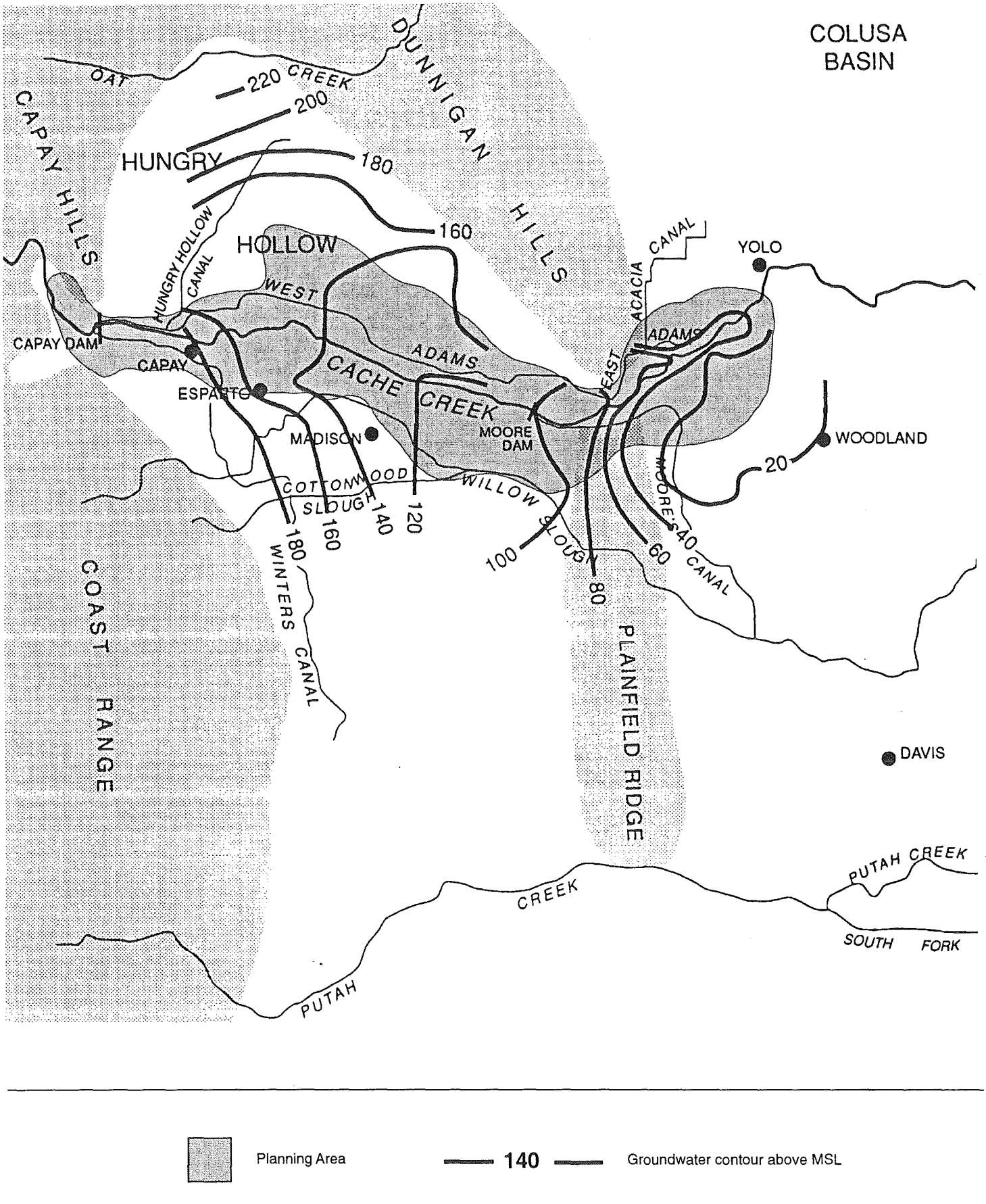


Figure 4.4-4 Groundwater Elevation Contour Map, Spring 1993

SOURCE: EIP et al (1995)

Table 4.4-1: Evapotranspiration Losses of Alternative Land Uses		
Land Use	Evapotranspiration	
	Feet/Year	Inches/Year
Pan Evaporation[1]/Wetland Habitat	5.42	65.0
Lake	3.92	47
Irrigated Pasture	3.64	43.7
Alfalfa	3.53	42.3
Rice	3.50	42.0
Subtropical Orchard (Tree Crop)	2.60	31.2
Sugar Beets	2.48	29.8
Almonds	2.38	28.5
Tomatoes	2.28	27.4
Table Grapes	2.23	26.7
Corn	2.05	24.6
Grain Sorghum	1.78	21.3
Potatoes	1.65	19.8
Dry Beans	1.35	16.2
Barley	0.95	11.4

Source: DWR, 1975.

[1] The use of evaporation pans is the most common method to estimate the maximum potential evaporation rate of a given area. This maximum evaporation rate (5.42 feet/year (EIP et al., 1995) is assumed for the shallow wetland areas around the reclaimed wet pits within the planning area.

Water Quality

The quality of surface and groundwater in the Cache Creek and Willow Slough basins is affected by source water quality,[8] geologic materials through which groundwater flows, and by land uses within the watershed. In general, groundwater contains higher concentrations of total dissolved solids (TDS) than surface waters due to the relatively slow movement of groundwater and correspondingly longer contact with soluble minerals in the subsurface.

[8]Source water quality refers to the quality of surface water (e.g., reservoir releases) and groundwater (e.g., springs) that discharge into Cache Creek upstream of the planning area.

Surface water bodies tend to be more susceptible to degradation by sediment-laden runoff and potential chemical discharges because they are exposed at the surface.

Water quality in surface and groundwater bodies is regulated by the State Water Resources Control Board and Regional Water Quality Control Boards. The planning area is under the jurisdiction of the Central Valley Regional Water Quality Control Board (RWQCB), which is responsible for the implementation of State and Federal water quality protection guidelines.

Water quality has been monitored in surface water and groundwater in the Cache Creek and Willow Slough hydrologic basins since the early 1950s. In general, water quality in the basins is considered excellent for agricultural purposes (except for elevated levels of boron), and fair for domestic use (Scott and Scalmanini, 1975; Evenson, 1985).

Groundwater quality in the western portion of the valley is typically poorer than elsewhere, often exceeding the State secondary drinking water standards for TDS (500 mg/L) (Department of Water Resources, 1978). In general, salts occur in the groundwater in the Cache Creek basin at acceptable concentrations, except boron. Boron, which is necessary for plant growth but toxic to certain plants at concentrations in excess of 1.0 mg/L, is imported to the Cache Creek basin. Since Cache Creek is a significant groundwater recharge feature, groundwater quality in the basin has been affected by the elevated levels of boron (Scott and Scalmanini, 1975). Boron-rich waters flow into Cache Creek from natural hot springs in the Bear Valley drainage. The YCFCWCD monitors Cache Creek for boron. Runoff and flow in Cache Creek resulting from the first rainfall events each winter tend to contain higher concentrations of boron than flows during the rest of the year. The YCFCWCD does not divert these "first flush" flows into the irrigation canal system (Barton, 1996).

Cache Creek is listed as an "Impaired Waterway" by the Central Valley Regional Water Quality Control Board in compliance with section 303(d) of the Clean Water Act (Yee, 1996). Grab samples collected from the creek during the winter of 1995 were found to contain mercury in excess of the Maximum Contaminant Level (0.002 mg/L). In addition, samples were subject to bioassay testing and found to be toxic to invertebrates. Mercury may have been introduced to the lower Cache Creek basin by leaching of natural mercury deposits in the upper basin and from the Sulphur Bank mine located at Clear Lake (USACOE, 1995). The designation as an impaired waterway serves to notify the public of potential water quality degradation. When funding becomes available, the RWQCB, in conjunction with the Yolo County Department of Public Works, may conduct additional water quality monitoring and establish Total Maximum Daily Loads for dischargers of contaminants to the Cache Creek system (Yee, 1996). The U.S. Army Corps of Engineers has recommended that any excavation work proposed within the Cache Creek channel should be preceded by collection of sediment samples for analysis of mercury. The proposed project (OCMP) does not include disturbance of channel sediments. Potential impacts associated with disturbance of channel sediments and remobilization of mercury are more fully addressed in the CCRMP.

Available analytical data on water quality samples collected from wells in the Cache Creek area are limited. Numerous wells have been sampled on single occasions and several wells have been analyzed for mineral quality over various periods. In the vicinity of Cache Creek below Capay, the data suggest consistent water quality with no observable degradation over the last 20 to 40 years. Community water supply sources in Esparto, Madison, Yolo, and south of the Yolo Fliers Club were all screened for organic chemicals in 1985; none were detected in any of the wells.

BASELINE conducted an informal survey of several agencies[9] in California that are involved with water quality issues and wet pit mining. Each agency was asked 1) whether or not wet pit gravel mining occurs within their jurisdiction, 2) whether water quality problems associated with the pits had been reported, 3) whether water quality monitoring had been conducted in surface and/or groundwater in the vicinity of the wet pits, and 4) whether pesticides and/or herbicides are used in the vicinity of the wet pits. In general, the responses indicated that wet pit mining had not resulted in any reported water quality problems. However, none of the agencies reported the collection of adequate data that would allow analysis of water quality trends in the vicinity of wet pits. Agricultural land uses, including use of pesticides and herbicides, in the vicinity of wet pits was reported by several agencies. However, no water quality problems had been reported.

A wide variety of potential sources of surface water and groundwater contamination occur within the Lower Cache Creek basin. Potential sources of contamination, shown on Figure 4.4-5, can be divided in six categories as follows (EPA, 1987):

Category 1 — Intentional discharges. These releases are intended to occur and generally include established controls for mitigation of potential impacts. The systems are generally designed to use the natural capacity of soils and the aquifer to degrade wastewater (e.g., cess pools, septic tanks, injection wells, and land application of wastewater and sludge). It is estimated that septic tanks and cess pools discharge the greatest volume of wastewater to the subsurface and are the most frequently reported source of groundwater contamination (Miller, 1980).

Category 2 — Releases from storage and treatment areas. These releases are not intended to occur. These systems are designed to store and/or treat substances (e.g., landfills, open dumps, and underground storage tanks).

Category 3 — Releases during transport. These releases are not intended to occur. These systems are designed to transmit products or waste (e.g., fuel pipeline, sewer lines). Releases from these systems generally occur due to accidents or neglect and would include sabotage and illegal dumping.

[9]The agencies contacted included: the Central Valley Regional Water Quality Control Board, Yuba County Planning Department, Fresno County Public Works, Zone 7 (Alameda County), California Department of Water Resources, Humboldt County Planning Department, San Benito County Planning Department, Tulare County Planning and Development Department.

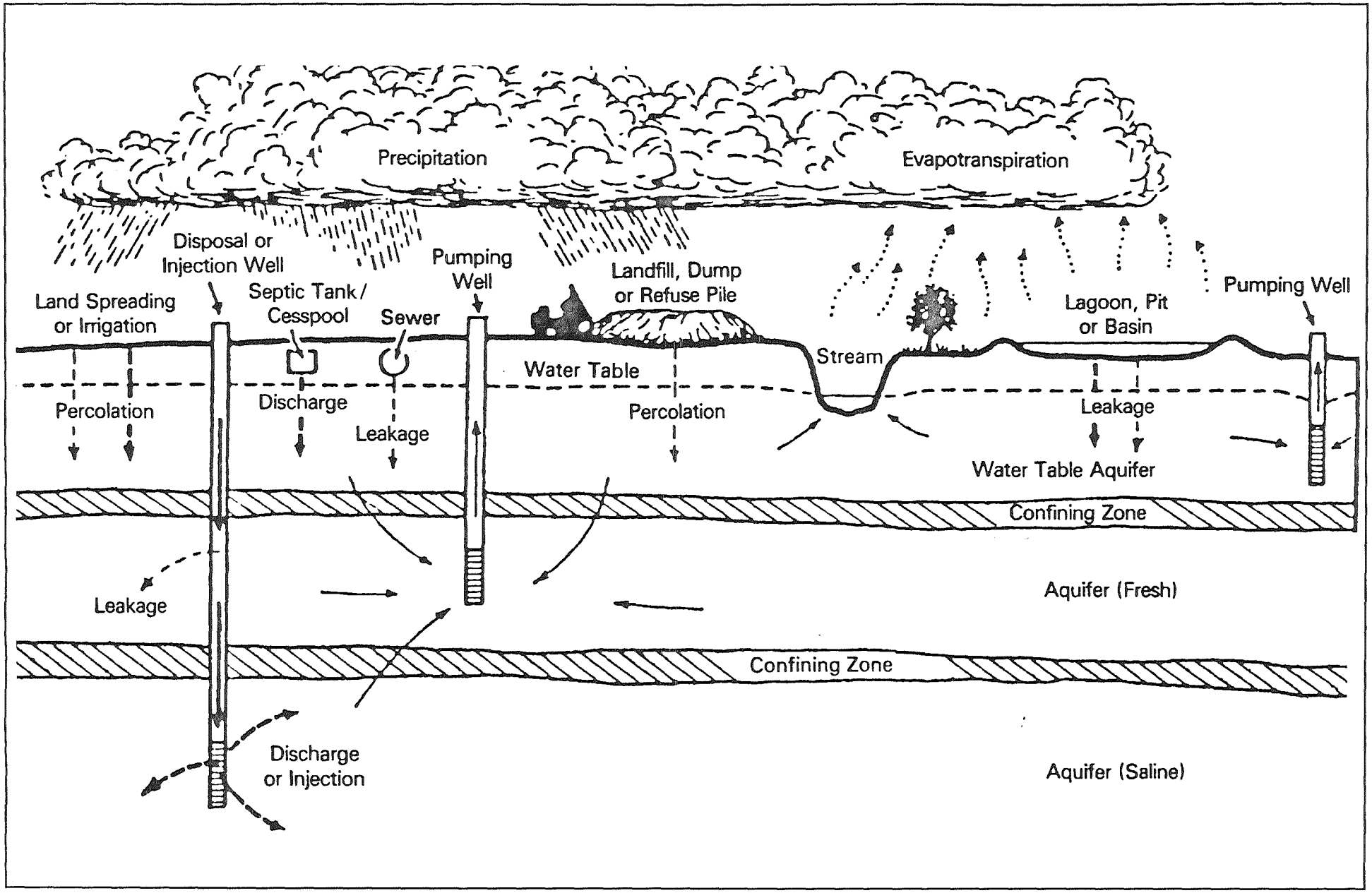


Figure 4.4-5 Potential Sources of Groundwater Contamination

SOURCE: EPA, 1987

Category 4 Discharges associated with other activities. In general, these releases are intended to occur, though controls for potential impacts are often minimal or nonexistent. This category contains agricultural activities (irrigation runoff, feedlot operations, and pesticide application) and urban runoff.

Category 5 Contamination through conduits. These releases are not intended to occur. This category includes creation of conduits that allow contamination to reach the groundwater (e.g., poorly designed wells, exploration holes, construction excavations, wet pit gravel mines, and drainage from existing or abandoned hard rock mines).

Category 6 Naturally occurring sources. Some naturally occurring sources of contamination can impact surface and/or groundwater quality. Problems associated with naturally occurring sources of contamination can be exacerbated by human activity. Salt water intrusion can be caused by overpumping of groundwater. Recharge of an aquifer with poor quality surface water (i.e., high boron content) can adversely impact groundwater quality.

Municipal Water Supply Wells

The towns of Esparto, Madison, and Yolo and the City of Woodland operate municipal wells within five miles of proposed mining areas. No other municipal wells have been identified in the five mile radius. The town of Capay does not have a municipal water system; homes are serviced by individual domestic wells (Lopes, 1996). The locations of municipal wells are shown of Figure 4.4-6. These municipalities rely entirely on groundwater resources for water supply.

The approximate distances from the nearest proposed mining area to the wells providing water for each municipality are summarized in Table 4.4-2. In addition, the table indicates whether the wells are located in upgradient, downgradient or cross gradient position relative to proposed mining areas. The regional groundwater flow directions are shown of Figures 4.4-3 and 4.4-4.

In many cases groundwater is adequately free of contaminants (both chemical and biological) to distribute and use as a drinking water source without any treatment (Simons, 1996). The water supply systems of each municipality are tested regularly for a variety of organic and inorganic compounds, as required by the USEPA and the Yolo County Department of Public Health. Based on results of these analyses, the water supplies meet or exceed established quality standards. Currently, the towns of Esparto, Madison, and Yolo do not treat, chlorinate, or otherwise disinfect the groundwater supplied to customers (Lopes, 1996; Burns, 1996; Horgan, 1996). The City of Woodland began chlorinating portions of its water supply in 1993 when bacteria were identified in 7 of the 18 active wells operated by the City (Phipps, 1996).

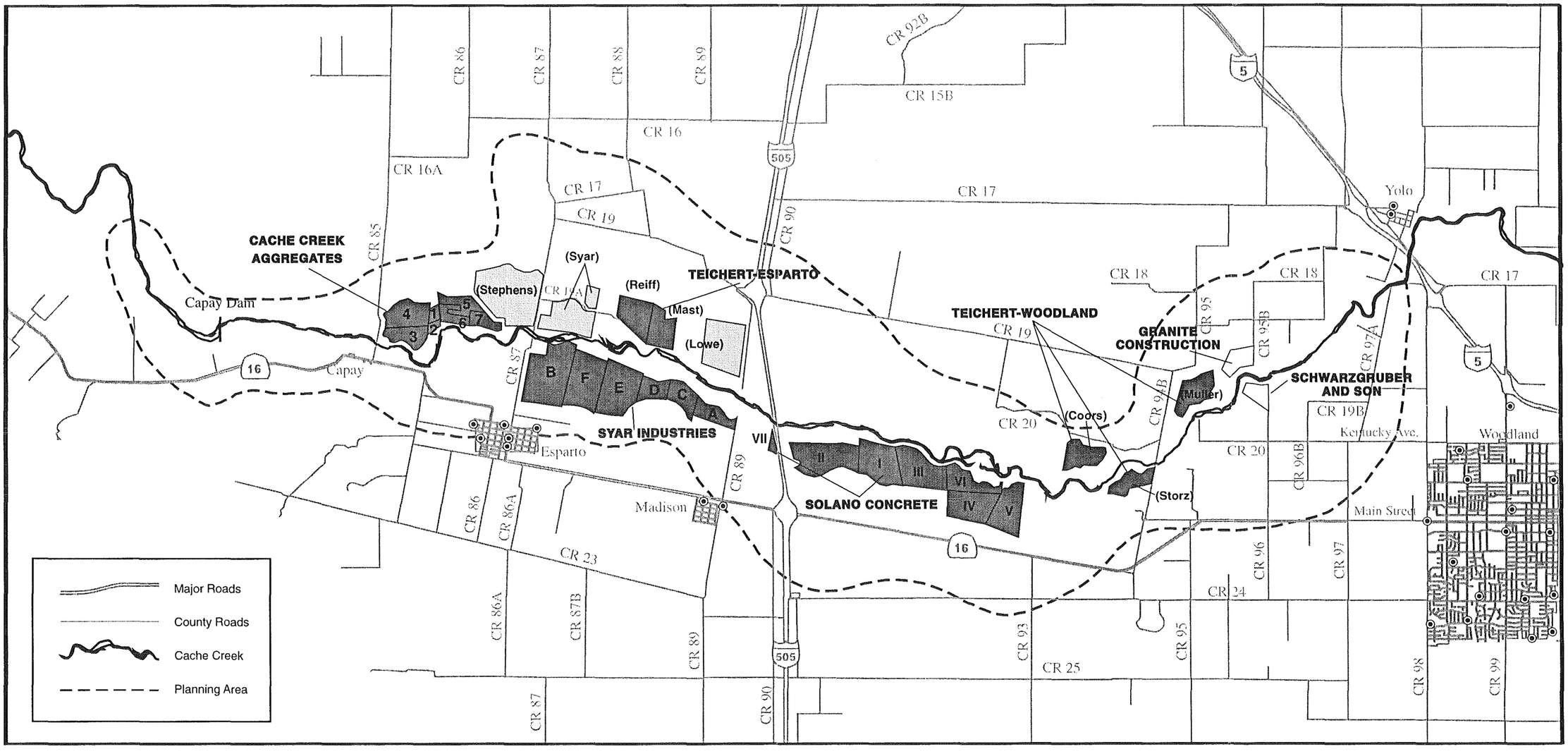


Figure 4.4-6 Municipal Well Locations

SOURCE: INDIVIDUAL MINING APPLICATIONS

Table 4.4-2: Municipal Well Locations Relative to Proposed Mining Sites

Municipality	Distance to Nearest Mining Site (feet)	Position Relative to Regional Groundwater Flow Direction
Esparto	1,750[1]	crossgradient
Madison	5,000[2]	crossgradient
Yolo	14,000[3]	downgradient
Woodland	10,500[3]	downgradient

1 Distance to "West Solano" mining area, Solano Concrete.
2 Distance to "Phase B" mining area, Syar Industries.
3 Distance to "Schwarzgruber and Son."

Approximately half of the community groundwater systems operating in the United States do not treat their water. In general, groundwater is less susceptible to microbial contamination than surface water. However, it is estimated that 60-70 percent of groundwater sources have been contaminated with fecal viruses and bacteria (Macler, 1996a). The Surface Water Treatment Rule (SWTR), developed by the EPA and promulgated in 1989, addressed microbial contamination of drinking water from surface water sources. Contained within the SWTR is a procedure for determining whether a water supply intake (i.e. well) is located near enough to a surface water supply for the pumped water to be considered surface water. For example, water supplied from a well completed within gravels of an active channel of a river would likely be considered surface water. None of the municipal wells in the vicinity of the project are near enough to surface water supplies to be considered under the SWTR (To, 1996).

The EPA is in the process of developing a Groundwater Disinfection Rule that would attempt to address potential public health concerns regarding microbial contamination of groundwater. It is anticipated that the disinfection rule would employ a "treatment technique" rather than attempt to achieve a particular water quality threshold because practical methods to detect pathogens before they reach an end-user are not available (Macler, 1996a). It is estimated that the Groundwater Disinfection Rule may be promulgated in 1998 and would require all municipalities which rely on groundwater supplies to disinfect or demonstrate that the groundwater is "naturally disinfected."

Description of Local Environment

The definition of the planning area boundary is, in part, hydrologically based. The planning area includes all areas within the mapped Mineral Resource Zones between the towns of

Capay and Yolo, less the active channel[10] of Cache Creek (Figure 3.2-3), which is addressed by the Cache Creek Resource Management Plan (CCRMP). Since the Cache Creek channel is, by definition, outside the planning area, the hydrology of the Creek is not extensively discussed in this EIR. The EIR on the CCRMP includes a more detailed description of processes within the Cache Creek channel. The terraces adjacent to the Creek outside the 100-year floodplain, and portions of the Willow Slough Basin comprise the planning area and are discussed in this section.

Surface Water

In an undeveloped or agricultural setting, a significant amount of precipitation that falls on the ground infiltrates into the subsurface. When rainfall intensities exceed the infiltration capacity of surface soils, runoff flows over the ground surfaces toward established natural or constructed drainage channels. Storm water runoff is then conveyed away from the area in creeks and canals. In a developed setting much of the natural soils can be covered with impervious surfaces (i.e., roads, driveways, and roofs), reducing infiltration and increasing amounts and altering flow patterns of runoff. The existing conditions within the planning area include very limited impervious cover.

The planning area includes three general types of land uses; agriculture, rural residential, and aggregate mining. The primary land use is irrigated agriculture. During the spring and fall, drainage of agricultural tailwater directly into creeks or irrigation canals is common practice in the area (USACOE, 1994). Runoff (the amount of precipitation that is transported away by drainage) from the planning area is estimated at 2.5 inches per year (Rantz, 1974).

The planning area is partially located within the 100-year flood hazard zone (floodplains of Cache Creek and Willow Slough, Figure 4.4-7) as mapped by the U.S. Department of Housing and Urban Development, Federal Insurance Administration (USFIA, 1980),[11] indicating that portions of the area could be inundated during the 100-year storm event.[12] FEMA generates Flood Insurance Rate Maps (FIRMs) which depict flood hazard areas within studied communities for use as planning tools. In most environments, FIRMs represent the best available estimate of the limits of the 100-year flood.

Within the planning area, alterations to the Cache Creek channel resulting from in-stream mining and improvements to the levees along the creek have resulted in significant changes to the 100-year floodplain. The FIRMs are no longer accurate. As required by

[10]The active channel is defined as the area of 100-year flood inundation or existing channel banks, whichever is farther landward.

[11]FIA was a predecessor of the Federal Emergency Management Agency (FEMA).

[12]The "base flood" (or 100-year flood) is the flood having a one percent chance of being equaled or exceeded in any given year. In any single 100-year period, several "base flood" events (or none) *could* occur. But over the long term, the frequency of the "base flood" is expected to *average* once in 100 years.

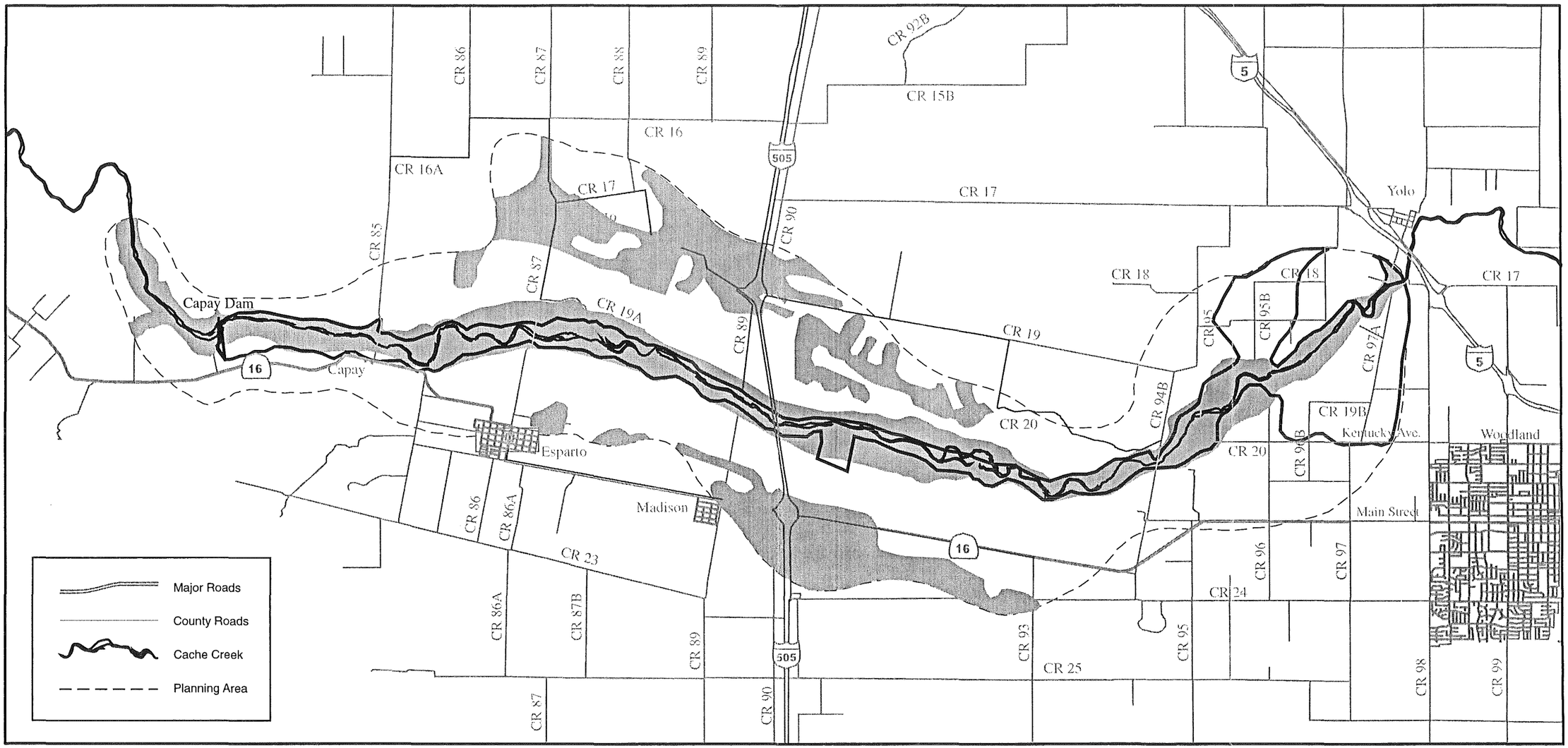


Figure 4.4-7 Cache Creek Flood Plain

SOURCE: FIA, 1980; U.S. ARMY CORPS OF ENGINEERS, 1994

County Resolution, the mining facilities which operate along Cache Creek must maintain 100-year flood protection for plant facilities and off-channel mining areas. Therefore, the active off-channel mining operations have performed hydraulic analyses to verify 100-year protection. These more recent analyses, which take into account channel modifications and levee improvements, indicate different floodplain limits than the 1980 FIRMs.

FEMA is in the process of updating the FIRMs for the planning area, but may not release the new maps for several years (Bencomo, 1995). Difficulty arises when the FIRMs are not accurate and development or erosion-control measures are proposed within the floodplain. Under the County Flood Ordinance, the County is bound to enforce permitting and development restrictions within the FEMA designated floodplain, even if the floodplain designation is incorrect. When significant modifications to a floodplain occur, a Letter of Map Revision to FEMA is required requesting an update to existing FIRMs.

Groundwater

The groundwater levels and flow direction in the planning area are generally consistent with the regional easterly to southeasterly gradient. However, significant perturbations in the flow direction can occur in the vicinity of active pumping wells (industrial, municipal, and agricultural).The recharge/discharge relationship between Cache Creek and the aquifer varies by location, and changes with seasonal fluctuations in the elevation of the groundwater table. Portions of the creek that are actively being recharged by the aquifer are termed "gaining" reaches (Figure 4.4-7). Those portions of the creek that recharge the aquifer are termed "losing" reaches (Figure 4.4-7). Review of various past investigations (David Keith Todd, 1995) indicates that, during the dry season (low groundwater), most of the Creek is losing water (with the exception of the reach just upgradient of the Plainfield Ridge). During periods of high groundwater,[13] part or all of the reach between the Esparto Bridge and the Plainfield Ridge may become a gaining reach.

When the water table in the banks of Cache Creek is higher than the thalweg[14] in the active channel groundwater flows into the channel (and would be considered a gaining reach). This phenomena has been termed the "chipped tea cup" theory (Woodward-Clyde, 1976) because it was thought that the elevation of the thalweg largely controlled the amount of groundwater that could be stored in the aquifer just as a full tea cup will drain to the level of a chip in its rim. Subsequent studies have concluded that the apparent loss of aquifer storage observed in the 1950s through the mid-1970s was the combined result of drought and extensive groundwater pumping (David Keith Todd, 1995). By 1983, the groundwater levels in the basin had essentially recovered to pre-1950s levels, confirming that significant aquifer storage capacity had not been lost.

[13]In the late winter and spring, the water table is elevated due to infiltrating rainfall and lack of pumping for agriculture.

[14]The line joining the deepest points of a creek channel.

Regulatory Framework

The following section lists the regulations, plans, and policies that would be applicable to the project. The impact section discusses the conformance of the project with these plans, policies, and regulations, when applicable.

Clean Water Act

Section 402(p) of the Clean Water Act (CWA) and implementing regulations require control of storm water discharges as part of the National Pollutant Discharge Elimination System (NPDES) program. Discharges of storm water from certain industrial activities and large municipalities require a permit under the NPDES program.

Implementation of the NPDES program has been delegated to the State of California. The State Water Resources Control Board (SWRCB) and Regional Water Quality Control Boards (RWQCBs) are the implementing agencies in the State. The SWRCB adopted a General NPDES Permit for Discharges of Storm Water Associated with Industrial Activities (General Permit) in 1991. Sand and gravel, crushed rock, asphaltic concrete, and concrete operations are included in the list of industries required to apply for inclusion under the General Permit.

SMARA and Related Regulations

The California Surface Mining and Reclamation Act (SMARA) of 1975 requires that the State adopt regulations which establish State policy for reclamation of mined land, including measures to be employed by lead agencies in specifying water quality, watershed, and flood control protection (Sec. 2756). In addition, SMARA requires adoption of regulations specifying minimum verifiable state-wide reclamation standards for drainage and stream protection (Sec. 2773).

The State reclamation regulations contain several minimum acceptable practices and performance standards for drainage diversion structures, waterways, and erosion control (CCR Title 14 Section 3706) that may pertain to mining within the planning area, including:

Sec. 3503(b)(1)	Settling ponds or basins shall be constructed to prevent sedimentation of streams at operations where they will provide a significant benefit to water quality.
Sec. 3503(b)(2)	Operations shall be conducted to substantially prevent siltation of groundwater recharge areas.
Sec. 3706(b)	The quality of water, recharge potential, and storage capacity of groundwater aquifers which are the source of water for domestic, agricultural, or other uses dependent on the water, shall not be diminished, except as allowed in the approved reclamation plan.
Sec. 3706(c)	Erosion and sedimentation shall be controlled during all phases of construction, operation, reclamation, and closure of a surface mining operation to minimize siltation of lakes and

watercourses, as required by the Regional Water Quality Control Board or the State Water Resources Control Board.

Sec. 3706(d) Surface runoff and drainage from surface mining activities shall be controlled by berms, silt fences, sediment ponds, revegetation, hay bales, or other erosion control measures, to ensure that the surrounding land and water resources are protected from erosion, gullying, sedimentation, and contamination. Erosion control methods shall be designed to handle runoff from not less than the 20 year/1 hour intensity storm event.

Sec. 3707(d) Use of fertilizers or other soil amendments shall not cause contamination of surface or groundwater.

State Reclamation Board Policies

The Reclamation Board (Board), a division of the California Department of Water Resources, is authorized under the State Water Code. It is the policy of The Reclamation Board to allow local control over the extraction of sand and gravel from floodways, so long as the Board's responsibilities in the area of floodway preservation are not jeopardized or compromised.

When local agencies act as a lead agency, the Board will act as a responsible agency in matters of floodway protection -- with emphasis on the early consultation process. The Board will continue to require applications for encroachment in accordance with its adopted procedures and standards.

Specific policies that relate to off-channel excavations include:

1. Unless a greater distance is stipulated by the levee maintaining agency, material shall not be excavated from within 100 feet of (a) the toe of any levee, or (b) an adjacent property boundary line.

2. The depth of the excavation shall be no lower than specified in the approval of Plans. For information on permitted depth for excavations adjacent to the landslide of a levee, contact Department of Water Resources, Central District, P.O. Box 160088, Sacramento, California 95816; Attention: Application Review Unit, or telephone (916) 445-3942.

3. The excavation shall be performed in either of the two following manners:

    a. Progressive Borrow. Material shall be excavated in strips parallel to the levee, progressing across the approved excavation area, starting from the edge of the area furthest from the levee. The bottom of the excavation shall be a sloping plane to a tolerance of one foot to provide for drainage away from the levee.

    b. Uniform Borrow. Material shall be excavated in strips perpendicular to the levee, progressing entirely across the approved excavation area. The bottom of the excavation shall be a sloping plane to a tolerance of one foot to provide for drainage away from the levee.

Regional Water Quality Control Board Basin Plan

The Basin Plan is a regulatory reference for meeting the State and Federal requirements for water quality control in the Central Valley Region. The preparation of basin plans is

supported by the Federal Clean Water Act and required by the State's Porter-Cologne Water Quality Control Act. The Central Valley Regional Water Quality Control Board, which is responsible for implementation of the Basin Plan in Yolo County to protect beneficial uses, evaluates discharges that may impact water quality and, if appropriate, issues numerical standards and monitoring requirements for the discharge.

Yolo County General Plan

The following policies related to water resources are included in the Safety (S) and Conservation (CON) elements of the 1980 Yolo County General Plan:

S 5 Yolo County shall regulate, educate, and provide guidelines and standards for avoiding and mitigating the effects of flooding.

S 6 Yolo County shall adopt and apply standards and ordinances for control of development relating to potential flooding and local drainage and require mitigation of identified impacts. The County may, at a future time, establish a policy for a countywide drainage plan, but does not require such a plan at this time.

S 7 Yolo County shall require development of all kinds, in areas of "acceptable low risk flooding," to be flood proof.[15]

S 9 Yolo County shall use the Federal Flood Insurance Program maps and standards in regulating and advising on development proposals in flood plains and these maps are a part of this General Plan by reference.

CON 16 Yolo County shall relate new development to water availability and water pollution avoidance or mitigation.

CON 17 Yolo County shall encourage waste water reclamation and reuse.

CON 20 Groundwater shall be protected from overdraft and shall not be encroached upon by construction. Impervious surfaces should be reduced or replaced and groundwater recharge enhanced. The use of non-impervious surfaces is encouraged.

CON 24 Yolo County shall continue to evaluate water resources and to maintain the Yolo County Water Resources Plan.

CON 35 Yolo County shall adopt a Cache Creek Management Program for the carefully managed use and conservation of Cache Creek and its sand and gravel resource, its riverside environment, its relationship to ground and surface water characteristics, and its value as a fishery and recreation resource.

CON 37 Yolo County shall cooperate with the Reclamation Districts to develop an adequate surface drainage plan.

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[15]Flood proof: Structures and facilities designed and constructed to accept the maximum 100-year flood circumstance without significant hazard to the public, to occupants, or to users, nor to sustain significant damage to vital systems that would lead to such hazards.

CON 40 Yolo County shall prohibit surface water courses or groundwater recharge areas to be used for dumping sites for toxic materials or secondarily treated waste water and shall support agricultural practices to minimize chemical and nutrient runoff, erosion, and siltation, and support the use of check dams.

Flood Damage Prevention Ordinance (Flood Ordinance)

The purpose of the Yolo County Flood Ordinance is to "...promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas (Sec. 8-3.103)."

The Flood Ordinance includes the following relevant objectives (Sec. 8-3.104):

(a) Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;

(b) Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;

(c) Controlling the alteration of natural floodplain, stream channels, and natural protective barriers, which help accommodate or channel flood waters;

(d) Controlling filling, grading, dredging, and other development which may increase flood damage, and

(e) Preventing or regulating the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards in other areas.

The Flood Ordinance requires acquisition of a Development Permit (Sec. 8.3-401) before construction or development begins in any area of special flood hazard.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

The project would have a significant effect on hydrology and water quality if it would result in:

- Substantial changes in absorption rates, drainage patterns, or rate and amount of surface runoff.
- Exposure of people or property to water-related hazards such as flooding (100-year or more frequent flood frequency may be appropriate threshold).
- Discharge into surface water or other alteration of surface water quality (e.g., temperature, dissolved oxygen, or turbidity) in excess of applicable waste discharge requirements.
- Substantial changes in the amount of surface water in any water body.

- Substantial changes in currents, or the course or direction of water movements.

- Substantial changes in the quantity of groundwater either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations or through substantial loss of groundwater recharge capability.

- Altered direction or rate of flow of groundwater.

- Impacts to groundwater quality.

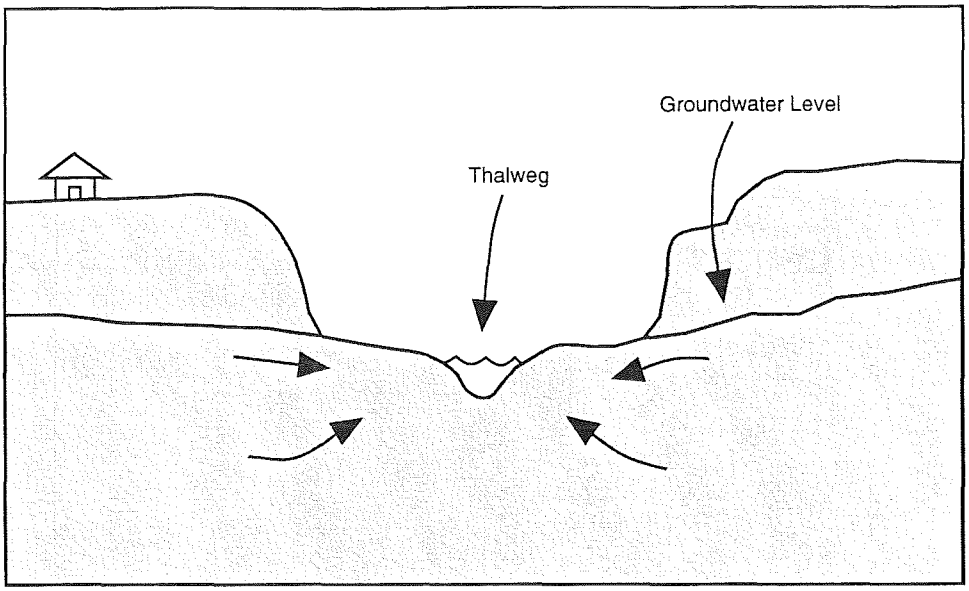
- Substantial reduction in the amount of groundwater otherwise available for public water supplies.

Impact 4.4-1
Potential Impacts to Groundwater Levels, Rate of Flow, and Direction of Flow

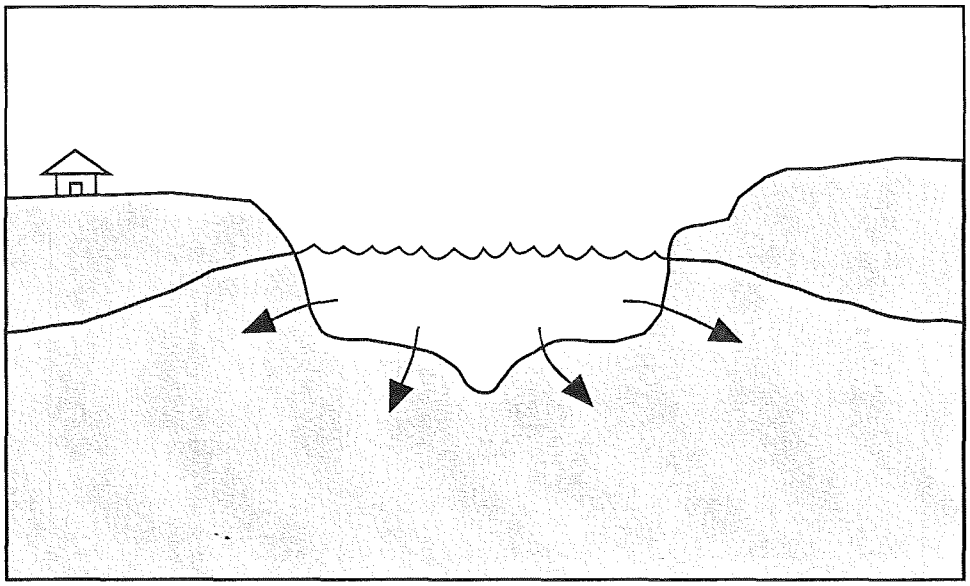
Off-channel extraction of sand and gravel deposits may include excavation below the groundwater table, creating wet pit lakes. Figure 4.4-8 depicts a typical cross-section through Cache Creek and a wet pit lake. Fine sediments generated during aggregate processing at the plants are frequently discharged into previously completed wet pit excavations. Overburden (excluding topsoil), excavated prior to mining to expose the marketable aggregate, is also frequently used to backfill the wet pits. The backfilling of wet pits with fine sediments introduces zones of reduced permeability to the aquifer (Figure 4.4-9). Groundwater continues to flow through the fine sediments, but at a somewhat reduced rate. This results in diversion of groundwater flow around the low permeability area.

Introduction of relatively low permeability zones influences groundwater levels in the vicinity of the backfilled pit. Upgradient of the pit, the low permeability zone acts as an inhibitor to flows, raising groundwater levels. Downgradient of the backfilled pit, groundwater levels are lowered because groundwater flows away from the low permeability zone in the native, coarser-grained materials faster than it can be replaced by flow through the low permeability zone. However, due to the high permeability of the surrounding native sand and gravel, groundwater levels equilibrate at a relatively short distance away from the low permeability zone (David Keith Todd, 1995).

Groundwater levels within the lower Cache Creek basin are primarily controlled by seasonal fluctuation in recharge, groundwater pumping (agricultural, municipal, and domestic), and hydrogeologic setting. On a regional scale, backfilled pits would represent a relatively minor aspect of the hydrogeologic setting. The hydrogeologic setting is essentially fixed (with the exception of creation of new backfilled pits). Seasonal fluctuations and long-term rising or falling trends in groundwater levels are almost entirely controlled by recharge and pumping. Recharge and pumping have such a large and time-dependent effect on groundwater levels, that it would be extremely difficult to distinguish between these effects and the potential localized effects of the backfilled pits.

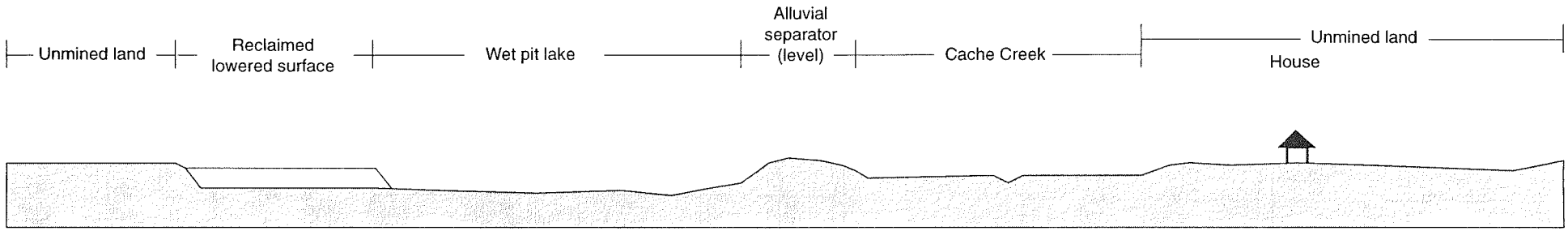


A gaining reach. Water flows from the groundwater system to Cache Creek.

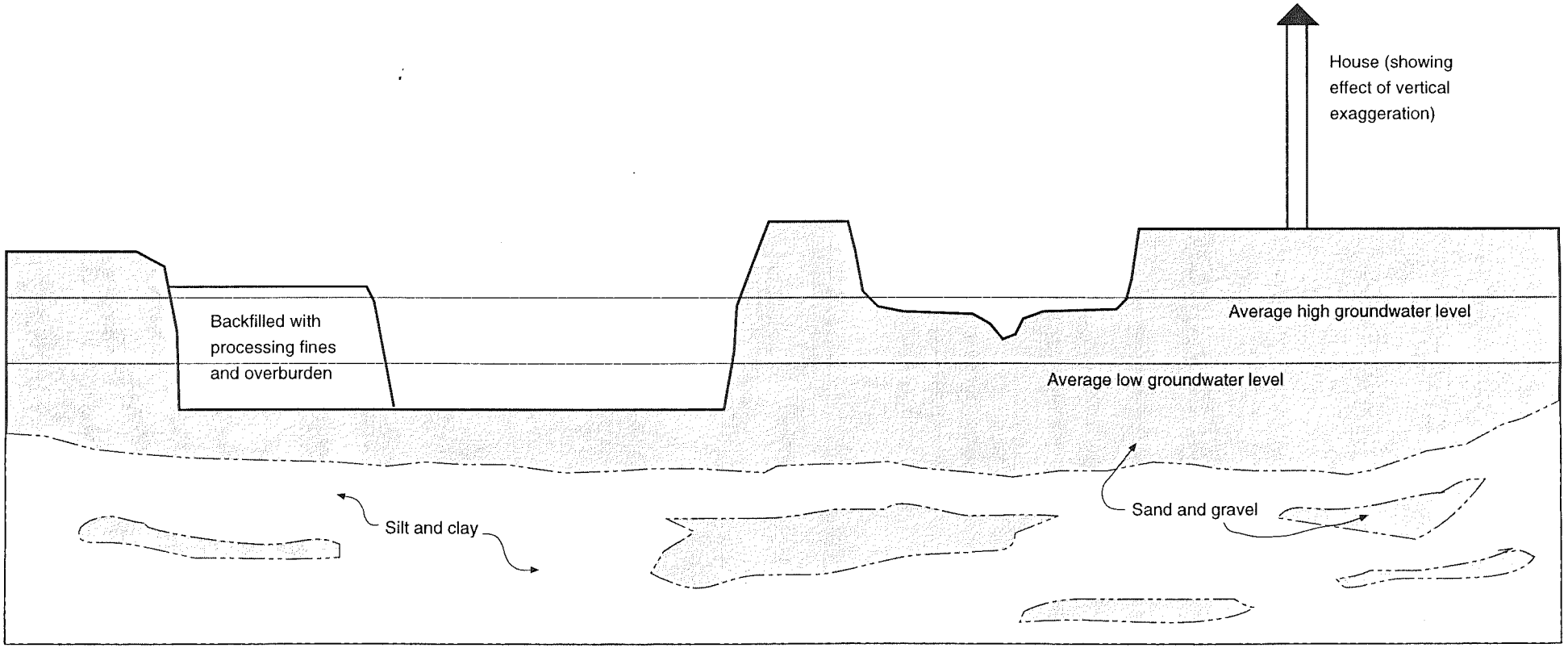


A losing reach. Surface water flow in Cache Creek recharges the banks and surrounding aquifer.

Figure 4.4-8 Schematic Cross-Section, Hydrology of Gaining and Losing Reaches



Scale: 1" = 800 feet (no vertical exaggeration)



Scale: Horizontal 1" = 800 feet (no vertical exaggeration)
Vertical 1"= 80 feet
(10x vertical exaggeration)

Figure 4.4-9 Typical Hydrogeologic Cross-Sections (With and Without Vertical Exaggeration)

Mathematical modeling has been conducted in an attempt to quantify the impacts to groundwater levels associated with backfilled pits (David Keith Todd, 1995). Modeling provides a framework to evaluate potential impacts under various scenarios. Modeling also allows for the isolation of recharge and pumping influences to determine what the actual effect of the backfilled pits on water levels might be. A 135-acre pit with a depth of 80 feet below the ground surface was assumed in the modeling by David Keith Todd (1995). The simulation assumed the pit was backfilled with low permeability materials. The result of the simulation indicated a maximum groundwater level decline of seven feet immediately downgradient of the pit, and a decline of one foot at a distance of 570 feet from the backfilled pit. Multiple mathematical simulations (David Keith Todd, 1995) indicated that the following are important factors when considering location and design of the backfilled pits:

- Extent of the sand and gravel aquifer. Impacts of backfilled pit of a given size will be more pronounced on a relatively thin or limited aquifer section (e.g., near the margins of the basin) than a thick, centrally located section.

- Geometry, permeability and orientation of backfill in relation to the direction of groundwater flow. The impact of backfill is generally proportional to its size. A backfill with its largest face oriented against groundwater flow will have a larger impact than one oriented within the groundwater flow direction. A less permeable backfill will have a greater impact than a more permeable one.

- Seasonal fluctuations in water levels. Impacts of backfilling are less distinguishable and significant in areas of widely fluctuating water levels.

- Location and depth of operating wells. Impacts of backfilling are generally inversely proportional to the distance from an affected well and the well depth.

Backfilling of a series of wet pits in close proximity to each other could increase the potential impacts to groundwater levels and flow. Depending on siting and design, a chain of backfilled pits could cause spatially extensive lowering of groundwater levels, adversely impacting groundwater levels in nearby wells or water levels in Cache Creek. The restriction of groundwater flow by low permeability zones may raise the water table in the vicinity of Cache Creek, upgradient from the filled pits, resulting in emergence of groundwater as surface water flow. The surface water flow may leave the basin and represent a loss in aquifer storage.

Draft OCMP and Implementing Ordinances

Under the OCMP, off-channel mining would be permitted and in-stream mining restricted to channel maintenance. Implementing the OCMP would result in the creation of additional backfilled wet pits in the planning area. Five off-channel long-term mining applications have been submitted to the County for review under the OCMP. Of the 2,211 acres proposed for mining in these applications, roughly 84 percent would be wet pit mines and

the remainder would be dry pit mines. Many of the proposed wet pit mines are a contiguous series of excavations that would create, in essence, single reclaimed backfilled pits up to a mile in length.

The OCMP contains policies designed to ensure that groundwater level and flow impacts relating to backfilled pits are minimized, including:

Obj. 3.3-3: Ensure that off-channel surface mines are operated such that surface and groundwater supplies are not adversely affected by erosion, lowering of the water table, and/or contamination.

This Objective would encourage reduction in potential impacts and minimize adverse impacts to hydrology or water quality and is supported by Action 3.4-5 and Performance Standards 3.5-1 and 3.5-2.

Action 3.4-5: Require that surface mining operations demonstrate that proposed off-channel excavations extending below the groundwater level will not adversely affect the producing capacity or water quality of local active wells.

This Action would minimize adverse impacts to hydrology and/or water quality. This Action is supported by Performance Standards 3.5-1 through 3.5-6, 3.5-10, and 3.5-11. The Performance Standards relating specifically to groundwater levels and flow (the subject of this impact) are discussed below (the Performance Standards relating to groundwater quality are discussed in Impact 4.4-2 of this EIR).

PS. 3.5-1: The area of backfilled off-channel excavations extending below the groundwater level should be minimized in order to reduce changes to groundwater flow. Backfilled pits should be oriented with regard to the direction of groundwater flow so in order to prevent localized obstructions. If a backfilled off-channel excavation were proposed to penetrate either fifty (50) feet or one-half (½) into the saturated thickness of the shallow aquifer then prior to the commencement of excavation below the water table, the applicant should demonstrate in a manner consistent with the Technical Studies that the pit design would not adversely affect active off-site wells within one-thousand (1,000) feet of the proposed pit boundary. If the application included a series of backfilled pits, then the applicant should also demonstrate that the cumulative effects of the multiple backfilled pits will not adversely affect groundwater flow, if there were any active off-site wells within one-thousand (1,000) feet of the pit boundaries.

The performance standard lacks specificity regarding the mathematical model (such as MODFLOW) to be used to simulate altered flow conditions, the criteria for determining the level of significance of impacts, and how the modeling would be evaluated and reviewed.

PS. 3.5-2: Under no circumstances shall any operator of an off-channel excavation use dewatering as a part of the surface mining operation.

This Performance Standard would minimize adverse impacts to hydrology and/or water quality. Dewatering of pits could cause regional reduction in groundwater levels and failure of nearby domestic and/or municipal wells.

Alternative 1a - No Project (Existing Conditions)

Under this alternative, mining would continue in a manner similar to current practices. The majority of aggregate within the planning area is currently extracted from within the Cache Creek channel. However, several off-channel mining operations are currently permitted. This alternative could result in localized impacts to groundwater levels and flow, but those impacts were evaluated and mitigation measures provided for in previous approvals.

Alternative 1b - No Project (Existing Permits and Regulatory Condition)

The impacts for this alternative would be similar to those of Alternative 1a.

Alternative 2 - No Mining (Alternative Site)

Under this alternative mining would be discontinued within the planning area and no new off-channel wet pits would be created. No additional backfilled wet pits would be created, and therefore additional impacts to groundwater levels and flow would not be generated.

Alternative 3 - Plant Operation Only (Importation)

The impacts for this alternative would be similar to those of Alternative 2.

Alternative 4 - Shallow Mining (Alternative Method/Reclamation)

Under this alternative no new backfilled off-channel wet pits would be created, and therefore additional impacts to groundwater levels and flow would not be generated.

Alternative 5a - Decreased Mining (Restricted Allocation)

Under this alternative, off-channel mining would be limited to no more than 2.3 million tons annually over fifty years. In-stream mining would cease. The result of implementing this policy would be an increased number of backfilled wet pits in the planning area, potentially impacting groundwater levels and flow.

Alternative 5b - Decreased Mining (Shorter Mining Period)

The impacts for this alternative would be similar to those of the OCMP.

Alternative 6 - Agricultural Reclamation (with Mining Operations as Proposed)

Under this alternative, permanent wet pit lakes would not be permitted; virtually all mined lands would be reclaimed to agriculture. It is likely that under this requirement, numerous temporary wet pits would be created and then reclaimed by backfilling, potentially impacting groundwater levels and flow. This alternative would have the greatest potential

for impacting groundwater levels and flow since it has the potential for the most backfilled pits.

Mitigation Measure 4.4-1a (OCMP, A-5a, A-5b, A-6)

Performance Standard 3.5-1 included in the OCMP should be as follows to reduce the potential impacts associated with backfilled pits.

Performance Standard 3.5-1: The area of backfilled off-channel excavations extending below the groundwater table shall be minimized to reduce changes to groundwater levels and flow. Backfilled pits shall be oriented with regards to the direction of groundwater flow so in order to prevent localized obstructions. If a backfilled off-channel excavation were proposed to penetrate either fifty (50) feet or one-half (½) into the saturated thickness of the shallow aquifer, then at least six months prior to the commencement of excavation below ~~the water table~~ average high groundwater level the applicant shall demonstrate in a manner consistent with the Technical Studies, that the pit design would not adversely affect active off-site wells within one-thousand (1,000) feet of the proposed pit boundary. If the application included a series of backfilled pits, then the applicant shall also demonstrate that the cumulative effects of the multiple backfilled pits will not adversely affect groundwater flow, if there were any active off-site wells within one-thousand (1,000) feet of the pit boundaries.

The applicant shall demonstrate, using MODFLOW,[16] that the proposed pit design will not adversely impact active off-site wells within 1,000 feet of the proposed pit boundary. An effect shall be considered adverse if the reduction in simulated groundwater levels exceeded two feet at any well located within 1,000 feet of the pit boundary or resulted in well failure. Average, historic low groundwater levels, which represent the condition of maximum threat to water levels in the subject well, shall be used for this simulation. If an adverse impact were identified by the MODFLOW simulation, the mining and reclamation plan will be modified or the applicant shall submit a written agreement that the well owner has agreed to relocate or redesign the well (at no expense to the County).

In addition, the following performance standards measures should be added to the OCMP:

3.5-16 *Site-specific aquifer testing shall be conducted, if needed, to determine aquifer properties for the required modeling.*

3.5-17 *A well survey shall be conducted and all wells within 1,000 feet of the limits of mining plotted on a scaled map. Each property owner owning a parcel(s) within 1,000 feet of the proposed limits of mining shall be contacted and queried about wells that may be located near the mining area.*

Implementation of this mitigation would reduce this impact to a less-than-significant level for the OCMP and Alternatives 5a, 5b, and 6.

[16]MODFLOW is a three-dimensional finite difference model used to simulate groundwater flow. A three-dimensional model would be necessary since aquifer permeability would vary with depth after reclamation.

Mitigation Measure 4.4-1b (A-1a, A-1b, A-2, A-3, A-4)

None required.

Existing mining projects, evaluated under previous CEQA review, would continue under Alternatives 1a and 1b. Alternatives 2, 3, and 4 would generate no additional impact associated with groundwater levels and flow since no new backfilled pits would be permitted, and therefore mitigation would not be required.

Impact 4.4-2
Potential Degradation of Water Quality During Aggregate Mining and Reclamation

In-channel and/or off-channel aggregate extraction within the planning area may result in mining below the water table. Mining below the water table results in the creation of wet pits, which tend to be more susceptible to water quality degradation than a groundwater system because the groundwater would be exposed at the surface. The soil and fine-grained deposits that cover an aquifer provide some protection to groundwater quality from chemical inputs. A wet pit, which exposes groundwater at the surface, has no such buffer to chemical inputs.

Potential sources of water quality degradation associated with wet pits include: chemical release from mining equipment, agricultural runoff into the pits, eutrophication,[17] flood water mixing, illegal dumping/sabotage, and bioaccumulation of mercury in flora and fauna within the pits. Chemical releases from mining equipment and agricultural runoff into the pits are considered mining and reclamation period impacts, and are considered below. Eutrophication, flood water mixing, and illegal dumping/sabotage are discussed in Impact 4.3-3. Bioaccumulation of mercury is discussed in Impact 4.4-3.

Chemical Releases from Equipment

Operation of mining equipment within and near wet pits exposes surface and groundwater to water quality impacts from potential chemical spills (fuels, lubricants, and hydraulic oil) from mining and reclamation equipment. Refueling and maintenance of the equipment would be required on a regular basis.

The regulatory framework and required actions regarding the storage and emergency response to chemical releases is discussed in the Hazards Section of this EIR. The potential long-term impacts to groundwater quality resulting from chemical releases are discussed in this section.

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[17]Eutrophication is defined as the loading of inorganic and organic dissolved and particulate matter to lakes and reservoirs at rates sufficient to increase the potential for high biological production. For further discussion, see Impact 4.4-3.

The potential impacts associated with a petroleum fuel hydrocarbon release to an open wet pit lake were simulated using mathematical modeling techniques (Luhdorff and Scalmanini, et al., 1996). Two models (MODFLOW and MT3D) were used to evaluate the fate of five gallons of gasoline discharged directly to the wet pit lake. The lake used in the simulation had an 80-acre surface area and a depth of 60 feet. After 5.5 years, the leading edge of the contaminant plume had migrated 325 feet downgradient of the wet pit. These modeling results are in general agreement with the results of a recent statewide evaluation of the mobility of fuel hydrocarbons in the subsurface conducted by the Lawrence Livermore National Laboratory (LLNL, 1995). The LLNL report also indicated that fuel hydrocarbons have limited impact on human health, the environment, and California's groundwater resources.

Agricultural Tailwater and Runoff

The dominant land use in the planning area is agriculture, and therefore, in most cases, the wet pits would be located near or adjacent to agricultural crops. Irrigation tailwater and storm water runoff tends to drain from agricultural fields toward low-lying areas. The wet pits would represent large low-lying areas. Runoff and tailwater from agricultural fields may contain residual pesticides, organic material, and sediment. If allowed to drain into the wet pits the tailwater could adversely impact groundwater quality.

Draft OCMP and Implementing Ordinances

Under the OCMP, off-channel mining would be encouraged over in-stream mining. This would increase the number of wet pits in the planning area. Five off-channel long-term mining applications have been submitted to the County for review under the OCMP. Of the 2,211 acres proposed for mining in these applications, roughly 84 percent would be wet pit mines and the remainder would be dry pit mines. This would result in long-term exposure of wet pits at numerous locations. As part of the mining and reclamation processes, excavators, loaders, scrapers, dragline cranes, motorized boats, and haul trucks would be operated for tens of thousands of hours in and around mining areas where groundwater is likely to be exposed in wet pit lakes. It is almost a certainty that a release of fuel, lubricants, and/or hydraulic oil will occur at some time during mining and reclamation activities.

The OCMP contains policies designed to address potential impacts to groundwater quality associated with wet pits, including:

Goal 3.2-2: Maintain the quality of surface and groundwater so that nearby agricultural productivity and available drinking water supplies are not diminished.

Obj. 3.3-3: Ensure that off-channel surface mines are operated such that surface and groundwater supplies are not adversely affected by erosion, lowering of the water table, and/or contamination.

Action 3.4-3: Include a groundwater monitoring program as a condition of approval for any surface mining operation that proposes off-channel excavations that extend below the groundwater level. The monitoring program shall require regular groundwater level data, as well as annual test for water quality based on a developed set of standards.

These policies would minimize adverse impacts to hydrology and/or water quality.

Action 3.4-4: Designate staff to begin compiling and coordinating the monitoring information generated by the off-channel mining operations, in order to form the foundation for preparing an ongoing groundwater data base covering the entire County. The data base should be expanded to include other relevant sources of information, so that it can be used as reference material for the Water Resources Agency and other regional water planning efforts.

The Water Resources Agency (a local consortium of water interest groups) is not the only agency that may wish to be involved in compiling and coordinating monitoring data. Other agencies may have jurisdiction and/or legitimate stake in the implementation of the monitoring program.

Action 3.4-5: Require that surface mining operations demonstrate that proposed off-channel excavations extending below the groundwater level will not adversely affect the producing capacity or water quality of local active wells.

This Action would minimize adverse impacts to hydrology and/or water quality. This Action is supported by Performance Standards 3.5-4 and 3.5-6.

PS. 3.5-3: Surface water shall be prevented from entering mined areas, through perimeter berms or ditches and grading. Appropriate erosion control measures shall be incorporated into all surface drainage systems.

This Performance Standard is not adequately specific to protect water quality. During intense storms, when rainfall rates greatly exceed infiltration rates, runoff will occur. The runoff must be drained to nearby creeks or conveyances or collected in low-lying areas or detention basins. In the case of poor quality runoff (runoff that may contain residual pesticides, nutrients, and sediment), protection of surface water and groundwater quality and protection from flooding may be contradictory goals.

Berms and ditches may be inadequate long-term mitigation to prevent runoff into the pits. In the long-term, berms may be broken down by biological activity and erosion and ditches may become filled with sediment and debris. A long-term inspection and maintenance program for the berms and ditches may not be practical.

PS. 3.5-4: All surface mining operations that propose off-channel excavations extending below the groundwater level shall develop and maintain a groundwater monitoring program. At a minimum, the program shall consist of three (3) monitoring wells, one upgradient of the wet pit and two downgradient. Monitoring wells shall be installed at least six (6) months prior to excavation below the groundwater level. The water level shall be recorded and a water quality test performed for all monitoring wells and submitted to the County prior to the commencement of wet pit mining. The test results shall provide baseline data for future comparison and analysis.

Once wet pit mining has commenced, groundwater levels shall be monitored quarterly, while groundwater quality shall be monitored annually. The analysis of groundwater quality shall include, but may not be limited to, the following: mineral constituents, nitrate, pH, electrical conductivity, turbidity, and total coliform. A report to the County shall be submitted annually regarding the results of the groundwater monitoring program.

This Performance Standard may not provide sufficient monitoring requirements, does not specify the required duration of monitoring after the completion of mining, or provide details on monitoring requirements for a series of wet pits. The turbidity analysis required under Performance Standard 3.5-4 should be eliminated. The level of turbidity of groundwater sample from a monitoring well is more a function of well design and sampling methods than actual turbidity of groundwater in the aquifer.

PS. 3.5-5: At least one toilet shall be provided for each off-channel mining operation. Chemical toilets shall be properly maintained and serviced regularly. Permanent toilets shall be properly engineered and the design approved by the Yolo County Building Official prior to installation. All on-site water storage facilities shall be labeled "potable" or "non-potable."

This Performance Standard would minimize adverse impacts to hydrology and/or water quality. This Performance Standard would help to ensure that septage is not introduced to wet pits.

PS. 3.5-6: If any off-channel excavation proposes to extend below the groundwater level, then six months prior to the commencement of excavation below the water table, the applicant shall demonstrate in a manner consistent with the Technical Studies that the pit is sufficiently set back from any active drinking water wells within one-thousand (1,000) feet of the proposed pit boundaries, in order to ensure that potential groundwater contamination is prevented.

This Performance Standard requires evaluation of <u>all</u> wells within 1,000 feet of proposed pit boundaries. The technical studies differentiate setbacks between domestic wells (500 feet) and municipal wells (1,000 feet). The performance standard is appropriately conservative to protect drinking water quality. However, it does not provide sufficient detail to allow practical implementation.

PS. 3.5-8: No wastewater shall be directly discharged to Cache Creek. Sediment fines generated by aggregate processing shall either be used for agricultural soil enhancement or shall be placed in settling ponds, designed and operated in accordance with all applicable regulations, and used for backfill materials in off-channel excavations. Agricultural tailwater shall be diverted to catchment basins prior to its release to the creek.

This Performance Standard addresses discharges associated with aggregate processing and agricultural runoff. Insufficient detail regarding diversion of agricultural tailwater is provided. Management of agricultural runoff is more thoroughly discussed under the revised Performance Standard 3.5-3 in the mitigation section.

Alternative 1a - No Project (Existing Conditions)

Under this alternative, mining would continue at existing sites under current practices. The majority of aggregate within the planning area is currently extracted from within the Cache Creek channel. However, several off-channel mining operations are currently permitted. The potential for impacts to groundwater quality for the existing permits was mitigated under previous CEQA analysis.

Alternative 1b - No Project (Existing Permits and Regulatory Condition)

The impacts from this alternative are similar to those of Alternative 1a.

Alternative 2 - No Mining (Alternative Site)

Under this alternative mining would be discontinued within the planning area and no new off-channel wet pits would be created. The potential for chemical releases from mining equipment and discharge of agricultural tailwater to new wet pits would be eliminated.

Alternative 3 - Plant Operation Only (Importation)

Under this alternative mining would be discontinued within the planning area and no new off-channel wet pits would be created. The potential for chemical releases from mining equipment and discharge of agricultural tailwater to new wet pits would be eliminated. Operation at the processing plants could continue and chemical releases could occur at those locations. However, processing plants are generally located at some distance from open water bodies and established surface water courses, and therefore would not pose a significant threat to regional groundwater quality.

Alternative 4 - Shallow Mining (Alternative Method/Reclamation)

Under this alternative no new off-channel wet pits would be created, and therefore potential impacts to groundwater quality associated with chemical releases to wet pits would be eliminated. However, under this alternative, much of the unsaturated zone would be removed during excavation, reducing the effectiveness of the soil buffer in mitigating chemical releases to the surface.

Alternative 5a - Decreased Mining (Restricted Allocation)

Under this alternative, off-channel mining would be encouraged over in-stream mining. The result of implementing this policy would be an increased number of wet pits in the planning area, potentially impacting groundwater quality.

Alternative 5b - Decreased Mining (Shorter Mining Period)

The impacts for this alternative would be similar to those of the OCMP Alternative.

Alternative 6 - Agricultural Reclamation (with Mining Operations as Proposed)

Under this alternative, permanent wet pit lakes would not exceed 20 percent of the total reclaimed areas; virtually all mined lands (80 percent) would be reclaimed to agriculture. However, under this alternative, numerous temporary wet pits would be created during mining and backfilled during the reclamation period. Water quality impacts could occur during the mining and reclamation period.

Mitigation Measure 4.4-2a (OCMP, A-5a, A-5b, A-6)

Mitigation of potential water quality impacts would be addressed as described in the flowchart presented as Figure 4.4-10. The OCMP and implementing ordinances should be modified as described below.

Pollution Prevention

Performance Standard 3.5-6 of the OCMP and the associated ordinance should be modified as follows:

If any off-channel excavation proposes to extend below the level of seasonal high groundwater ~~level~~, then six months prior to the commencement of excavation below the ~~water table~~ average high groundwater level the applicant shall ~~demonstrate in a manner consistent with the Technical Studies that the pit is sufficiently set back from any active drinking water wells within one-thousand (1,000) feet of the proposed pit boundaries in order to ensure that potential groundwater contamination is prevented~~. identify and locate all off-site wells within 1,000 feet of the proposed mining boundary. If active wells are identified, well characteristics (pumping rate, depth, and locations of screens) shall be determined. If wells are not located within 1,000 feet, the pre-mining impact evaluation will be considered complete.

If mining is proposed within 1,000 feet of a municipal water supply or within 500 feet of a domestic water supply well, a capture zone analysis shall be conducted using the U.S. Environmental Protection Agency model WHPA. The simulation shall assume 30 days of continuous pumping of the water supply well (at its maximum probable yield) under analysis. A mining setback shall be established so that the capture zone and the pit do not coincide. Alternatively, the applicant shall submit a written agreement that the well owner has agreed to relocate or redesign the well (at no expense to the County). The analysis shall be prepared and signed by a Registered Professional Engineer or Certified Hydrogeologist and submitted to the County for review and shall be submitted to, and approved by, the County at least six months prior to commencement of excavation below the seasonal high groundwater level.

Any new drinking water wells proposed for installation within 1,000 feet of a proposed wet pit mining area shall be subject to review by the Yolo County Environmental Health Department. The County shall determine, based on site-specific hydrogeology and available water quality data, whether to approve the proposed well installation.

The County may retain appropriate staff or contract consultant to provide third party critical review of all hydrogeologic reports related to mining applications.

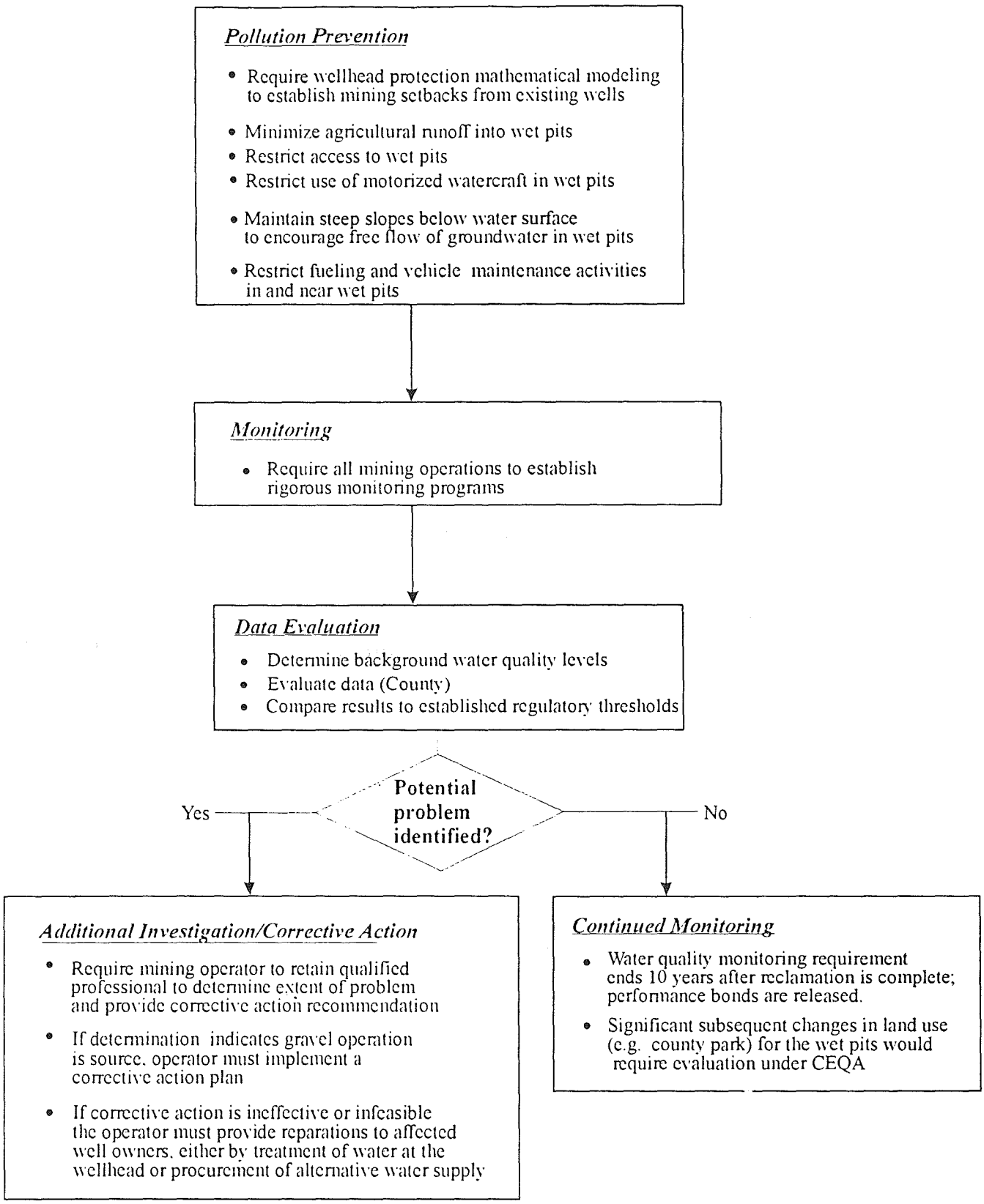

Figure 4.4-10 Water Quality Evaluation and Mitigation Flowchart

Performance Standard 3.5-3 of the OCMP and the associated ordinance should be replaced with the following Performance Standard:

> Surface water shall be prevented from entering mined areas, through perimeter berms or ditches and grading. Appropriate erosion control measures shall be incorporated into all surface drainage systems. Drainage and detention facilities within the proposed mining areas shall be designed to prevent discharges to the wet pits and surface water conveyances (i.e., creeks and sloughs) from the 20-year/1-hour storm or less. For events greater than the 20-year/1-hour storm, runoff should be directed into surface water conveyances. Drainage plans shall not rely solely on ditches and berms to direct runoff away from the wet pit. Without proper maintenance, berms and ditches may deteriorate with time and become ineffective. Drainage plans shall emphasize grading of disturbed areas that results in broad gentle slopes that drain away from the pits. Grading plans shall be reviewed by the County to evaluate compliance with drainage plan objectives prior to project approval.
>
> In addition, a restriction shall be recorded on the deed that requires berms and ditches be permanently maintained in a condition consistent with the final approval. The deed restriction shall require inspection of the berms and ditches by a registered geologist or professional engineer every five years after completion of reclamation. An inspection report including recommendations for corrective action, if needed, shall be submitted to the Yolo County Community Development Agency following each inspection. The property owner shall be required to implement recommended corrective action, if any. In addition, an inspection easement (which allows County staff or other authorized personnel) to inspect the ditches and berms shall be recorded on the deed.

Performance Standard 2.5-8 of the OCMP and the associated ordinance should be modified as follows:

> Unnecessary personnel shall be excluded from off-channel excavations. Open wet pits shall be fenced with a four strand barbed wire fence (minimum of four feet in height) or the equivalent, prior to the commencement of excavation, during excavation, and during reclamation. Fencing may enclose the property of which mining is a part, the mining site, or both. In addition, signs shall be installed at the project site boundaries and access road, indicating that the excavation area is ~~a danger zone~~ restricted. Additional security (e.g., gates with protected locks and wing fences to prevent drive-arounds) shall be provided at all vehicular access routes. The fencing and gates shall be maintained throughout the mining and reclamation period and after completion of reclamation. A requirement shall be recorded on the deed of the property which requires the landowner to maintain fences and gates.

The potential for water quality degradation resulting from operation of motorized watercraft is adequately mitigated by Performance Standards 3.5-10 and 2.5-8.

Maintaining steep slopes below the groundwater table in the wet pits would discourage "clogging" of the aquifer and encourage the free flow of groundwater into and out of the wet pits. Groundwater flow would continuously "freshen" the water and reduce the potential for eutrophication of the wet pit lakes, or if it does occur, reduce the severity.

The potential for eutrophication of the wet pit lakes would be adequately mitigated by Performance Standards 2.5-18 and 3.5-11 (discussed in Impact 4.4-3).

Mitigation of potential releases from mining equipment and vehicles in and near the wet pits is adequately addressed in the Hazards section of this EIR.

Performance Standard 2.4-11 of the OCMP and associated ordinance should be deleted.

Monitoring

Performance Standard 3.5-4 of the OCMP and the associated ordinance should be modified as follows:

> All surface mining operations that propose off-channel excavations extending below the groundwater table shall develop and maintain a groundwater monitoring program consisting of two components: water level measurements and water quality testing. A groundwater level monitoring program shall be initiated at least six months prior to removal of overburden. At a minimum, the groundwater level monitoring program shall consist of three monitoring wells, with at least one well upgradient of the wet pit and one well downgradient of the wet pit. Monitoring programs for proposed mining areas exceeding 100 acres (total proposed mining area over the life of the project) shall include one additional well for each 100 acres to be mined. Therefore, proposed mining areas of 1 to 99 acres would require 3 wells, 100 to 199 acres would require four wells, 200 to 299 acres would require 5 wells, and so on. These wells shall be distributed through the vicinity of the proposed mining area and used for groundwater level measurements. Groundwater levels shall be collected from the monitoring wells on a quarterly basis for six months prior to mining and for the duration of the mining period. All wellheads shall be surveyed with horizontal and vertical control to allow calculation of groundwater elevations and development of groundwater contour maps. Groundwater levels shall be measured with an accuracy of plus or minus 0.01 foot, at minimum.
>
> Water quality in the vicinity of each active wet pit mining location would be evaluated by analyzing samples from selected monitoring wells (one upgradient and one downgradient) and wet pit surface water sampling locations. Since mining would be conducted in phases over a relatively long period of time, pit boundaries would change with time. Selection, and installation if necessary, of downgradient monitoring wells, which would be critical to adequately characterize the groundwater quality in the vicinity of the wet pits, would be proposed by the applicant for review and approval by the County. The selected monitoring wells shall be installed and sampled at least six months prior to removal of overburden. The downgradient wells should be located as near to active wet pit mining areas as is practical. The upgradient wells should be located an adequate distance from the proposed mining area to ensure that effect of the wet pit on water quality in the well would be negligible. The water samples from the wet pit should be collected in a manner to ensure that they are representative of water quality within the wet pit. The minimum sampling schedule and required analyses are described below.
>
> Groundwater level and pit water surface level measurements:
>
> Quarterly in all wells for the duration of mining and reclamation
>
> For proposed wet pit mining, sample collection and analysis of physical, chemical, and biological constituents shall be conducted according the following specifications:

- Prior to removal of overburden- One upgradient and one downgradient well shall be sampled at least six months prior to removal of overburden and again at the start of excavation. The samples shall, at minimum, be analyzed for general minerals, inorganics, nitrates, total petroleum hydrocarbons (TPH) as diesel and motor oil, benzene, toluene, ethylbenzene, and xylenes (BTEX), pesticides (EPA 8140 and 8150), and coliform (with E. coli confirmation).

- During wet pit mining and active reclamation- The wet pit shall be sampled semi-annually for the duration of mining and active reclamation. The samples shall, at minimum, be analyzed for general minerals, inorganics, nitrates, TPH as diesel and motor oil, BTEX, pesticides (EPA 8140 and 8150), and coliform (with E. coli confirmation).

  One upgradient, and one downgradient wells shall be analyzed, at minimum, for general minerals, inorganics, nitrates, TPH as diesel and motor oil, BTEX, pesticides (EPA 8140 and 8150), and coliform (with E. coli confirmation). The wells shall be sampled according to the following schedule:

  0-2 years: Semi-annually

  2 years to completion of reclamation: Annually

- After active reclamation- After all heavy equipment work has been completed in the vicinity of the pit, the TPH and BTEX analyses may be discontinued. The wet pit, one upgradient, and one downgradient well shall be sampled and analyzed for pH, temperature, nutrients (phosphorus and nitrogen), total dissolved solids, total coliform (with E. coli confirmation), and biological oxygen demand. This monitoring shall be conducted every two years for a ten year period after completion of reclamation.

A report to the County Community Development Agency and Department of Environmental Health shall be submitted ~~annually regarding the results of the groundwater monitoring program~~ within 30 days of the required groundwater testing.

If, at the completion of the mining and reclamation period, water quality has not been impacted, all monitoring wells shall be destroyed in accordance with California Department of Water Resources Well Standards (DWR, 1991). If the County or other agency wishes to maintain the wells for future water resources evaluation, selected wells could be preserved for this use.

The County may retain appropriate staff or contract consultant to provide third party critical review of all hydrogeologic reports related to monitoring.

Data Evaluation/Corrective Action

The following Performance Standard should be added to the OCMP and implementing ordinance.

PS. 3.5-16: A performance bond shall be acquired to ensure that monitoring continues through the mining period and ten years after the completion of reclamation.

Action 3.4-4 of the OCMP should be modified as follows:

The Yolo County Community Development Agency shall designate staff to ~~begin compiling and coordinating the monitoring information generated by the off-channel mining operations, in order~~

~~*to form the foundation for preparing an ongoing groundwater database covering the entire County*~~ *coordinate with City, County, regional, and State agencies that may wish to receive copies of data generated from the off-channel mining operations, including the towns of Capay, Esparto, Yolo, and Madison, the city of Woodland, and the Yolo County Flood Control and Water Conservation District, the Water Resources Agency, the Central Valley Regional Water Quality Control Board, and the California Department of Water Resources. The data base shall be expanded to include other relevant sources of information, so that it can be used as reference material for* ~~*the Water Resources Agency and other*~~ *regional water planning efforts.*

If at any time during the monitoring period, testing results indicate that sampling parameters exceed Maximum Contaminant Levels (MCLs), as reported in the California Code of Regulations, or established background levels, a qualified professional shall evaluate potential sources of the contaminants. The evaluation shall determine the source and process of migration (surface or subsurface) of the contaminants. A report shall be submitted to the regulatory agencies (Yolo County Community Development Agency and the Central Valley Regional Water Quality Control Board) which identifies the source of the detected contaminants and specifies remedial actions to be implemented by the applicant for corrective action. If it is determined that the source of water quality degradation is off-site, and County and RWQCB are in agreement with this conclusion, the applicant shall not be responsible for corrective action.

If corrective action is ineffective or infeasible, the responsible party must provide reparation to affected well owners, either by treatment of water at the wellhead or by procurement of alternate water supply.

Analysis of environmental impact for projects in the vicinity of the wet pits shall include consideration of potential water quality impacts on the open water bodies.

Implementation of these mitigation measures would reduce this potential impact to a less-than-significant level for the OCMP and Alternatives 5a, 5b, and 6.

Mitigation Measure 4.4-2b (A-1a, A-1b, A-2, A-3, A-4)

None required.

Current mining projects under Alternatives 1a and 1b would continue under existing approvals (no impact). Alternatives 2, 3, and 4 would generate no new wet pits, and therefore mitigation would not be required.

Impact 4.4-3
Potential Degradation of Water Quality after Reclamation of Mined Lands

Mining below the water table may occur within the planning area, creating wet pit lakes. Reclamation plans may include leaving wet pit lakes as permanent features. The potential long-term water quality impacts associated with wet pit lakes are described below.

Eutrophication/Biological Degradation

Eutrophication is defined as the loading of inorganic and organic dissolved and particulate matter to lakes and reservoirs at rates sufficient to increase the potential for high biological

production. Eutrophication could occur during the mining period, but is considered more likely to occur over the long term, especially if the sidewalls of the pit potentially become clogged with fine-grained sediments or biological matter. Eutrophic lakes tend to have colored water (green/brown), high algae content, and very low dissolved oxygen content. Eutrophication can be exacerbated by introduction of nutrients from agricultural operations, poorly designed and/or sited septic systems, and municipal wastewater treatment systems.

A wet pit that penetrates the groundwater table would be continually "freshened" by groundwater flow through the sidewalls, and would therefore not be significantly susceptible to stagnation (David Keith Todd, 1995). The free flow of groundwater could be reduced by clogging of the sidewalls (sedimentation or biological clogging), resulting in a pit more susceptible to eutrophication. Maintaining steep slopes would reduce the potential for clogging, but may conflict with the conditions necessary for high value biotics habitat and result in hazards to the public. Biotics require gentler slopes and broad shallow water areas. Gentle slopes and increased biological activity could increase the potential for eutrophication.

Establishment of habitat in the wet pits during and after the reclamation period could introduce additional sources of water quality degradation. These sources may include: 1) fecal material from animals (waterfowl, small mammals, and fish) that may contain microbiological contaminants, 2) surface scum (floating planktonic cells, colonies and filaments of algae), and 3) rooted plant biomass, including nuisance plants.

The following conclusions were made by Bruce Macler, the manager of the development of the Groundwater Disinfection Rule with the USEPA, about potential biological water quality impacts associated with wet pit mining along Cache Creek (Macler, 1996b):

> The types of plants and animals discussed above do not represent a source of contamination that would adversely impact drinking water supplies. The primary source of microbial contamination of surface and groundwater supplies is fecal material from humans and other large mammals. The only known microorganism that waterfowl carry and could introduce in small quantities into the wet pits is avian sarcoma, a virus with very little potential for transport in an alluvial aquifer. It is far more likely that domestic and municipal groundwater supplies would be impacted by nearby septic systems than a wet pit lake that supports no livestock grazing or human recreation.

Nearly all research on persistence and transport of pathogens in water begins with a source of the pathogens (i.e., a cesspool, cattle feedlot, sewage sludge application area). Required or recommended setbacks[18] established by the USEPA (1987) and the California Department of Water Resources (1991) are based on a concentrated source of pathogens. As discussed above, wet pit gravel mining and proposed reclamation would not result in creation of this type of a source. To further demonstrate that an alluvial aquifer has considerable ability to filter potential pathogen-containing water, data from another wet pit mining area are described below.

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[18] Setbacks require that drinking water supply wells are installed at a given distance from a contaminant source, typically 100 to 400 feet, to protect public health from pathogens.

Wet pit gravel mining has been conducted within the Middle Reach of the Russian River since the 1960s (EIP, 1994). The aquifer underlying the Russian River system is similar to the aquifer underlying Cache Creek. Both are composed primarily of sand and gravel near the channel with silt and clay content increasing with distance from the thalweg. Both aquifers experience significant seasonal groundwater level fluctuation and both are used as a primary drinking water source.

Mining of the Basalt Pit, located within the Middle Reach within 200 feet of the active channel of the Russian River and approximately 1 mile south of the City of Healdsburg, was initiated in 1967. The City of Healdsburg Wastewater Treatment Plant began discharging secondarily treated wastewater into the Basalt Pit in 1972. The long-term average discharge is approximately one million gallons per day (Robertson, 1996). The Basalt Pit is highly eutrophic (BASELINE, 1992). Surface and groundwater quality has been monitored on a quarterly basis in the vicinity of the Basalt Pit since 1992. Monitoring indicates that the pit water contains total and fecal coliform, often exceeding 700 MPN.[19] Samples collected from the nearest downgradient monitoring well (located within 50 feet of the pit) typically contain no total coliform or low levels (ranging from 2.1 to 64 MPN). Fecal coliform at 1.1 MPN has been detected on only one occasion in the monitoring well(Robertson, 1996). These data indicate that the area of water quality degradation resulting from microorganisms in the vicinity of the eutrophic wet pit is limited to a relatively short distance from the pit boundary.

Eutrophication and establishment of habitat in the reclaimed wet pits may reduce groundwater quality in the aquifer near the pits. However, a significant pathogen source would not be present. This potential source of water quality impact is considered less than significant.

Flood Water Mixing

Flood waters that overtop alluvial separators (which would happen only during a storm with magnitude greater than the 100-year event since 100-year flood protection is a condition of approval for all off-channel mining projects) would likely mix with water in the wet pits. Flood water can contain contaminants, including untreated or partially treated sewage, petroleum hydrocarbons, and heavy metals. Mixing of flood water with the wet pits could impact water quality in the aquifer near the pits, however this is considered a low probability impact (chance of occurrence is one percent in any given year) and only moderately exacerbated by the presence of the pits. Temporary impacts to shallow groundwater quality would occur whether the pits were present or not. This potential source of water quality impact is considered less than significant without mitigation.

[19] MPN means "most probable number" and is a statistical technique for determining the presence of coliform.

Illegal Discharge of Chemicals

It is possible that wastes and/or chemicals could be illegally discharged or dumped into the wet pits during the mining and/or reclamation period or after reclamation is complete. It is considered less likely that illegal discharges would occur during the mining and reclamation period because mining and processing personnel would represent a high profile presence. BASELINE conducted an informal survey of several agencies[20] in California that are involved with water quality issues and wet pits created by mining. None of these agencies reported knowledge of any illegal dumping or discharges to wet pits within their jurisdiction. Nevertheless, illegal dumping could occur during mining, the reclamation period, or after reclamation is complete. It is anticipated that the most significant impact would result from a large amount of chemical or waste transported to the wet pit lake by a car or truck. It seems unlikely that a sufficient quantity of material to cause a significant impact would be carried on foot to the lake.

An illegal discharge, depending on the type of chemical and quantity, could cause a significant adverse impact to groundwater quality in the vicinity of the wet pit and downgradient of the discharge. This source of water quality impact is considered significant.

Discharges from Motorized Watercraft

After the completion of mining and reclamation, it is possible that the wet pit lakes could be used for recreational purposes, either legally or illegally. Legal recreational use could result if the lakes were made available to the public (i.e. county park) or private use by permission of the property owner. Illegal recreational users could access the lakes by trespassing. Discharges of fuel, lubricants, and/or bilge water could result in degradation of water quality in the lakes. If this type of discharge occurred on a regular basis, it is possible that groundwater quality in the aquifer adjacent to the wet pit could be impacted. This source of water quality impact is considered significant.

Infiltration of Agricultural Waters

Under the existing condition, the ground surface, where infiltrating rainfall and irrigation waters enter the subsurface, is approximately 10 to 75 feet above the groundwater table. Under some potential mining scenarios, the post reclamation ground surface would be lowered and, therefore, be nearer to the groundwater table, reducing the thickness of the unsaturated zone. Water percolating through soils and sediment is generally improved in quality as organic chemicals are adsorbed to soil particles. Reducing the thickness of this

[20]The agencies contacted included: the Central Valley Regional Water Quality Control Board, Yuba County Planning Department, Fresno County Public Works, Zone 7 (Alameda County), California Department of Water Resources, Humboldt County Planning Department, San Benito County Planning Department, Tulare County Planning and Development Department.

"filter" may reduce its capacity to remove contaminants such as herbicide and pesticide residues from the infiltrating water, reducing groundwater quality.

A scenario was developed using mathematical modeling to evaluate the potential for pesticides to leach through the unsaturated zone and reach the groundwater table (Luhdorff and Scalmanini, et al., 1996). Atrazine was selected as the pesticide to use in the simulation because it is applied to crops in the planning area and is an identified "leacher" (a compound with high leaching potential relative to other similar compounds). An unsaturated zone with a thickness of 10 feet was used in the simulation to represent pre-mining conditions. The results indicated that atrazine concentrations were significantly reduced by processes in the unsaturated zone. However, after 900 days, atrazine reached the water table in concentrations greater than the USEPA maximum contaminant level.

An unsaturated zone thickness of five feet was used in a second simulation to represent post reclamation conditions. In the post reclamation scenario, the model indicates that the reduced unsaturated zone thickness is essentially offset by the reduction in grain size which would result from proposed mining and reclamation activities.

Topsoil formerly in agricultural production may be used to provide a growing medium for reclamation plantings around the reclaimed pits. These soils may contain residual concentrations of persistent pesticides and/or herbicides (e.g., DDT, DDE). Rainfall may leach detectable concentrations of these chemicals into the wet pits, degrading water quality.

Bioaccumulation of Mercury

Mercury, a silver-white liquid metal in its elemental form, is a potential environmental pollutant. Mercury is a potent neurotoxin, capable of causing brain damage in developing fetuses and mild tremors and emotional disturbances in adults exposed to sufficient concentrations. Compounds of mercury can also be harmful to health. Organic mercury compounds, including methylmercury, are rapidly accumulated by aquatic animals. The concentration of these compounds increases through time in the flesh of fish (bioaccumulation). In addition, the accumulation of organic mercury concentrates along aquatic food chains, reaching high levels at the top predators through a process referred to as biomagnification. Consumption of fish with bioaccumulated levels of methylmercury is the largest source of mercury exposure for humans.

The Cache Creek watershed drains areas of the Clearlake Highlands and presents the potential for significant levels of mercury in sediment and water resources. Mercury-bearing ores are primarily found within the Cenozoic Clear Lake Volcanics bedrock within the north-central Coast Ranges but are also found in extremely deformed Franciscan bedrock within the region. Most of the mercury deposits are formed as epithermal (low temperature, low pressure) deposits of sulfide ores, including cinnabar. These deposits have been historically mined within the region and have produced a large percentage of mercury mined within the United States.

Recent water quality sampling performed by the Central Valley Regional Water Quality Control Board (Foe, 1996) indicates that floodwaters sampled from Cache Creek during 1995 and 1996 contain significant levels of mercury. Unfiltered water samples collected just upstream of the town of Rumsey contained total mercury at levels between 1,000 to 4,000 nanograms (10^{-9} grams) per liter (parts per trillion). These levels were considerably higher than mercury levels measured in samples collected upstream on Cache Creek, downstream of Clear Lake, and on the North Fork of Cache Creek downstream of Indian Spring Reservoir. The levels at Rumsey were also higher than the levels measured in Bear Creek. These data indicate a potential source of elevated mercury between the confluences of the North Fork (upstream) and Bear Creek (downstream) with Cache Creek. The suspected source is probably an unidentified abandoned mercury mining operation within the watershed of one of the smaller creeks entering this reach of Cache Creek (Foe, 1996).

The availability of mercury within the Cache Creek watershed, both naturally-occurring as bedrock deposits and from mercury mining and processing facilities, indicates that the alluvial sediments within the OCMP planning area may contain significant levels of mercury. The mercury within these deposits is likely inorganic forms of mercury, including fragments of mercury sulfide deposits and mercury adsorbed to clay particles. Soils developed on these deposits may also contain mercury. In particular, the organic surface (A-horizon) soils are likely to contain relatively high levels (compared to deeper sediments) because of the affinity of mercury for forming strong complexes with organic material in these soils.

Under existing conditions, the forms of mercury expected in the sediments would be relatively stable and have low solubility. The mobility of mercury in the subsurface would be limited by the oxidizing environment of the unsaturated zone, neutral to slightly acidic soil conditions, and relatively low temperatures.

Under these existing conditions, the solubility of mercury is low and adverse impacts to groundwater quality would not be expected. The maximum contaminant level (MCL) for mercury for drinking water set forth in the California Code of Regulations is 0.002 milligrams per liter (mg/L). Twenty three groundwater quality samples collected within the OCMP planning area during the period 1992 to 1995 (Luhdorff and Scalmanini, et al.,1996) have not contained mercury above detection limits (0.0002 mg/L). These data indicate that if mercury is present in groundwater, the concentration is more than ten times lower than the drinking water standard.

However, aquatic life is more susceptible to the impact of mercury in water due to the potential for direct exposure to methylmercury. The US Environmental Protection Agency's national ambient (four-day average) water quality criteria to protect freshwater aquatic life for mercury is 0.000012 mg/L. This threshold is, therefore, 167 times lower than drinking water standard.

Methylmercury is formed through "methylation" of inorganic mercury. Methylation occurs primarily as an assimilative process within the cells of organisms which are able to metabolize available mercury compounds. Sulfur-reducing anaerobic bacteria are considered to be the most efficient organisms for methylation of mercury. The conversion of mercury to methylmercury is, therefore, promoted by anaerobic (oxygen-deficient), acidic (low pH) aquatic environments. The rate of methylmercury production is generally controlled by the availability of mercury and the presence of anaerobic bacteria. Although methylmercury is volatile and unstable in the aquatic environment, bioaccumulation of this compound in the tissue of aquatic life and biomagnification of methylmercury in the food chain present potential environmental health impacts in environments where methylmercury forms.

Reclamation of off-channel mining areas within the OCMP planning area to deep, permanent lakes could present conditions favorable to the conversion of mercury to methylmercury. Thermal stratification of lake waters and accumulation of organic matter could promote the development of anaerobic conditions in the bottom of the lakes. Although throughflow of groundwater through the lakes would be expected to reduce the potential for severe eutrophication of the lakes, algal growth and detritus from the margins of the lakes could provide a significant source of organic materials. Deeper portions of the lakes could be deficient in dissolved oxygen. Anaerobic conditions could promote the development of significant anaerobic bacteria populations, capable of converting inorganic mercury to methylmercury.

Although anaerobic conditions could develop within the lakes, the production of methylmercury would be dependent on the availability of inorganic mercury within the lakes. Detection of mercury in the alluvial deposits within the OCMP planning area would be expected due to the presence of mercury within the Cache Creek watershed. However, data are not currently available on the concentration of inorganic mercury within the alluvial sediments in which the lakes would be formed. Although the concentration of total mercury in lake sediments or lake water provides an indication of the availability of mercury for methylation, a direct correlation between the amount of total mercury and the amount of methylmercury within an aquatic system has not been established in studies conducted within the region of the project site (Burau, 1996). Biological organisms may not be able to metabolize all forms of inorganic mercury (which would be measured in total mercury analysis). In addition, specific water quality parameters, such as pH, dissolved oxygen levels, would control the environments necessary for methylation of mercury.

Wet pit mining operations at the Solano Concrete Company's property, located near the center of the OCMP planning area, have been conducted since 1980 under an approved mining permit. Progressive mining of the 100-acre Hutson parcel has created a large open water body. Mining was completed at the parcel in November 1995. Surface water quality samples were collected in the mining pit during three sampling events in 1992, 1994, and 1995. Testing of the water sampled in the pit did not identify total mercury concentrations above the detection limit of 0.0002 mg/L (Luhdorff and Scalmanini, et al., 1996). The US EPA water quality criterion for protection of freshwater aquatic life is 0.000012 mg/L.

These levels are significantly lower than the EPA's recommended maximum short-term (one-hour average) criterion for the protection of aquatic life (0.0024 mg/L).

The pH measurements for the collected samples from the Hutson parcel lake ranged from 8.5 to 8.7, suggesting a consistent moderately alkaline condition for the surface water in the lake. The pH was slightly more alkaline than groundwater samples from wells surrounding the pit. The measured pH of the water would not be conducive to the processes which promote methylation of mercury.

The surface water sampling results from the Solano Concrete Company's wet pit mining operation do not indicate conditions that would promote conversion of mercury to methylmercury. However, the surface water samples collected from an active mining pit would not necessarily be reflective of the chemistry of waters at the bottom of the pit or those in a reclaimed lake. In addition, the availability of inorganic mercury is not accurately known. The expected source of inorganic mercury would be the alluvial sediment itself, and in particular the fine-grained sediments which could include clay particles with adsorbed mercury. It should be noted that sediments below the groundwater table have been exposed to groundwater. It is possible that low oxygen levels and the presence of anaerobic bacteria within the groundwater may have resulted in some previous methylation of inorganic mercury within the aquifer over time.

Discharge of fines from the aggregate processing plants to the mined areas as part of reclamation would increase the percentage of fine-grained sediment in the reclaimed lakes. The fine-grained sediments generated from processing of aggregate from off-channel mining areas would be expected to have mercury concentrations similar to those in the deposits forming the bottom and sides of the lakes. Processing fines generated from aggregate mined from the active Cache Creek channel may contain relatively higher mercury concentration; these young deposits may be affected by increased available mercury due to historic mining operations within the watershed. Although the OCMP requires flood protection for the proposed mining areas, additional input of sediment to the lakes could occur during infrequent discharges of Cache Creek flows into the pits during floods exceeding the 100-year event. Minor inputs of mercury from precipitation and atmospheric fallout could also be expected.

The potential increased conversion of inorganic mercury to methylmercury as a consequence of development of anaerobic conditions within lakes formed in proposed mining areas is a possible impact. Increased production of methylmercury could have a significant impact on aquatic life within the lakes. Bioaccumulation of methylmercury within fish inhabiting the lakes could present health effects to people consuming these fish. The Food and Drug Administration set the threshold level of methylmercury in fish consumed by humans at 1.0 mg/kg. However, the National Academy of Science recommends a level of 0.5 mg/kg. Although methylation of mercury could occur in other aquatic environments within the Cache Creek system, including wetland areas, potential production of methylmercury in lakes formed in mining areas would be a significant environmental impact related to activities under the proposed OCMP.

Draft OCMP and Implementing Ordinances

Under the OCMP, off-channel mining would be encouraged over in-stream mining. The result of implementing the OCMP would be an increased number of wet pits in the planning area. Five off-channel long-term mining applications have been submitted to the County for review under the OCMP. Of the 2,256 acres proposed for mining in these applications, roughly 84 percent would be wet pit mines and the remainder would be dry pit mines. This would result in long-term exposure of wet pits at numerous locations (11 pits covering 771 acres at completion of reclamation).

The OCMP contains Goals and Performance Standards designed to address potential long-term impacts to groundwater quality associated with permanent wet pits:

Goal 3.2-2: Maintain the quality of surface and groundwater so that nearby agricultural productivity and available drinking water supplies are not diminished.

This Goal, with regard to potential long-term water quality impacts, is supported by Performance Standards 2.5-8, 2.5-18, 3.5-10, and 3.5-11.

PS. 2.5-8: Unnecessary personnel shall be excluded from off-channel excavations. Open pits shall be fenced with a four strand barbed wire fence or the equivalent, prior to the commencement of excavation. Fencing may enclose the property of which mining is a part, the mining site, or both. In addition, signs shall be installed at the project site boundaries and access road, indicating that the excavation area is a danger zone.

This Performance Standard may not provide adequate protection of water quality. Additional security measures at the gates would further deter vehicular access to the wet pits, minimizing potential impacts associated with illegal dumping.

PS. 2.5-18: All final reclaimed slopes shall have a minimum safety factor equal to or greater than the critical gradient as determined by an engineering analysis of the slope stability. Final slopes less than five (5) feet below groundwater shall be designed in accordance with the reclaimed use. Reclaimed wet pit slopes located five (5) feet or more below groundwater level shall not exceed 1:1 (horizontal:vertical), in order to minimize the effects of sedimentation and biological clogging on groundwater flow and to prevent stagnation.

The appropriateness of slope steepness with regards to slope stability is discussed in Impact 4.3-2 of this EIR. Steep slopes would reduce the effects of sedimentation and clogging (relative to gentler slopes), and would tend to reduce the likelihood of stagnation and eutrophication of the wet pit lakes.

PS. 3.5-10: The use of motorized watercraft on any pond, lake, or other water body created as part of the approved reclamation plan is prohibited.

This Performance Standard is not adequately specific regarding whether motorized watercraft on lakes would be permitted during mining, or whether electric-powered watercraft would be permitted.

PS. 3.5-11: The use of off-channel wet pits for the storage and treatment of sewage effluent, or for landfill purposes, is prohibited.

This Performance Standard would minimize adverse impacts to hydrology and/or water quality.

Alternative 1a - No Project (Existing Conditions)

Under this alternative, mining would continue in a manner similar to current practices. The majority of aggregate within the planning area is currently extracted from within the Cache Creek channel. However, several off-channel mining operations are currently permitted. Potential impacts to water quality resulting from current mining operations have been evaluated under previous CEQA review.

Alternative 1b - No Project (Existing Permits and Regulatory Condition)

The impacts for this alternative would be similar to those of Alternative 1a.

Alternative 2 - No Mining (Alternative Site)

Under this alternative mining would be discontinued within the planning area and no new off-channel wet pits would be created. The potential for local long-term water quality degradation associated with new wet pits would be eliminated.

Alternative 3 - Plant Operation Only (Importation)

Under this alternative mining would be discontinued within the planning area and no new off-channel wet pits would be created. The potential for long-term water quality degradation associated with new wet pits would be eliminated. Operation at the processing plants could continue and chemical release could occur at those locations. However, processing plants are generally located at some distance from open water bodies and established surface water courses, and therefore would not pose a significant threat to regional groundwater quality. In addition, processing plant operations are required to maintain and implement a Storm Water Pollution Prevention Plan to reduce or eliminate impacts to surface water quality

Alternative 4 - Shallow Mining (Alternative Method/Reclamation)

Under this alternative no new off-channel wet pits would be created, and therefore the potential for long-term water quality degradation associated with new wet pits would be eliminated. However, under this alternative, much of the unsaturated zone would be removed during excavation, reducing the effectiveness of the soil buffer in mitigating chemical releases to the surface.

Under this alternative, off-channel mining would be encouraged over in-stream mining. The result of implementing this policy would be an increased number of wet pits in the planning area, potentially impacting groundwater quality.

Alternative 5b - Decreased Mining (Shorter Mining Period)

The impacts for this alternative would be similar to those of the OCMP Alternative.

Alternative 6 - Agricultural Reclamation (with Mining Operations as Proposed)

Under this alternative, permanent wet pit lakes would not be permitted; a minimum of 80 percent of all mined lands would be reclaimed to agriculture. It is likely that under this requirement, numerous temporary wet pits would be created during mining and backfilled during the reclamation period. Up to 20 percent of the mined areas could be reclaimed as wet pits. Therefore, potential long-term water quality impacts associated with permanent wet pits could occur.

Mitigation Measure 4.4-3a (OCMP, A-5a, A-5b, A-6)

In addition to the policies included in the OCMP, the following mitigation measures shall be implemented to reduce potential impacts associated with backfilled pits.

The potential for eutrophication and biological degradation of wet pit lakes would be adequately mitigated by Performance Standards 2.5-18 and 3.5-11, and Mitigation Measure 4.4-2a.

The potential for illegal discharges to occur would be adequately mitigated by Mitigation Measure 4.4-2a.

The potential for water quality degradation resulting from legal operation of motorized watercraft is adequately mitigated by Performance Standard 3.5-10. The potential impacts associated with illegal operation of watercraft in the lakes is adequately mitigated by the requirement for fencing and locked gates, discussed above (Performance Standard 2.5-8).

The potential impacts associated with groundwater quality degradation would be partially mitigated by implementation of the monitoring program described in Mitigation Measure 4.2-2. In addition, the following Performance Standard shall be added to the OCMP and implementing ordinance:

Overburden and processing fines shall be used whenever possible to support reclamation activities around reclaimed wet pits. These materials may be used in reclamation activities without testing for agricultural chemicals. If topsoil (A-horizon soil), formerly in agricultural production, is proposed for use within the drainage area of a wet pit, the soils must be sampled prior to

...Methods, SW-846, Third Edition (as updated). Topsoil that contains pesticides or herbicides above the Maximum Contaminant Levels for primary drinking water (California Code or Regulations) shall not be placed in areas that drain to the wet pits.

The following performance standards shall be added to the OCMP to mitigate the potential for significant adverse impacts associated with the conversion of mercury occurring within Cache Creek alluvial deposits to methylmercury:

Prior to approval of reclamation of aggregate mining areas to permanent lakes, the County shall commission a sampling and analysis program, to be implemented in one existing wet pit mining area within the OCMP planning area, to evaluate the potential for increased methylmercury production associated with wet pit mining and reclamation of mining areas to permanent lakes. The program shall include sampling of water and sediments from the bottom of the existing pit and analysis of the samples for organic content, pH, dissolved oxygen content, dissolved carbon content, and total mercury. In addition, samples of predatory fish (preferably, largemouth bass) shall be collected and analyzed for mercury and methylmercury content. If the initial sampling indicates either of the following conditions, the County shall perform verification sampling:

- *Average concentrations of total mercury in excess of 0.000012 mg/l in the water;*
- *Mercury levels in fish samples in excess of 0.5 mg/kg.*

If verification sampling indicates exceedance of these mercury standards, the County shall not approve reclamation of mining areas to permanent lakes.

In the event of approval of reclamation of mined areas to permanent lakes, the first lake reclaimed as part of each approved long-range mining plan shall be evaluated annually by the landowner for five years for conditions that could result in significant methylmercury production. The annual evaluations shall be conducted by a qualified aquatic biologist or limnologist and shall include the following analyses:

- *Lake condition profiling during the period June through September, including measurements of pH, eH (or redox potential), temperature, dissolved oxygen, and total dissolved carbon.*
- *Collection of a minimum of five predator fish (preferably largemouth bass) specimens and analysis of the specimens for mercury and methylmercury content.*

If the average fish specimen mercury content exceeds 0.5 mg/kg for two consecutive years, wet pit mining on property controlled by the mining operator/owner shall be suspended and the owner/operator shall either:

and is determined by the Cal EPA Off of Env Health Hazard Assessment to warrant fish consumption

- *Present a revised reclamation plan to the Yolo County Community Development Agency which provides for filling reclaimed lake to a level five feet above average seasonal high groundwater level with a suitable backfill material, or*
- *Present a mitigation plan to the Yolo County Community Development Agency which provides a feasible and reliable method for reducing methylmercury production. Potential mitigation could include permanent aeration of bottom levels of the lake, alteration of water chemistry (increasing pH or dissolved organic carbon levels), or control of anaerobic bacteria populations. The mitigation plan would require approval by the Regional Water Quality Control Board, Department of Fish and Game, and the Yolo County Department of Environmental Health.*

Implementation of these mitigation measures would reduce this potential impact to a less-than-significant level for the OCMP and Alternatives 5a, 5b, and 6.

Mitigation Measure 4.4-3b (A-1a, A-1b, A-2, A-3, A-4)

None required.

Current projects under Alternatives 1a and 1b would continue under existing approvals (no impacts). Alternatives 2, 3, and 4 would generate no new wet pits, and therefore mitigation would not be required.

Impact 4.4-4
Loss of Water from Aquifer Storage Due to Evaporation

Water continuously moves through the hydrologic cycle; either from the subsurface to the atmosphere through evaporation and evapotranspiration or from the atmosphere to the subsurface as precipitation/infiltration. In general, when it is not raining, moisture moves from the subsurface to the atmosphere through evaporation and evapotranspiration. In addition to water naturally being exchanged through the hydrologic cycle, groundwater and surface water are used for irrigation of crops. In the planning area, the crops are irrigated by both surface water and groundwater.

Impacts of evaporative losses from a wet pit lake are typically evaluated by comparing such losses with historic evapotranspiration losses from agricultural crops. The annual evaporation rate from an open water surface in the vicinity of the planning area is estimated to be 3.92 feet per year (DWR, 1975) (Table 4.4-1). Annual evapotranspiration rates for crops typically grown in the area range from 0.95 foot/year to 3.64 feet/year (Table 4.4-1). However, the presence of wet pits could provide valuable habitat. Water in the Cache Creek system has several designated beneficial uses as described in the Basin Plan (RWQCB, 1991) including agriculture, drinking water, and habitat support.

Draft OCMP and Implementing Ordinances

Implementation of the OCMP would result in the creation of numerous permanent wet pits within the planning area. Based on the mining and reclamation plans proposed under the five long-term applications currently under review by the County, the total wet pit surface area that would be created in the next 30 years would be approximately 771 acres. Annual losses of groundwater from these wet pit surfaces is estimated at 3,022 acre-feet per year, based on a rate of 3.92 feet/year. This apparent loss would be reduced by the amount of precipitation that does not run off[21] (average runoff is 2.5 inches per year (Rantz, 1974)).

[21]Precipitation that does not run off stays within the basin as soil moisture (used by plants) or groundwater recharge. Under existing conditions, 16.5 inches of the average 19 inches of rainfall remain in the basin. The 2.5 inches that would typically run off under existing conditions would be captured by the proposed wet pits. This would reduce the net loss of water from storage due to evaporation from the pits by 161 acre-feet.

Therefore the net loss of water due to evaporation associated with the wet pits is estimated to be 2,861 acre-feet per year (3.71 feet/year from lakes, 5.21 feet/year from wetland habitat). The potential impact associated with the loss of 2,861 acre-feet of water per year may be mitigated by the creation of valuable wildlife habitat in the open water lake areas.

The OCMP contains policies designed to address potential adverse impacts associated with wet pits, including:

Action 3.4-1: Consider evapotranspiration losses as an acceptable result of exposed groundwater, when reclaimed shallow wet pit areas are included as a part of proposed riparian habitat or recreational facilities.

Under this policy, the County designates habitat support as an acceptable use of groundwater. Upon completion of proposed mining, annual evaporation losses from wet pits are estimated at 2,861 acre-feet per year. This is a less-than-significant impact.

PS. 3.5-12: Reclaimed wet pits shall minimize shallow depths in order to reduce evapotranspiration, unless the shallow areas are being reclaimed to wetland habitat. Wet pits shall be considered shallow when they extend less than ten (10) feet into the groundwater table.

This Performance Standard attempts to balance the contradictory objectives of minimizing evaporation losses and creation of valuable habitat. Steep-sided wet pits provide little riparian habitat value, but reduce evaporative losses relative to shallow wet pits. Creation of valuable habitat would be required to mitigate this potential impact. However, implementation of this performance standard would not reduce loss of groundwater to evaporation.

Water is lost to the atmosphere (evapotranspiration) and from open water wet pit lakes (evaporation). Open pit lakes will eventually support valuable wildlife habitat. Both agriculture and habitat are described as designated beneficial uses of water in the Basin Plan (1991).

Alternative 1a - No Project (Existing Conditions)

Under this alternative, mining would continue in a manner similar to current practices. The majority of aggregate within the planning area is currently extracted from within the Cache Creek channel. However, one off-channel wet pit is currently permitted. Potential impacts resulting from evaporative losses from current mining operations have been evaluated under previous CEQA review.

Alternative 1b - No Project (Existing Permits and Regulatory Condition)

Same as Alternative 1a.

Alternative 2 - No Mining (Alternative Site)

Under this alternative mining would be discontinued within the planning area and no new off-channel wet pits would be created. No evaporative losses would occur locally under this alternative beyond those that would occur at permitted mining and reclamation sites.

Alternative 3 - Plant Operation Only (Importation)

Same as Alternative 2.

Alternative 4 - Shallow Mining (Alternative Method/Reclamation)

Under this alternative no new off-channel wet pits would be created. No additional evaporative losses would occur under this alternative.

Alternative 5a - Decreased Mining (Restricted Allocation)

Under this alternative, off-channel mining would be encouraged over in-stream mining. The result of implementing this policy would be an increased number of wet pits in the planning area, resulting in increased evaporative losses. This is a potentially significant impact.

Alternative 5b - Decreased Mining (Shorter Mining Period)

Same as OCMP Alternative.

Alternative 6 - Agricultural Reclamation (with Mining Operations as Proposed)

Under this alternative new permanent off-channel wet pits would be limited to 20 percent of the total reclaimed area. Evaporative losses during mining, prior to reclamation as agricultural land, and from the permanent lakes would occur. This is a potentially significant impact.

Mitigation Measure 4.4-4a (OCMP, A-5a, A-5b, A-6)

None required.

Performance Standard 3.5-12 of the OCMP should be modified as follows:

> ~~*Reclaimed wet pits shall minimize shallow depths in order to reduce evapotranspiration, unless the shallow areas are being reclaimed to wetland habitat. Wet pits shall be considered shallow when they extend less than ten (10) feet into the groundwater table.*~~ *All permanent wet pits shall be reclaimed to include valuable wildlife habitat.*

Implementation of this mitigation measure would reduce this impact to a less-than-significant level for the OCMP and Alternatives 5a, 5b, and 6.

Mitigation Measure 4.4-4b (A-1a, A-1b, A-2, A-3, A-4)

None required.

Current mining projects under Alternatives 1a and 1b would continue under existing approvals (no impact). Alternatives 2, 3, and 4 would generate no impact associated with evaporative losses, and therefore mitigation would not be required.

Impact 4.4-5
Potential Impacts Associated with Groundwater Recharge

It may be possible to use former mining areas (dry pits and future wet pits may be created) as recharge basins as part of a groundwater recharge system. However, the creation of wet pits alone provides no recharge benefits; the presence of the pits results in a net loss of groundwater from the aquifer, since evaporation rates exceed rainfall in the planning area. In addition, recharge would not be achieved by pumping groundwater into the pits, since this would result in removing groundwater from storage while simultaneously replenishing it. Recharge could be achieved by diverting surface water from irrigation canals and/or creeks into the pits.

Management of groundwater and surface water supplies and transfers is the primary responsibility of the Yolo County Flood Control and Water Conservation District (YCFCWCD). A water management plan has not been completed by YCFCWCD at this time. It is therefore unknown whether the wet pit lakes would be compatible with the goals of a YCFCWD water management plan.

OCMP and Implementing Ordinances

The OCMP and associated Technical Studies provide insufficient information on the use of former mining areas as groundwater recharge facilities to allow for adequate analysis of associated potential environmental impacts. The OCMP contains policies regarding the use of former mining areas as recharge facilities. However, a water management plan has not been prepared as part of the project, and therefore cannot be evaluated in this EIR. The intent of the County to cooperate and coordinate with the YCFCWCD is an appropriate goal; however, the OCMP should not attempt to design or mitigate potential environmental impacts associated with a groundwater recharge program that has not been completed. The following policies regarding groundwater recharge are included in the OCMP:

Goal 3.2-1: Promote the conjunctive use of surface and groundwater to maximize the availability of water for a range of uses, including habitat, recreation, agriculture, water storage, flood control, and urban development.

Obj. 3.3-1: Encourage the development of a Countywide water management program, including the participation of the YCFCWCD and other relevant agencies, to coordinate the monitoring and analysis of both surface and groundwater supplies.

Obj. 3.3-3: Improve the recharge capability along Cache Creek through the development of off-channel ponds, lakes, and canals that have the ability to raise local groundwater levels.

Action 3.4-2: Coordinate with the Yolo County Flood Control and Water Conservation District in developing an integrated groundwater recharge plan for Cache Creek, in order to increase the available groundwater supply for municipal and agricultural uses. When it is intended that reclaimed off-channel excavations be used as a part of the recharge plan, the County shall consider the siting and design requirements needed to accommodate the District's requirements.

Action 3.4-6: Locate groundwater management facilities in accordance with the Recommended Management Activity Zones described in the Technical Studies. Groundwater recharge basins shall be concentrated in Zone 4.

Action 3.4-7: Encourage the transfer of sediment fines generated by aggregate processing from mining operations located in areas recommended for groundwater recharge (Zone 4 in the Recommended Management Activity Zones described in the Technical Studies) to areas where groundwater enhancement is less favorable, especially Zone 3. This would reduce the impacts associated with backfilling in areas where recharge efforts are emphasized.

Action 3.4-8: Develop groundwater recharge basins in Zone 4 of the Recommended Management Activity Zones described in the Technical Studies. Said basins should be situated at least ten feet above the groundwater level, with relatively flat pit floors that are easily accessible by maintenance equipment.

PS. 3.5-7: Off-channel excavations that will be reclaimed to recharge basins shall maintain a minimum ten (10) foot unsaturated zone below the pit floor, in order to allow for groundwater mounding and provide maintenance opportunities.

PS. 3.5-14: Reclamation plans including proposed ponds, lakes, or other bodies of water shall be referred to the Yolo County Flood Control and Water Conservation District and the Mosquito Abatement District for review and comment prior to approval.

PS. 3.5-15: If any off-channel excavations are proposed to be reclaimed to water recharge facilities, then prior to the commencement of excavation below the water table, the applicant shall demonstrate in a manner consistent with the Technical Studies that the recharged water will not be discharged into a gaining reach of Cache Creek.

Alternative 1a - No Project (Existing Conditions)

A water management plan has not been completed, and therefore cannot be evaluated in this EIR. Potential impacts associated with the use of former mining areas as recharge facilities would be subject to CEQA review after a water management plan has been completed.

Alternative 1b - No Project (Existing Permits and Regulatory Condition)

Same as Alternative 1a.

Alternative 2 - No Mining (Alternative Site)

Same as Alternative 1a.

Alternative 3 - Plant Operation Only (Importation)

Same as Alternative 1a.

Alternative 4 - Shallow Mining (Alternative Method/Reclamation)

Same as OCMP.

Alternative 5a - Decreased Mining (Restricted Allocation)

Same as OCMP.

Alternative 5b - Decreased Mining (Shorter Mining Period)

Same as OCMP.

Alternative 6 - Agricultural Reclamation (with Mining Operations as Proposed)

Same as OCMP.

Mitigation Measure 4.4-5a (OCMP, A-4, A-5a, A-5b, A-6)

The County shall eliminate the following Actions and Performance Standards from the OCMP: Objective 3.3-3, Actions 3.4-2, 3.4-6 through 3.4-8, Performance Standards 3.5-7, 3.5-9, 3.5-14, and 3.5-15.

Implementation of the mitigation measures would eliminate potential impacts associated with coordination with a separate undefined project.

Mitigation Measure 4.4-5b (A-1a, A-1b, A-2, A-3)

None required.

Impact 4.4-6
Potential Impacts Resulting from Storm-Related Flooding

In most of the upstream portions of the planning area (west of Road 94B), the existing configuration of the Cache Creek channel has the capacity to convey the 100-year storm (NHC, 1995). In several locations downstream (east of Road 94B), the Cache Creek channel cannot contain 100-year flows. Portions of the planning area are also subject to

flooding from local runoff and overflows from smaller tributaries, including Lamb Valley Slough and Willow Slough.

Draft OCMP and Implementing Ordinances

Implementation of the OCMP would encourage off-channel mining rather than in-channel mining. If in-channel mining were eliminated or reduced to levels below the rate of replenishment, sand and gravel would begin to accumulate in the channel, reducing flood storage volume and conveyance. Without intervention (maintenance mining within the channel or heightening levees), the channel would eventually aggrade to the level where 100-year flood protection of the mining areas would be lost.

Completion of all the mining and reclamation proposed by the five long-term applications submitted to the County would result in the creation of numerous internally-drained lowered surfaces. This would, in effect, remove a portion of the contributing drainage area to Cache Creek and result in an incremental reduction in the base flood elevation. However, since the total area to be mined is only 2,211 acres (3.45 square miles) and the Cache Creek drainage basin has a watershed area of 1,140 square miles, the 0.3 percent reduction in drainage area is expected to have very little impact on regional flooding.

The OCMP contains policies designed to address potential adverse impacts associated with wet pit lakes, including:

Goal 4.2-1: Recognize that Cache Creek is a dynamic stream system that naturally undergoes gradual and sometimes sudden changes during high flow events.

This Goal is supported by Actions 4.4-2, 4.4-3, and 4.4-6.

Goal 4.2-2: Coordinate land uses and improvements along Cache Creek so that the adverse effects of flooding and erosion are minimized.

This Goal is supported by Actions 4.4-1, 4.4-4, and 4.4-5; and Performance Standards 4.5-1 and 4.4-6.

Goal 4.2-3: Establish a more natural channel floodway capable of conveying flood waters without damaging essential structures, causing excessive erosion, or adversely affecting adjoining land uses.

This Goal is supported by Action 4.4-7 and Performance Standard 4.5-7.

Obj. 4.3-1: Provide flood management as required to protect the public health and safety.

It is assumed that this Objective refers to flood management within the planning area since protection of health and safety outside the planning area would be beyond the jurisdiction of the OCMP. Regardless, implementation of this goal may exacerbate existing flooding problems downstream of the planning area. Reducing channel roughness and minimizing

backwater effects at essential structures (i.e. bridges) could result in increasing base flood elevations at downstream locations. This Objective is supported by Action 4.4-5 and Performance Standards 4.5-6 and 4.4-7.

Obj. 4.3-2: Determine an approximate flood capacity standard for Cache Creek, so that the extent of a more stable channel configuration may be designed.

This Objective is outside the scope of the OCMP. Existing County Resolution (94-82) requires (and the OCMP would require) that the mining areas are protected from the 100-year flood. This Objective would more appropriately be included in the Cache Creek Resources Management Plan.

Action 4.4-1: Revoke the 1979 In-Channel Mining Boundary, as defined in Section 10-3.303.(a) of the Yolo County Mining Ordinance. In its place, adopt a new in-channel area based on the present channel bank and the 100-year floodplain, as determined by the U.S. Army Corps of Engineers in the Westside Tributaries Study. This is a more accurate measure of delineating the boundary between in-channel and off-channel uses.

The proposed new in-channel boundary incorrectly identifies a portion of the Solano Concrete mining area (south of Cache Creek and east of Interstate 5) as "in-channel." The Solano Concrete mining area is outside the 100-year floodplain and should not be included within the new channel boundary.

Action 4.4-2: Designate the streamway influence boundary described in the Technical Studies as part of the Off-Channel Mining Plan. The boundary describes the general area of the creek subject to meandering, as defined by the historical activities of the channel. The streamway influence boundary also defines the area where in-stream and off-channel issues overlap and are addressed in both plans.

This Action would minimize impacts to hydrology and/or water quality.

Action 4.4-3: Use the data and assumptions provided in the Technical Studies, when evaluating significant modifications to the floodplain. This will ensure a consistent frame of reference and will update the model to account for changing future conditions.

This Action would minimize impacts to hydrology and/or water quality.

Action 4.4-4: Work with other agencies having jurisdiction over Cache Creek including, but not limited to, the Yolo County Flood Control and Water Conservation District, the U.S. Army Corps of Engineers, the State Reclamation Board, and the Federal Emergency Management Agency in developing a coordinated solution for managing flood events throughout the watershed of Cache Creek.

This Action would minimize impacts to hydrology and/or water quality.

Action 4.4-5: Manage activities and development within the floodplain to avoid hazards and adverse impacts on surrounding properties. This shall be accomplished through enforcement of the County Flood Ordinance and ensuring that new development complies with the requirements of the State Reclamation Board.

This Action would minimize impacts to hydrology and/or water quality.

Action 4.4-6: Allow for the design of spillways or other engineered features that provide controlled pit capture during a catastrophic flood event.

This Action is not supported by Performance Standards. Performance Standards are provided below as mitigation measures.

Action 4.4-7: Enter into a Memorandum of Understanding with the Yolo County Flood Control and Water Conservation District to provide a regular source of surface water flow in Cache Creek throughout the year, when annual precipitation is sufficient. The timing and volume of flows should be established consistent with the Technical Studies, in order to create a stable low-flow channel and allow for the natural revegetation of off-channel areas along the creek, where appropriate.

This Action would minimize impacts to hydrology and/or water quality.

PS. 4.5-1: All off-channel surface mining operations shall be provided with a minimum of 100-year flood protection. Off-channel excavations that extend below the existing streambed elevation of Cache Creek shall be designed to minimize the possibility of levee breaching and/or pit capture, except under controlled circumstances.

Specific Performance Standards designed to minimize the possibility of levee failure and/or pit capture are described under Impact 4.3-2.

PS. 4.5-4: Silt basins which store water during periods of surface runoff shall be equipped with sediment control and removal facilities and protected spillways designed to minimize erosion when such basins have an outlet to lower ground and/or Cache Creek.

This Performance Standard is repeated as Performance Standard 2.5-17. Refer to Impact 4.3-2 of this EIR for discussion of siltation basins.

PS. 4.5-5: No wastewater shall be directly discharged to Cache Creek. Sediment fines generated by aggregate processing shall be placed in settling ponds, designed and operated in accordance with all applicable regulations, and used for backfill material in off-channel excavations.

This Performance Standard is repeated as Performance Standard 3.5-8. Refer to Impact 4.4-2 of this EIR for discussion regarding handling of wastewater from processing plants.

PS. 4.5-6: New development (such as buildings, levees, or dikes) located within the floodplain shall conform to all applicable requirements of the Yolo County Flood Ordinance, the Federal Emergency Management Agency (FEMA), and the State Reclamation Board.

This Performance Standard would minimize impacts to hydrology and/or water quality.

PS. 4.5-7: Stormwater drainage systems shall be designed so as to prevent flooding on surrounding properties and County rights-of-way.

This Performance Standard would minimize impacts to hydrology and/or water quality.

Alternative 1a - No Project (Existing Conditions)

Under the existing conditions, off-channel aggregate operations are required to maintain 100-year flood protection for mining and processing areas under Yolo County Resolution 94-82. Existing regulations governing activities within the planning area do not specifically address the potential for exacerbating downstream flooding problems. This alternative could result in impacts to flooding downstream, but those impacts were evaluated by previous CEQA review.

Alternative 1b - No Project (Existing Permits and Regulatory Condition)

Same as Alternative 1a.

Alternative 2 - No Mining (Alternative Site)

If existing permits to mine and operate plants were canceled, regulatory authority to enforce maintenance of alluvial separators may be eliminated. Those areas that are currently protected from 100-year floods would continue to benefit from that protection until an overtopping or erosional event compromised the alluvial separator. At that time, it is unlikely that resources for repair of the alluvial separator would be available from the property owner or County. The mining operators have resources (equipment, operators, and knowledge) to conduct repairs to the alluvial separators and slopes, should failures occur. Eliminating the presence of mining operators from the planning area would reduce the likelihood that the separators would be maintained. Without the alluvial separators, floodplain limits would expand. Agricultural fields, homes, and roads, which currently are protected from floods less than the 100-year event, could be inundated during large storms.

Alternative 3 - Plant Operation Only (Importation)

If existing permits to mine and operate the plants were canceled, regulatory authority to enforce maintenance of alluvial separators may be eliminated. Those areas that are currently protected from 100-year floods would continue to benefit from that protection until an overtopping or erosional event compromised the alluvial separator. At that time, it is unlikely that resources for repair of the alluvial separator would be available from the property owner or County. Flooding and erosion of remaining plant sites would be a potentially significant impact.

Alternative 4 - Shallow Mining (Alternative Method/Reclamation)

Same as OCMP.

Alternative 5a - Decreased Mining (Restricted Allocation)

Same as OCMP.

Alternative 5b - Decreased Mining (Shorter Mining Period)

Same as OCMP.

Alternative 6 - Agricultural Reclamation (with Mining Operations as Proposed)

Same as OCMP.

Mitigation Measure 4.4-6a (OCMP, A-4, A-5a, A-5b, A-6)

As discussed previously, the existing configuration of Cache Creek west of Road 94B can convey 100-year flows within its banks. Cache Creek east of Road 94B and the tributaries cannot convey 100-year flows within their banks. Therefore, simply raising levees to contain these flows on lower Cache Creek (east of Road 94B) and the tributaries would likely exacerbate flooding downstream. The following performance standard should be added to the OCMP:

> *Performance Standard 4.5-8: Flood protection upgrades shall be completed in the vicinity of the mining and processing areas, if necessary, to ensure protection from the 100-year flood event. Flood protection shall be provided from flooding associated with overtopping of the alluvial separators or levees along Cache Creek and all tributaries and drainage channels (including, but not limited to, Willow Slough and Lamb Valley Slough).*
>
> *The flood protection upgrades shall be designed and constructed to provide the necessary 100-year protection without exacerbating downstream flooding problems. Downstream flooding could be increased if floodplain storage areas were removed from the drainage system by constructing levees in areas where they did not exist before (or raising levees that are overtopped in floods up to the 100-year event). Alternative flood management design systems (potentially using detention basins, infiltration galleries, and/or floodplain storage in noncritical areas) shall be required as a condition of project approval.*

The following performance standard should be added to the OCMP:

> *Performance Standard 4.5-9: The County Floodplain Administrator shall file for a Letter of Map Revision with FEMA, to update the FIRMs affected by channel maintenance activities and levee improvements with the planning area every ten years.*

Implementation of these mitigation measures would reduce this impact to a less-than-significant level for the OCMP and Alternatives 4, 5a, 5b, and 6.

Mitigation Measure 4.4-6b (A-1a, A-1b)

None required.

Current mining projects proposed under Alternatives 1a and 1b would continue under existing approvals (less-than-significant impact).

Mitigation Measure 4.4-6c (A-2, A-3)

None required.

If new mining projects were no longer approved within the planning area, protection of new mining areas from the 100-year event would not be relevant. Protection from 100-year floods would only be required for the processing plants as long as they were in operation and until the plant sites were fully reclaimed, as required under existing permits. Alternatives 2 and 3 would generate no new impacts associated with flooding.

Impact 4.4-7
Potential Impacts from Flooding Related to Dam Failure

The planning area could be flooded if the Indian Valley Dam were to fail catastrophically (Borcalli and Associates, 1994). Based on calculations conducted as part of a dam failure analysis, the inundation wavefront would reach the western portion of the planning area at Capay approximately three hours after dam failure. The wavefront would likely reach the eastern portion of the planning area at Yolo approximately seven hours after dam failure. Inundation depths would be expected to range between 4.0 and 17.0 feet.

An Emergency Action Plan (YCFCWCD, 1996) designed to coordinate response to failure of the Indian Valley Dam has been prepared. The plan, to be implemented by the YCFCWCD in case of an emergency, contains specific requirements for notification, evacuation, and surveillance of the hazard or potential hazard. Efficient evacuation of the area should be possible since it would take several hours for the flood water to reach the planning area. Mining within potential dam failure inundation areas is not restricted, and mining within the planning area would not exacerbate existing flooding associated with a dam failure event.

Draft OCMP and Implementing Ordinances

Flooding associated with dam failure is a low probability event that has been addressed by existing requirements by preparation and implementation of an Emergency Action Plan. Dam failure represents a less-than-significant impact, therefore no mitigation is required.

Alternative 1a - No Project (Existing Conditions)

Same as OCMP.

Alternative 1b - No Project (Existing Permits and Regulatory Condition)

Same as OCMP.

Alternative 2 - No Mining (Alternative Site)

Under this alternative, mining would be discontinued within the planning area, and therefore would result in no impact.

Alternative 3 - Plant Operation Only (Importation)

Same as Alternative 2.

Alternative 4 - Shallow Mining (Alternative Method/Reclamation)

Same as OCMP.

Alternative 5a - Decreased Mining (Restricted Allocation)

Same as OCMP.

Alternative 5b - Decreased Mining (Shorter Mining Period)

Same as OCMP.

Alternative 6 - Agricultural Reclamation (with Mining Operations as Proposed)

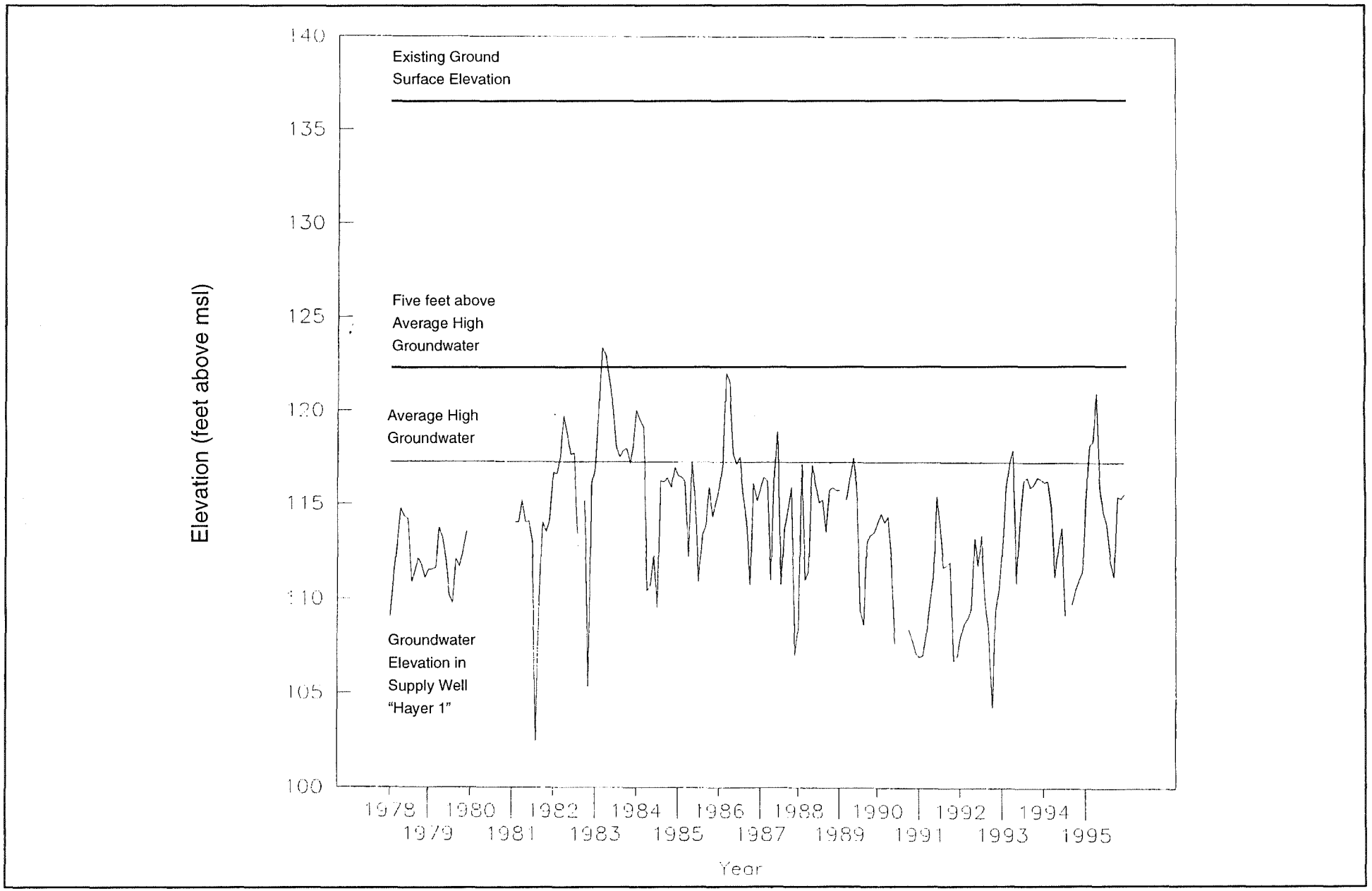
Same as OCMP.

Mitigation Measure 4.4-7a (OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, A-6)

None required.

Impact 4.4-8
Potential Impacts Associated with Inundation of Dry Pits or Lowered Reclaimed Surfaces by High Groundwater Conditions

Mining and reclamation resulting in the creation of dry pits and/or lowered surfaces may occur within the planning area. Shallow mining areas that do not extend below the water table, or deep wet pit mines backfilled with processing fines and overburden may be reclaimed to lowered agricultural surfaces in compliance with County objectives to preserve agricultural lands. These surfaces may be inundated by high groundwater conditions, causing damage to winter crops and delayed access to fields for planting of high-value summer crops. Under extreme conditions, the reclaimed surface could be rendered unfarmable. Figure 4.4-11 shows the relationship between groundwater level fluctuations measured in one water supply well and the existing ground surface.



Note: This hydrograph is based on monthly water level measurements. Some low groundwater levels (summer) may be affected by a pump operating in the well. Typically pump does not operate in winter. Gaps in the plot reflect missing data.

Figure 4.4-11 Groundwater Level Fluctuations

SOURCE: RUSSO, 1996

Draft OCMP and Implementing Ordinances

Under this alternative, wet pit and dry pit mining areas may be reclaimed to lowered agricultural surfaces. The distance between the reclaimed surface and the average high groundwater level has not been specified in the OCMP or the associated ordinance. Potential inundation of lowered surfaces would be a significant impact requiring mitigation.

Alternative 1a - No Project (Existing Conditions)

Under this alternative, mining would continue in a manner similar to current practices. The majority of aggregate within the planning area is currently extracted from within the Cache Creek channel. However, off-channel mining is occurring under the existing conditions and would likely continue under this alternative until reserves are exhausted. Short-term mining applications have been approved with the requirement that reclaimed surfaces must be, at a minimum, five feet above average high groundwater level. Reclamation to five feet above average high groundwater represents a less-than-significant impact.

Alternative 1b - No Project (Existing Permits and Regulatory Condition)

Same as Alternative 1a.

Alternative 2 - No Mining (Alternative Site)

Under this alternative, mining would be discontinued within the planning area. Reclamation of the past off-channel mined areas would require reclamation in accordance with approved reclamation plans. Those plans have already been subject to CEQA review. No new lowered surfaces would be created, and therefore no impact would result.

Alternative 3 - Plant Operation Only (Importation)

Same as Alternative 2.

Alternative 4 - Shallow Mining (Alternative Methods/Reclamation)

Under this alternative, mining would be limited to depths no greater than 10 feet above the historic high groundwater elevation. It is unlikely, even during a prolonged storm, that high groundwater levels greater than 10 feet above historic levels would be sustained for an extended period, and therefore represents a less-than-significant impact without mitigation.

Alternative 5a - Decreased Mining (Restricted Allocation)

Same as OCMP.

Alternative 5b - Decreased Mining (Shorter Mining Period)

Same as OCMP.

Alternative 6 - Agricultural Reclamation (with Mining Operations as Proposed)

Same as OCMP.

Mitigation Measure 4.4-8a (OCMP, A-5a, A-5b, A-6)

The following Performance Standard should be added to the OCMP and associated ordinance:

> *Performance Standard 3.5-16: The final distance between reclaimed lowered surfaces and average high groundwater shall not be less than five feet. The average high groundwater level shall be established for each proposed mining area. The degree of groundwater level fluctuation varies with location throughout the basin and within relatively small areas (proposed mining sites). The determination of average high groundwater level shall be conducted by a professional engineer or certified hydrogeologist and shall be based on wet season water level elevation data collected at the proposed site or adjacent areas with similar hydrogeological conditions. Water level records prior to 1977 should not be used since they would reflect conditions prior to installation of the Indian Valley Dam. The dam caused a significant change in hydrology of the basin and data collected before its installation should not be used in estimation current average high groundwater levels. The newly installed or existing wells should be adequately distributed throughout the proposed mining site to reflect spatial variation in groundwater levels and fluctuations.*

Implementation of this implementation measure would reduce the impact to a less-than-significant level for the OCMP and alternatives 5a, 5b and 6.

Mitigation Measure 4.4-8b (A-1, A-2, A-3, A-4)

None required.

Current mining projects under Alternatives 1a and 1b would continue under existing approvals (no impact). No mining, and therefore no impact, would occur under Alternatives 2 and 3. Alternative 4 adequately mitigates this potential impact.

4.5 AGRICULTURE

4.5 AGRICULTURE

INTRODUCTION

This section examines impacts to agricultural resources related to implementation of the OCMP and alternatives. The main issues addressed in this section include:

- consistency with the State Mining and Reclamation Act (SMARA) Regulations;
- potential impacts caused by permanent conversion of agricultural lands;
- potential impacts caused by the temporary loss of agricultural productivity;
- permanent loss of agricultural soils due to wind or water erosion;
- potential impacts to agricultural capability caused by soil management during removal, stockpiling, and reuse; and
- potential cumulative loss of productive agricultural lands.

SETTING

The following agricultural section presents background information on the agricultural industry in Yolo County, discusses the farmland designations and soil types within the planning area, and describes the different methodologies and definitions used by agencies to identify "prime" and "non-prime" agricultural soils.

Description of the Regional Environment

The planning area is located on the western margin of the Sacramento Valley, one of the most productive agricultural regions of the United States. The combination of a favorable climate, topography, fertile soils, and available water resources attracted farmers to the region in the mid-1800s. Plentiful native grasslands encouraged early stock raising. By the late 1800s, the development of irrigated agriculture supported production of alfalfa, barley, and wheat (NHC, 1995). Continued agriculture has been the dominant land use in the lower Cache Creek basin.

The California Department of Conservation (CDC, 1994) reported that Yolo County had approximately 427,481 acres of "important farmland" and 135,602 acres of grazing land in 1992. The total of 565,178 acres of agricultural land represents approximately 85 percent of the total acreage in the County (661,760 acres). Of the "important farmland" in the County in 1992, 271,534 acres were identified as "prime farmland" by CDC.

According to the latest Agricultural Crop Report published by the County Agricultural Commissioner, there were approximately 490,900 acres in Yolo County in agricultural production in 1994 (Table 4.5-1). Agriculture accounts for about 74 percent of the total

TABLE 4.5-1: Agricultural Acreage in Yolo County by Crop or Use	
Agricultural Crop or Use	**Harvested Acres**
Rangeland and Crop Stubble	126,612
Tomatoes (canning)	69,700
Wheat	59,031
Safflower	40,005
Screenings, Baled and Oat Straw	36,741
Hay Alfalfa	31,775
Seed Crops	22,633
All Fruits and Nuts (walnuts, almonds, prunes,	21,436
grapes)	21,650
Corn	20,917
Rice	19,492
All Other Field Crops	13,000
Irrigated Pasture	5,057
All Other Vegetable Crops	443
Nursery Products	
TOTAL	**490,858**

Source: Yolo County Agricultural Commissioner, *1994 Agricultural Crop Report.*

[1] Some double counting exists due to multiple crops so this number is approximate. Acreage for some agricultural uses, such as poultry, are not included.

acreage in the County.[1] The average annual revenue from crops in 1994 was $607 per acre. The predominant crops, in terms of acreage, are rangeland for livestock, tomatoes for canning, wheat, safflower, straw, alfalfa, all fruits and nuts, corn, and rice (Table 4.5-1). The most important crops in 1994, in terms of value, were tomatoes, wheat, seed, rice, safflower, English walnuts, corn, melons, and almonds (Table 4.5-2). These ten crops accounted for almost $247 million in gross receipts, or four-fifths of the $297.9 million agricultural industry in Yolo County. Tomatoes accounted for almost 40 percent of the total revenues in 1994. The average 1994 revenue for tomato crop production was $1,695 per acre.

[1]The agricultural acreage estimate is based on crop reports. Production of more than one crop from individual agricultural fields results in recounting of the acreage of each crop that is added to the total acreage. Acreage for some minor agricultural uses, such as poultry, is not included.

TABLE 4.5-2. Gross Value of Most Important Crops in Yolo County	
Crop	**Value**
Tomatoes	$118,121,000
Alfalfa Hay	20,986,000
Wheat	18,702,000
Seed	17,487,000
Rice	14,643,000
Safflower	12,488,000
English Walnuts	12,349,000
Corn	11,009,000
Melons	10,809,000
Almonds	10,416,000
All others	50,895,000
TOTAL	$297,905,000

Source: Yolo County Agricultural Commissioner, *1994 Agricultural Crop Report.*

Description of Local Environment

The planning area is located within an east-west trending alluvial valley formed along Cache Creek, a major regional stream. The planning area extends through a broad alluvial plain, called Hungry Hollow, between the Capay Dam at the western margin of the area to the western flank of the Dunnigan Hills. This portion of the valley is filled with a thick sequence of alluvial sediments that are mantled by highly productive agricultural soils. The agricultural fields in this area are irrigated with surface water supplied by the West Adams Canal, located north of the creek, and numerous irrigation water supply wells.

The valley of Cache Creek narrows as the channel cuts through the Dunnigan Hills. Agriculture is limited in this reach of the creek. As the creek flows eastward out of the hills, the Cache Creek Valley enters the greater Sacramento Valley and forms a broad alluvial surface on which agriculture flourishes. The southern margin of this eastern portion of the study area is supplied irrigation water from the Moore and Magnolia Canals; the northern area is served by the East Adams Canal.

Agriculture is the dominant land use within the planning area. These farmlands are generally flat land composed of irrigated prime and non-prime soils, much of which is currently under intensive row crop or orchard cultivation. Prime agricultural lands are generally considered to consist of lands that do not present significant limitations to agricultural production; these lands have the highest agricultural value. Non-prime agricultural lands are farmlands within agricultural areas that are limited by less than

optimal soil conditions, drainage problems, or incompatible adjacent land uses, or a combination of these factors.

Different public agencies use various criteria for designating agricultural land as "prime farmland." Applicable definitions of prime farmland include those employed by 1) the U.S. Department of Agriculture Natural Resources Conservation Service (USDA), 2) the California Department of Conservation (CDC) Prime Farmland Mapping and Monitoring Program, 3) the State of California in the Williamson Act of 1965, and 4) Yolo County Surface Mining Reclamation Ordinance.

U.S. Department of Agriculture

The soil capability classification system developed by the U.S. Department of Agriculture is perhaps the most widely known and cited. The USDA has prepared county-level Soil Surveys for most agricultural counties in the United States. The USDA uses a soil classification system based on eight primary capability classes, which can then be further defined in terms of capability "subclasses" and capability "units."

The USDA county soil surveys classify farmland by capability and suitability for agricultural use, according to soil types and cropping limitations. While the USDA soil surveys do not designate any land as "prime farmland," both the State Mining and Geology Board (SMGB) Reclamation Regulations (Section 3707 of CCR Title 14) and the Yolo County Interim Criteria reference the USDA definition of prime agricultural soils. Past practice may have been to consider lands in Capability Classes I and II as prime farmland; however, the USDA has recently been using a list that identifies prime farmlands in Yolo County by soil type, qualified by whether or not the lands are irrigated or drained.

The USDA soil classification system further defines all of the soil classes (except for Class I) with one or more capability subclasses, which are represented with a small letter immediately following the class Roman numeral. Each of the subclass designations indicates a general characteristic that limits the use of the soils. For example, a Class IIe soil is limited by a risk of erosion. The most commonly found capability subclass letters used to describe Yolo County soils are described below:

- **"e"** shows that the main limitation is a risk of erosion unless close-growing plant cover is maintained;

- "w" shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); and

- **"s"** shows that the soil is limited mainly because it is shallow, droughty, or stony.

The USDA soil classification system also designates a capability "unit" for similar soil types within the same subclass. The capability unit is expressed as an Arabic number, following the class Roman numeral and small letter subclass, such as IIs-3. The capability unit

number gives further soil limitation information, which allows soils to be more specifically characterized as to common management practices.

The most commonly used capability unit numbers in Yolo County soils include:

0 – A problem or limitation caused by sand or gravel in the substratum.
1 – An actual or potential erosion hazard.
2 – A problem or limitation of wetness caused by poor drainage or flooding.
3 – A problem or limitation caused by slow or very slow permeability of the subsoil or substratum.
4 – A problem or limitation caused by coarse soil texture or excessive gravel.
5 – A problem or limitation caused by moderately fine or fine textured soil.
6 – A problem or limitation caused by salt or alkali.
7 – A problem or limitation caused by cobblestones, other stones, or rock outcrops.
8 – A problem or limitation caused by a shallow depth to soil bedrock or hardpan.
9 – A problem or limitation caused by low fertility, acidity, or toxicity (including excess boron).

Finally, the USDA employs a similar, but separate, soil classification system that is based on a 100-point scale. The Storie Index was developed to indicate relative suitability of a soil for intensive agriculture. The Storie Index is analogous to the soil capability classification, except that only soil characteristics, not outside factors such as flooding or erosion, are described. Grade 1 soils (Storie Index of 80 to 100) have few or no limitations that restrict their use for crops; grade 2 soils (Storie Index of 60 to 80) are suitable for most crops but they have minor limitations that narrow the choice of crops and have few special management needs. Other grades with lower ratings have progressively greater limitations.

Planning Area Soils

The soil types that have been identified within the planning area by the Yolo County Soil Survey (USDA, 1972) are listed in Table 4.5-3. The table contains two lists, the first of predominant soil types, and the second list of less frequently found soil types. Each of the soils' Capability Class, its common name, and its Storie Index are indicated. A generalized soil map of the planning area is presented in Figure 4.5-1.

Of the sixteen most prominent soils within the planning area, seven are identified by the USDA as Class I or II. The predominant Class I and II soils include Brentwood silty clay loam (BrA), Yolo silt loam (Ya), Marvin silty clay loam (Mf), Tehama loam (TaA), and Capay silty clay (Ca).

The highest quality soils in the area (Class I-1) are represented by the Brentwood silty clay loam (BrA) and Yolo silt loam (Ya) soil groups. Both of these loams are rated as Class I prime soils, with few limitations for agricultural use. Their Storie index is 81 (BrA) and 100 (Ya). These Class I-1 soils consist of very fine sandy loams to silty clay loams formed on fans in alluvium derived from mixed sources. They are well drained and fertility is moderately high to high. Soils in this unit are well suited to a wide range of row crops, forage crops, orchards, and dry farmed grain. Sugar beets, tomatoes, alfalfa, almonds, and barley are among the main crops.

TABLE 4.5-3: Soil Types within the Planning Area			
Map Symbol	**Soil Series Name**	**Capability Class**	**Storie Index**
Most Common Soils:			
BrA	Brentwood silty clay loam	I-1	81
Ca	Capay silty clay	IIs-5	50
CtD2	Corning gravelly loam	IVe-3	25
HcA	Hillgate loam	IVs-3	54
Lm	Loamy alluvial land	IVs-4	59
Mf	Marvin silty clay loam	IIs-3	65
Pb	Pescadero silty clay	IVw-6	35
Rg	Rincon silty clay loam	IIs-3	73
Rh	Riverwash	VIIIw-4	25
Sh	San Ysidro loam	IVs-3	50
SmF2	Sehorn-Balcom complex	VIe-5	14,22
Sn	Soboba gravelly sandy loam	IVs-4	25
So	Sycamore silt loam	IIw-2	76
TaA	Tehama loam	IIs-3	72
Wm	Willows clay	IIIw-5	34
Ya	Yolo silt loam	I-1	100
Least Common Soils:			
BaF2	Balcom silty clay loam	VIe-1	22
BaE2	Balcom silty clay loam	IVe-1	43
BdF2	Balcom-Dibble complex	VIe-1	22,19
CtE2	Corning gravelly loam	VIe-3	21
DbF2	Dibble clay loam	VIe-3	19
HdA	Hillgate loam	IIIs-3	63
Ms	Myers clay	IIs-5	51
Pb	Pescadero silty clay	IVw-6	35
Rb	Reiff gravelly loam	IIs-4	71
SkD	Sehorn clay	IIIe-5	41
SmD	Sehorn-Balcom complex	IIIe-5	41,62
SV	Sycamore complex	IIs-3	61-76
S1D	Sehorn cobbly clay	IVe-5	32
TaB	Tehama loam	IIe-3	69
Wn	Willows clay, marly variant saline-alkali	IVw-6	11
Yb	Yolo silty clay loam	I-1	90
Za	Zamora loam	I-1	95

Source: U.S. Department of Agriculture, Soil Conservation Service, 1972, Soil Survey of Yolo County, California.

Commonly found Class II soils within the area include Capay silty loam (Ca), Marvin silty clay loam (Mf), Rincon silty clay loam (Rg), Sycamore silt loam (So), and Tehama loam (TaA). These Class II soils generally consist of silt loams to silty clay loams. These soils formed on fans and in basins in alluvium derived from mixed sources. Fertility is moderately high to high. The Storie index of these soils ranges from 50 (Capay) to 76 (Sycamore). Soils in this unit are suited to row crops, forage crops, orchards, and dry farmed grain. Sugar beets, tomatoes, alfalfa, almonds, and barley are the main crops. Class II soils in the planning area are somewhat limited in their agricultural productivity by either shallow or strong soils, slow permeability of the subsoil, and poor drainage.

As already noted above, the USDA soil surveys do not designate any land as "prime farmland," although both the State Mining and Geology Board Reclamation Regulations (Section 3707 of CCR Title 14), and the Land Conservation (Williamson) Act, reference the USDA definition of prime agricultural lands. The draft Yolo County Surface Mining Reclamation Ordinance defines "prime agricultural land" as "all land zoned Agricultural Preserve and all land which meets the definition of prime agricultural set forth in Section 51201 of the Government Code of the State," which is the Williamson Act.

Past practice has been to consider all lands in Capability Classes I and II as "prime" farmland, as well as well as some Class III soils. According to the broad definition of "prime farmland" under the Williamson Act, all Class I and II soils found identified within the planning area by the USDA Soil Survey would be considered prime, plus all farmed soils that meet the criteria of $200 per year in annual gross revenues. Thus, some Class III or IV soils that have been planted with high value tree crops such as almonds could be considered prime under the Williamson Act.

According to the Yolo County Soil Survey, much of the soil within the planning area boundary is categorized as Capability Class I and II soils (Figure 4.5-1). Large expanses of Class I and II soils are found in the middle reaches of the Cache Creek drainage, on both the north and south side outside the channel designated in the Cache Creek Resource Management Plan. It is estimated that over 14,000 acres of the planning area are composed of these Class I and II soils.

There are also significant areas composed of non-prime soils within the planning area (Figure 4.5-1). The lesser quality soils found in the planning area include Willow clay (We), a Class III soil, and several Class IV soils, many of which are limited due to stony or gravelly conditions, slow permeability, and other factors.

The largest areas of non-prime soils are concentrated in the western end of the Cache Creek drainage, where the elevation begins to rise into the foothills and in the area east of the I-505 freeway along SR 16 to Jacob's Corner and the Woodland Airport. The predominant non-prime soils in the western end of the OCMP are Sehorn-Balcom complex (SmF2), Corning gravelly loams (CtD2 and CtE2), rated Class IV and VI soils. Along SR 16 the predominant soil is San Ysidro loam (Sh), which is rated a Class IV soil. There is

also a long, narrow band of Soboba gravelly sandy loam (Sn) and Loamy alluvial land (Lm) along the outer edges of the Cache Creek channel, both Class IV soils.

California Department of Conservation (CDC)

In California, the CDC Prime Farmland Mapping and Monitoring Program has been working collaboratively with the USDA since 1980 to map many of the State's agricultural lands, on a county-by-county basis, according to their suitability for agricultural production. The CDC has prepared several Important Farmland Maps for Yolo County, with the most recent map updated in 1994. The maps are now updated by CDC every two years.

The CDC Important Farmland Map for Yolo County (CDC, 1994), similar to the USDA Soil Survey, indicates that over 11,000 acres of the MRZ-2 areas on either side of Cache Creek are designated as Prime Farmland (Figure 4.5-2). CDC defines "prime farmland" as:

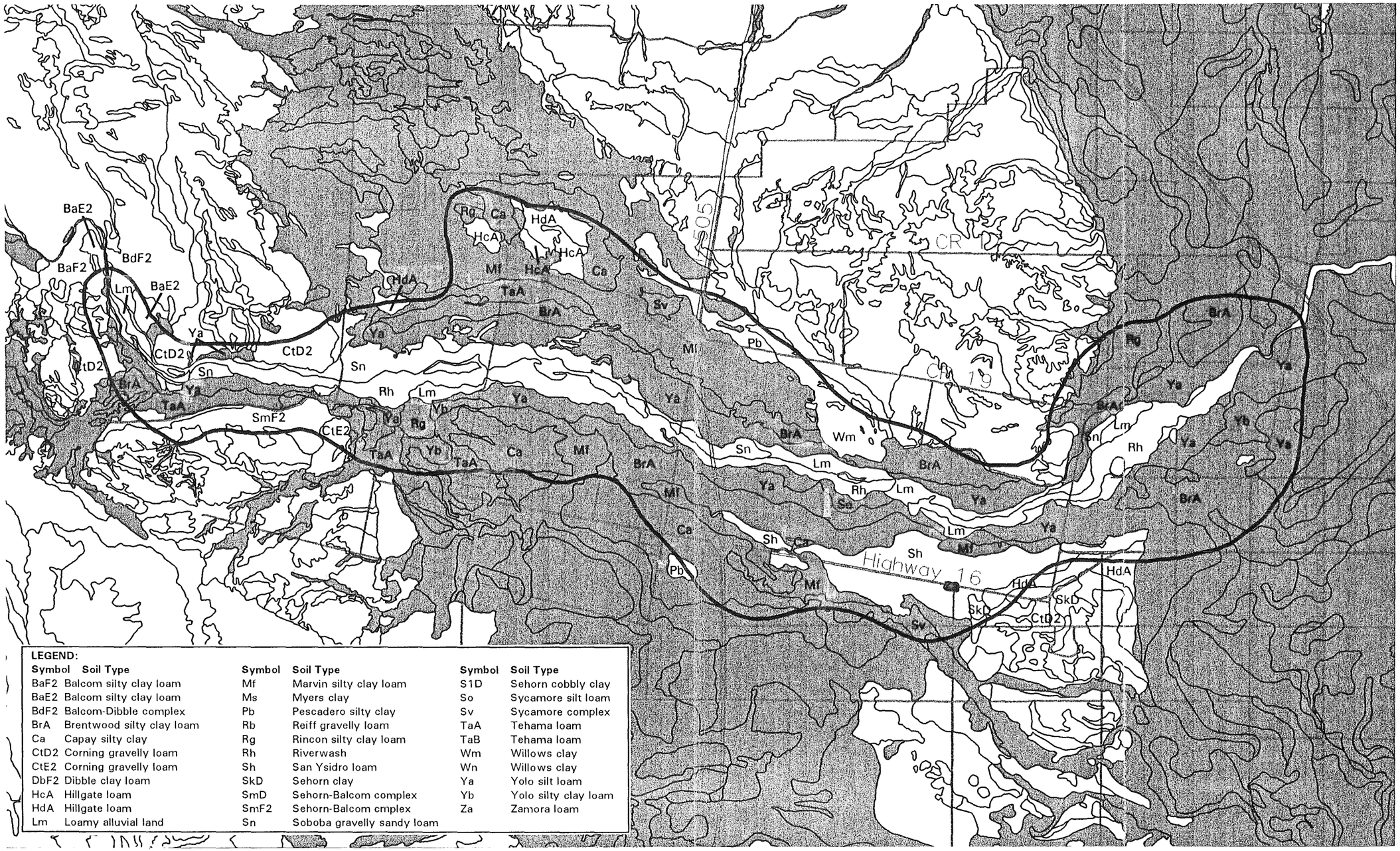
> [L]and which has the best combination of physical and chemical characteristics for the production of crops. It has the soil quality, growing season and moisture supply needed to produce sustained high yields of crops when treated and managed, including water management, according to current farming methods. Prime farmland must have been used for the production of crops at sometime during the last two update cycles prior to the mapping date. It does not include publicly owned lands for which there is an adopted policy preventing agricultural use.

The farmland mapping of the planning area indicates other large areas of significant agricultural land, including Farmland of Statewide Importance. These lands generally have a good combination of physical and chemical features for the production of agricultural crops but do not meet the requirements for Prime Farmland designation. Relatively small areas of these lands are designated in north of the creek. The designation Unique Farmland applies to lands of lesser soil quality that are, nonetheless, used for production of leading cash crops. One large area south of Cache Creek is designated as Unique Farmland, corresponding to the USDA-identified San Ysidro loam soils along SR 16 near Jacobs Corner. The least productive soils in the western end of the planning area are designated as Farmlands of Local Importance (quality lands that are not currently irrigated), Grazing Land, and Other lands (primarily areas within and adjacent to the Cache Creek channel).

Williamson Act and Yolo County SMRO

The Williamson Act and both the existing and draft Yolo County Surface Mining Reclamation Ordinances' definition of prime farmland are similar. Prime farmlands are defined as:

- All land that qualifies as Class I or Class II in the Soil Conservation Service land use capability classifications.
- Land that qualifies for ratings 80 through 100 in the Storie Index Rating.



LEGEND:

Symbol	Soil Type	Symbol	Soil Type	Symbol	Soil Type
BaF2	Balcom silty clay loam	Mf	Marvin silty clay loam	S1D	Sehorn cobbly clay
BaE2	Balcom silty clay loam	Ms	Myers clay	So	Sycamore silt loam
BdF2	Balcom-Dibble complex	Pb	Pescadero silty clay	Sv	Sycamore complex
BrA	Brentwood silty clay loam	Rb	Reiff gravelly loam	TaA	Tehama loam
Ca	Capay silty clay	Rg	Rincon silty clay loam	TaB	Tehama loam
CtD2	Corning gravelly loam	Rh	Riverwash	Wm	Willows clay
CtE2	Corning gravelly loam	Sh	San Ysidro loam	Wn	Willows clay
DbF2	Dibble clay loam	SkD	Sehorn clay	Ya	Yolo silt loam
HcA	Hillgate loam	SmD	Sehorn-Balcom complex	Yb	Yolo silty clay loam
HdA	Hillgate loam	SmF2	Sehorn-Balcom cmplex	Za	Zamora loam
Lm	Loamy alluvial land	Sn	Soboba gravelly sandy loam		

Scale in Miles

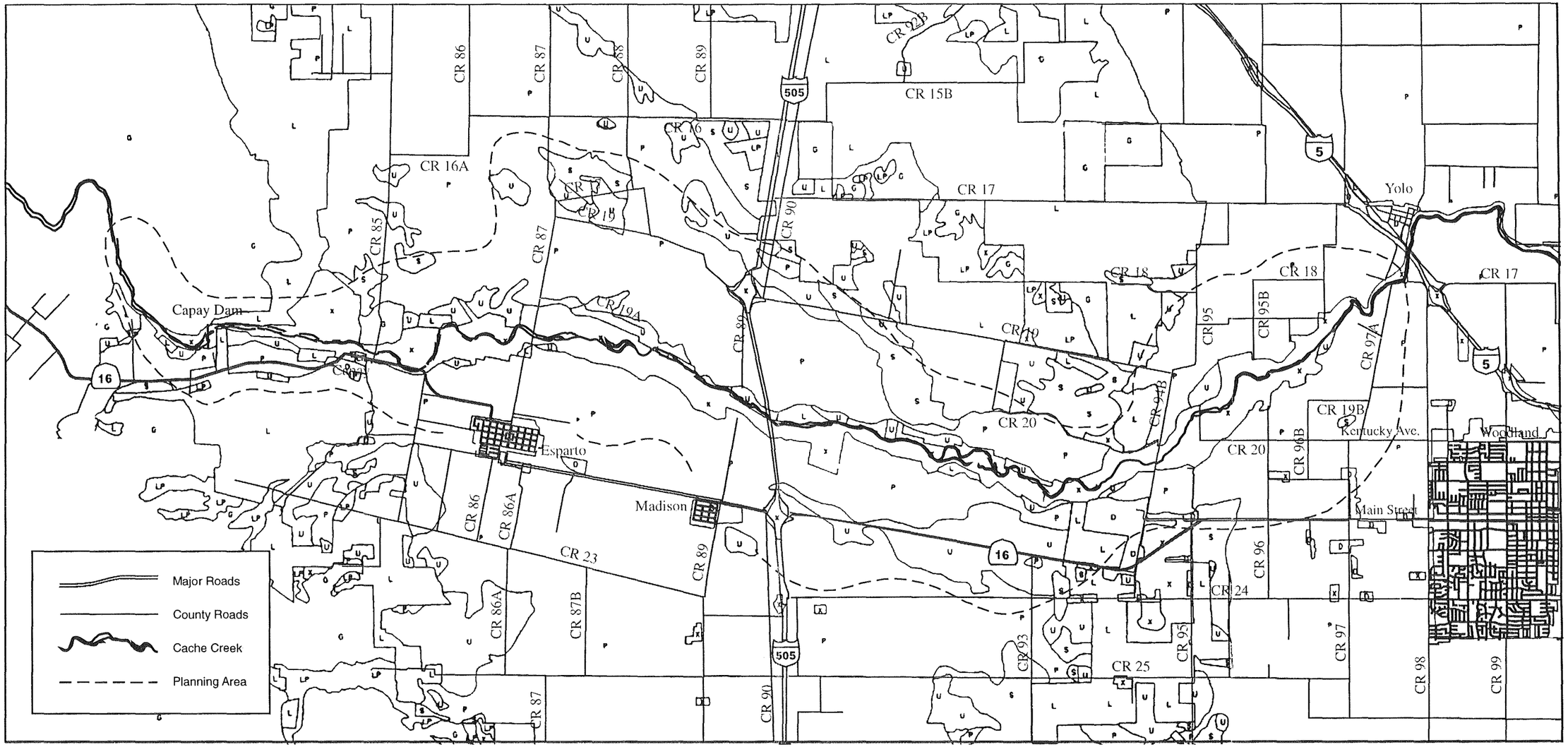
0 1 2

N

Capability Class I and II Soils

Figure 4.5-1 Site Soils

SOURCE: USDA, 1972



N

Scale in Miles

0 1 2

P PRIME FARMLAND
Land with the best combination of physical and chemical features for the production of agricultural crops.

S FARMLAND OF STATEWIDE IMPORTANCE
Land with a good combination of physical and chemical features for the production of agricultural crops.

U UNIQUE FARMLAND
Land of lesser quality soils used for the production of the State's leading agricultural cash crops.

L FARMLAND OF LOCAL IMPORTANCE
Cultivated farmland having soils which meet the criteria for Prime or Statewide, except that the land is not presently irrigated, and other nonirrigated farmland.

LP LOCAL POTENTIAL FARMLAND
Prime or Statewide soils which are presently not irrigated or cultivated.

G GRAZING LAND
Land on which the existing vegetation is suited to the grazing of livestock.

D URBAN AND BUILT-UP LAND
Land occupied by structures or infrastructure to accomodate a building density of at least one unit to one and one-half acres, or approximately six structures to ten acres.

X OTHER LAND
Land which does not meet the criteria of any other category.

W WATER
Water bodies of 40 or more acres in size.

Figure 4.5-2 Important Farmlands Map

SOURCE: CALIFORNIA DEPARTMENT OF CONSERVATION, AND FARMLAND MAPPING AND MONITORING PROGRAM, 1994

- Land that supports livestock used for the production of food and fiber and which has an annual carrying capacity equivalent to at least one animal unit per acre as defined by the USDA.

- Land planted with fruit or nut bearing trees, vines, bushes or crops that have a nonbearing period of less than five years and that will normally return during the commercial period on an annual basis from the production of unprocessed agricultural plant production not less than $200 per acre.

- Land that has returned from the production of unprocessed agricultural plant products an annual gross value of not less than $200 per acre.

The only low value crops cultivated on agricultural soils in Yolo County that would not meet the $200 per acre gross annual receipts criteria are some grain crops, such as barley, oats and volunteer hay, according to the per acre yield data published by the Yolo County Agricultural Commissioner.

Regulatory Setting

SMARA and Related Regulations

The State of California regulates reclamation of surface-mined areas through the Surface Mining and Reclamation Act (SMARA) of 1975, as amended. While SMARA does not contain detailed provisions concerning the reclamation of mined land for agricultural purposes, Section 2712 states:

> It is the intent of the Legislature...to assure that...mined lands are reclaimed to a usable condition which is readily adaptable for alternative land uses.

Section 2773 specifies that site-specific reclamation plans are required and also mandates that statewide reclamation standards be established, including standards for "[p]rime and other agricultural land reclamation" and standards for "[t]opsoil salvage, maintenance, and redistribution." The section further states that "[t]hese standards shall apply to each mining operation, but only to the extent that they are consistent with the planned or actual subsequent use or uses of the mining site."

Guidelines for implementation of the surface mining and reclamation provisions contained in SMARA were promulgated by the State Mining and Geology Board (SMGB) in CCR Title 14. The regulations provide detailed requirements pertaining to reclamation, including performance standards for prime agricultural land reclamation and performance standards for other agricultural land. The OCMP and related mining ordinances are consistent with SMARA by requiring (Action 5.4-3) conformance of all mining projects with SMARA and the SMGB reclamation requirements.

Yolo County General Plan

Several goals and numerous policies and elements of the Yolo County General Plan are relevant to the proposed OCMP. In particular, the General Plan's stated goals include:

- Wise land use based on both physical and social characteristics of the County;
- Protection of prime and other agricultural land from urban development; and
- Establishment of natural and wildlife areas (preserves).

Land use policies of the General Plan that are especially relevant to the proposed OCMP are listed below. The majority of the policies are provided verbatim; some lengthy policies are summarized and, if so, are indicated as such.

LU 6 It is the policy of Yolo County to vigorously conserve and preserve the agricultural lands in Yolo County. Yolo County shall protect and conserve agricultural land use especially in areas presently farmed or having prime agricultural soils and outside of existing planned urban communities and outside of city limits.

The OCMP and accompanying ordinances contain policies and regulations that require lands disturbed by mining to be reclaimed to agricultural and open space uses. The productivity of the mined lands reclaimed to agriculture would be monitored to ensure that it equals or exceeds the productive capacity of the land before mining commenced.

LU 7 Non-agricultural land use activities are prohibited from agriculturally designated areas in Yolo County except as defined in policies LU 12, LU 17, LU 18, LU 19 (reserved for future use), and LU 46.

LU 8 (Williamson Land Conservation Program) and LU 9 (Agricultural Preserve Zoning). In summary, these policies provide for adoption by the County of the Williamson Act Land Conservation Program, and for application of Agricultural Preserve (A-P), zoning to all lands which qualify for an agricultural preserve contract.

The exceptions defined in policies LU 12, LU 17, LU 18, and LU 46 do not directly apply to the OCMP. Aggregate mining is a permissible use for agricultural lands zoned General Agriculture. Mining is currently restricted in areas zoned Agricultural Preserve to mining operations necessary for erosion control.

The OCMP contains policies that recommend amendments to the Agricultural Preserve (A-P) zoning regulations to allow mining.

Open space policies of the General Plan that are particularly relevant to the proposed project include:

OS 1 Yolo County shall preserve appropriate open space land through available means of land use controls, regulations, and advice or guidance and through coordination with the other elements of this General Plan, as amended, and with other agencies.

OS 2 In summary, this policy states that Yolo County shall use diverse policies and other regulatory means to preserve open space. This policy defines "open space" to include areas used for managed resource production including agricultural land and areas containing major mineral deposits, including sand and gravel clays.

OS 3 Yolo County shall preserve agricultural land as the principal component of open space.

The OCMP contains several policies to ensure that agricultural lands would be returned to agricultural use, or other open space uses, under an approved reclamation plan. Agricultural or open space uses of the reclaimed lands would conform with these policies.

Conservation policies of the General Plan that are particularly relevant to the OCMP include:

CON 5 This policy states, in part, that "Yolo County shall require conservation of natural resources in the development and managed utilization including... the reclamation of lands and waters."

CON 11 Yolo County shall encourage the highest agricultural use of good agricultural soils and the development of acceptable agricultural industry.

CON 12 Yolo County shall regulate land use and encourage and cooperate with appropriate agencies to conserve, study, and improve soils. Prime soils shall be preserved outside of designated urban areas.

Mining allowed under the OCMP would result in temporary and long-term disturbance of prime soils in portions of the off-channel mining area. Required reclamation plans must include measures to preserve and reuse agricultural soils. Potentially significant impacts on prime farmland are described in Impacts 4.5-1, 4.5-2, and 4.5-7.

CON 13 This policy states, in part, that "Yolo County shall regulate development to avoid degradation of land forms through non-agricultural grading..."

The OCMP and the accompanying reclamation ordinances require specific measures for reclamation of agricultural lands disturbed by grading during mining and reclamation.

Yolo County Zoning Ordinance

The main issue of consistency of the OCMP with the Yolo County Zoning Ordinance with regards to agricultural zoning deals with the need to revise the Agricultural Preserve (A-P) zoning district requirements to allow mining on lands under active Williamson Act contract. The current zoning code restricts mining on A-P lands to aggregate extraction required for erosion control only. Off-channel mining operations under the OCMP would not generally be performed for erosion control. Therefore, for mining to be permitted on these lands, a change in the zoning code is needed.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

The project would have a significant impact on agricultural resources if it would:

- Permanently convert prime agricultural soils to a non-agricultural use;

- Cause the loss of agricultural productivity or crop values that represent a major proportion of the County's production or value of crops;

- Impair or degrade the existing productivity of agricultural soils, or adversely affect agricultural resources and operations, in the planning area or county; or

- Conflict with adopted plans or policies of State and other agencies that seek to preserve or protect agricultural soils, lands, and operations.

Impact 4.5-1
Consistency with the California Land Conservation Act of 1965 (Williamson Act) Regulations

The Williamson Act is a State program that allows agricultural landowners to pay reduced property taxes in return for their contractual agreement to retain the land in agricultural and open space uses for period of ten years. The legal contract is signed between the landowner and the County. The specific land uses that are allowed on agricultural lands under Williamson Act contracts are regulated by State law (Government Code Section 51200 et seq). In general, uses on Williamson Act-contracted lands must be consistent with the intent of the law to conserve agricultural, open space, and natural resource lands.

A recent legislative amendment to the Williamson Act (AB 2663, Sher) was enacted in 1994. The new law added Section 51238.2 to the Government Code, which specifically addresses surface mining of contracted lands. The new requirements of Sections 51238.1 and 51238.2 restrict the types of uses that may be allowed on Williamson Act lands. Section 51238.1 states:

> Uses approved on contracted lands shall be consistent with all of the following principles of compatibility:
>
> (1) The use will not significantly compromise the long-term productive agricultural capability of the subject contracted parcel or parcels or on other contracted lands in agricultural preserves.
>
> (2) The use will not significantly displace or impair current or reasonably foreseeable agricultural operations on the subject contracted parcel or parcels or on other contracted lands in agricultural preserves. Uses that significantly displace agricultural operations on the subject contracted parcel or parcels may be deemed compatible if they relate directly to the production of commercial agricultural products on the subject contracted parcel or parcels or neighboring lands, including activities such as harvesting, processing, or shipping.
>
> (3) The use will not result in the significant removal of adjacent contracted land from agricultural or open-space use.

Section 51238.2 states:

> Mineral extraction that is unable to meet the principles of Section 51238.1 may nevertheless be approved as compatible use if the board or council is able to document that (a) the underlying contractual commitment to preserve prime land as defined in subdivision (c) of Section 51201, or (b)

the underlying contractual commitment to preserve nonprime land for open-space use as defined in subdivision (c) of Section 51201, will not be significantly impaired.

Conditions imposed on mineral extraction as a compatible use of contracted land shall include compliance with the reclamation standards adopted by the Mining and Geology Board pursuant to Section 2773 of the Public Resources Code, including the applicable performance standards for prime agricultural land and other agricultural land, and no exception to these standards may be permitted.

Draft OCMP and Implementing Ordinances

The off-channel mining applications being processed under the draft OCMP would result in disturbance of 2,256 acres of land, including 45 acres of borrow area. Within the area proposed for mining, approximately 1,523 acres are currently under Williamson Act contract and are zoned by Yolo County as Agricultural Preserve (A-P). The draft OCMP contains the following action, which addresses the need to revise agricultural zoning to permit mining in A-P zones:

Action 5.4-2: Revise the A-P (Agricultural Preserve) Zone to allow for the operation of surface mining on contracted land, in accordance with the provisions of the California Land Conservation (Williamson) Act. The primary purpose of the Williamson Act is to preserve open space, including agriculture, scenic areas, wildlife habitat, and recreational uses. Where surface mining operations propose to reclaim sites to one of the above uses, the land may remain in contract.

The implementing draft Surface Mining Reclamation Ordinance proposes specific uses that are compatible with Agricultural Preserves, in compliance with Sections 51238.1 and 51238.2 of the Williamson Act. One of the purposes of the draft Surface Mining Reclamation Ordinance is stated as follows:

The continued protection of agriculture and open-space uses is essential. As such, all off-channel, prime agricultural land and/or off-channel lands zoned Agricultural Preserve (A-P) shall either be reclaimed to an agriculturally productive state equal to or greater that which existed before mining commenced, or shall be reclaimed to those uses which are declared by the County to be compatible within agricultural preserves. Such uses include, but are not limited to, the following:

(1) Agriculture and range land;
(2) Groundwater storage and recharge areas;
(3) Fish, wildlife, and plant habitat;
(4) Watercourses and flood control basins;
(5) Recreational or open space lands.

The long-term mining applications that have been submitted to the County propose to reclaim mined lands to agriculture (row or tree crops), to open water areas, or to wildlife habitat. Perimeter slopes created as the result of land surface lowering of reclaimed agricultural fields caused by mining are generally identified as vegetated areas in reclamation plans. Approximately 830 acres of prime farmland, most of which is currently under contract, would be converted to non-agricultural uses under the long-term mining and reclamation plans. The non-agricultural uses proposed for reclaimed lands would be consistent with the uses that would be allowable under Action 5.4-2. The draft OCMP also

includes Action 5.4-3 that encourages the use of agricultural preserves and/or conservation easements. This Action statement could be modified to require mitigation for conversion of contracted agricultural land to non-agricultural uses through temporary conservation easements on other agricultural lands, or the enrollment of non-contracted lands within the planning area, or the County, into the Williamson Act.

Both the draft OCMP and the two implementing ordinances (the Surface Mining and Off-Channel Mining Ordinances) contain performance standards by which surface mining and reclamation operations will be measured. These performance standards are in compliance with the reclamation standards required by the State Surface Mining and Reclamation Act (SMARA). Thus, the OCMP and implementing ordinances allowing mining and other specific reclamation uses on contracted lands would be consistent with the Williamson Act, including the provisions of the recent amendments (Sections 51238.1 and 51238.2), following adoption of the modification of the zoning code proposed by Action 5.4-2.

Alternative 1a: No Project (Existing Conditions) and
Alternative 1b: No Project (Existing Permits and Regulatory Condition)

Under Alternatives 1a and 1b, no OCMP would be adopted and surface mining would continue based on 1995 actual production levels of each producer. Under current regulations, mineral extraction is considered a compatible use in Agricultural Preserves by Yolo County only if the aggregate extraction is performed for erosion control. Reclamation to agricultural use is required for all mining on agricultural lands. None of the permitted off-channel mining will occur on lands currently zoned A-P or under Williamson Act contract.

Alternative 2: No Mining (Alternative Site)

Under Alternative 2, no OCMP would be adopted and all existing permits to mine and/or operate plants would be voided. Regional demand for PCC-grade aggregate material would be satisfied from reserves outside Yolo County. Reserves of marketable PCC-grade aggregates in alluvial environments outside Yolo County are generally located in areas of prime and other productive agricultural lands. Therefore, this alternative could induce the permanent conversion of prime and other agricultural land to non-agricultural uses outside the County.

Alternative 3: Plant Operation Only (Importation)

Under this alternative, no OCMP would be adopted, existing mining permits would be voided, but existing plants would continue to operate at approved levels. This alternative would be similar to Alternative 2 in its potential to induce farmland conversion outside of Yolo County, which could be inconsistent with the Williamson Act, depending on the local zoning regulations that have been adopted by the affected counties.

Alternative 4: Shallow Mining (Alternative Method/Reclamation)

Under this alternative, the OCMP would be modified to allow only shallow mining, and reclamation efforts would be assumed to be to primarily agricultural uses (80 percent). The remaining 20 percent would be reclaimed to habitat uses. All other proposals of the OCMP and the implementing ordinances would be adopted. Mineral extraction and reclamation to agricultural and open space uses would be considered compatible with the Williamson Act under Yolo County regulations. The permanent conversion of 442 acres under Williamson Act contract would result from this alternative. This permanent loss of contracted agricultural land could be partially mitigated by establishing temporary or permanent conservation easements on other agricultural lands, or by enrolling other non-contracted lands within the planning area, or the County, into the Williamson Act. The permanent conversion of agricultural lands to non-agricultural uses is analyzed in more detail in Impact 4.5-2 of this EIR.

Alternative 5a: Decreased Mining (Restricted Allocation)

Under Alternative 5a, the OCMP and its implementing ordinances would be adopted, but mining proposals would be restricted to one-half of the current annual allocation. It is assumed that 51 percent (564 acres) of contracted land would be converted to non-agricultural uses, including lakes and habitat restoration, due to access roads and slopes, and that reclamation of mined lands would be to agriculture, lakes, and habitat restoration. All other proposals of the OCMP and the implementing ordinances would be adopted. Mineral extraction and reclamation to agricultural and open space uses would be considered compatible with the Williamson Act under Yolo County regulations. The permanent loss of contracted agricultural land could be partially mitigated by establishing temporary or permanent conservation easements on other agricultural lands, or by enrolling other non-contracted lands within the planning area, or the County, into the Williamson Act. The permanent conversion of agricultural lands to non-agricultural uses is analyzed in more detail in Impact 4.5-2 of this EIR.

Alternative 5b: Decreased Mining (Shorter Mining Period)

Under Alternative 5b, the OCMP and its implementing ordinances would be adopted, but individual mining permits and renewal periods would be shortened. As under Alternative 5a, it is assumed that 51 percent (777 acres) of contracted agricultural land would be converted to non-agricultural uses, including open water areas, access roads, and slopes and habitat restoration. All other proposals of the OCMP and the implementing ordinances would be adopted. Mineral extraction and reclamation to agricultural and open space uses would be considered compatible with the Williamson Act under Yolo County regulations. The permanent loss of contracted agricultural land could be partially mitigated by establishing temporary or permanent conservation easements on other agricultural lands, or by enrolling other non-contracted lands within the planning area, or the County, into the Williamson Act. The permanent conversion of agricultural lands to non-agricultural uses is analyzed in more detail in Impact 4.5-2 of this EIR.

Alternative 6: Agricultural Reclamation (with Mining Operations as Proposed)

Under Alternative 6, the OCMP would require a minimum performance standard of 80 percent agricultural reclamation. All other requirements of the implementing ordinances would be adopted. Approximately 1,050 acres of contracted agricultural land would be converted to non-agricultural uses. Extensive earth-borrowing from adjacent non-mining areas would be required in order to generate pit-fill material; these earth-borrow areas themselves would require reclamation to predominantly agricultural uses. Mineral extraction and reclamation to agricultural and open space uses would be considered compatible with the Williamson Act under Yolo County regulations. The permanent conversion of contracted agricultural land could be partially mitigated by establishing temporary or permanent conservation easements on other agricultural lands, or by enrolling other non-contracted lands within the planning area, or the County, into the Williamson Act. The permanent conversion of agricultural lands to non-agricultural uses is analyzed in more detail in Impact 4.5-2 of this EIR.

Mitigation Measure 4.5-1a (OCMP, A-4, A-5a, A-5b, A-6)

None required.

Mitigation Measure 4.5-1b (A-1a, A-1b)

None warranted, since no significant impacts have been identified. Existing mining operations would continue with no changes. The existing permits would not be subject to the compatibility requirements of Sections 51238.1 and 51238.2 of the Williamson Act, since mining would not occur on contracted lands.

Mitigation Measure 4.5-1c (A-2, A-3)

None required. All responsible agencies would be responsible for adopting zoning restrictions that specify compatible mining and reclamation uses consistent with the California Land Conservation Act of 1965.

Implementation of this mitigation would reduce this impact to a less-than-significant level for Alternatives 2 and 3.

Impact 4.5-2
Potential Impact of Permanent Loss of Agricultural Land Caused by Conversion of Agricultural Land to Other Post-Reclamation Uses

The planning area is defined on the basis of the Mineral Resource Zones identified by the California Division of Mines and Geology for Portland Cement Concrete grade aggregate resources within the lower Cache Creek basin (Figure 3.2-2). Approximately 66 percent of the total planning area is classified as MRZ-2 indicating that available subsurface information confirms the presence of valuable aggregate resources.

Current and past aggregate mining in the area have focused on the extraction of sand and gravel from in-stream mining operations. Aggregate mining also is occurring in off-channel locations within the planning area. The off-channel operations are located on terrace surfaces above and along the active channel. Mining of these areas requires the removal and stockpiling of overburden sediments that overlie the sand and gravel deposits. The overbank deposits are not marketable aggregate resources. However, the fine-grained sediments, deposited during past flooding events, provide the parent material on which high quality agricultural soils have developed. These soils, combined with the favorable climate and available water supply of the area, have encouraged productive agricultural development of the terrace surfaces.

The proposed mining of the aggregate would result in the significant loss of volume of subsurface materials. The potential for reclamation of the off-channel mining pits back to agricultural use is dependent on the depth of excavation. Pits excavated to depths below the groundwater level in excess of the thickness of the overburden sediments at the site would require that either 1) the pits are reclaimed to open water uses or 2) appropriate backfill materials are imported to supplement the available on-site sediments.

If agricultural areas subject to mining are reclaimed to non-agricultural uses (such as open water), a permanent loss of agricultural productivity would occur. When mining pits are backfilled and returned to agricultural use, the previously existing ground surface is lowered (a distance dependent on the depth of mining and the position of the groundwater table). Lowering of the surface creates perimeter slopes. The gradient of the slopes proposed by the mining applications (required by SMARA to be not greater than 2:1) is generally too steep to allow agricultural activity typical of that currently practiced in the lower Cache Creek basin on the slopes. Whereas some crops, such as vineyards, could be developed on these steep slopes, the practicality of this type of agriculture is limited. The relatively small area covered by the slope and the dissimilarity of the topography and crops from conditions in adjacent areas do not promote efficient farmland management. In addition, conventional farming practices, including tilling and agricultural chemical use, can present water quality impacts for lakes surrounded by the slopes. Thus, even when reclamation is to agricultural use, a net loss of agricultural land is expected for areas occupied by perimeter slopes.

Draft OCMP and Implementing Ordinances

The proposed project would permit the excavation and reclamation of off-channel mining pits in areas currently under agricultural production. The OCMP does not require that reclamation of mining areas in agricultural areas result in these areas being returned to agricultural production. The OCMP could, therefore, result in the permanent conversion of prime and non-prime agricultural land to non-agricultural uses.

Five long-term mining/reclamation applications are currently under environmental review by the County. These applications would be approved only if they were determined to be in compliance with the OCMP and related ordinances. A sixth mining/reclamation

application, anticipated for analysis purposes to be submitted within the next five years, would also be subject to the requirements of the OCMP and its related ordinances. In addition to these proposed mining operations, the long-term applications include the re-zoning of an additional 676 acres of land, which could result in off-channel mining of these areas. The proposed projects and a possible application for off-channel mining operations at a sixth site, could potentially result in the cumulative disturbance of 2,256 acres of land during mining operations (including a 45-acre borrow area). All of these potentially mined areas, totaling 2,932 acres, are close to Cache Creek on lands that include prime (Class I and II) and non-prime (Class III and IV) soils as mapped by the Soil Conservation Service (USDA, 1972).

The two largest long-term mining applications (Syar and Solano Concrete) propose to mine 1,332 acres of farmland south of Cache Creek, east and west of the I-505 freeway. The 1,332 acres consist primarily of Class I [Brentwood silty clay loam (BrA) and Yolo silty loam (Ya)] and Class II (Capay silty loam (Ca) and Marvin silty clay loam (Mf)) soils. All of the Syar mining area (734 acres) is designated as prime farmland by the California Department of Conservation (CDC). Approximately 87 percent (522 acres) of the Solano mining area is designated by CDC as "Prime Farmland"; the remaining land (located adjacent to the Cache Creek channel) is classified as "Other Land" and "Farmland of Local Importance."

The next largest mining area is the Cache Creek Aggregates property located in the western portion of the planning area, north of Cache Creek. The 360 acres to be mined are composed of mostly Class IV soils (Soboba gravelly sandy loam and Loamy alluvial land) (Figure 4.5-1). The North central portion (approximately 38 acres) of this site contains Class I Yolo sandy loam and is designated by CDC as "Prime Farmland." The western portion is designated as "Grazing Land"; the southern margin of the site along Cache Creek is "Other Land." The remaining portions of the site are designated as "Land of Local Importance" and "Unique Farmland."

The Teichert-Esparto application proposes mining of 283 acres of land made up of primarily of Class I (Yolo silt loam) and Class IV (Loamy alluvial land) soils. The northern portion of the site (approximately 45 acres) is designated as "Prime Farmland"; the central portion is "Unique Farmland"; and the southern portion is "Other Land" along Cache Creek.

The Teichert-Woodland application includes three separate mining areas near the County Road 94B crossing of Cache Creek. The western and northern portions (approximately 91 acres) of the Muller property contain Class I Yolo and Brentwood soils; the central portion contains Class IV Soboba and Loamy alluvial land. The northwestern and central portions (approximately 123 acres) are designated as "Prime Farmland"; the eastern portion is "Unique Farmland." The entire Coors property (approximately 101 acres), located north of the creek and west of County Road 94B, contains Class I Yolo and Brentwood soils and the entire site is designated as "Prime Farmland." The majority (56 acres) of the Storz property contains Yolo sandy loam. Approximately 50 acres of the site is designated "Prime Farmland"; the remainder of the site is designated "Unique

Farmland." The three areas (totaling 676 acres) that are proposed for rezoning include a mix of prime (Class I and II) and non-prime (Class IV) soils.

The 1972 USDA Soil Survey for Yolo County provides generalized mapping of soil characteristics within the planning area. However, much more detailed soil analysis is required for individual sites within the OCMP to determine the exact composition and limitations of soils proposed for mining and reclamation. Individual mining company applicants under the OCMP would retain a qualified agricultural consultant to verify the USDA soil survey and offer more detailed analysis of the soil properties within the permit area. More detailed soil surveys, including more extensive soil sampling and chemical analysis, have been required by the County for all long-term mining applications.

The site-specific soil investigations may present information that either confirms or conflicts with the characterization of conditions presented in the SCS soil survey or the CDC farmland mapping of the planning area. The productivity of farmland is dependent on a number of factors, including soil conditions, site drainage, and availability of irrigation water. In addition to these physical conditions, agricultural productivity is dependent on appropriate farm management. Many areas that have suitable conditions for farming, but are not classified as prime agricultural land by CDC or prime soils, can meet the requirements for prime agricultural land under the Williamson Act.

The mining of the proposed projects and the Schwarzgruber property would result in the disturbance of 2,256 acres of land, the majority of which is under some form of agricultural production. The combined reclamation plans would return 1,143 acres to agricultural production following mining, including 642 acres to row crops, 456 acres to tree crops, and 45 acres to pasture land. Approximately 1,223 acres of existing farmland would be reclaimed to non-agricultural uses, including open water bodies (771 acres), habitat (273 acres), and vegetated slopes and permanent roads (179 acres). The net result would be the approximate loss of 1,223 acres of agricultural land.

The total area of prime farmland (under each of the definitions described above) that would be converted to non-agricultural use cannot be definitively determined. However, the potential loss can be approximately estimated by the expected conversion of land that is designated as containing Class I and Class II soils by the SCS. Permanent conversion of approximately 830 acres of Class I and Class II soil would be the combined effect of the five reasonably foreseeable projects. Most of these lands are designated as "Prime Farmland." The rezoning of approximately 676 acres of land for potential future mining would likely result in additional loss of Class I and Class II soils. The amount of this loss would depend on the type of reclamation proposed by mining projects on these lands.

The OCMP proposes the following policies that relate to the potential permanent conversion of agricultural land to non-agricultural uses:

Goal 5.2-1: Improve soil and water resources so that a diverse agricultural economy, supporting a variety of crops and products, is maintained.

Obj. 5.3-1: Encourage the preservation of prime and important farmland along Cache Creek, while giving consideration to other compatible beneficial uses, such as groundwater storage and recharge facilities, surface mining operations, riparian habitat, and public recreation.

These goals are supported by the following Actions:

Action 5.4-3: Provide for the protection of farmland within the planning area, including mined and reclaimed farmland through the use of agricultural preserves and/or conservation easements.

This Action is not specific as to how agricultural land would be protected from permanent conversion to non-agricultural uses. A practical Performance Standard shall be added to the OCMP that would minimize or provide offset for the conversion of agricultural land to non-agricultural use.

Action 5.4-4: Ensure that all proposed surface mining operations that include reclamation to agricultural uses comply with the requirements of the Land Conservation (Williamson) Act and the State Mining and Geology Board Reclamation Regulations.

The Williamson Act and SMGB Reclamation Regulations require that mined areas within prime agriculture land, defined most conservatively by the Williamson Act, be reclaimed to an agricultural use that is as productive as the pre-mining condition. The OCMP shall include a Performance Standard that requires conformance of reclamation plans with this requirement. The Performance Standard shall acknowledge that the removal of aggregate resources, without importation of additional backfill, results in a net lowering of the land surface during reclamation and the consequent permanent conversion of agricultural land to slopes that do not, generally, permit agricultural use. The steepness and limited area covered by the slopes restrict the practicality of returning these areas to agricultural production. The permanent loss of agricultural land would be a significant and unavoidable impact.

Alternative 1a - No Project (Existing Conditions)

Under this alternative, aggregate production within the planning area by each permitted operator would be allowed to continue at a production rate that is equal to the 1995 production until permitted reserves are exhausted. Mining in the area would include current permitted in-channel and off-channel operations. Under current regulations, reclamation to agricultural use would result in the loss of 37 acres due to perimeter slopes. Although the majority of agricultural land would be returned to agriculture, the construction of perimeter slopes and the associated permanent loss of agriculture land is expected. The permanent conversion of agricultural land to non-agricultural use is a significant and unavoidable impact.

Alternative 1b - No Project (Existing Permits and Regulatory Condition)

This alternative would allow continued mining within the planning area under current regulations; mining would be allowed based on currently approved maximum production

allocations for each permitted operator. As described for Alternative 1a, the mining would likely occur in both in-channel and off-channel areas until permitted reserves are exhausted. This mining has already been determined to result in loss of agricultural land (approximately 37 acres) to perimeter slopes, even though current requirements to reclaim mined lands to agriculture are in effect. The permanent conversion of agricultural land to non-agricultural use is a significant and unavoidable impact.

Alternatives 2 - No Mining (Alternative Site) and
Alternatives 3 - Plant Operation Only (Importation)

Under Alternatives 2 and 3, no future aggregate mining would occur in the planning area. No permanent loss of additional agricultural land within the project area would result. However, given the general relationship of marketable PCC-grade aggregate reserves to alluvial environments, and the corresponding relationship of valuable agricultural lands to these same environments, the permanent conversion of agricultural lands to non-agricultural uses could occur in some mining areas[2] outside of Yolo County. Although the amount of agricultural land converted to non-agricultural uses cannot be accurately estimated, any permanent conversion would be a significant impact.

Alternative 4 - Shallow Mining (Alternative Method/Reclamation)

The shallow mining option presented by this alternative would provide an opportunity to return more mined land to agricultural use than if deep mining were allowed. The reclaimed surfaces under this alternative would be greater than ten feet above the groundwater table, a condition favorable to agricultural reuse. However, perimeter slopes would result from the removal of the aggregate resources and the consequent lowering of the ground surface. This potential conversion of agricultural land to non-agricultural use would be a significant and unavoidable impact.

Alternative 5a - Decreased Mining (Restricted Allocation) and
Alternative 5b - Decreased Mining (Shorter Mining Period)

Under these alternatives, off-channel mining would be allowed in the project area. Both alternatives would likely result in off-channel mining on agricultural land and permanent conversion of agricultural land to non-agricultural use. Based on the assumption that 49 percent of areas disturbed by mining under these alternatives would be reclaimed to agriculture, a maximum of approximately 564 acres of agricultural land could be converted to non-agricultural uses. Any permanent conversion would be a significant and unavoidable impact.

[2]Aggregate reserves in Yuba County consist of tailings from historic hydraulic gold mining. Reserves at Maher Air Force Base underlie a military/industrial land use. In general, extraction of these resources would not, therefore, affect agricultural lands.

Alternative 6 - Agricultural Reclamation (with Mining Operations as Proposed)

This alternative would require that a minimum of 80 percent of mined lands would be reclaimed to agricultural use. An additional 2,994 acres would be used as borrow areas to provide sufficient overburden to reclaim mined lands to agriculture. Assuming that all mined and borrow land is in agriculture, up to 20 percent (approximately 1,050 acres) of disturbed agricultural land would be converted to non-agricultural use. This conversion would include land converted to perimeter slopes for lowered agricultural surfaces. This conversion would be a significant and unavoidable impact.

Mitigation Measure 4.5-2a (OCMP, A-4, A-5a, A-5b, A-6)

The following Performance Standards shall be included in OCMP and incorporated into the surface mining ordinances to reduce but not eliminate the impact of potential permanent conversion of prime agricultural lands to non-agricultural post-reclamation use:

Performance Standard 4.5-8: All proposed mining and reclamation plans shall provide information in permit applications to allow identification of portions of the proposed mined lands that meet the definition of "prime farmlands" as defined under the Williamson Act.

Performance Standard 4.5-9: All mining permit applications that include "prime farmlands" as defined by the provisions of the Williamson Act shall identify the location and acreage of "prime farmlands" which, as a result of reclamation, would be permanently converted to non-agricultural uses. For each acre of "prime farmland" that would be converted to non-agricultural use, the reclamation plan shall present provisions to offset (at a 1:1 ratio) the conversion of these lands. The potential offsets can include, but not be limited to one or more of the following options:

- *Identification of improvements by a qualified soil scientist to the agricultural capability of non-prime lands within or outside the project site that convert non-prime to prime agricultural conditions. These improvements can include permanent improvement of soil capability though soil amendments, reduction of soil limitations (such as excessive levels of toxins), or improvements in drainage for areas limited by flooding or low permeability soils.*

- *Placement of permanent Agricultural Preserve easements on lands meeting Williamson Act definition of "prime farmland" ~~that are not currently under Williamson Act contract.~~*

- *Demonstration of the ability to provide irrigation to non-prime lands limited only by lack of irrigation water supply. The identified water supply cannot be made at the expense of "prime farmlands" currently using the same water supply.*

Mitigation Measure 4.5-2b (A-2, A-3)

None required. However, agencies regulating aggregate mining projects in agricultural areas outside Yolo County should consider adopting regulations similar to Performance Standard 4.5-9 to reduce the impacts of permanent conversion of agricultural land to non-agricultural uses.

Mitigation Measure 4.5-2c (A-1a, A-1b)

None available. The impact of loss of agricultural land would be significant and unavoidable.

Implementation of the above measures where available would reduce but not eliminate this impact for the OCMP and all alternatives. This impact would remain significant and unavoidable.

Impact 4.5-3
Potential Impacts of the Temporary Loss of Agricultural Productivity Due to Disturbance by Mining

Aggregate resources on agricultural lands within the planning area could be excavated in the future by off-channel mining operations. Although reclamation of mining areas back to agricultural uses is encouraged, the entire mining area would be disturbed during the course of mining. Reclamation to agriculture could also require excavation of "borrow" areas in lands adjacent to or near the mining sites if sufficient backfill materials are not available at the mining site to complete reclamation. The disturbance of agricultural land during mining and reclamation would preclude agricultural production on those lands during that period.

Draft OCMP and Implementing Ordinances

A total of 2,211 acres of agricultural land is proposed to be mined within the planning area, according to the five long-term mining applications that have been filed with the County, plus a sixth application (Schwarzgruber) that is anticipated to be filed within the next five years (Table 4.5-4). The mining area includes approximately 1,690 acres of land with Class I and Class II soils, most of which are designated as "Prime Farmland." In addition, three requests have been filed with the County to rezone an additional 676 acres to the S-G Reserve (Sand and Gravel Reserve) zone overlay, to allow for future mining.

Under the OCMP, a total of 2,887 acres (11 percent) of the approximate 26,300-acre OCMP planning area could be available for mining proposed for aggregate mining in the foreseeable future. Essentially all of the proposed mining areas are located on lands currently supporting or potentially supporting agriculture. Although active mining of this land would not be expected to be occurring simultaneously, the mined areas would be considered disturbed until reclamation is completed. The expected mining phasing described in Section 4.2 indicates that mining and reclamation activities in the year 2016 would represent an approximate maximum area of disturbed acreage. Approximately 821 acres would be disturbed during 2016 and would represented a reasonable maximum temporary loss of potentially productive agricultural land that could occur in any given year as a consequence of the OCMP. This acreage represents one percent of the approximate 566,696 acres of land that were in agricultural production in Yolo County in 1992. Assuming that all disturbed farmlands could support tomato crop production, and that the

1994 average value for tomato crops was $1,695 per acre, the maximum annual loss for prime lands removed from production would be $1.4 million.

Table 4.5-4. Anticipated Conversion of Productive Agricultural Lands Due to OCMP Projects

Name	Total Acres To Be Mined	Acres To Be Reclaimed for Agriculture	Haul Roads/Slopes	Acres To Be Reclaimed for Other Uses	Net Loss of Agricultural Land
Solano Concrete	598	346[1]	26	226	252
Syar	734	413	74	247	321
Collet	360	114	28	218	246
Teichert-East	148	0	19	129	148
Teichert-West	283	115	32	136	168
Schwarzgruber	88	0	0	88	0
Subtotal	2211	988	179	1044	1135
Rezonings					
Stephens	296	N/A	N/A	N/A	N/A
Lowe	250	N/A	N/A	N/A	N/A
Syar	130	N/A	N/A	N/A	N/A
Subtotal	676	--	--	--	--
TOTAL	2,887	988	179	1,044	1,135

N/A Acreages of reclaimed uses are not available for rezoning areas.

The OCMP presents the following policy related to the management of agricultural land:

Action 5.4-6: Encourage off-channel excavation operations to access additional aggregate reserves though the use of wet pits, in order to minimize the amount of agricultural land disturbed by mining.

This action would provide partial mitigation for the potential impact of temporary loss of agricultural land. To be more effective, the Action shall be supplemented by a performance standard that provides further practical measures for controlling the area and duration of disturbance of agricultural land.

Alternative 1a - No Project (Existing Conditions) and
Alternative 1b - No Project (Existing Permits and Regulatory Condition)

Under Alternatives 1a and 1b, all regulations in place as of the end of 1995 would continue, including the Yolo County Reclamation Ordinance and Yolo County Resolution 94-82. Aggregate production would be limited to the 1995 production rate for each active aggregate mining operation. Under this alternative, in-channel and off-channel mining

could be performed to meet these production rates. The temporary disturbance of agricultural lands (maximum of 543 acres, Table 4.5-5) due to mining would be more than under current conditions based on approved phasing. Although mitigated to the extent feasible under previous environmental analysis, this impact remained significant and unavoidable.

Table 4.5-5. Anticipated Conversion of Productive Agricultural Lands Due to Mining Alternatives

Alternative	Acreage Mined	Mined Acreage Reclaimed to Agricultural Use	Acreage Reclaimed to Non-Agricultural Use
OCMP	2,211	998	1,223
No Project (Existing Conditions)	543	202	47
No Project (Existing Permits)	543	202	47
No Mining (Alternatives Site)	0	0	0
Plant Operation Only	0	0	0
Shallow Mining	2,211	1,769	442
Decreased Mining (Restricted Allocation)	1,105	541	564
Decreased Mining (Shorter Mining Period)	1,105	541	564
Agricultural Reclamation	5,250	4,200	1,050

(1) Includes 294 acres of in-channel mining that were not previously in agricultural use.

Under this alternative, all regulations in place as of the end of 1995 would continue, and the existing mining permits (mostly within the Cache Creek channel) would continue to be exercised. The anticipated disturbance of agricultural lands (maximum of 249 acres) due to mining would be more than under current conditions based on approved phasing. Although mitigated to the extent feasible under previous environmental analysis, this impact remained significant and unavoidable.

Alternative 2 - No Mining (Alternative Site)

Under this alternative, all existing mining permits would be voided. Mining would occur elsewhere outside Yolo County, and finished aggregate would be trucked into the area. Under this alternative, it is assumed that reclamation of previously mined areas would continue under existing regulations and performance standards in the Yolo County Reclamation Ordinance and Yolo County Resolution 94-82. No additional farmlands within Yolo County would be disturbed due to mining. Out-of-County locations from which aggregate materials would be obtained could experience temporary losses of agricultural production. This would be a significant and unavoidable impact.

Alternative 3 - Plant Operation Only (Importation)

Under this alternative, all existing mining permits would be voided. Mining would occur elsewhere outside Yolo County, and raw aggregate would be trucked into the area for processing. Under this alternative, it is assumed that reclamation of previously mined areas would continue under existing regulations and performance standards in the Yolo County Reclamation Ordinance and Yolo County Resolution 94-82. Off-site locations from which aggregate materials would be obtained could experience temporary losses of agricultural production. This would be a significant and unavoidable impact.

Alternative 4 - Shallow Mining (Alternative Method/Reclamation)

Under this alternative, the OCMP would restrict all new mining to depths of no more than ten feet above groundwater. The mining area would not be expanded relative to the proposed projects. Reclamation of mined areas would occur under existing regulations and performance standards in the OCMP. This alternative would result in more disturbance to farmlands (approximately 2,211 acres) than under existing conditions. This would be a significant and unavoidable impact.

Alternative 5a - Decreased Mining (Restricted Allocation) and
Alternative 5b - Decreased Mining (Shorter Mining Period)

Under Alternatives 5a and 5b, existing mining operations would continue, but the OCMP would restrict mining. Each of the alternatives would include mining operations that would result in disturbance of approximately 1,105 acres. Most, if not all, of the mining would be in areas currently under agricultural use. Reclamation of mined areas would occur under existing regulations and performance standards in the OCMP. The temporary loss of agricultural productivity would be a significant and unavoidable impact.

Alternative 6 - Agricultural Reclamation (with Mining Operations as Proposed)

Under this alternative, the OCMP would set a minimum reclamation standard of 80 percent of agricultural reclamation. Up to 20 percent of the area disturbed by mining could be reclaimed to open space uses. Reclamation of mined areas would occur under existing regulations and performance standards in the OCMP. Additional agricultural lands would be disturbed as "borrow" acres to bring mined lands back to agricultural production. Relative to the mining and reclamation plans that have been submitted for the five long-term mining plans currently under review by the County, shallow mining would require an additional 2,994 acres of land to complete this reclamation. The total acreage of disturbed land (mining and borrow areas) would be approximately 5,250 acres over a 30-year period.

Mitigation Measure 4.5-3a (OCMP, A-4, A-5a, A-5b, A-6)

The following performance standard shall be added to OCMP and incorporated into the related ordinances to minimize the temporary loss of agricultural land to mining:

Performance Standard 5.5-3: All proposed mining and reclamation plans shall present a phasing plan for mining and reclamation activities. The phasing plan shall be structured to minimize the area of disturbed agricultural lands during each mining phase, and encourage the early completion of reclamation of agricultural land.

Implementation of the measure would not reduce the impact to a less-than-significant level.

Mitigation Measure 4.5-3b (A-1a, A-1b)

None available.

Mitigation Measure 4.5-3c (A-2, A-3)

None required. Agencies regulating aggregate mining projects in agricultural areas outside Yolo County should adopt performance standards, similar to Performance Standard 5.5-3 of the OCMP, to minimize the area and duration of disturbance of agricultural lands.

Implementation of the above mitigations where available would not reduce this impact to a less-than-significant level; this impact would be unavoidable and significant for the OCMP and all alternatives.

Impact 4.5-4
Permanent Loss of Agricultural Soils Due to Wind or Water Erosion

The loss of topsoil is a significant problem in agricultural areas. Topsoil is the organic-rich upper soil horizons that provide important nutrients vital to plant growth. During agricultural operations, topsoil is exposed during plowing and, in some cases, during cultivation. These disturbances can occur more than once per year. The exposed soils can be subject to erosion by wind and water. Under undisturbed conditions, the erosion potential for the majority of soils within the study area is slight to negligible. None of the soils is identified by the SCS as being susceptible to wind erosion. The low erosion potential is controlled by the cohesive nature of the surface soils and the generally flat to slightly sloping ground surface and related slow runoff rates. Potential mining within the planning area could result in the creation of slopes around mining areas that increase the potential for erosion by runoff. Soil exposed by mining, following the removal of vegetative cover, is more susceptible to erosion by wind and water. The side slopes of soil stockpiles created during mining can also be more susceptible to erosion for similar reasons. The potential impacts related to erosion were described in Impact 4.3-2. Mitigation measures to reduce erosion impacts would apply to all soils and sediments within the planning area disturbed by mining, including agricultural soils.

Exposure of the soil and sediment during mining and reclamation to trafficking by heavy equipment results in increased dust generation. The effects of mining on dust generation are described in Impact 4.7-1 in the Air Quality section of this EIR. Dust generation

represents the suspension and potential off-site transport of fine-grained soil particles. As such, the dust generation can result in wind erosion of the soil. Mitigation Measure 4.7-1a would reduce dust generation and, therefore, wind erosion of agricultural soils.

The potential for erosion of agricultural soils would also be reduced through stockpiling of these soils during mining and reclamation activities. When stored in appropriately managed stockpiles, the surface area of soil exposed to erosion would be reduce in comparison to the surface area exposed to periodic disturbance of soils in agricultural fields.

Draft OCMP and Implementing Ordinances

Aggregate mining under the OCMP would require that large amounts of topsoil be stored in large piles for extended period of time. It is difficult to quantify exactly how much topsoil would be expected to be lost due to wind and water erosion over time. The erosion would depend on the specific timing and management of soil removal and stockpiling activities proposed by individual projects. The OCMP includes a performance standard that serves to mitigate the potential soil erosion that could occur during stockpiling.

PS. 5.5-2 Topsoil stockpiles shall not exceed (40) feet in height, with slopes no steeper than 2:1 (horizontal:vertical). Stockpiles shall be seeded with a vegetative cover to prevent erosion and leaching. The use of topsoil for purposes other than reclamation shall not be allowed without the prior approval of the Community Development Director.

The policy addresses only topsoil stockpiles. Loss of subsoils (B-horizon) from stockpiles could significantly impact reclamation success.

Alternative 1a - No Project (Existing Conditions) and
Alternative 1b - No Project (Existing Permits and Regulatory Condition)

Under Alternatives 1a and 1b, all regulations in place as of the end of 1995 would continue. The requirements of these regulations for stockpile management would reduce the potential for loss of topsoil and other soils due to erosion of stockpiles. Erosion is also controlled by slope stabilization requirements. No further mitigation would be required.

Alternative 2 - No Mining (Alternative Site) and
Alternative 3 - Plant Operation Only (Importation)

Under Alternatives 2 and 3, mining would occur elsewhere outside Yolo County, and either raw or finished aggregate would be trucked into the area. Under this alternative, it is assumed that reclamation of previously mined areas would continue under existing regulations and performance standards in the Yolo County Reclamation Ordinance and Yolo County Resolution 94-82. This alternative would not result in any loss of soil to erosion related to mining activities and stockpile management within the project area. However, the potential for topsoil erosion related to agricultural activities would continue.

Improper management of soil during mining and reclamation activities in other areas could result in loss of agricultural soils.

Alternative 4 - Shallow Mining (Alternative Method/Reclamation)

Alternative 4 assumes that the OCMP would restrict all new mining to depths of no more than ten feet above groundwater. Reclamation of mined areas would occur under existing regulations and performance standards in the OCMP. This alternative would probably result in significant volumes of soil being exposed to erosion.

Alternative 5a - Decreased Mining (Restricted Allocation) and
Alternative 5b - Decreased Mining (Shorter Mining Period)

Under Alternatives 5a and 5b, off-channel mining operations would be permitted within the planning area. Reclamation of mined areas would occur under existing regulations and performance standards in the OCMP. Significant removal and management of agricultural soil would occur and the impacts identified for the OCMP alternative would also apply to these alternatives.

Alternative 6 - Agricultural Reclamation (with Mining Operations as Proposed)

Under this alternative, the OCMP would allow alternative forms of reclamation, such as water recharge basins or wildlife habitat, on a maximum of 20 percent of the mined lands. The OCMP would set a minimum reclamation standard of 80 percent of agricultural reclamation. Reclamation of mined areas would occur under existing regulations and performance standards proposed in the OCMP. These requirements could increase the potential for agricultural soil loss on the 2,994 acres of borrow area necessary to provide backfill for reclamation.

Mitigation Measure 4.5-4a (OCMP, A-2, A-3, A-4, A-5a, A-5b, A-6)

OCMP Action 5.5-2 shall be amended as follows to impose similar restrictions on the stockpiling of all soils, not just topsoil. Mining plans for areas outside Yolo County should also include a similar requirement.

> *Action 5.5-2: Topsoil, subsoil, and subgrade materials in stockpiles shall not exceed (40) feet in height, with slopes no steeper than 2:1 (horizontal:vertical). Stockpiles shall be seeded with a vegetative cover to prevent erosion and leaching. The use of topsoil for purposes other than reclamation shall not be allowed without the prior approval of the Community Development Director.*

Implementation of this mitigation would reduce this impact to a less-than-significant level for the OCMP and Alternatives 2, 3, 4, 5a, 5b, and 6.

Mitigation Measure 4.5-4b (A-1a, A-1b)

None required.

Impact 4.5-5
Potential Impacts on Agricultural Capability Caused by Soil Management During Removal, Stockpiling, and Reuse

The removal, handling, storage, and replacement of soil during excavation and reclamation could adversely affect the quality of the soil. Appropriate soil management is an important component of successful agricultural reclamation. Improper management soil practices can result in chemical, physical, and biological changes in soil, including loss of organic material, impairment of the microbial community, or mixing of soil horizons. In addition to these changes, the compaction of soil during mining and soil replacement can cause reduction in the permeability of soil, possibly causing drainage problems. Improper grading of reclaimed agricultural fields can adversely affect site drainage and irrigation, and thus productivity.

Draft OCMP and Implementing Ordinances

Under the OCMP, off-channel aggregate mining would occur in agricultural areas on the alluvial terrace along Cache Creek. The mining would require removal, stockpiling, and ultimate replacement of agricultural soils that overlie the aggregate resources. Proper management of these soils is critical to the success of agricultural reclamation. The management of these soils must include segregation of soil horizons to ensure that soil layering for reclaimed agricultural areas is similar to pre-mining conditions. Typical aggregate pit mining operations generally remove soil and overburden over an entire mining area, facilitating segregation of natural layering of the soil. The soil horizons can be recognized on the basis of color and pre-mining subsurface data, which indicates the depth range of individual soil horizons.

The OCMP includes the following policies that address appropriate management of soil during mining and reclamation:

Goal 5.2-1: Improve soil and water resources so that a diverse agricultural economy, supporting a variety of crops and products, is maintained.

Obj. 5.3-2: Ensure the use of appropriate agricultural management practices in reclaiming mined areas to productive farmland.

These policies, as they relate to management of agricultural soil resources, are supported by the following Performance Standards 5.5-1, 5.5-2, and 5.5-4, discussed below:

PS. 5.5-1: Soil shall be cut in maximum depths in order to minimize traffic and limit compaction. The handling and transportation of soil shall be minimized. All handling of topsoil shall be accomplished when the soil is dry in order to avoid undue compaction.

PS. 5.5-4: Where areas are to be reclaimed to agricultural usage, all A and B horizon soils shall be ripped to a depth of three (3) feet after every one (1) foot layer of soil is laid down, in order to minimize compaction.

Performance Standard 5.5-1 presents appropriate mitigation for management of soil resources by requiring that mining operations minimize the handling and transportation of soil. Performance Standard 5.5-4 provides sufficient mitigation of the potential for compaction of replaced soil and development of reduced permeability. Following completion of placement of the soil, operation of farm equipment could eventually result in the development of a compacted subsoil horizon (referred to as a "plow pan"). However, this is a problem for all agricultural fields in the area, which is not related to soil relocation. The performance standards provide adequate mitigation for the potential for compaction.

PS. 5.5-2: Topsoil stockpiles shall not exceed forty (40) feet in height, with slopes no steeper than 2:1 (horizontal:vertical). Stockpiles shall be seeded with a vegetative cover to prevent erosion and leaching. The use of topsoil for purposes other than reclamation shall not be allowed without the prior approval of the Community Development Director.

Performance Standard 5.5-2 sets appropriate guidelines for the design of soil stockpiles. The standard is supported by additional standards in SMARA (Section 3711) that require segregation of soil horizons and expedite reuse of soil. Although stockpiling of soil would be necessary for most mining operations, concurrent reclamation of mined lands during mining of other areas could reduce need to stockpile the soils. Prolonged stockpiling of A-horizon soils in thick piles can result in the adverse effects (oxygen-deficient environment) on microbial populations. Although the diversity of microbial species and their populations in soil removed from agricultural fields is typically low, expedited reuse would reduce the adverse effects on the existing populations.

Performance Standard 5.5-2, and the provisions of SMARA, would establish appropriate controls for stockpile management. The provision for restricting the use of topsoil for uses other than reclamation limits the potential for the topsoil from mining areas be removed from the area.

Alternative 1a - No Project (Existing Conditions) and
Alternative 1b - No Project (Existing Permits and Regulatory Condition)

Under these alternatives, all regulations in place as of the end of 1995 would continue. These regulations include the Yolo County Reclamation Ordinance and Yolo County Resolution 94-82. The Resolution includes requirements for soil segregation, stockpiling, and placement. These existing requirements would effectively mitigate the potential impacts of improper soil management in the absence of an OCMP.

Alternative 2 - No Mining (Alternative Site) and
Alternative 3 - Plant Operation Only (Importation)

Under these alternative, all existing mining permits would be voided. Mining would occur elsewhere outside Yolo County, and aggregate would be trucked into the area. Regulation of soil management during mining and reclamation in Yolo County would not be required. Mitigation of potential impacts on agricultural soils caused by mining would be provided by conformance with SMARA.

Alternative 4 - Shallow Mining (Alternative Method/Reclamation)

The restriction of mining depth in this alternative would not reduce the potential impacts of improper soil management. All mining, shallow or deep, requires the removal and management of surface soils. The provisions of SMARA and the OCMP would provide adequate mitigation of potential impacts related to agricultural soils.

Alternative 5a - Decreased Mining (Restricted Allocation) and
Alternative 5b - Decreased Mining (Shorter Mining Period)

Under these alternatives, additional off-channel mining operations would be permitted in the planning area. Significant soil removal would occur and the potential impacts of improper soil management would be present. The provisions of SMARA and the OCMP would provide adequate mitigation of potential impacts related to agricultural soils.

Alternative 6 - Agricultural Reclamation (with Mining Operations as Proposed)

Under this alternative, the OCMP would set a minimum reclamation standard of 80 percent to agricultural reclamation. However, the OCMP would also allow reclamation such as water basins or wildlife habitat. Soil excavation and management would occur. The policies discussed above for the OCMP alternative would also apply to this alternative. The provisions of SMARA and the OCMP would provide adequate mitigation of potential impacts related to agricultural soils.

Mitigation Measure 4.5-5a (OCMP, A-1a, A-1b, A-2, A-3, A-4, A-5a, A-5b, A-6)

None required.

Impact 4.5-6
Potential Impacts on Agricultural Production Related to Lowered Reclaimed Surfaces

Aggregate mining in the planning area could result in the removal of large volumes of subsurface materials for processing and sale as aggregate products. This would cause a net volume deficit that would result in the permanent lowering of the land surface. The lowering of the land surface would result in the formation of depressions in the existing relatively flat topography of the area. Mined areas in which the depth of mining is greater than the depth of groundwater would be permanently flooded as groundwater would fill the depression. Areas that are backfilled to above the groundwater table would have a resulting ground surface that is closer to the groundwater table than the pre-mining ground surface. These reclaimed surfaces could also collect storm water and be flooded. Inadequate drainage could cause ponding of water. The lowering of the reclaimed surface could also promote the preferential flow of cold air to these areas, possibly causing crop damage.

Draft OCMP and Implementing Ordinances

Under the OCMP, agricultural reclamation of off-channel mining areas would result in the formation of lowered agricultural fields. Five long-term mining permit applications currently under environmental review by the County would collectively result in mining of approximately 2,211 acres. The reclamation plans submitted with the applications indicate that approximately 988 acres of the mined areas would be reclaimed to agriculture. All of the reclaimed agricultural fields would be lowered relative to the existing ground surface between 8 and 19 feet. The lowering of these fields could affect the agricultural productivity in the post-reclamation period, as described below, due to high groundwater levels, poor drainage, and changes in atmospheric conditions.

Relative High Groundwater

When the lowered surfaces are reclaimed for agricultural use, the altered hydrologic and atmospheric conditions could impact agricultural productivity. If groundwater levels are too shallow in the reclaimed condition, some crops planted on the surfaces could be adversely affected. The depth to groundwater should be sufficient to prevent saturation of the roots for extended periods of time. Saturation of the roots during the growing season is particularly adverse. Temporary saturation of the roots during the winter rainy season is tolerated by most plants grown in the region. Most crops within the area have rooting depths that do not exceed five feet below the ground surface. Winter crops grown in the area, such as wheat and barley, have shallower rooting depths.

There has been some history of successful and unsuccessful reclamation programs for off-channel mining along Cache Creek. A portion of the existing Solano Concrete mining operation on the Hutson parcel has been successfully reclaimed to productive agricultural uses. Phase I of the Hutson parcel was reclaimed in 1989 and planted with wheat. The wheat yields that were monitored in 1992 and 1994 were proven to be equivalent or greater than wheat yields from nearby undisturbed farmland. In addition, another 13 acres of land, comprising Phase II and a portion of Phase III reclamation plans for the Hutson parcel, have been recently reclaimed. The wheat yields during the initial cropping season for this 13 acres were also documented as higher than yields from adjacent, unmined lands. These results suggest that Solano Concrete has been successful in implementing their reclamation plan (BASELINE, 1995).

Another mining operation has not been as successful in implementing a reclamation program. The Teichert Aggregates-Fong site attempted to reclaim lands for agricultural use. According to the proposed reclamation plan prepared by the company, approximately 22 acres of mined lands near Cache Creek were to be restored as productive farmland. However, the productivity of the lands has been impaired possibly due to high groundwater levels or discharge of water from surrounding areas. The predominant crops grown in the planning area include tree crops (orchards), tomatoes, sugar beets, almonds, safflower, and sunflower (Perkins, 1996). The unsuccessful reclamation experience at the Teichert-Fong site indicates that if aggregate wet pit mining is permitted to depths too close to the

groundwater table or in areas that collect seepage, the choice of crops for the reclaimed land may be restricted.

Inadequate Drainage

The issues of drainage and flooding are important for the crops grown in the planning area. None of the predominant crops grown along Cache Creek is resistant to damage from long-term standing water. During the rainy, winter months the predominant crop is wheat, which can be damaged from prolonged exposure to water. Tomatoes are usually planted in February, and if flooded, the crop may need to be replaced, as occurred in 1995 (Perkins, 1996).

The OCMP and the draft Surface Mining Reclamation Ordinance do not set performance standards to ensure that drainage systems for the reclaimed lands are designed to enhance, and not adversely impair, agricultural productivity. The OCMP contains a general performance standard related to drainage:

PS.2.5-17: Upon the completion of operations, grading and vegetation shall minimize erosion and convey surface runoff to natural outlets or interior basins. The condition of the land shall allow sufficient drainage to prevent water pockets or undue erosion. Natural and storm water drainage shall be designed so as to prevent flooding on surrounding properties and County rights-of-way.

Similarly, the Surface Mining Reclamation Ordinance does not include any specific requirements that reclamation plans must design drainage systems to ensure no impacts on the productivity of future agricultural crops.

The OCMP and ordinances should be augmented with standards to ensure reclamation drainage systems would be designed so that uncontrolled runoff would not cause erosion or flooding of the reclaimed agricultural fields.

Atmospheric Temperatures

The potential for cold injury to farmland crops is increased for lowered reclaimed surfaces relative to the pre-mining conditions. The higher density of cold air causes it to flow to low-lying areas of the landscape. This effect is particularly apparent in calm weather. Turbulence during windy conditions causes effective mixing of cold and warm air. Cold air that settles into low lying areas can increase the potential for frost damage to crops on the lowered surface. Lower temperatures at sensitive times of crop growth could potentially increase the risk of cold injury, limit the choice of crops to be grown, or cause a delay in planting.

The concern that lowered reclaimed fields can increase the risk of cold injury was evaluated during environmental review of the short-term off-channel mining application process in 1995. The EIRs for those projects concluded that the increased risk of cold injury was a less-than-significant impact. This opinion was based on information collected

to date on agricultural productivity on the lowered surfaces at the Solano Concrete Company's Hutson parcel site, located near the center of the OCMP planning area. The elevation of the reclaimed agricultural fields at that site are 8.5 to 14 feet below the surrounding ground surface. The annual monitoring reports for the initial reclaimed acreage at Solano Concrete's Hutson parcel have not revealed any adverse impacts on cropping patterns, yields or agricultural productivity due to the lower elevation. The potential for cold damage to crops on lowered agricultural fields has not occurred and is, therefore, considered a less-than-significant impact.

Alternative 1a - No Project (Existing Conditions) and
Alternative 1b - No Project (Existing Permits and Regulatory Condition)

Under alternatives 1a and 1b, all regulations in place as of the end of 1995 would continue. These regulations include the Yolo County Reclamation Ordinance and Yolo County Resolution 94-82. The Resolution requires that wet pit mining areas be reclaimed to agriculture and that the reclaimed agricultural surfaces be a minimum of five feet above average high groundwater. The Resolution also presents requirements that the reclaimed agricultural surfaces be regraded to allow surface/furrow irrigation of crops and to allow adequate storm water drainage. These requirements would adequately minimize the impacts related to the effects of lowered surfaces on agricultural productivity. The environmental impact analysis for short-term, off-channel mining applications indicated that the impact of potential increased cold injury was a less-than-significant impact that did not require mitigation.

Alternative 2 - No Mining (Alternative Site) and
Alternative 3 - Plant Operation Only (Importation)

Under alternatives 2 and 3, all existing mining permits would be voided. Mining would occur elsewhere outside Yolo County, and aggregate would be trucked into the area. Under this alternative, it is assumed that reclamation of previously mined areas would continue under existing regulations and performance standards in the Yolo County Reclamation Ordinance, Yolo County Resolution 94-82, and the conditions of approval for the mining permits. The impacts of the potential effects of lowered agricultural surfaces on agricultural productivity was evaluated and appropriate mitigation is provided in the reclamation plans.

Alternative 4 - Shallow Mining (Alternative Method/Reclamation)

Alternative 4 assumes that the OCMP would restrict all new mining to depths of no more than ten feet above groundwater. Reclamation of mined areas would occur under existing regulations and performance standards in the OCMP. The reclaimed agricultural surface would be greater than ten feet above the groundwater table as replacement of overburden and topsoil would raise the surface above the mining depth. The resulting height of the surfaces above the groundwater table would be sufficient to avoid any impacts on crops related to groundwater depth.

Alternative 5a - Decreased Mining (Restricted Allocation) and
Alternative 5b - Decreased Mining (Shorter Mining Period)

Under these two alternatives, off-channel mining operations would be permitted within the planning area. Reclamation of mined areas would occur under existing regulations and performance standards in the OCMP. The successful reclamation of agricultural lands could be affected because the OCMP and accompanying ordinances do not include specific performance standards or regulations to ensure that agricultural lands to be reclaimed would not be adversely affected by high groundwater or lack of adequate drainage.

Alternative 6 - Agricultural Reclamation (with Mining Operations as Proposed)

Under this alternative, the OCMP would minimize alternative forms of reclamation such as water recharge basins or wildlife habitat. The OCMP would set a minimum reclamation standard of 80 percent of agricultural reclamation. Reclamation of mined areas would occur under existing regulations and performance standards in the OCMP. The successful reclamation of agricultural lands could be affected because the OCMP and accompanying ordinances do not include specific performance standards or regulations to ensure that agricultural lands to be reclaimed would not be adversely affected by high groundwater or lack of adequate drainage.

would not adversely affect reclaimed agricultural fields.

Mitigation Measure 4.5-6a (OCMP, A-2, A-3, A-4, A-5a, A-5b, A-6)

The OCMP and ordinances shall be augmented with the following standard to ensure reclamation drainage systems would be designed so that uncontrolled runoff. Mining and reclamation requirements in areas outside the planning area should also include similar requirements.

> *Performance Standard 5.5-5: Reclaimed agricultural surfaces shall be graded to provide adequate field gradients to allow surface/furrow irrigation of crops and allow for adequate storm water drainage.*

This mitigation would reduce the impact on crops related to adverse drainage conditions to a less-than-significant level.

Mitigation Measure 4.5-6b (A-4, A-5a, A-5b, A-6)

The addition of Performance Standard 3.5-16 (Mitigation Measure 4.4-2a) would reduce the potential damage to crops by high groundwater conditions to a less-than-significant level.

Mitigation Measure 4.5-6c (A-1a, A-1b)

No mitigation required. Existing requirements and conditions of approval for off-channel mining adequately mitigate these impacts related to drainage and reclaimed field height above the groundwater level.

Impact 4.5-7
Potential Cumulative Loss of Productive Agricultural Land Within Yolo County

The potential loss of agricultural land within Yolo County is the result of land development pressures related to expansion of urban development and other competing land uses. Recent agricultural land conversion rates for Yolo County tabulated by the California Department of Conservation indicate that, during the years 1990-1992, approximately 2,993 acres of "important farmland" were removed from production as the result of conversion to non-agricultural uses. Approximately 2,225 net acres of prime farmland were converted to other agricultural and non-agricultural uses. The main reason for the net decrease was the redefinition of prime lands to lesser quality lands identified by the CDC as Farmlands of Local Importance. This "downgrading" of the agricultural value of these lands was primarily the consequence of prime land being left idle for two or more cycles. During the same period, the CDC reported that 319 acres of prime farmland had been converted to urban uses and 448 acres of prime soils had been converted to "other land" (CDC, 1994).

Prime farmland loss has also been caused by aggregate mining within the OCMP project area. The approval of three short-term aggregate mining applications in 1995 resulted in the permitting of aggregate mining that would result in incremental permanent conversion of approximately 37 acres of agricultural land to non-agricultural uses (Reiff 11, Woodland 18, Solano 8). An additional 600+ acres may be converted for the possible groundwater recharge and recovery program by the Yolo County Flood Control and Water Conservation District.

The Woodland General Plan indicates that between 2,108 acres (Alternative 2) and 2,296 acres (Alternative 1) of agricultural land could be converted to urban land uses by 2015. The expected growth within the spheres of influence of the towns of Esparto and Madison could also result in the additional loss of approximately 2,200 acres of agricultural land to urban development.

Draft OCMP and Implementing Ordinances

Under the OCMP, off-channel mining would contribute to the permanent conversion of agricultural land to non-agricultural uses within the County. The reasonably foreseeable mining projects over the next 30 years could result in the conversion of 1,223 acres of agricultural land to non-agricultural uses. This incremental loss of agricultural land would be a cumulative impact that is significant and unavoidable.

Alternative 1a - No Project (Existing Conditions)

Under alternative 1a, in-channel and off-channel mining would be permitted. Off-channel mining would contribute to the loss of agricultural land. Construction of perimeter slopes around lowered reclaimed agricultural fields in approved reclamation plans would result in a loss of approximately 37 acres of agricultural land. The incremental cumulative increase in loss of agricultural land in Yolo County would be a significant and unavoidable impact.

Alternative 1b - No Project (Existing Permits and Regulatory Condition)

Under alternative 1b, in-channel and off-channel mining would be permitted. Permitted off-channel mining would result in a loss of approximately 37 acres of agricultural land. The potential cumulative impact of loss of agricultural land in Yolo County under this alternative would be significant and unavoidable.

Alternative 2 - No Mining (Alternative Site) and
Alternative 3 - Plant Operation Only (Importation)

Under these alternatives, aggregate mining within the planning area would not be permitted. No loss of agricultural land would result. However, the loss of agricultural land could occur in mining areas outside the County as the result of the demand for aggregate resources within the County. The potential cumulative loss of agricultural land within other mining areas would be a significant and unavoidable impact.

Alternative 4 - Shallow Mining (Alternative Method/Reclamation)

Shallow aggregate mining within the planning area would be permitted under this alternative. Reclamation of a minimum of 80 percent of the mined lands to agriculture would be required. Therefore, a maximum of 20 percent of the mined areas (442 acres could be reclaimed to non-agricultural uses. The mining permitted under this alternative would contribute to the permanent conversion of agricultural land to non-agricultural uses. This cumulative loss of agricultural land within the County would be a significant and unavoidable impact.

Alternative 5a - Decreased Mining (Restricted Allocation) and
Alternative 5b - Decreased Mining (Shorter Mining Period)

Under these alternatives, off-channel mining within the OCMP would be permissible. The off-channel mining would contribute to the permanent conversion of agricultural land to non-agricultural uses. The potential cumulative impact of loss of agricultural land in Yolo County under this alternative would be significant and unavoidable.

Alternative 6 - Agricultural Reclamation (with Mining Operations as Proposed)

Under this alternative, off-channel mining within the OCMP would be permissible. The off-channel mining would likely occur on agricultural lands. Even though the reclamation of off-channel mining areas would be required to return 80 percent of the mining areas to agricultural use, the reclamation would contribute to the permanent conversion of up to 20 percent of agricultural land (1,041 acres) to non-agricultural uses. The potential cumulative impact of loss of agricultural land in Yolo County under this alternative would be significant and unavoidable.

Mitigation Measure 4.5-7a (OCMP, A-1a, A-1b, A-4, A-5a, A-5b, A-6)

Implementation of Mitigation Measure 4.5-2a would reduce the cumulative impact of permanent conversion of agricultural land to non-agricultural uses to a less-than-significant level if the mitigation results in no net loss of agricultural land. Any permanent loss of agricultural land resulting from mining activities would be a significant and unavoidable impact.

Mitigation Measure 4.5-7b (A-2, A-3)

None available.

The County does not have the jurisdiction to mitigate the loss of agricultural lands as the result of mining activities occurring outside the County. Any loss of agricultural land caused by aggregate mining in these areas would be a significant and unavoidable impact.