APPENDIX Y

Clean Water Act Draft 404(b)(1) Analysis

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Section 404(b)(1) On-Site Alternatives Analysis

For

SunCreek Specific Plan

Backbone Infrastructure

Sacramento County, California

2 May 2012

Prepared For:
City of Rancho Cordova

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ENVIRONMENTAL CONSULTANTS

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CONTENTS

Section 404(b)(1) On-Site Alternative Analysis

Backbone Infrastructure

INTRODUCTION 1
PROJECT PROPONENT 1
PROJECT LOCATION 2
PROJECT DESCRIPTION 2
Project Components 2
Roads 2
Sanitary Sewer 2
Drainage and Flood Control 2
Water Supply 3
Existing Conditions 3
Wetlands/Waters of the U.S. 4
REGULATORY BACKGROUND 4
Clean Water Act, Section 404 Application 4
Purpose of Alternatives Analysis 5
ALTERNATIVES 7
ALTERNATIVES ANALYSIS 8
Alternatives Overview 8
Alternative B1 8
Alternative B2 9
Alternative B3 9
Alternative B4 10
Alternative B5 10
Alternative B6 11
Alternative B7 11
Alternative B8 12
Proposed Project 12
Analysis of Alternatives 13
Factors Affecting Practicability 14
Alternative B1 17
Overview 17

DRAFT

Project Purpose 17
Logistics 17
Cost Impact Analysis 18
Environmental Impacts 18
Summary 18
Alternative B2 18
Overview 18
Project Purpose 19
Logistics 19
Cost Impact Analysis 19
Environmental Impacts 19
Summary 19
Alternative B3 20
Overview 20
Project Purpose 20
Logistics 20
Cost Impact Analysis 22
Environmental Impacts 23
Summary 23
Alternative B4 23
Overview 23
Project Purpose 24
Logistics 24
Cost Impact Analysis 25
Environmental Impacts 25
Summary 25
Alternative B5 26
Overview 26
Project Purpose 26
Logistics 26
Cost Impact Analysis 27
Environmental Impacts 27
Summary 27

DRAFT

Alternative B6 28
Overview 28
Project Purpose 28
Logistics 28
Cost Impact Analysis 29
Environmental Impacts 29
Summary 29
Alternative B7 30
Overview 30
Project Purpose 30
Logistics 30
Cost Impact Analysis 31
Environmental Impacts 31
Summary 31
Alternative B8 32
Overview 32
Project Purpose 32
Logistics 32
Cost Impact Analysis 33
Environmental Impacts 33
Summary 33
SUMMARY/CONCLUSION 33

LIST OF TABLES

Table 1 – Existing and Potentially Jurisdiction Waters of the U.S. 4
Table 2 – Proposed Impact Acreages within Infrastructure Footprint 13
Table 3 –Summary of Analysis of Alternative to Minimize Impacts to Wetlands and Waters of the U.S. 34

DRAFT

LIST OF FIGURES

Figure 1. Site and Vicinity
Figure 2. Proposed Impact Plan
Figure 3. Wetland Delineation and Assessment
Figure 4. Areas Evaluated for Potential Additional Avoidance (Alternatives)
Figure 5. Alternative B1
Figure 6. Alternative B2
Figure 7a. Alternative B3 – Proposed Project Land Use Plan
Figure 7b. Alternative B3 – Potential Alternative Land Use Plan
Figure 8a. Alternative B4 – Proposed Project Land Use Plan
Figure 8b. Alternative B4 – Potential Alternative Land Use Plan
Figure 9. Alternative B5
Figure 10a. Alternative B6
Figure 11a. Alternative B7 – Proposed Project Land Use Plan
Figure 11b. Alternative B7 – Potential Alternative Land Use Plan
Figure 12. Alternative B8

LIST OF ATTACHMENTS

Attachment A – Alternatives Overview
Attachment B – Alternative B3 (Cost Impact Analysis)
Attachment C – Alternative B4 (Cost Impact Analysis)
Attachment D – Alternative B7 (Cost Impact Analysis)

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INTRODUCTION

The Backbone Infrastructure project provides supporting infrastructure including sewer, water, and drainage improvements, water treatment plant, water wells, sewer pump station, and on- and off-site roadway improvements to allow for the phased implementation of the SunCreek Specific Plan Area (SPA) project. The SPA has a total of 1,265 acres of land within it's boundary of which 1,010 acres is proposed as developable land. A total of 8.360 acres of potentially jurisdictional waters of the U.S. were identified within the infrastructure footprint. This includes approximately 7.144 acres of verified waters of the U.S. within the SPA and 1.216 acres of potentially jurisdictional waters of the U.S. within the adjacent off-site areas. As the Infrastructure project is limited to the footprint of the actual infrastructure and its construction corridor, the applicant is requesting an Individual Permit for project impacts to all 8.360 acres of verified and potential waters of the U.S

The overall infrastructure plan has been designed to serve the comprehensive needs of the entire SPA. There are six separate development sites within the SPA; however, only four (Shalako, Jaeger Ranch, Smith, and Sierra Sunrise) are currently participating in the Section 404 permit application process. It is anticipated that the two non-participating properties (Grantline and Kamilos) will submit separate applications at a later date. However, the infrastructure components that occur on these two properties are included within the Backbone Infrastructure permit application.

PROJECT PROPONENT

Project:

SunCreek Backbone Infrastructure

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PROJECT LOCATION

The Backbone Infrastructure project for the SunCreek SPA and the areas that might be affected by off-site improvements include portions of Sections 15, 21 and 29, Township 8 North, Range 7 East (MDBM) of the "Buffalo Creek, California" 7.5-minute quadrangle (U.S. Department of the Interior, Geological Survey, 1980) (Figure 1. *Project Site and Vicinity*).

PROJECT DESCRIPTION

The purpose of the Backbone Infrastructure project is to provide associated supporting infrastructure including sewer, water, and drainage improvements, water treatment plant, water wells, sewer pump station, and on- and off-site roadway improvements to allow for the phased implementation of the SunCreek SPA project (Figure 2. Proposed Impact Plan).

Project Components

Roads

The proposed roadway network would include major circulation roads that will serve the entire SPA and the region (see Figure 2).

Sanitary Sewer

The main sanitary sewer system planned for the SPA is included in the Backbone Infrastructure. This includes sewers in major roadways as well as separate sewer lines, and a sewer pump station.

Drainage and Flood Control

Included in the Backbone Infrastructure are 12 separate detention basins, each designed to mitigate the hydro-modification impacts to downstream receiving waters, to provide water

quality treatment, storm runoff attenuation and retention of all summertime nuisance water runoff from the upstream development area. The several detention basins will serve areas greater than the individual parcels on which they are located. In addition four drainage crossings are proposed where the roadway or trails cross Kite Creek. These drainage crossings will be natural substrate structures that will maintain the natural character of Kite Creek and allow for unobstructed passage of wildlife.

Water Supply

A water treatment plant (WTP) and two water wells are included in the Backbone Infrastructure project. The WTP is located in the southern portion of the SPA, within the southwestern portion of the Shalako property while the water wells are located in the northwest corner.

Existing Conditions

The Backbone Infrastructure Area is primarily confined within the SPA boundary. However, a small portion of the proposed roads occur outside of the SPA boundary. Portions of the Backbone Infrastructure Area also occur within the two non-participating properties (Kamilos and Grantline). Wetland types within the Infrastructure Area include vernal pools, seasonal wetlands, swale, ephemeral drainage, intermittent drainage, and stream.

The predominant vegetation community within the Backbone Infrastructure Area is annual grassland. According to the *Soil Survey of Sacramento County, California* (U.S. Department of Agriculture, Soil Conservation Service 1993), thirteen soil units, or types, have been mapped within the Action Area, including (125) Corning complex, 0-8% slopes; (126) Corning-Redding complex, 8-30% slopes; (145) Fiddyment fine sandy loam, 1-8% slopes; (157) Hedge loam, 0-2% slopes; (158) Hicksville loam, 0-2% slopes; (159) Hicksville gravelly loam, 0-2% slopes; (175) Madera loam, 2-8% slopes; (189) Peters clay, 1-8% slopes; (193) Red Bluff-Redding complex, 0-5% slopes; (197)Redding loam, 2-8% slopes; (198) Redding gravelly loam, 0-8% slopes; (214) San Joaquin silt loam, 0-3% slopes; and (215) San Joaquin silt loam, 3-8% slopes.

Wetlands/Waters of the U.S.

A total of 8.360 acres of existing and potentially jurisdictional waters of the U.S. were identified within the infrastructure footprint, including verified delineations within the SPA and adjacent off-site areas for which assessment data has been provided (Figure 3. *Wetland Delineation and Assessment*). Waters of the U.S. include vernal pools, seasonal wetlands, swales, ephemeral drainage, intermittent drainage, and stream (Table 1. Existing and Potentially Jurisdictional Waters of the U.S.).

Approximately 8.360 acres of existing and potential waters of the U.S. have been mapped within the Backbone Infrastructure (both on-site and off-site) including 5.338 acres of vernal pools, 0.510 acre of seasonal wetland, 1.545 acres of swales, 0.156 acre of ephemeral drainage, 0.164 acre of intermittent drainage, and 0.647 acre of stream.

Table 1 – Existing and Potentially Jurisdictional Waters of the U.S.

Type	Acreage
Vernal pool	5.338
Seasonal wetland	0.510
Swale	1.545
Ephemeral Drainage	0.156
Intermittent Drainage	0.164
Stream	0.647
TOTAL:	**8.360**

REGULATORY BACKGROUND

Clean Water Act, Section 404 Application

The Applicant is submitting a permit application to the U.S. Army Corps of Engineers (Corps) to obtain authorization to discharge dredged and/or fill materials into waters of the U.S. under the authority of the Corps pursuant to Section 404 of the Clean Water Act. Pursuant to these requirements, the Corps will conduct a two-part analysis: 1) the Corps will determine consistency with Section 404 (b)(1) Guidelines to consider practicable alternatives to the dredge or fill of waters of the U.S.; and 2) the Corps will conduct a public interest review. This document provides the analysis of practicable alternatives

Purpose of Alternatives Analysis

The purpose of this analysis is to objectively evaluate the practicability of several alternatives to the proposed project and provide the Corps with documentation to be used in evaluating the proposed project permit application for compliance with Section 404(b)(1) (guidelines). The guidelines require that the alternatives analysis be adequate to establish that the project is the least environmentally damaging practicable alternative (LEDPA). This is accomplished by comparing the proposed project with other alternatives in terms of practicability, project purpose, and overall environmental effects. For this analysis, a reasonable statement of purpose has been developed and the alternatives have been evaluated in light of that purpose.

While it is understood that the information provided in this document must be verified by the Corps, the analysis is consistent with federal regulations and provides a fair and objective evaluation of alternatives.

This section presents an overview of the requirements of the 404(b)(1) guidelines and a discussion of the implementing guidance issued by the Corps. The 404(b)(1) guidelines are the substantive criteria used by the Corps in evaluating discharges of dredged or fill material into waters of the U.S. under Section 404 of the Clean Water Act. The guidelines require that four criteria be satisfied in order for the Corps to make a decision that a proposed discharge is in compliance. These criteria are:

1. *The discharge must be the least environmentally damaging practicable alternative*: This alternatives analysis evaluates a range of alternatives to the proposed project, in terms of environmental effects, practicability and consistency with the overall project purposes.
2. *The discharge must not violate any water quality standard, toxic effluent standard or jeopardize the continued existence of a threatened or endangered species*: Through the environmental review process, mitigation measures will be developed to insure that water quality and toxic effluent standards will not be violated. The U.S. Fish and Wildlife Service will be consulted regarding potential effects to federally listed species.
3. *The discharge must not result in a significant degradation of the waters of the United States*: Water quality impacts and potential impacts will be minimized through

implementation of water quality management and erosion control plans as approved by the Regional Water Quality Control Board and the local planning jurisdiction.

4. *Unavoidable impacts to the aquatic ecosystem must be mitigated*: Based on an agreement between the Corps and EPA, efforts must first be directed at avoiding and reducing impacts to waters of the United States prior to the evaluation of potential compensatory mitigation measures. Mitigation may be applied only to unavoidable impacts. In keeping with this guidance, this alternatives analysis does not attempt to substitute mitigation for avoidance wherever the project goals may concurrently be met. Unavoidable impacts to biological resources associated with waters of the United States will be mitigated by either on-site construction of compensation wetlands, through the purchase of appropriate mitigation credits from agency-approved sources, or by a combination of mitigation measures acceptable to the regulatory agencies.

Before the Corps can issue a permit, they must find that the requirements of the guidelines have been satisfied. The key criteria for most permit applicants, and the focus of this analysis, is the requirement that the discharge be the least environmentally damaging, practicable alternative. The pertinent section of the regulation states:

"Except as provided under Section 404(b)(2), no discharge of dredged of fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have a less adverse impact on the aquatic ecosystem so long as discharge does not have other significant adverse environmental consequences.

a. For the purposes of this requirement, practicable alternatives include, but are not limited to:
   1) On-site activities that do not include a discharge into waters of the United States or ocean waters,
   2) Discharges of dredged or fill material at other locations in waters of the United States or ocean waters,
b. An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology and logistics in light of overall project purposed. If it is otherwise a practicable alternative, an area not presently owned by the applicant

which could reasonably be obtained, utilized, expanded, or managed in order to fulfill the basic purpose of the proposed activity may be considered;

c. Where the activity associated with a discharge which is proposed for a special aquatic site does not require access or proximity to or citing within the special aquatic site in question to fulfill its basic purpose (i.e., is not "water dependent"), practicable alternatives that do not involve special aquatic sites are presumed to be available unless clearly demonstrated otherwise. In addition, where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise."

The key provisions in the language are practicability and overall project purposes. An alternative is practicable if it is available to the applicant and capable of being accomplished by the applicant after consideration of costs, existing technology and logistics, in light of overall purposes. If a practicable alternative would have less impact on the aquatic ecosystem, and does not include other significant adverse impact, then the proposed project is not the least damaging practicable alternative.

ALTERNATIVES

The proposed project (Backbone Infrastructure) would directly impact 8.360 acres of wetlands and waters, which are special aquatic sites as described above (see Figure 2). None of the proposed project components are considered to be water dependent. Therefore, according to the guidelines, less damaging alternatives are presumed to be available unless demonstrated otherwise. The following discussion presents the methodology of the analysis, followed by an evaluation of the alternatives for determination of the least damaging practicable alternative as compared to the proposed project. Alternatives have been developed and evaluated with the goals of practicability, consistency with the overall project purposes, and avoiding and minimizing impacts to waters of the U.S.

ALTERNATIVES ANALYSIS

The alternatives analyzed in this document were developed in consultation with the Corps. Overall land use configurations of the project were evaluated in an analysis of alternatives studied for the entire SunCreek SPA, which was conducted to support the Environmental Impact Statement/Environmental Impact Report (EIS/EIR) being prepared for the SPA. Following review of that document, the Corps identified specific areas on the property for which it requested a project-specific analysis to determine if additional avoidance was practicable. Alternatives were analyzed to determine if there were less environmentally damaging alternatives (Figure 4. *Areas Evaluated for Potential Additional Avoidance (Alternatives*).

The alternatives numbered in Figure 4 represent portions of the specific alternative areas discussed with the Corps on the overall SPA that fell within the Backbone Infrastructure project footprint. Analysis of these areas that are not related to the Backbone Infrastructure will not be discussed here, but will be discussed within the Alternatives Analysis for each individual property. The Backbone Infrastructure project footprint falls within eight of the potential avoidance areas identified by the corps. A summary of each is area provided below and is followed by a detailed analysis of each alternative.

Alternatives Overview

Alternative B1

Alternative B1 is located on the northwestern corner of the Shalako Property and contemplates the practicability of extending the southern boundary of the proposed preserve southward by a total of 0.39 gross acres to capture and preserve a vernal pool located south of the currently proposed preserve in the northwest corner of the Shalako property. A portion of the alternative falls within the Backbone Infrastructure project and will be discussed here. This alternative evaluates the overall avoidance of an additional 0.087 acre of waters of the U.S. (of which only 0.021 acre falls within the Backbone Infrastructure alignment) by relocating a well and its access road/right-of-way connecting with Sunrise Boulevard. The access road/right-of-way is currently proposed along the northern portion of this alternative and impacts a portion of a

vernal pool within this Alternative (Figure 5 *Alternative B1).* The well site would have to be relocated in order to avoid impacts to the proposed alternative (Figure 5b. *Alternative B1 – Proposed Alternative Land Use Plan*). In order for the entire alternative to be feasible, modifications to the Shalako project design will also be required. Modifications to the Shalako project design will not be discussed here.

Alternative B2

Alternative B2 is located in the south-central portion of the Shalako Property. The current Backbone Infrastructure design incorporates a sewer line that transects the preserve from east to west (Figure 6. *Alternative B2*). This alternative evaluates the potential avoidance of an additional 0.235 acre of waters of the U.S. within the proposed preserve by relocating/realigning the proposed sewer line.

Alternative B3

Alternative B3 is located along the western boundary of the Kamilos and Jaeger properties and Rancho Cordova Parkway. The potential avoidance area entails extending the existing open space preserve to the south and adds approximately 16.59 acres to the overall open space preserve with the avoidance of an additional 1.041 acres of waters of the U.S. The majority of the alternative is located within the Kamilos and Jaeger projects and those portions will be addressed within the Alternatives Analysis for those projects. However, a portion of the alternative falls within the Backbone Infrastructure project and will be discussed here (Figure 7a. *Alternative B3 – Proposed Project Land Use Plan*). This alternative evaluates the potential avoidance of an additional 0.235 acre of waters of the U.S. in the Backbone Infrastructure alignment that may be accomplished by re-aligning and/or redesigning portions of several roads to avoid impacts to the alternative preserve (Figure 7b. *Alternative B3 – Potential Alternative Land Use*). In order for this alternative to be feasible, modifications to the Kamilos and Jaeger Ranch project designs will also be required in order for the entire alternative to be preserved. Modifications to these project designs will not be discussed here.

Alternative B4

Alternative B4 is located on the south-central portion of the Smith Property. This 8.21 acre alternative evaluates the possibility of extending the proposed preserve to the north to incorporate approximately 0.531 acre of additional waters of the U.S. including several vernal pools and a swale system. This alternative is further evaluated to be extended to the north by Alternative B5 (see discussion below). The majority of this alternative occurs within the Backbone Infrastructure footprint, but a small part of it occurs on the Smith Property. The portion that occurs on the Smith Property, as it does not affect he Backbone Infrastructure project, will be addressed within the Alternatives Analysis for that project. This alternative is located in the center of the Specific Plan on the Community Park Site and evaluates the potential avoidance of an additional 0.457 acre of waters of the U.S. in the Backbone Infrastructure alignment by relocating a joint use hydro-modification/water quality/detention basin (Figure 8a. *Alternative B4 – Proposed Project Land Use Plan* and Figure 8b. *Alternative B4 – Potential Alternative Land Use Plan*). In order for this alternative to be feasible and to accomplish the desire additional avoidance, modifications to the Smith project design will also be required. Modifications to the Smith property project design will not be discussed here.

Alternative B4 comprises the southern portion of a larger potential avoidance area (Alternative B5) discussed with the Corps. The larger alternative extends further to the north and incorporates several branches of the swale addressed in Alternative B4.

Alternative B5

Alternative B5 is located on the northern boundary of the Smith Property along the proposed North Campus Drive. The 31.81 acre alternative is comprised of three subsections which incorporates 1.688 acres of a swale system that occurs within the Smith Property. This alternative connects to Alternative 4 on it southern boundary, which in turn connects to the wetland preserve of the proposed project The majority of potential additional avoidance occur outside of the Backbone Infrastructure footprint, on the Smith and Sierra Sunrise projects and these portions will be addressed within the Alternatives Analysis for these projects. However, a portion of the alternative falls within the Backbone Infrastructure footprint and will be discussed

here (Figure 9. *Alternative B5*). This alternative evaluates the avoidance of an additional 0.231 acre of waters of the U.S. by re-aligning North Campus Drive. In order for this alternative to be feasible, modifications to the Smith and Sierra Sunrise project designs would be required. Modifications to these project designs will not be discussed here. In addition, Alternative B4 will need to be implemented to allow for a connection between the proposed preserve and Alternative B5. Without preserving B4, any additional avoidance achieved in Alternative B5 would not be contiguous to any other planned open space (i.e. an isolated preserve)

Alternative B6

Alternative B6 is located to the east of the proposed preserve on the Jaeger Ranch property and extends through the Sierra Sunrise property to incorporate approximately 1.241 acres of a stream system and several vernal pools and swales. The majority of this 16.51 acre alternative is located on the Jaeger Ranch and Sierra Sunrise projects and these portions will be addressed within the Alternatives Analysis for these projects. However, portions of the Backbone Infrastructure project would need to be relocated and/or redesigned in order for this alternative to be fully realized. Americanos Blvd. bisects the area of potential additional avoidance and a sewer line, storm drain piping and a trail are proposed on the western boundary of this alternative. This alternative evaluates the potential avoidance of an additional 0.056 acre of waters of the U.S. that fall within the Backbone Infrastructure project by re-aligning or redesigning a road and the other affected infrastructure.

Alternative B7

Alternative B7 is located along the northern boundary of the Sierra Sunrise Property and the southern boundary of the Grantline Property and evaluates the possibility of extending the proposed preserve on the Sierra Sunrise property into the Grantline property. The northern half of the 12.35-acre potential preserve area contemplated in Alternative B7 occurs on the Grantline property and that portion will be addressed within the Alternatives Analysis for that project. The portion that occurs within the footprint to the Backbone Infrastructure project evaluates the potential avoidance of an additional 0.174 acre of waters of the U.S. by re-aligning a proposed arterial roadway and relocating two hydro-modification/water

quality/detention basins (Figure 11a. *Alternative B7 – Proposed Project Land Use Plan* and Figure 11b. *Alternative B7 – Potential Alternative Land Use Plan*). In order for this alternative to be feasible and to realize the desired potential additional avoidance, modifications to the Grantline project design would also be required. Modifications to the Grantline project design will not be discussed here.

Alternative B8

The Backbone Infrastructure portions of Alternative B8 are located primarily along the northern boundary of the Grantline Property. This 29.67 acre alternative is comprised of three sections that have been identified by the Corps as areas of potential additional avoidance. The first section is located along the western side of the Grantline project which incorporates the branches of a swale and drainage system. The second section of the alternative is located along the north-central boundary line, and the third section is located in the eastern-most corner of the Grantline property. The western section of this alternative would augment the additional avoidance contemplated in Alternative B7 to the south, which connects to the proposed preserve in the Sierra Sunrise property. The majority of this alternative is found on the Grantline project and this portion will be addressed within the Alternatives Analysis for that project. The portions of the potential additional avoidance areas that falls within the Backbone Infrastructure footprint will be discussed here (Figure 12). This alternative evaluates the potential avoidance of an additional 0.182 acre of waters of the U.S. within the Backbone Infrastructure footprint by re-aligning and/or redesigning Chyrsanthy Road and an arterial road that connects to Chrysanthy Road. In order for this alternative to be feasible, modifications to the Grantline project design would be required. Modifications to the Grantline project design will not be discussed here.

Proposed Project

As the Backbone Infrastructure project is limited to the footprint of the actual infrastructure and its construction corridor, the applicant is requesting an Individual Permit for project impacts to all 8.360 acres of verified and potential waters of the U.S (Table 2. *Proposed Impact Acreages within Infrastructure Footprint*). The Backbone Infrastructure is composed of two types of

impacts, on-site and off-site. All of the on-site areas are part of the six properties within the SPA and these acreages have all been verified by the Corps. Off-site areas are portions of the Backbone Infrastructure that occur outside of the six SPA properties. Jurisdictional delineations have not yet been conducted for these areas and data presented here is assessment level only.

Table 2 – Proposed Impact Acreages within Infrastructure Footprint

Type	Existing	On-Site Impacts	Off-Site Impacts	Total Impacts
Vernal Pool	5.338	4.408	0.930	5.338
Seasonal Wetland	0.510	0.417	0.093	0.510
Swale	1.545	1.430	0.115	1.545
Ephemeral Drainage	0.156	0.156	0.000	0.156
Intermittent Drainage	0.164	0.164	0.000	0.164
Stream	0.647	0.569	0.078	0.647
TOTAL:	**8.360**	**7.144**	**1.216**	**8.360**

Analysis of Alternatives

The practicability of redesigning and/or realigning the Backbone Infrastructure project to accomplish potential additional avoidance at the on-site alternatives has been analyzed using several criteria. First, the analysis considers whether the alternative would affect the Project Purpose; secondly, if any logistical issues would render the alternative impracticable (this analysis primarily considers whether the infrastructure necessary to support the alternative could be feasibly installed; and third, the analysis considers basic cost factors, including an estimation of the cost of infrastructure and other development costs per developable acre for the Proposed Project and the project alternatives. The analysis addresses project level costs that would make an alternative impracticable or otherwise incapable of being done. Finally, each alternative is also analyzed in regards to environmental factors (impacts to wetlands/waters and federally listed species) and other factors such as regional needs. To summarize, each alternative will be analyzed for the following factors to determine the LEDPA for the project:

Factors Affecting Practicability

1. **Project Purpose** – Would the Alternative affect the Project Purpose?

The purpose of the SunCreek Specific Plan Area project is to:

(1) Implement the City of Rancho Cordova's General Plan, the Sacramento Area Council of Governments' Blueprint and Smart Growth Principles and the Sunrise Douglas Community Plan. The project is a portion of the Sunrise Douglas Community Plan.

(2) Provide mixed density residential housing development within the City of Rancho Cordova's Sunrise Douglas Community Plan area.

(3) Develop neighborhoods connected by a significant open space and recreational parkway.

(4) Provide neighborhood-serving retail areas.

(5) Provide additional housing to balance the high employment concentrations in and around the City of Rancho Cordova.

(6) Provide a mix of housing types to diversify the City of Rancho Cordova's housing stock.

(7) Provide transportation facilities within the project area consistent with the City of Rancho Cordova's Circulation Plan.

(8) Provide an appropriate site for a high school and middle school that will serve the Sunrise Douglas Community Plan Area, and three neighborhood elementary schools.

(9) Provide an appropriate site for a community park that will serve the Sunrise Douglas Community Plan Area.

(10) To provide a key link in the city-wide trail network that connects the Folsom South Canal bike pedestrian trail to corridors along Laguna Creek and Cosumnes River tributaries.

(11) To set aside wetland resources for the conservation of wetlands within the Community Plan Area.

2. **Logistics** – Does the alternative allow the project to conform to the land use plan circulation design and school and park, water treatment, and flood control standards?

   The proposed project is a part of the Sunrise Douglas Community Plan which has been in various stages of development over the past 17 years. Several of the major arterial roadways have been built or have had extensive planning efforts and studies completed. The major arterial roadways that have had substantial segments already constructed are; Sunrise Boulevard, Grant Line Road, Rancho Cordova Parkway, Kiefer Boulevard and Chrysanthy Boulevard. The SunCreek Specific Plan has based its circulation design on these constructed and planned arterial roadway segments. The proposed SunCreek backbone roadways considered these already existing roadways when laying out the Plan Areas new roadways, taking into consideration intersection spacing, adjacent land uses and the wetland preserve area. The Plan Area has gone through numerous land use modifications to provide appropriate balance of housing, educational, commercial and retail development to ensure a successful and viable development.

3. **Costs Impact Analysis** – does the alternative result in additional Backbone Infrastructure construction costs? Are the additional costs reasonable in relation to the amount of additional wetland avoidance that could be achieved? Does the alternative have a development cost per net developable acre that is not substantially more than that of the proposed project alternative?

4. **Environmental Impacts** – does the alternative have significantly less impacts on waters of the U.S. than the proposed project alternative? Does the alternative have significantly less impacts on federally-listed species than the proposed project alternative?

   A total of 8.360 acres of potentially jurisdictional waters of the U.S. were identified within the infrastructure footprint, which includes delineated areas within the SPA and adjacent off-site areas for which assessment data has been provided (Figure 3).

Potential waters of the U.S. include vernal pools, seasonal wetlands, swales, ephemeral drainage, intermittent drainage, and stream. All of the 8.360 acres mapped within the Backbone Infrastructure boundary would be impacted to meet the project purpose.

The portion of the Backbone Infrastructure area that occurs within the four participating properties was surveyed for special-status plants in 2005 and 2008. No federally-listed or proposed plant species were observed during these surveys. Plant surveys have not been conducted for the Infrastructure areas that occur within the Kamilos and Grantline properties and within the offsite Infrastructure areas. Surveys for these areas will be conducted in the spring of 2012.

Surveys for federally-listed vernal pool branchiopods have not been conducted within the property. The applicant is assuming presence for vernal pool tadpole shrimp (*Lepidurus packardi*) and vernal pool fairy shrimp (*Branchinecta lynchi*) within vernal pools, seasonal wetland, and swale features.

Elderberry shrubs have not been observed within the portions of the Backbone Infrastructure located within the participating properties. As a result, Valley elderberry longhorn beetle (VELB) surveys were not conducted on these areas. The portions of the Infrastructure area that occur on the non-participating properties and within the offsite areas have not been surveyed for elderberry shrubs. These areas will be surveyed in 2012, and if elderberry shrubs are found, protocol-level surveys for VELB will be conducted.

5. **Summary of Practicability** – An alternative is considered practicable only if it meets all of the above criteria.

Alternative B1

Overview

Alternative B1 is located on the northwestern corner of the Shalako Property and contemplates the practicability of extending the southern boundary of the proposed preserve southward by a total of 0.39 gross acres to capture and preserve a vernal pool located south of the currently proposed preserve in the northwest corner of the Shalako property. A portion of the alternative falls within the Backbone Infrastructure project and will be discussed here. This alternative evaluates the overall avoidance of an additional 0.087 acre of waters of the U.S. (of which only 0.021 acre falls within the Backbone Infrastructure alignment) by relocating a well and its access road/right-of-way connecting with Sunrise Boulevard. The access road/right-of-way is currently proposed along the northern portion of this alternative and impacts a portion of a vernal pool within this Alternative (Figure 5 *Alternative B1).* The well site would have to be relocated in order to avoid impacts to the proposed alternative (Figure 5b. *Alternative B1 – Proposed Alternative Land Use Plan*). In order for the entire alternative to be feasible, modifications to the Shalako project design will also be required. Modifications to the Shalako project design will not be discussed here.

Project Purpose

Relocating the well and access road would not affect the project purpose.

Logistics

In order to achieve the potential additional avoidance contemplated by Alternative 1, the well site would need to be relocated. This is logistically feasible, however, the well cannot be relocated north without additional impacts to the proposed wetland preserve and relocating the well to the south would have a significant adverse affect on the Commercial Mixed Use land use plan proposed for that area.

Cost Impact Analysis

Actual construction costs would not likely be significantly higher. Although not quantified, additional costs may occur if the relocated well site requires additional access road construction and/or if other structure(s) would be required to make the well site compatible with the adjacent Commercial Mixed Use land plan into which the well site would be required to be relocated.

Environmental Impacts

Alternative B1 would only avoid an additional 0.021 acre of waters of the U.S. and potential federally-listed species habitat that occurs within the footprint of the Backbone Infrastructure project. Modifications to the Shalako project would be required in order to preserve the entire alternative and achieve the total potential avoidance of 0.087 acres.

Summary

This alternative would adversely affect the Commercial Mixed Use development proposed on the Shalako project while only avoiding approximately two one-hundredths of an acre of wetland habitat. The well site is not compatible with the uses contemplated within the Commercial Mixed Use area and is not considered a practicable alternative, especially given the minute amount of wetland habitat avoided.

Alternative B2

Overview

Alternative B2 is located in the south-central portion of the Shalako Property. The current Backbone Infrastructure design incorporates a sewer line that transects the wetland preserve from east to west. This alternative evaluates the potential avoidance of an additional 0.235 acre of waters of the U.S. within the proposed preserve by relocating and/or reconfiguring the proposed sewer line (see Figure 6).

Project Purpose

Relocating the sewer line would not affect the project purpose.

Logistics

Relocating the sewer line is logistically feasible. Reconfiguring the sewer line was at one time logistically infeasible as the sewer line and its maintenance access road were to also to serve as a berm which would provide downstream flood protection during significant storm events. Revised overall storm drainage plans have been modified and the sewer line and an associated trail may be able to be installed at grade, which would eliminate 0.235 acre of wetland fill previously associated with the sideslopes of the berm-like structure.

Cost Impact Analysis

The cost to realign and redesign the sewer line and easement access road/trail would not result in significant additional costs.

Environmental Impacts

If deemed feasible, Alternative B2 would avoid an additional 0.235 acre of waters of the U.S. and potential federally-listed species habitat.

Summary

This alternative, if final design studies deem it feasible, would avoid an additional 0.235 acre of wetland by realigning the sewer line crossing. This alternative is potentially possible as previous needs to detain water at this crossing have been eliminated through revisions to the drainage design on the overall project. The new design may allow for an at-grade crossing and eliminated the need for the sewer line crossing to also provide detention.

Alternative B3

Overview

Alternative B3 is located along the western boundary of the Kamilos and Jaeger properties and Rancho Cordova Parkway. The alternative extends the existing open space preserve to the south and would add approximately 16.59 acres to the overall open space preserve and the additional avoidance of 1.041 acres of waters of the U.S. This alternative evaluates the avoidance of an additional 0.235 acre of waters of the U.S. within the Backbone Infrastructure footprint by re-aligning portions of several roads to avoid impacts to the alternative preserve (see Figures 7a and 7b). In order for this alternative to be feasible, modifications to the Kamilos and Jaeger Ranch project designs will also be required in order for the entire potential additional avoidance area to be preserved. Modifications to these project designs will not be discussed here.

In order for Alternative B3 to be feasible, three roads would need to be re-aligned to avoid the preserve. This includes portions of Central Park Drive, Rancho Cordova Parkway and North Campus Drive. The western half of Rancho Cordova Parkway has been constructed as part of another project and cannot be re-aligned.

Project Purpose

This alternative would not adversely affect the overall project purpose.

Logistics

In order to preserve the wetland/water features in the proposed alternative, a major arterial roadway would need to be realigned or redesigned to span the subject drainages. Backbone Infrastructure components associated with Alternative B3 include portions of Rancho Cordova Parkway, a north-south aligned roadway and Central Park Drive and North Campus Drive both east-west aligned roadways. Rancho Cordova Parkway cannot be realigned to the west due to

an existing residential development and open space preserve located adjacent to the western right-of-way along this portion of the Plan Area boundary.

Rancho Cordova Parkway is a major north-south arterial roadway and is currently a component of the City's Capital Improvement Plan. Rancho Cordova Parkway is proposed to be 155-foot wide right-of-way containing landscape corridors, sidewalks, four mixed flow travel lanes, two transit lanes and a median. Approximately 1.7 miles of the western half of the Rancho Cordova Parkway has been constructed and has already filled the downstream portions of wetland/waters feature being considered for preservation with this Alternative.

Avoiding impacts to the wetlands/waters within Alternatives B3 would require realignment of two northbound mixed flow travel lanes, one northbound transit lane and the eastern sidewalk and landscape corridor along Rancho Cordova Parkway. The realigned northbound travel lanes would require 2,000-foot radius reversing curves to move the northbound half of the roadway, 450-feet to the east and would be approximately 3,500-feet in length in order to avoid the wetland/waters features. The realignment of Rancho Cordova Parkway would change the intersection geometry of the North Campus Drive intersection leg from the standard 90-degree intersection to a skewed intersection leg of 112-degrees.

North Campus Drive is one of four Plan Area east-west transportation corridors and has been planned to intersect with Rancho Cordova Parkway at an existing intersection on the adjacent development. Each of these transportation corridors has been through extensive planning efforts to insure that the entire Sunrise-Douglas Community Plan Area has an efficient transportation network. Realignment of North Campus Drive to the north is not feasible due to a large wetland preserve area planned adjacent to the north-east corner of the intersection and would cause greater wetland/waters impacts than the currently proposed alignment. Realigning the intersection to the south also is not feasible due to intersection spacing constraints. Central Park Drive, also an east-west transportation corridor, is planned to intersect with Rancho Cordova Parkway approximately 1,300-feet to the south of North Campus Drive. Rancho Cordova Parkway is a major north-south transportation corridor for the City of Rancho Cordova. These types of roadways only allow intersections to occur every one-quarter mile (1,300-feet).

Therefore it is not feasible to realign the roadway in order to avoid the wetland/waters feature and it must be bridged.

The realignment of Rancho Cordova Parkway would change the turning movements from Rancho Cordova Parkway onto Central Park Drive to only right-turns, eliminating the through and left-turn movements. Central Park Drive is also one of the four east-west transportation corridors that is planned to intersect Rancho Cordova Parkway at an existing 3-way subdivision road intersection making it a 4-way intersection. Realigning the northbound mixed flow travel lanes 450-feet to the east would convert the existing, all turning movement allowed, 3-way intersection into a right-turn only allowed intersection plus add another right-turn only allowed intersection, separated by a 450-foot wide strip of open land instead of just one all turning movement allowed 4-way intersection.

The adjacent land uses currently planned at the Rancho Cordova Parkway-Central Park Drive intersection, are mainly commercial mixed use and this area is intended to be a transit oriented development served by bus, bus rapid transit, local shuttles or all three modes of transit. Shifting the Rancho Cordova Parkway-Central Park Drive intersection to the north is not feasible since there is already an intersection planned to the north. Shifting the Rancho Cordova Parkway-Central Park Drive intersection to the south also isn't feasible since the intersection would relocate the southern right-of-way of Central Park Drive adjacent to the open space preserve area which would impact the commercial mixed use intent of this currently planned intersection.

Therefore, due to the existing single-family development located to the west, the currently planned land uses for the Rancho Cordova Parkway –Central Park Drive intersection area and the severe impact to the circulation movements through the core of the Plan Area make preservation of these wetland/waters features infeasible.

Costs Impacts Analysis

In order to quantify the cost impacts of implementing this alternative, an estimate was prepared that compares the Site development cost of the Proposed Project and Alternative B3

(Attachment B). It is estimated that realignment of the Rancho Cordova Parkway and reconfiguring Rancho Cordova Parkway-Central Park Drive Intersection would result in an increased construction cost of $4,547,500.00 and reduce the developable land in the plan area by 27.2 acres and 350 dwelling units.

Environmental Impacts

Alternative B3 would only avoid an additional 0.235 acres of waters of the U.S. and potential federally-listed species habitat. Modifications to other projects within the SPA would be required in order to realize the potential additional avoidance areas contemplated in this area.

Summary

Redesigning the Backbone Infrastructure project to accommodate the additional avoidance in this alternative is not practicable. Four and half million dollars to avoid an additional 0.235 acres is not reasonable, especially given the fact that the subject areas would still be cut off by major roads from the proposed open space area located in the northwest corner of the Kamilos property.

Alternative B4

Overview

Alternative B4 is located on the south-central portion of the Smith Property. This 8.21 acre alternative extends the proposed preserve to the north to incorporate approximately 0.531 acre of additional waters of the U.S. including several vernal pools and a swale system. This Alternative is further extended to the north by Alternative B5 (see discussion below). The majority of this alternative occurs within the Backbone Infrastructure footprint and would result in 0.457 acres of additional wetland avoidance, but a small part of it occurs on the Smith Property. The portion that occurs on the Smith Property will be addressed within the Alternatives Analysis for that project. This alternative is located in the center of the Specific

Plan on the Community Park Site and would require the relocation of a joint use water quality/hydro-modification/detention basin (see Figure 8b).

Alternative B4 comprises the southern portion of the larger alternative discussed with the Corps. The larger alternative extends further to the north and incorporates several branches of the swale which is found in Alternative B4.

Project Purpose

This alternative would adversely affect the proposed project purpose as it would preclude the implementation of a water quality/storm water detention basin located in this part of the specific plan.

Logistics

In order to preserve the wetland features in the proposed alternative, a large joint use water quality/hydro-modification/detention basin would need to be relocated and an additional basin would be necessary. Water quality/hydro-modification/detention basins prevent untreated and uncontrolled storm runoff releases from an upstream development area from entering wetland preserve areas and damaging the features being protected. Since wetland preserves are typically located in the lower areas of a site where water quality/hydro-modification/detention basins are located, dividing a site with a wetland preserve area requires an additional basin as each side of the wetland preserve must be protected from untreated and uncontrolled storm runoff releases from the upstream development area from entering the wetland preserve and damaging the feature being protected.

The current proposed water quality/hydro-modification/detention basin is designed as a joint use basin within a portion of the Community Park Site. The basin is designed to have a permanent wet water quality basin that continuously treats the runoff from small storm events and the summertime nuisance flows. As a storm event increases in intensity the basin fills, inundating the turf areas of the Community Park. Splitting the basin into two separate basins severally impacts the ability for the basin to be designed as a joint use facility. Since the two

separate basins cannot efficiently be designed as joint use basins, each basin would need to be expanded in size, further impacting the area set aside as a Community Park. This scenario could prevent the Community Park Site from being accepted by the City of Rancho Cordova. Therefore, in order to provide an acceptable Community Park Site area and configuration the adjacent land uses would need to be revised. The land uses adjacent to the Community Park Sites northern boundary is a combination High School/middle school site which requires a minimum 80.0 acre site. Since the Community Park and High School/Middle School Sites can not be reduced in size only the proposed development area can be reduced in size to accommodate this alternative.

Costs Impacts Analysis

In order to quantify the cost impacts of implementing this alternative, an estimate was prepared that compares the Site development cost of the Proposed Project and Alternative B4 (Attachment C). It is estimated that the addition of a water quality/hydro-modification/detention basin, the relocation and redesign of the currently proposed water quality/hydro-modification/detention basin with the alternative area would result in a loss of 160 dwelling units and an increase cost of $421,400.00.

Environmental Impacts

Alternative B4 would avoid an additional 0.457 acre of waters of the U.S. and potential federally-listed species habitat. Potential additional wetland impacts would most likely result from relocation of the water quality/detention basin, but have not been quantified.

Summary

This alternative does support the proposed project, in that it logistically infeasible to relocate and/or reconfigure the basins, while at the same time maintaining the Community Park and High School/Middle School proposed for this portion of the SunCreek Specific Plan Area. It also not practicable as it would only avoid an additional 0.457 acres of wetlands, while costing approximately $450,000.

Alternative B5

Overview

Alternative B5 is located on the northern boundary of the Smith Property along the proposed North Campus Drive. The 31.81 acre alternative evaluates the possibility of avoiding 1.688 acres of a swale system, and associated vernal pool habitat, which runs through the Smith Property. This alternative would augment Alternative 4 to the south which connects to the overall preserve that is part of the proposed project. The majority of this alternative is found on the Smith and Sierra Sunrise projects and these portions will be addressed within the Alternatives Analysis for these projects. However, a small portion of the alternative falls within the Backbone Infrastructure footprint and will be discussed here. This alternative evaluates the avoidance of an additional 0.231 acre of waters of the U.S. that might be accomplished by re-aligning North Campus Drive (see Figure 9). In order for this alternative to be feasible, modifications to the Smith and Sierra Sunrise project designs would be required. Modifications to these project designs will not be discussed here. In addition, Alternative B4 would need to be implemented to allow for a connection between the proposed project preserve and the additional avoidance contemplated in Alternative B5. Without preserving B4, any open space established by Alternative B5 will be isolated.

Project Purpose

Although redesigning North Campus Drive would not affect the project purpose, The overall additional avoidance proposed in the Alternative would not allow for the proposed project purpose to be implemented. The overall alternative is only possible if the High School/Middle School proposed for the northern portion of the Smith property is not constructed.

Logistics

North Campus Drive is located along the northern boundary of the SPA. This road is a shared road with the proposed development project to the north. Re-aligning the road to the south is not feasible as that would further impact the wetlands within the proposed alternative and

would fragment the overall open space area that Alternative 5 contemplates. Alternatively, a causeway-type span would be required to avoid impact to wetlands at this location. The cost to implement a causeway type crossing (an elevated roadway) would cost significantly more that the proposed project and would not be practicable given the amount of wetlands (less than a quarter of an acre) that might be avoided.

Cost Impact Analysis

No cost estimates have been prepared for the Backbone Infrastructure portion of this alternative, as a causeway-type crossing at this location is not practicable, especially given the fact that there is no planned preserve to north of North Campus Drive. There is no reason to evaluate the potential costs to design and implement an elevated roadway at this location.

Environmental Impacts

The Backbone Infrastructure portion of this potential avoidance area contains only 0.231 acre of waters of the U.S. and potential federally-listed species habitat. Relocating the road would impact approximately the same amount of wetlands and waters of the U.S. as the swales that are currently impacted by this section of the road, flow south and would be similarly impacted by any other alignment. Modifications to other projects within the SPA would also be required in order to preserve the entire area that this alternative contemplates. As Alternative 4 is not practicable, any wetlands avoided in Alternative 5 would be situated in a somewhat isolated configuration and would not provide the functions and values that are desired from permanently preserved wetlands.

Summary

Relocating and/or redesigning North Campus Drive to avoid additional wetlands is not practicable. As there are no wetlands proposed for preservation on adjacent properties to the north that would connect to the additional open space area contemplated in Alternative 5B, the cost of designing and implementing an elevated road to minimize impacts would not be

justified, especially given that fact that only 0.231 acres would be avoided. Relocating the road would result in the same amount of impacts.

Alternative B6

Overview

Alternative B6 is located to the east of the proposed preserve on the Jaeger Ranch property and extends through the Sierra Sunrise property to incorporate approximately 1.241 acres of a stream system and several vernal pools and swales. The majority of this 16.51 acre alternative is located on the Jaeger Ranch and Sierra Sunrise projects and these portions will be addressed within the Alternatives Analysis for these projects. However, portions of the Backbone Infrastructure project would need to be relocated and/or redesigned in order for this alternative to be fully realized. Americanos Blvd. bisects the area of potential additional avoidance and a sewer line, storm drain piping and a trail are proposed on the western boundary of this alternative. This alternative evaluates the potential avoidance of an additional 0.056 acre of waters of the U.S. that fall within the Backbone Infrastructure project by re-aligning or redesigning a road and the other affected infrastructure.

Project Purpose

This alternative would not affect the project purpose.

Logistics

Although it is logistically feasible to relocate or redesign (elevate) Americanos at this location, and the proposed sewer line on the western end of this alternative could be constructed by bore and jack techniques, ultimately there would be no reasonable additional avoidance as both the road and the proposed trail would need to cross the potential additional avoidance area at some point.

Cost Impact Analysis

The cost of an elevated road crossing at this point would not be practicable, as the open space area and associated wetlands that could be avoided are not significant enough to warrant the additional cost. This is especially true in that the 0.056 acres would only be realized if the roadway were elevated and if the trail along the proposed project's main open space were eliminated. The trail is a required component of the project. Actual costs to implement this alternative have not been prepared, as the changes to the Backbone would only be warranted if the Alternative is found to be a component of the least environmentally damaging practicable alternative for both the Jaeger Ranch project and the Sierra Sunrise project.

Environmental Impacts

Alternative B6 evaluates the potential to avoid an additional 0.056 acre of waters of the U.S. and potential federally-listed species habitat. Although not quantified, only a fraction of this already small amount could be realized as the trail and road would ultimately need to cross the open space area at some point and impacts associated with the Backbone Infrastructure project could be reduced at best, but not eliminated. The open space corridor contemplated in Alternative 6B has significant impacts on the land use plans of Sierra Sunrise and Jaeger Ranch.

Summary

When discussing impacts associated with the Backbone Infrastructure project, Alternative 6B would most likely not result in less impacts to wetlands and waters. Additional wetland avoidance could only be achieve through the spanning of the potential open space area and would not justify the cost given that only 0.045 acres are affected by the current alignment of Americanos Blvd.

Alternative B7

Overview

Alternative B7 is located along the northern boundary of the Sierra Sunrise Property and the southern boundary of the Grantline Property and evaluates the possibility of extending the proposed preserve on the Sierra Sunrise property into the Grantline property. The northern half of the 12.35-acre potential preserve area contemplated in Alternative B7 occurs on the Grantline property and that portion will be addressed within the Alternatives Analysis for that project. The portion that occurs within the footprint to the Backbone Infrastructure project evaluates the potential avoidance of an additional 0.174 acre of waters of the U.S. by re-aligning a proposed arterial roadway and relocating two hydro-modification/water quality/detention basins (Figure 11a. *Alternative B7 – Proposed Project Land Use Plan* and Figure 11b. *Alternative B7 – Proposed Alternative Land Use Plan*). In order for this alternative to be feasible and to realize the desired potential additional avoidance, modifications to the Grantline project design would also be required. Modifications to the Grantline project design will not be discussed here.

Project Purpose

The project purpose would not be affected by Alternative 7B.

Logistics

In order to preserve the wetland features in the alternative, two water quality/hydro-modification/detention basins located along Americanos Boulevard would need to be relocated and redesigned. Americanos Boulevard is a major component of the City of Rancho Cordova's Transportation Capitol Improvement Plan and its alignment was established with the approval of the Sunrise Douglas Community Plan. Numerous Specific Plans have based their land use plans on this alignment. Americanos Boulevard, a major arterial roadway that bisects the expanded preserve area cannot be rerouted to avoid the wetland feature. Therefore, an elevated roadway would be necessary to span the proposed preserve in Alternative B7.

The detention basins are designed to intercept the upstream development storm water runoff to ensure the downstream receiving waters don't receive untreated and increased erosive forces. The basins would need to be redesigned and reconfigured to ensure that large event storm runoff overland flows traveling through the development would still be intercepted by the water quality/hydro-modification/detention basins. Therefore, Detention Basin #2 (on the east side of Americanos Boulevard) needs to be elongated such that the overland storm flows heading in a southerly direction are directed into the basin.

Costs Impacts Analysis

In order to quantify the cost impacts of implementing this alternative, an estimate was prepared that compares the Site development cost of the Proposed Project and Alternative B7 (Attachment D). It is estimated that the reconfiguration of two water quality/hydro-modification/detention basin, the construction of a bridge would result in a loss of 60 dwelling units and an increase cost of $4,513,900.00.

Environmental Impacts

Alternative B7 would avoid an additional 0.174 acre of waters of the U.S. and potential federally-listed species habitat. Modifications to other projects within the SPA would be required in order to accomplish the potential additional avoidance that this alternative contemplates.

Summary

This alternative would result in significant higher costs as a result of the need for an elevated roadway and the relocated basins would result in the loss of approximately 10 acres of proposed residential land use acreage. The additional cost of approximately $4.5 million is not practicable in relation to the 0.174 acres of potential additional avoidance.

Alternative B8

Overview

The Backbone Infrastructure portions of Alternative B8 are located primarily along the northern boundary of the Grantline Property. This 29.67 acre alternative is comprised of three sections that have been identified by the Corps as areas of potential additional avoidance. The first section is located along the western side of the Grantline project which incorporates the branches of a swale and drainage system. The second section of the alternative is located along the north-central boundary line, and the third section is located in the eastern-most corner of the Grantline property. The western section of this alternative would augment the additional avoidance contemplated in Alternative B7 to the south, which connects to the proposed preserve in the Sierra Sunrise property. The majority of this alternative is found on the Grantline project and this portion will be addressed within the Alternatives Analysis for that project. The portions of the potential additional avoidance areas that fall within the Backbone Infrastructure footprint will be discussed here (Figure 12). This alternative evaluates the potential avoidance of an additional 0.182 acre of waters of the U.S. within the Backbone Infrastructure footprint by re-aligning and/or redesigning Chyrsanthy Road and an arterial road that connects to Chrysanthy Road. In order for this alternative to be feasible, modifications to the Grantline project design would be required.

Project Purpose

The project purpose would not be affected by Alternative 8B.

Logistics

Chrysanthy Road is located along the northern boundary of the SPA. This road is a shared road with the proposed development project to the north. Re-aligning the road to the south is not feasible as that would further impact the wetlands within the proposed alternative. Therefore, a bridge to span the preserve area would be required for each of the three preserve sections in this alternative. As no open space preserve are proposed on the adjacent property to the

north, elevating Chrysanthy would serve no purpose and realigning Chrysanthy further south would only fragment any open space area that may be practicable on the Grantline property. The current location allows for the largest contiguous open space potential on the areas that have been identified for potential additional avoidance.

Cost Impact Analysis

Costs for realigning Chrysanthy and Americanos blvd. have not been prepared as moving the roads would not result in additional avoidance and elevating Chrysanthy would serve no purpose.

Environmental Impacts

The wetlands and waters of the U.S. that occur within the Backbone Infrastructure project's footprint total 0.182 acre. Only a fraction of this could be realized by realigning the road, which is not practicable as the road is a shared road with the property to the north. Elevating or spanning the wetland features is not practicable (logistically or economically) as there is no open space to the north for which the potential additional open space areas could connect.

Summary

This alternative is not practicable due to logistics, economics and potential environmental benefits. Less than 0.182 acre of additional avoidance is potentially possible.

SUMMARY/CONCLUSION

Table 3 below summarizes the results for the Analysis of the Alternatives. Of the eight Alternatives, only Alternative 2B may result in additional avoidance while at the same being logistically feasible, economically reasonable (both in additional cost and in cost per additional acre of avoided wetland).

Table 3 – Summary of Analysis of Alternatives to Minimize Impacts to Wetlands and Waters of the U.S.*

	Potential reduction in wetland impacts		Additional Cost Reasonable	Cost per Acre of Avoided Wetland Reasonable?		Project Purpose				Logistics	Environmental/Waters		Practicable
Alternative B1	0.021		YES	NO		YES				YES	NO		NO
Alternative B2	0.235		YES	YES		YES				YES	NO		YES
Alternative B3	0.235		NO	NO		YES				NO	NO		NO
Alternative B4	<0.457		NO	NO		NO				NO	NO		NO
Alternative B5	<0.231		NO	NO		YES				NO	NO		NO
Alternative B6	<0.056		NO	NO		YES				NO	NO		NO
Alternative B7	<0.174		NO	NO		YES				NO	NO		NO
Alternative B8	<0.182		NO	NO		YES				NO	NO		NO

*See individual alternative analysis for Alternative-specific details

Project Purpose

– Can the alternative be implemented in a location or configuration that would support the project purpose?

Cost

1 – Can the alternative be implemented without costing substantially more than that of the proposed project alternative?
2 – Is the additional cost reasonable related to amount of additional wetland avoidance?
3 – Can the alternative be implemented without increasing the cost per developable acre to point where the project component is no longer economically feasible?

Logistics

– Does the alternative conform to the land use plan circulation design without presenting other logistical challenges?

Environmental/Waters

– Does the alternative have significantly less impacts on waters of the United States than the proposed project alternative?

LEDPA

– Is the Alternative Practicable? Does the Alternative represent the Least Environmentally Damaging Practicable Alternative?

DRAFT

LIST OF FIGURES

Figure 1. Site and Vicinity

Figure 2. Proposed Impact Plan

Figure 3. Wetland Delineation and Assessment

Figure 4. Areas Evaluated for Potential Additional Avoidance (Alternatives)

Figure 5. Alternative B1

Figure 6. Alternative B2

Figure 7a. Alternative B3 – Proposed Project Land Use Plan

Figure 7b. Alternative B3 – Potential Alternative Land Use Plan

Figure 8a. Alternative B4 – Proposed Project Land Use Plan

Figure 8b. Alternative B4 – Potential Alternative Land Use Plan

Figure 9. Alternative B5

Figure 10a. Alternative B6

Figure 11a. Alternative B7 – Proposed Project Land Use Plan

Figure 11b. Alternative B7 – Potential Alternative Land Use Plan

Figure 12. Alternative B8

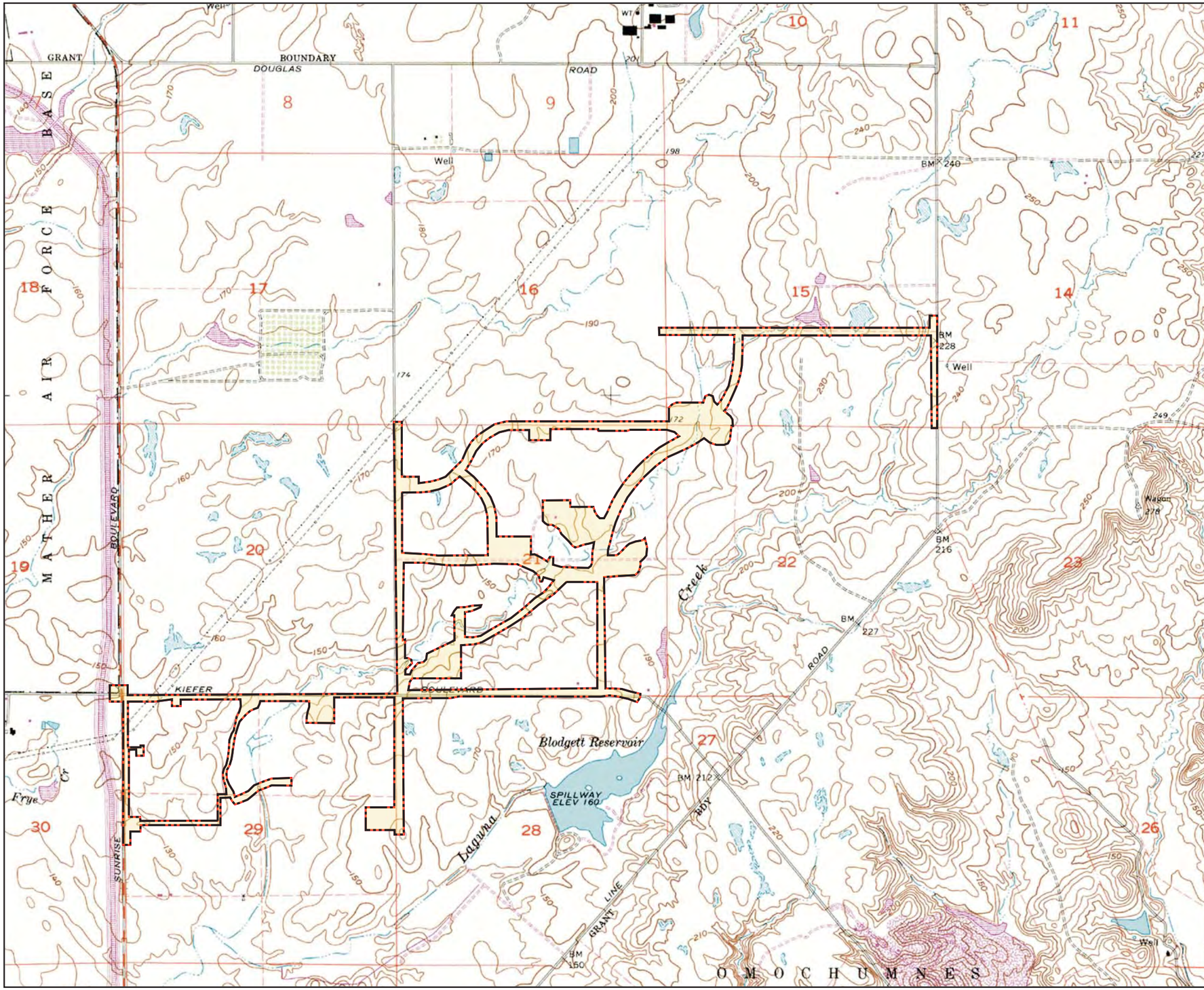


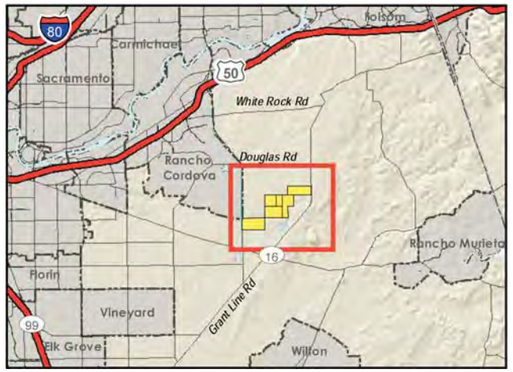
Figure 1.
Project Site and Vicinity

§15, 21, & 29, T.8N., R.7E., MDBM
Latitude 38° 32' 00" N
Longitude 121° 12' 45" W
Lower Sacramento Watershed (18020109)

Backbone Infrastructure

Scale in Feet
0 2000

Buffalo Creek, California, 7.5 minute topographic quadrangle, US Geological Survey, 1980.



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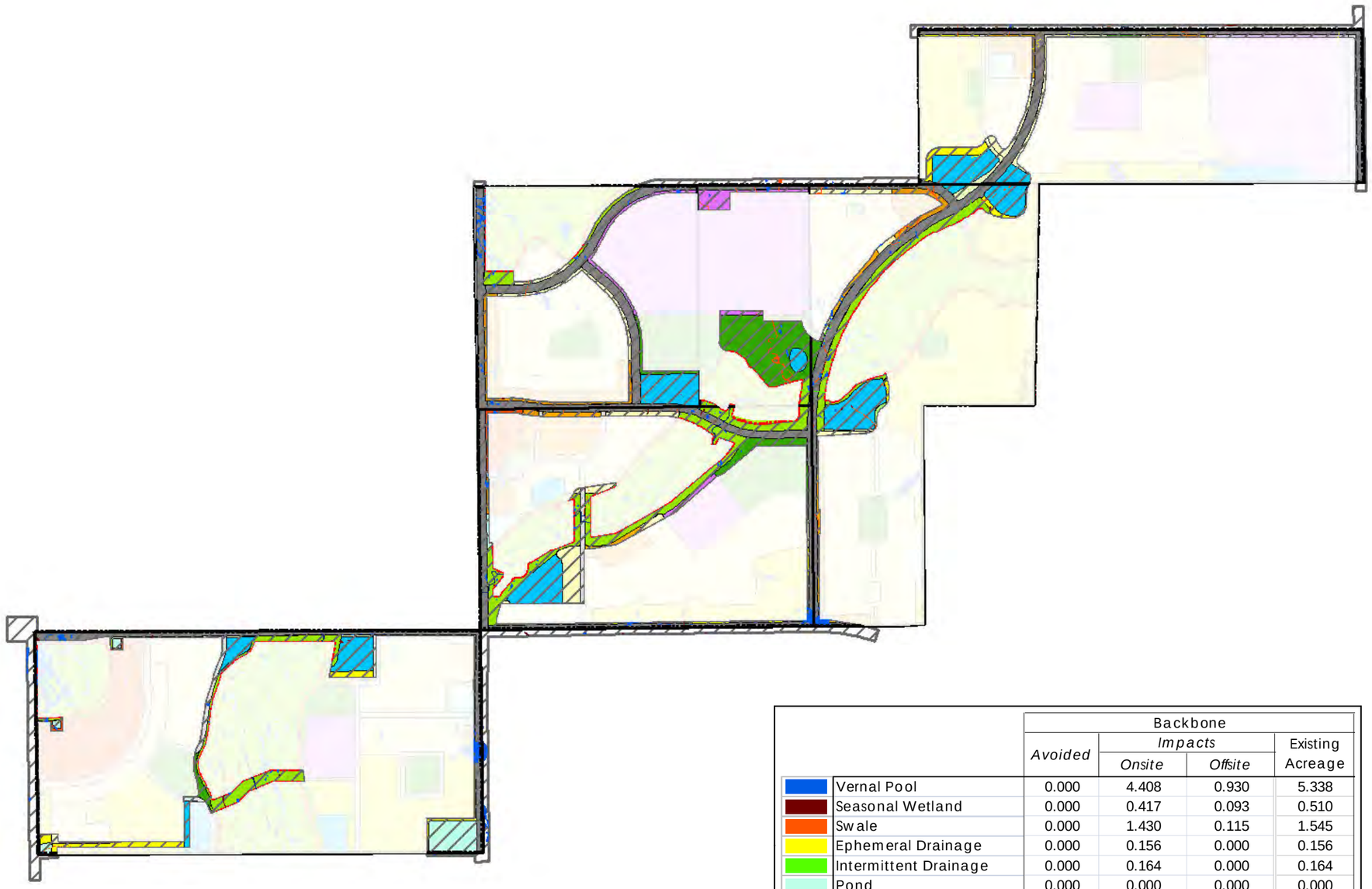
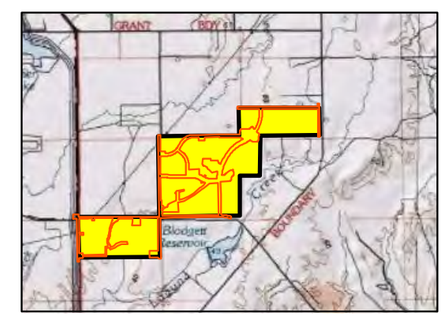
2009-142 Suncreek SP

Figure 2. Proposed Impact Plan

Backbone



Project Boundary
Property Boundaries
Preserve Boundary
Proposed Backbone
CMDR
CMU
Canal
DB
HDR
LDR
LTC
MDR
MinorRoad
PC
PP
PQP
Park
Road
School
Wetland Buffer



		Backbone			
		Avoided	*Impacts*		Existing Acreage
			Onsite	*Offsite*	
	Vernal Pool	0.000	4.408	0.930	5.338
	Seasonal Wetland	0.000	0.417	0.093	0.510
	Swale	0.000	1.430	0.115	1.545
	Ephemeral Drainage	0.000	0.156	0.000	0.156
	Intermittent Drainage	0.000	0.164	0.000	0.164
	Pond	0.000	0.000	0.000	0.000
	Stream	0.000	0.569	0.078	0.647
	Isolated Vernal Pool	0.000	0.000	0.000	0.000
	Total	*0.000*	*7.144*	*1.216*	8.360

Detailed analysis has not yet been conducted to determine offsite impacts.

Scale in Feet
0 1,400
1 " = 1,400 '

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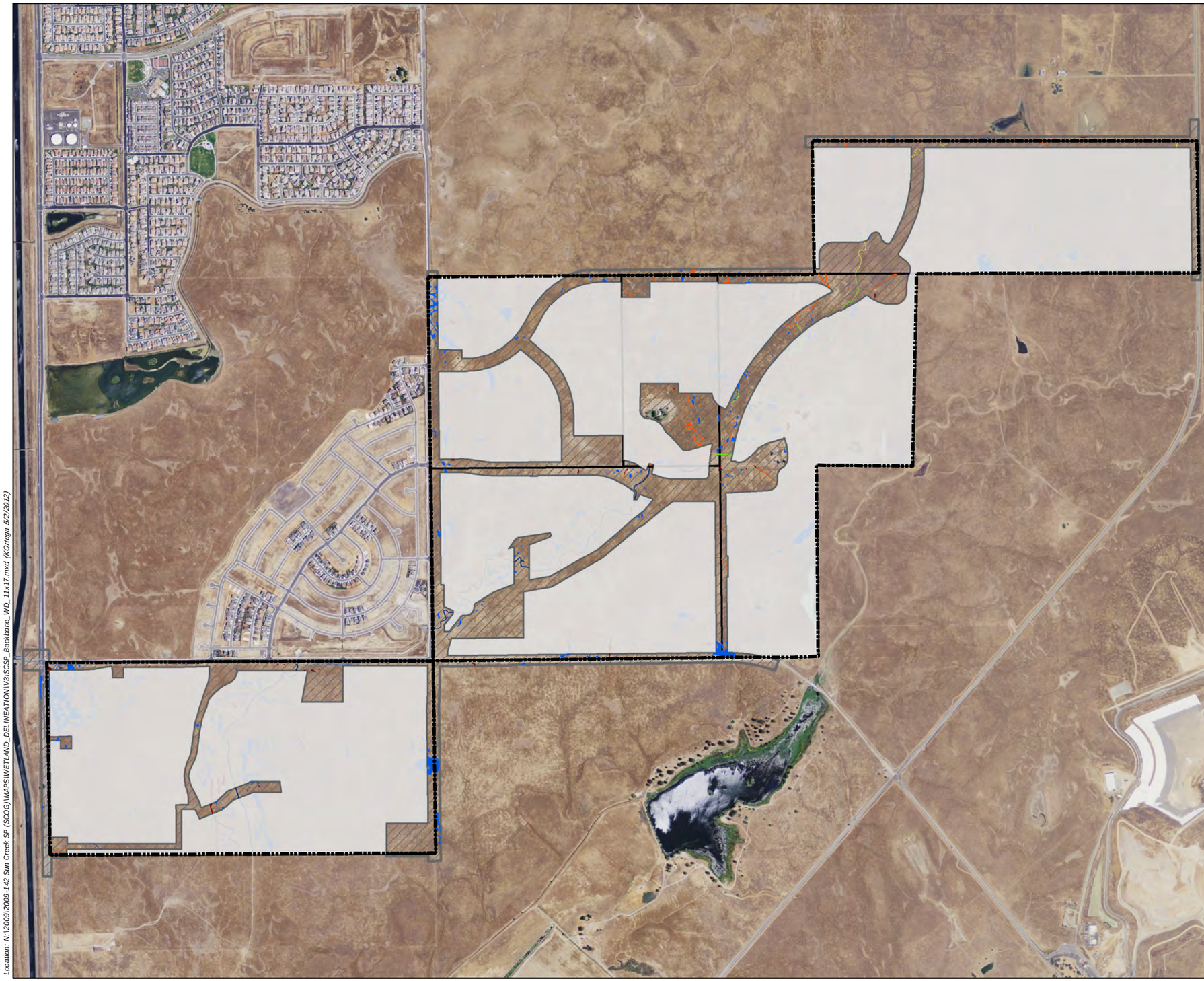
Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\404\404_v4\INDIVIDUAL\SCSP_Backbone_Imp_11x17.mxd (KOrtega 10/7/2011)

Map Date: 10/7/2011

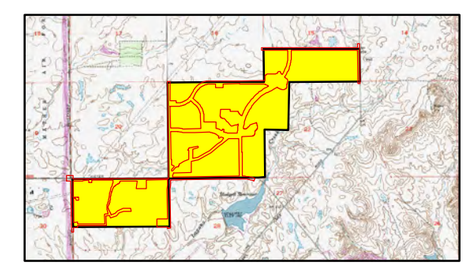
Figure 3. Wetland Delineation & Assessment



Project Boundary
Property Boundaries
Proposed Infrastructure

	Existing Acreage
Vernal Pool	5.338
Seasonal Wetland	0.510
Swale	1.545
Ephemeral Drainage	0.156
Intermittent Drainage	0.164
Pond	0.000
Stream	0.647
Isolated Vernal Pool	0.000
Total	*8.360*

Detailed analysis has not yet been conducted to determine offsite wetland acreages.



Scale in Feet
0 1,400
1 " = 1,400 '

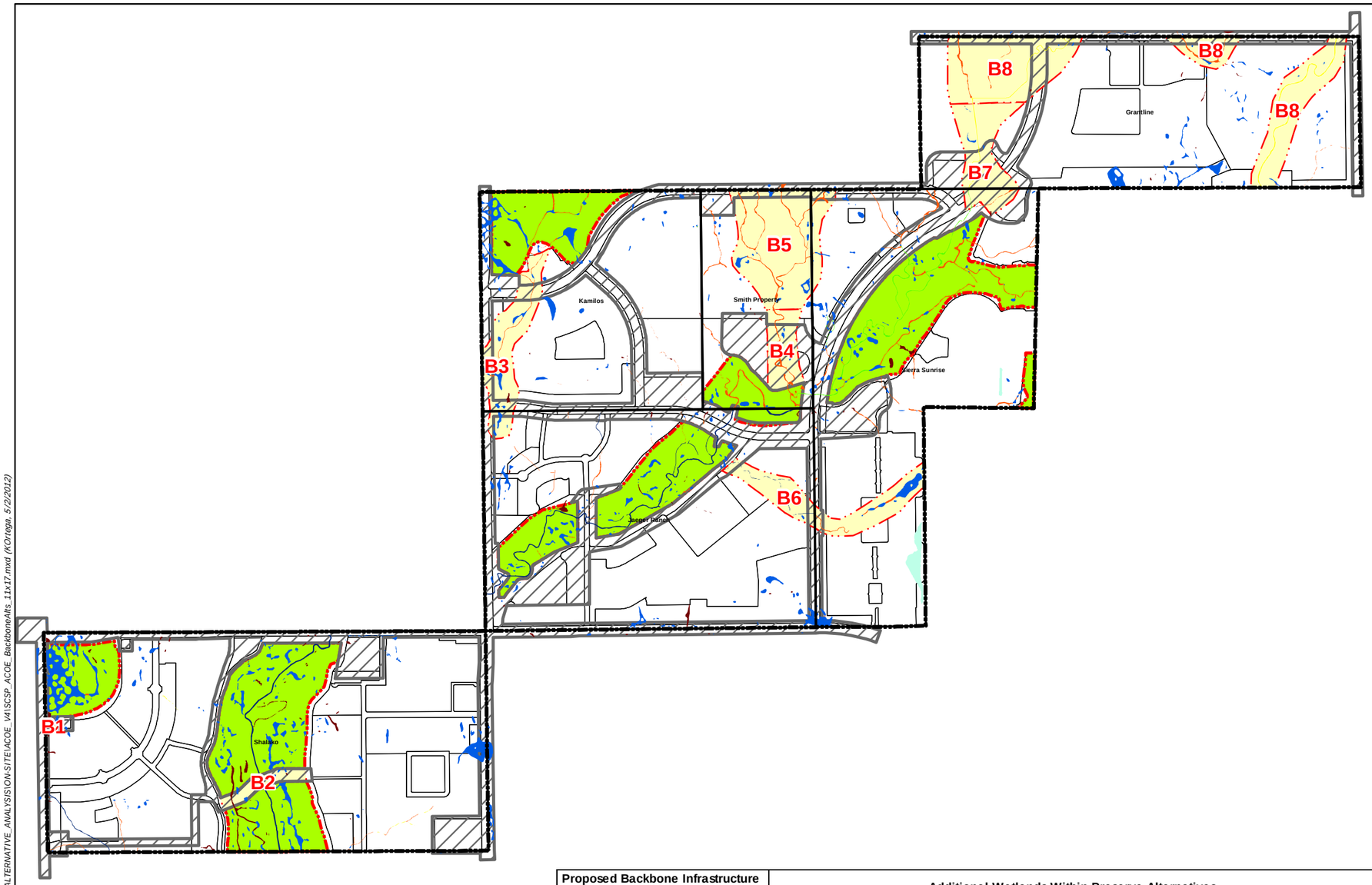
ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\WETLAND_DELINEATION\V3\SCSP_Backbone_WD_11x17.mxd (KOrtega 5/2/2012)

DRAFT

Map Date: 5/2/2012

Figure 4.
Areas of Potential Additional Avoidance (Alternatives)



Map Features

- Project Boundary
- Property Boundaries
- Proposed Backbone
- Preserve Boundary
- ACoE Alternative Preserves

Scale in Feet

0 1,400

1 " = 1,400 '

	Proposed Backbone Infrastructure			Additional Wetlands Within Preserve Alternatives									
	Avoided	*Direct Impacts*	Existing Acreage	B1	B2	B3	B4	B5	B6	B7	B8	B1-B8 Total	B9*
Vernal Pool	0.000	5.338	5.338	0.021	0.112	0.178	0.098	0.100	0.000	0.009	0.005	0.523	0.095
Seasonal Wetland	0.000	0.510	0.510	0.000	0.071	0.026	0.000	0.000	0.000	0.013	0.009	0.119	0.009
Swale	0.000	1.545	1.545	0.000	0.000	0.031	0.359	0.131	0.036	0.069	0.076	0.702	0.000
Ephemeral Drainage	0.000	0.156	0.156	0.000	0.000	0.000	0.000	0.000	0.000	0.064	0.092	0.156	0.000
Intermittent Drainage	0.000	0.164	0.164	0.000	0.000	0.000	0.000	0.000	0.000	0.019	0.000	0.019	0.000
Pond	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Stream	0.000	0.647	0.647	0.000	0.052	0.000	0.000	0.000	0.020	0.000	0.000	0.072	0.000
Isolated Vernal Pool	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	*0.000*	*8.360*	8.360	0.021	0.235	0.235	0.457	0.231	0.056	0.174	0.182	1.591	0.104

*Acreages include 0.053 acres of indirect impacts.

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS
kOrtega

Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\ON-SITE\ACOE_V4\SCSP_ACOE_BackboneAlts_11x17.mxd (KOrtega, 5/2/2012)

DRAFT

Map Date: 5/2/2012

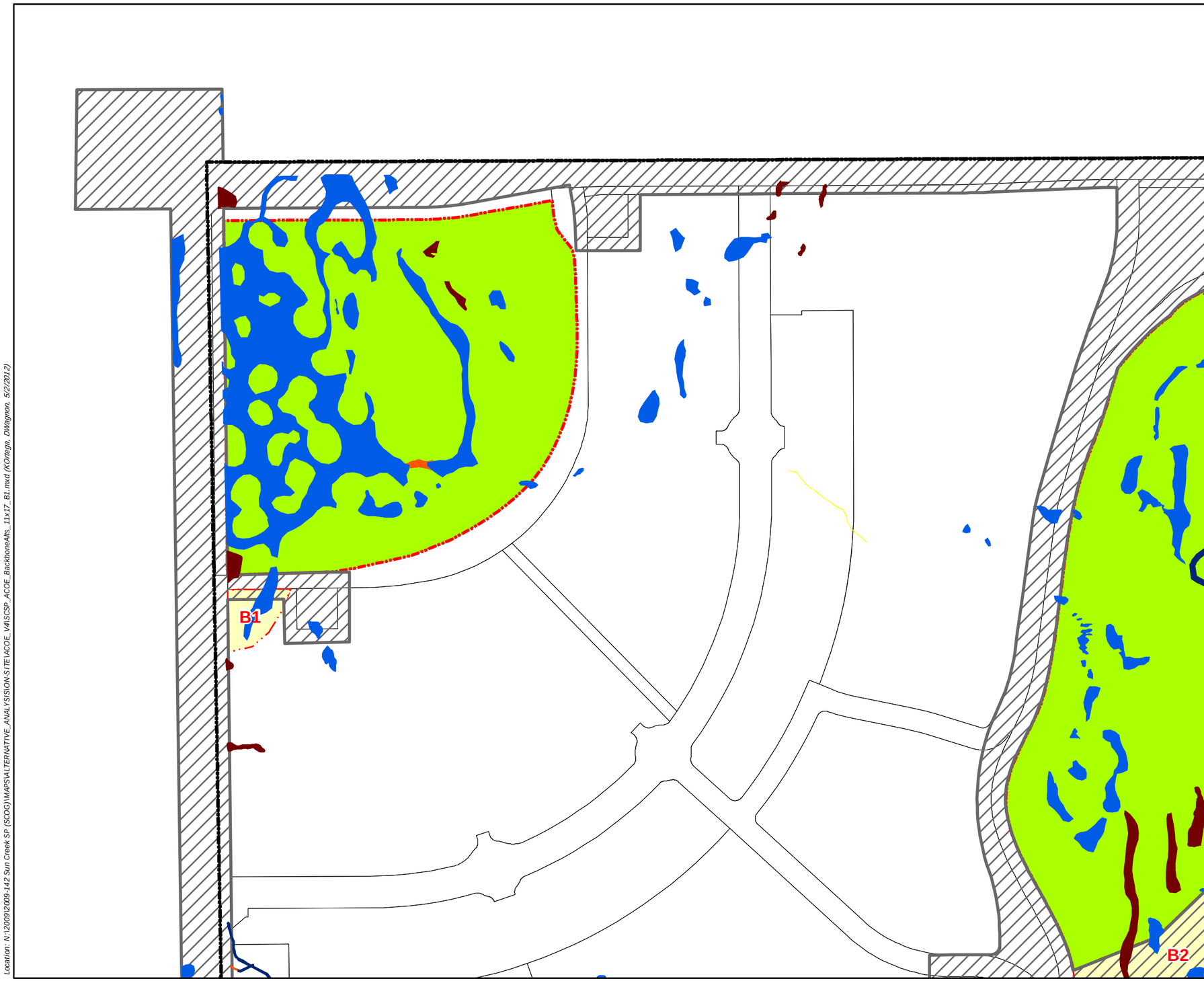


Figure 5.
Alternative B1

Map Features

- Property Boundaries
- Project Boundary
- Proposed Backbone
- ACoE Alternative Preserves
- Preserve Boundary

Wetlands

- Vernal Pool
- Seasonal Wetland
- Swale
- Ephemeral Drainage
- Stream

Scale in Feet

0 250

1 " = 250 '

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS
dwagnon

Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\ON-SITE\ACOE_V4\SCSP_ACOE_BackboneAlts_11x17_B1.mxd (KOrtega, DWagnon, 5/2/2012)

DRAFT

Map Date: 5/2/2012

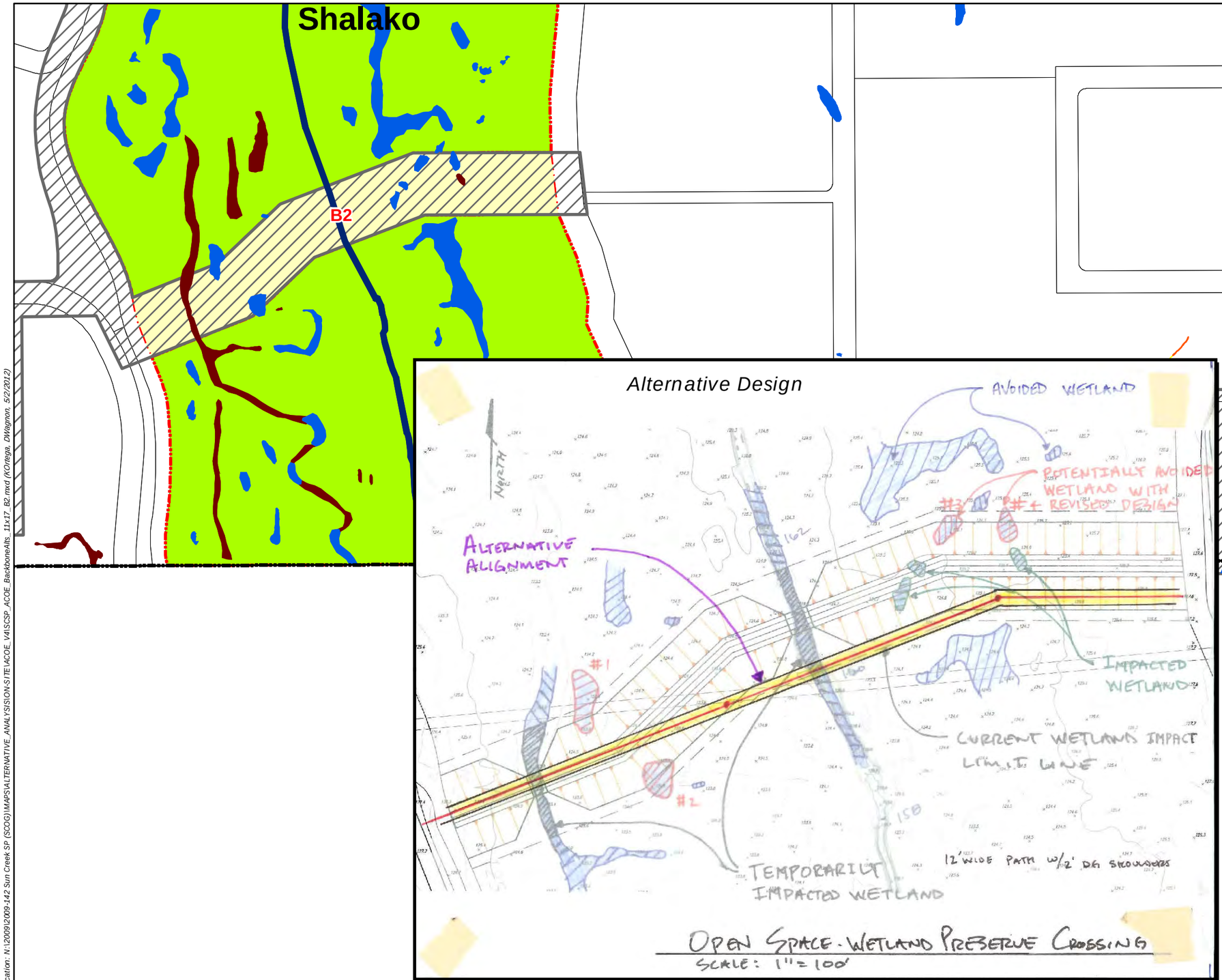


Figure 6.
Alternative B2

Map Features

- Property Boundaries
- Project Boundary
- Proposed Backbone
- ACoE Alternative Preserves
- Preserve Boundary

Wetlands

- Vernal Pool
- Seasonal Wetland
- Swale
- Ephemeral Drainage
- Stream

Scale in Feet

0 250

1 " = 250 '

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\ON-SITE\ACOE_V4\SCSP_ACOE_BackboneAlts_11x17_B2.mxd (KOrtega, DWagnon, 5/2/2012)

DRAFT

Map Date: 5/2/2012

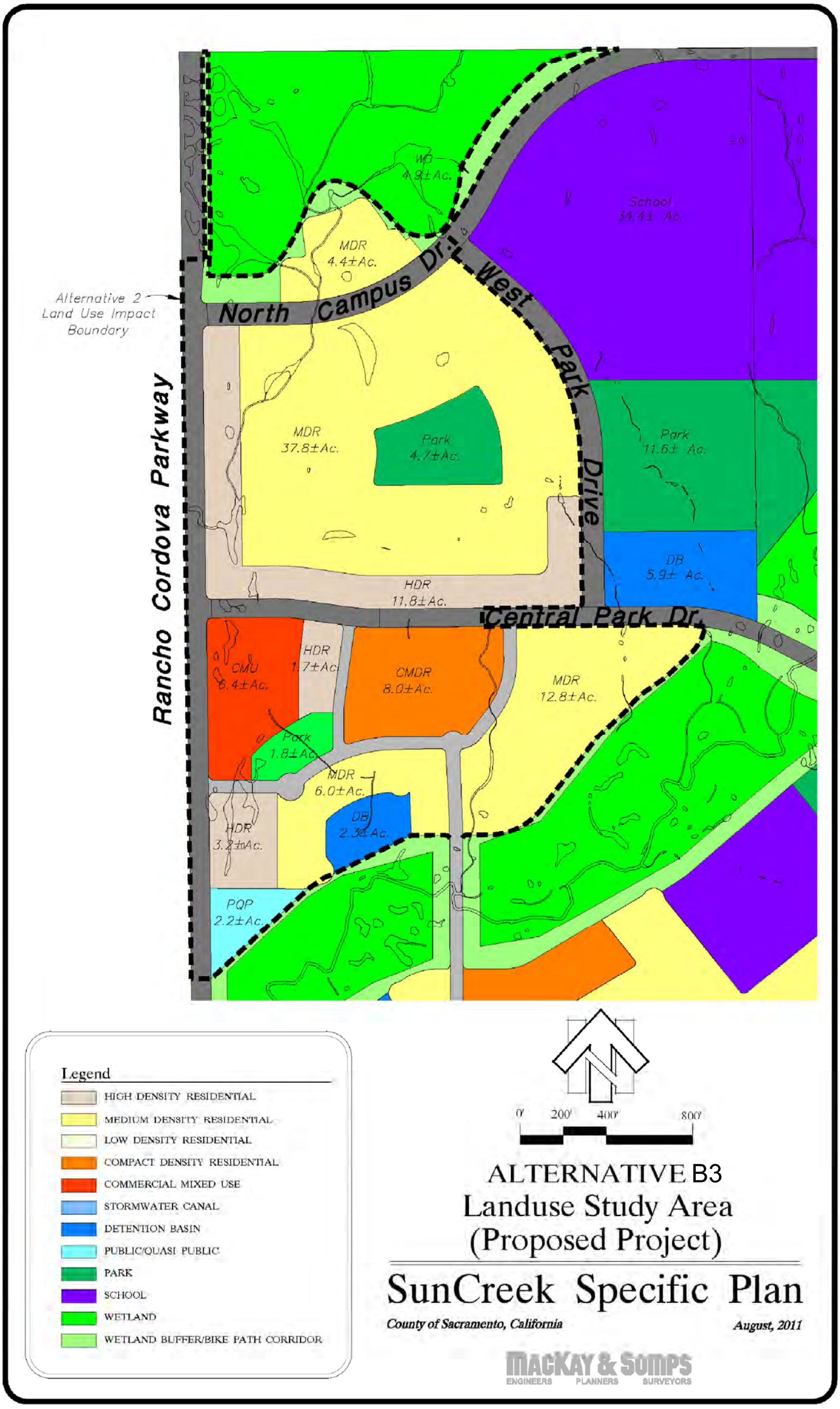


Figure 7a

DRAFT

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

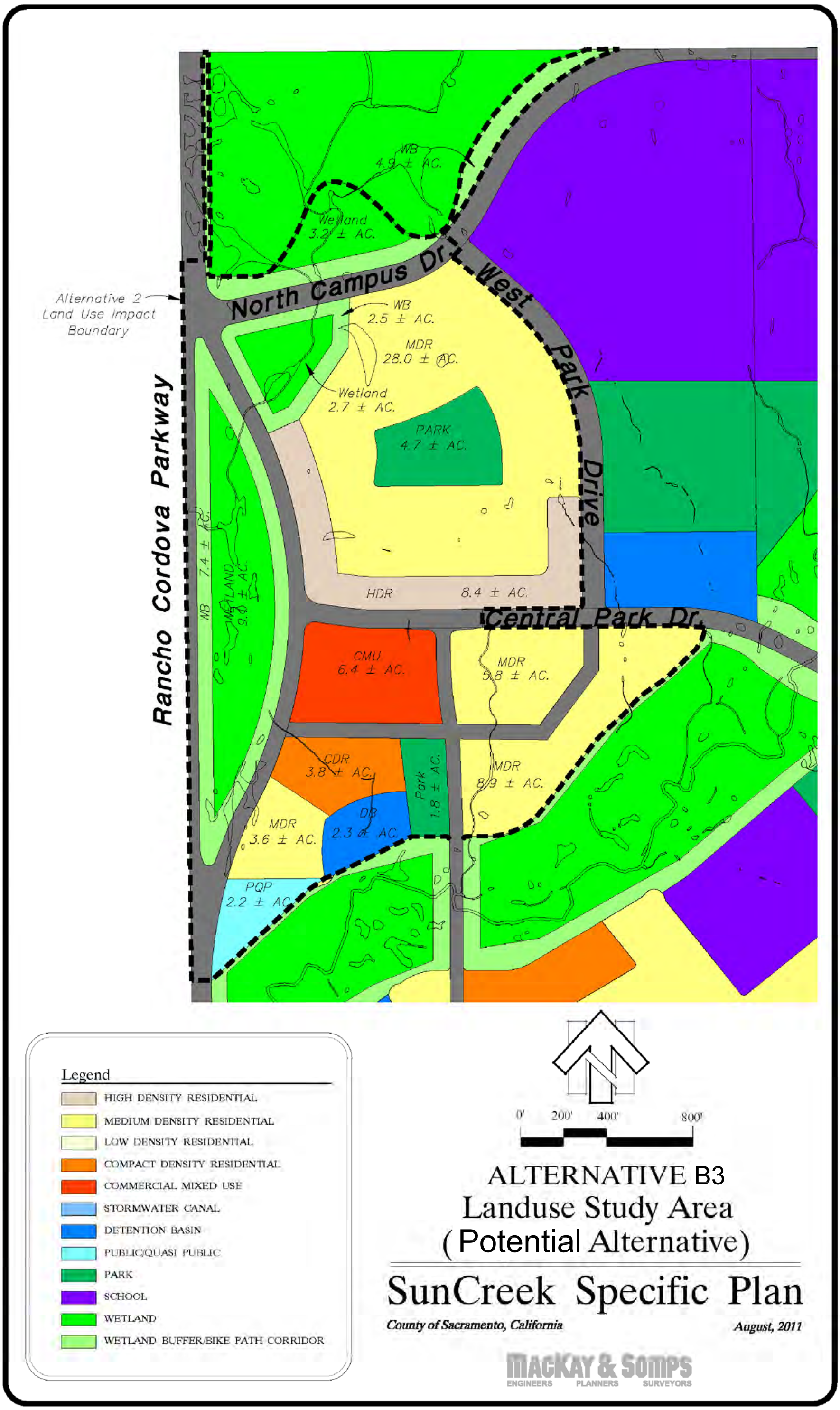
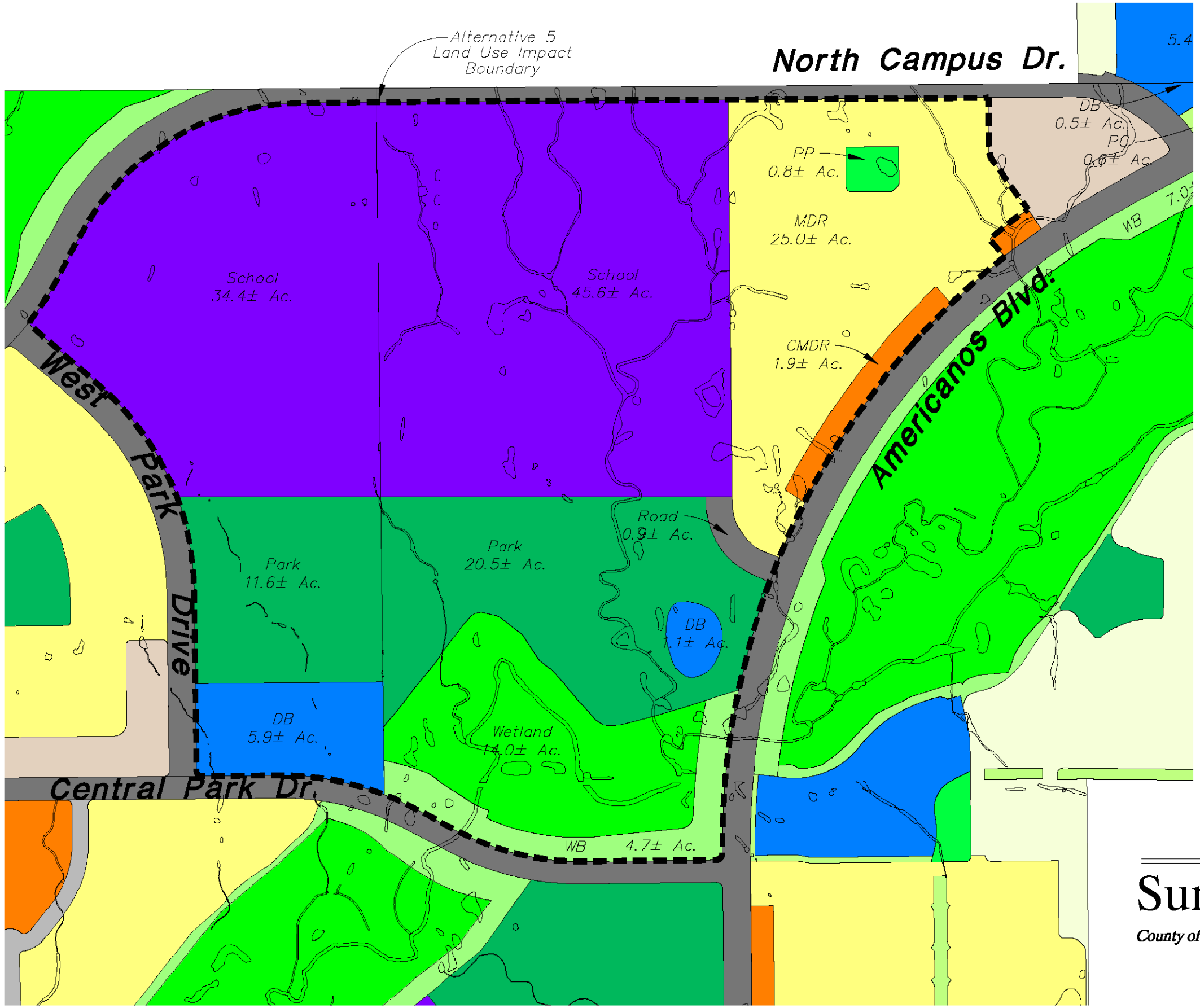


Figure 7b

DRAFT

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS



Legend

- HIGH DENSITY RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- LOW DENSITY RESIDENTIAL
- COMPACT DENSITY RESIDENTIAL
- COMMERCIAL MIXED USE
- STORMWATER CANAL
- DETENTION BASIN
- PUBLIC/QUASI PUBLIC
- PARK
- SCHOOL
- WETLAND
- WETLAND BUFFER/BIKE PATH CORRIDOR

0' 200' 400' 800'

ALTERNATIVE B4
Landuse Study Area
(Proposed Project)

SunCreek Specific Plan

County of Sacramento, California *August, 2011*

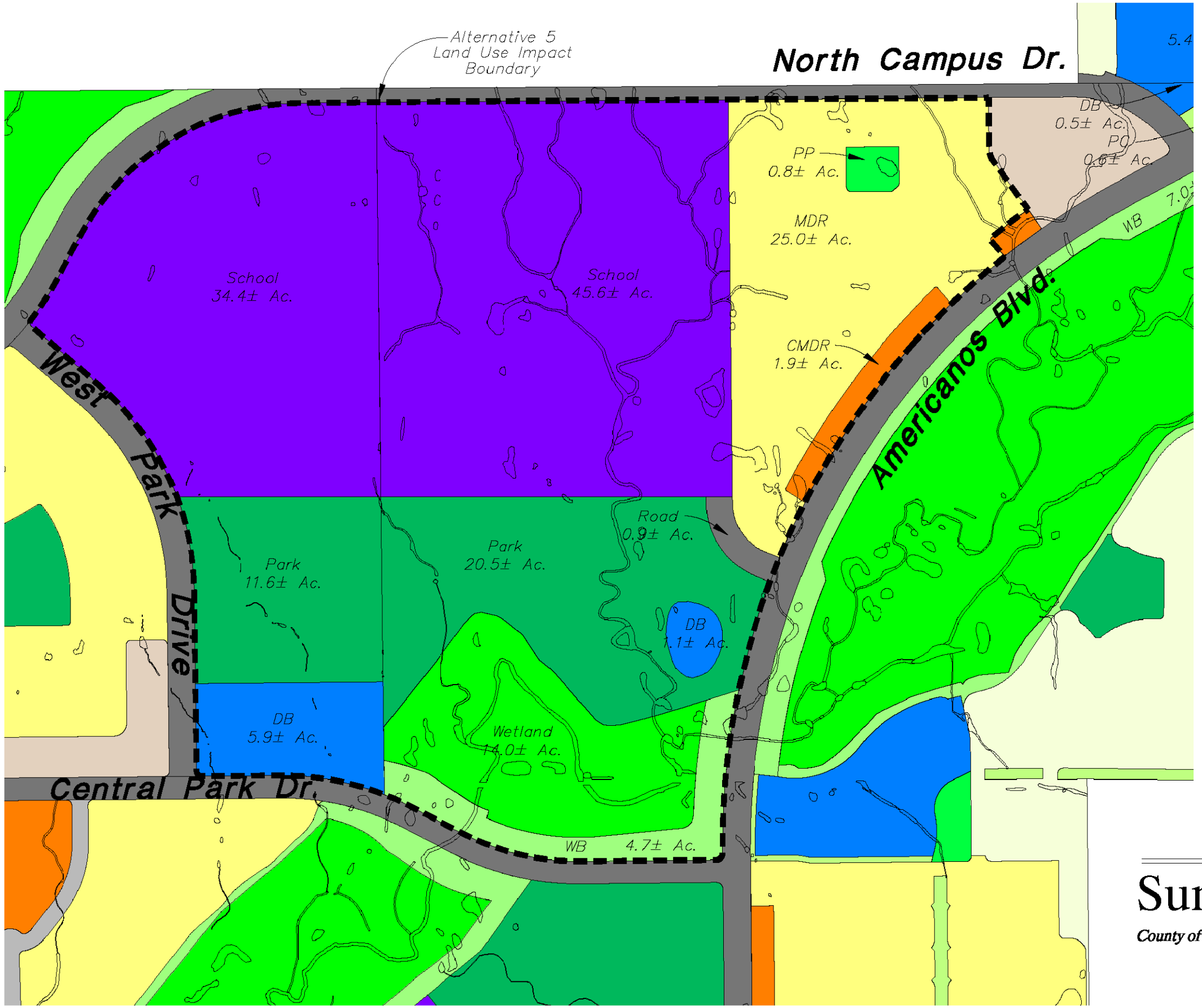
MacKay & Somps
ENGINEERS PLANNERS SURVEYORS

N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\ON-SITE\ACOE_V4\Alternative_Landuses.dwg

Figure 8a

DRAFT

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS



Legend

- HIGH DENSITY RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- LOW DENSITY RESIDENTIAL
- COMPACT DENSITY RESIDENTIAL
- COMMERCIAL MIXED USE
- STORMWATER CANAL
- DETENTION BASIN
- PUBLIC/QUASI PUBLIC
- PARK
- SCHOOL
- WETLAND
- WETLAND BUFFER/BIKE PATH CORRIDOR

0' 200' 400' 800'

ALTERNATIVE B4
Landuse Study Area
(Potential Project)

SunCreek Specific Plan

County of Sacramento, California *August, 2011*

MacKay & Somps
ENGINEERS PLANNERS SURVEYORS

N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\ON-SITE\ACOE_V4\Alternative_Landuses.dwg

Figure 8b

DRAFT

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

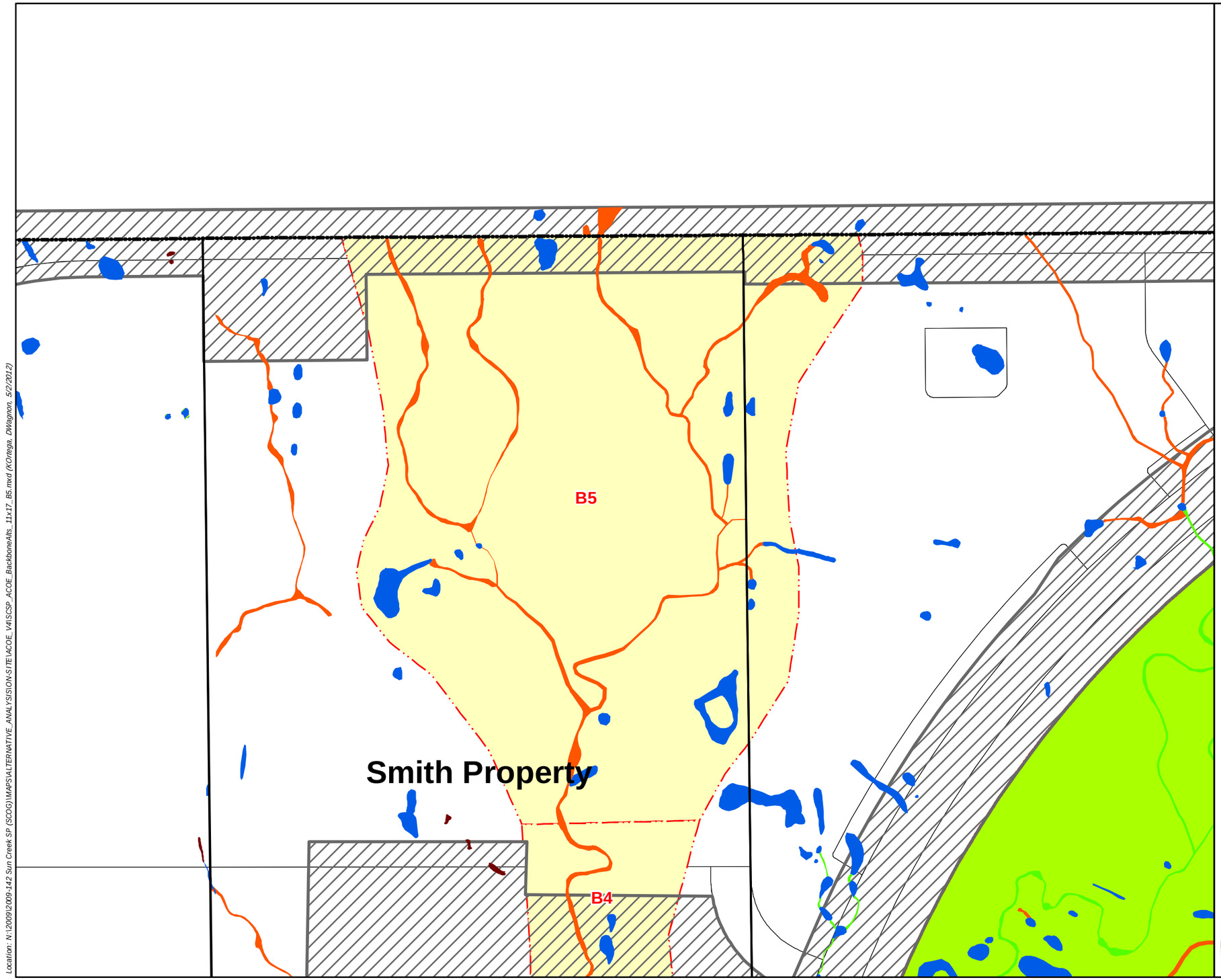


Figure 9.
Alternative B5

Map Features

- Property Boundaries
- Project Boundary
- Proposed Backbone
- ACoE Alternative Preserves
- Preserve Boundary

Wetlands

- Vernal Pool
- Seasonal Wetland
- Swale
- Intermittent Drainage
- Isolated Vernal Pool

Scale in Feet

0 250

1 " = 250 '

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS
dwagnon

Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\SITE\ACOE_V4\SCSP_ACOE_BackboneAlts_11x17_B5.mxd (KOrtega, DWagnon, 5/2/2012)

DRAFT

Map Date: 5/2/2012

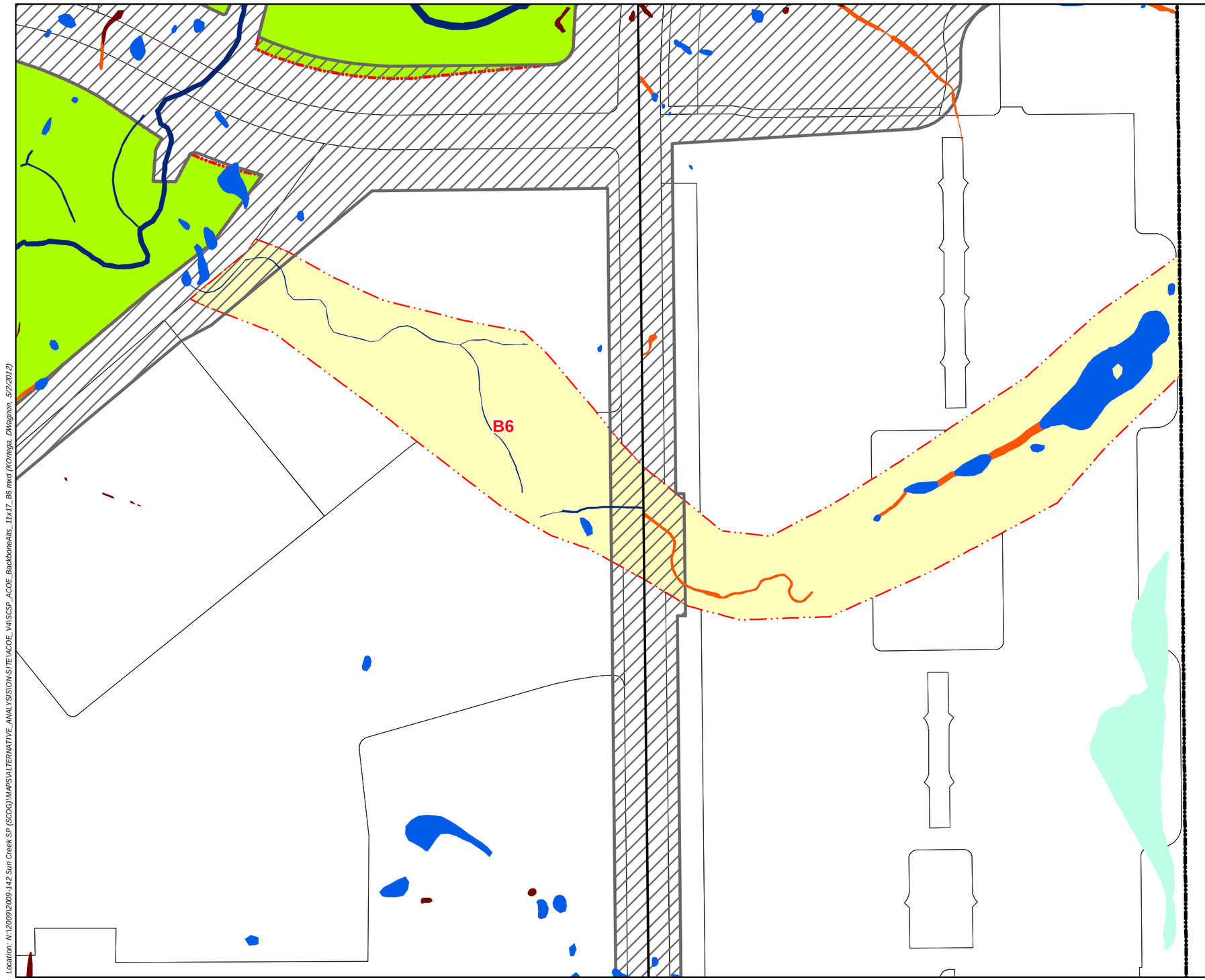


Figure 10a.
Alternative B6

Map Features

- Property Boundaries
- Project Boundary
- Proposed Backbone
- ACoE Alternative Preserves
- Preserve Boundary

Wetlands

- Vernal Pool
- Seasonal Wetland
- Swale
- Pond
- Stream

Scale in Feet

0 250

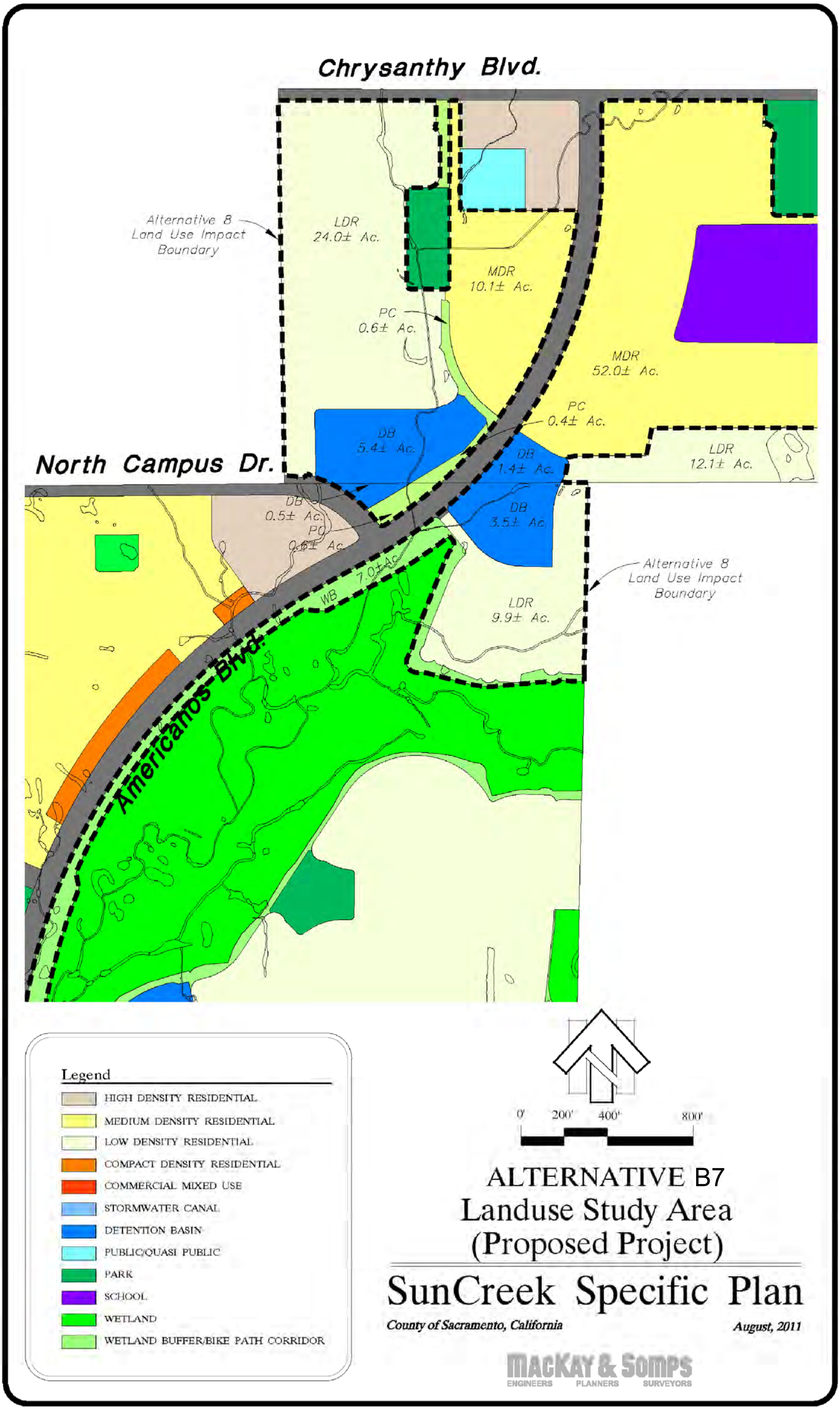
1 " = 250 '

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS
dwagnon

Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\ON-SITE\ACOE_V4\SCSP_ACOE_BackboneAlts_11x17_B6.mxd (KOrtega, DWagnon, 5/2/2012)

DRAFT

Map Date: 5/2/2012

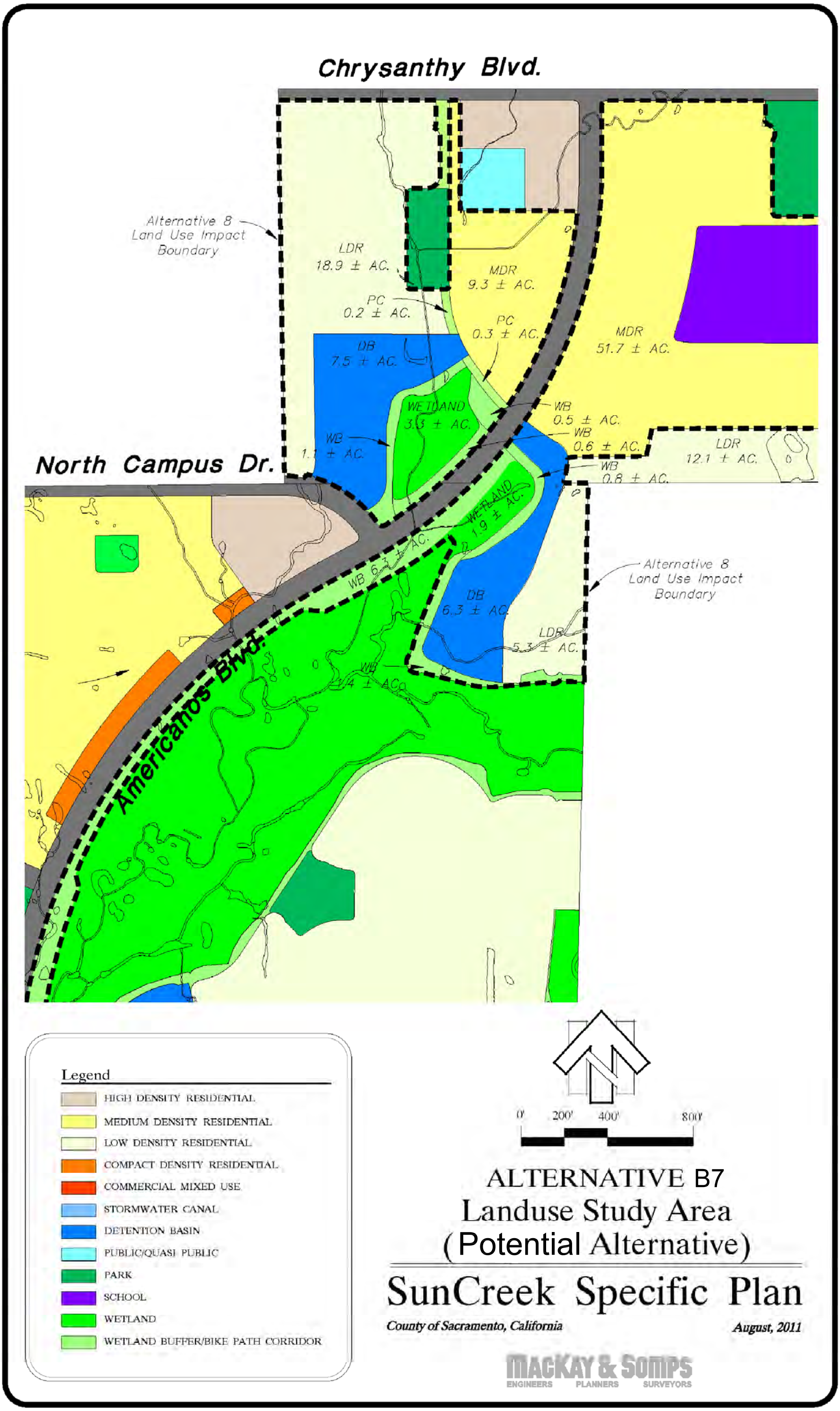


N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\ON-SITE\ACOE_V4\Alternative_Landuses.dwg

Figure 11a

DRAFT

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

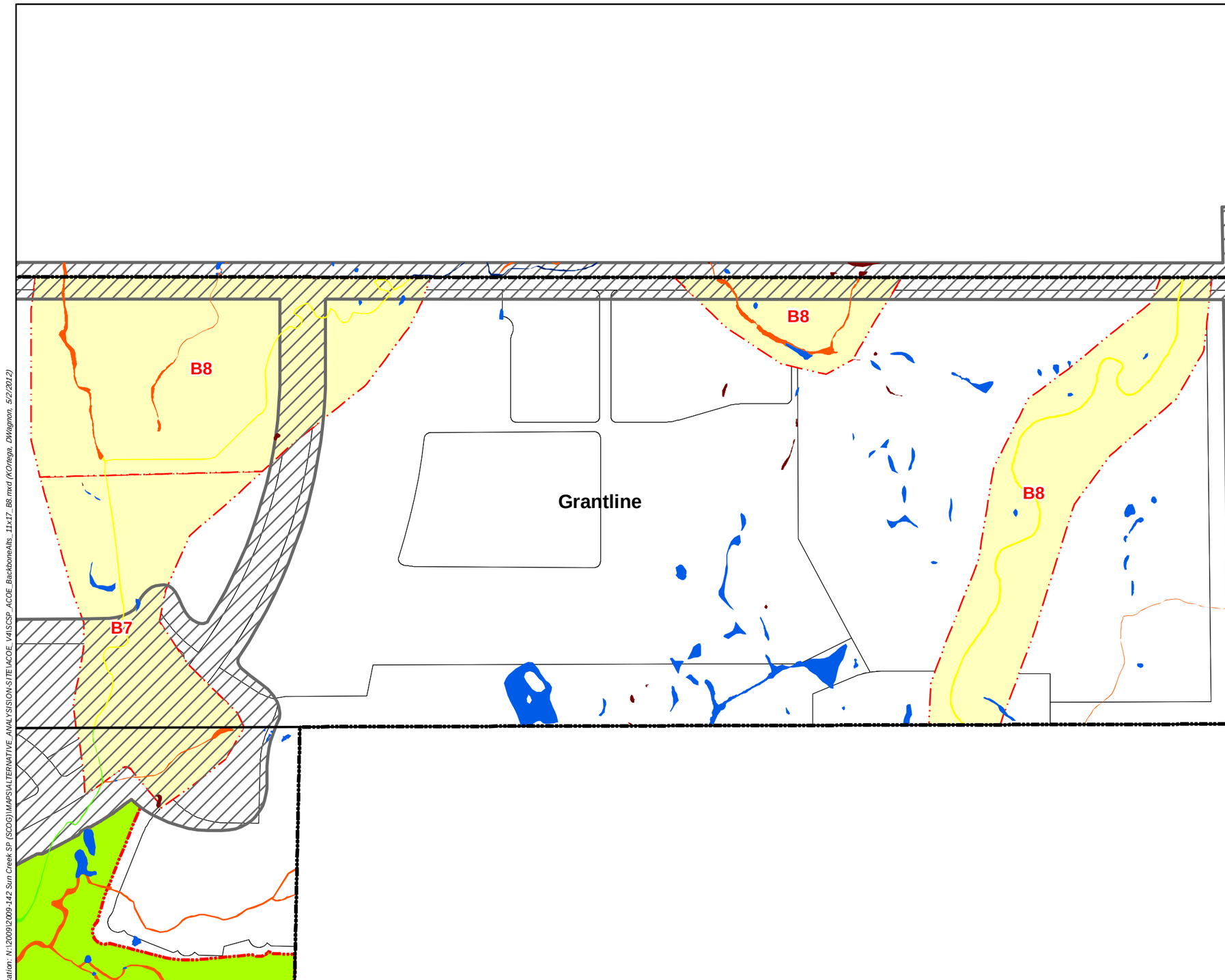


N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\ON-SITE\ACOE_V4\Alternative_Landuses.dwg

Figure 11b

DRAFT

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS



Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\ON-SITE\ACOE_V4\SCSP_ACOE_BackboneAlts_11x17_B8.mxd (KOrtega, DWagnon, 5/2/2012)

Figure 12.
Alternative B8

Map Features

- Property Boundaries
- Project Boundary
- Proposed Backbone
- ACoE Alternative Preserves
- Preserve Boundary

Wetlands

- Vernal Pool
- Seasonal Wetland
- Swale
- Ephemeral Drainage
- Intermittent Drainage
- Stream

Scale in Feet

0 420

1 " = 420 '

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS
dwagnon

DRAFT

Map Date: 5/2/2012

DRAFT

LIST OF ATTACHMENTS

Attachment A – Alternatives Overview

Attachment B – Alternative B3 (Cost Impact Analysis)

Attachment C – Alternative B4 (Cost Impact Analysis)

Attachment D – Alternative B7 (Cost Impact Analysis)

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ATTACHMENT A

Alternatives Overview

JOB NAME:	Sun Creek Specific Plan
PROJECT NO:	2009-142
MAP SCALE:	1 " = 400 '
DATE:	8/4/2010
REVISION:	5/3/2012
FILE NAME:	N:\2009\2009-142 Sun Creek SP\SCOG\MAPS\ALTERNATIVE_ANALYSIS\ON-SITE\ACOE_V4\SCSP_ACOE_BackboneAlts.mxd

Map Features

- Project Boundary
- Property Boundaries
- Preserve Boundary
- ACoE Alternative Preserves

	Proposed Backbone Infrastructure			Additional Wetlands Within Preserve Alternatives								
	Avoided	*Direct Impacts*	Existing Acreage	B1	B2	B3	B4	B5	B6	B7	B8	B1-B8 Total
Vernal Pool	0.000	5.338	5.338	0.021	0.112	0.178	0.098	0.100	0.000	0.009	0.005	0.523
Seasonal Wetland	0.000	0.510	0.510	0.000	0.071	0.026	0.000	0.000	0.000	0.013	0.009	0.119
Swale	0.000	1.545	1.545	0.000	0.000	0.031	0.359	0.131	0.036	0.069	0.076	0.702
Ephemeral Drainage	0.000	0.156	0.156	0.000	0.000	0.000	0.000	0.000	0.000	0.064	0.092	0.156
Intermittent Drainage	0.000	0.164	0.164	0.000	0.000	0.000	0.000	0.000	0.000	0.019	0.000	0.019
Pond	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Stream	0.000	0.647	0.647	0.000	0.052	0.000	0.000	0.000	0.020	0.000	0.000	0.072
Isolated Vernal Pool	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	*0.000*	*8.360*	8.360	0.021	0.235	0.235	0.457	0.231	0.056	0.174	0.182	1.591

*Acreages include 0.053 acres of indirect impacts.

NOTES

Gross project acreage: +/- 1265 ac.

Gross preserve acreage: +/- 204 ac.

Base data source: Wade Associates

This exhibit depicts wetland/water information and data from several sources. Wetland boundaries have not been legally surveyed and may be subject to adjustments if exact locations are required. In most instances, acreages are subject to verification by the U.S. Army Corps of Engineers. Some wetland features may appear outside of depicted boundaries and were left as is pending Army Corps of Engineers verification.

The project boundary extents depicted on this graphic have been provided by Wade Associates. The boundary coordinates have been surveyed using the NAD83 base datum and were provided in the California State Plane projection, Grid Units. This boundary is expected to be spatially precise to California requirements, but ECORP holds no liability to the accuracy of the boundary

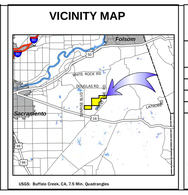
N

SCALE N FEET

0 200 400 800

1 " = 400 '

VICINITY MAP



USGS: Buffalo Creek, CA, 7.5 Min. Quadrangles

SUN CREEK SPECIFIC PLAN

ACOE PRESERVE ALTERNATIVES

Date: 8/4/2010	REVISION DATE: 5/3/2012	PROJECT NUMBER:	2009-142
GIS SPECIALIST: KO	SCALE: 1 " = 400 '	MAP NAME:	SCSP_ACOE_BackboneAlts.mxd
MAP LOCATION: N:\2009\2009-142 Sun Creek SP\SCOG\MAPS\ALTERNATIVE_ANALYSIS\ON-SITE\ACOE_V4		QA/QC:	
WETLAND VERIFICATION LETTER DATE:		PM:	GREGB

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ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

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2525 Warren Drive
Rocklin, CA 95677
Ph: (916) 782-9100

Bay Area
2600 Embarcadero, Ste. 200
Oakland, CA 94606
Ph: (510) 839-0150

Central Coast
3740 Broad Street, Place Bldg., Ste. 203
San Luis Obispo, CA 93401
Ph: (805) 544-3836

Inland Empire
390 North 5th St.
Redlands, CA 92374
Ph: (909) 307-0046

San Diego Region
391 Carlsbad Village Drive
San Diego, CA 92123
Ph: (858) 514-8040

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ATTACHMENT B

Alternatives B3 (Cost Impact Analysis)

SunCreek Plan Area Specific Plan

Wetland Preserve Alternative B3

Additional Avoidance Area Land Use and Cost Impacts for Preservation of Additional Wetlands/Waters of the United States

Land Use Impacts	Proposed Project Land Use Areas (ac)	Alternative No. 2 Land Use Areas (ac)	Land Use Area Lost (ac)	Land Use Area Gained (ac)	Dwelling Units Lost
Residential					
CDR (14.2du/ac)	8.0	3.8	4.2		60
HDR (21.2du/ac)	16.7	8.4	8.3		176
MDR (7.8du/ac)	61.0	46.3	14.7		115
Commercial Mixed Use					
CMU (8.1du/ac) (FAR 0.25)	6.4	6.4			
Miscellaneous					
PQP	2.2	2.2			
DB	2.3	2.3			
Park	4.7	4.7			
PP	1.8	1.8			
WB	4.9	14.8		9.9	
Wetland	0	15.0		15.0	
Minor Road	4.0	4.2		0.2	
Road	12.3	14.4		2.1	
Land Use Impacts Totals	**124.3**	**124.3**	**27.2**	**27.2**	**350**

SunCreek Plan Area Specific Plan

Wetland Preserve Alternative B3

Additional Avoidance Area Land Use and Cost Impacts for Preservation of Additional Wetlands/Waters of the United States

Backbone Infrastructure Cost Impacts	Units	Quantity	Unit Cost	Amount
New Backbone Infrastructure Construction Due to Alternative				
Rancho Cordova Parkway (Southbound Half Section)				
Subgrade Preparation	SF	55,800	$ 0.15	$ 8,370.00
Roadway Excavation	CY	5,170	$ 5.00	$ 25,850.00
6" AC over 24" AB Pavement 18' wide 3,100' long = 55,800 SF	SF	55,800	$ 7.00	$ 390,600.00
Median Curb, Type 3 (6" Barrier)	LF	2,900	$ 18.00	$ 52,200.00
Erosion Control	SF	55,800	$ 0.25	$ 13,950.00
Rancho Cordova Parkway (Northbound Half Section)				
Clearing and Grubbing 84' wide 3,200' long	SF	140,800	$ 0.10	$ 14,080.00
Subgrade Preparation	SF	140,800	$ 0.15	$ 21,120.00
Rough Grading 84' wide 3,000' Long Average Cut 3 ft.	CY	26,670	$ 3.00	$ 80,010.00
Roadway Excavation	CY	8,700	$ 5.00	$ 43,500.00
Storm Drainage	LF	3,100	$ 50.00	$ 155,000.00
Curb & Gutter, Type 2 (Vertical Curb)	LF	3,100	$ 25.00	$ 77,500.00
6" AC over 24" AB Pavement 44' wide 3,200' long = 140,800 SF	SF	140,800	$ 7.00	$ 985,600.00
Median Curb, Type 3 (6" Barrier)	LF	3,100	$ 18.00	$ 55,800.00
Erosion Control	SF	162,300	$ 0.25	$ 40,575.00
Misc. Paving 6" AC over 24" AB	SF	21,500	$ 7.00	$ 150,500.00
Con-Span Bridge Structure (90ft. x 104ft.)	SF	7,280	$ 250.00	$ 1,820,000.00
Bore and Jack 24-inch Drainage Pipe Casing	LF	120	$ 500.00	$ 60,000.00
Bore and Jack 24-inch Treated Water Supply Pipe Casing	LF	120	$ 500.00	$ 60,000.00
Bore and Jack 10-inch Non-Potable Water Pipe Casing	LF	120	$ 500.00	$ 60,000.00
North Campus Drive				
Con-Span Bridge Structure (90ft. x 60ft.)	SF	7,280	$ 250.00	$ 1,820,000.00
Bore and Jack 24-inch Drainage Pipe Casing	LF	100	$ 500.00	$ 50,000.00
Bore and Jack 30-inch Treated Water Supply Pipe Casing	LF	100	$ 500.00	$ 50,000.00
Bore and Jack 30-inch Potable Water Pipe Casing	LF	100	$ 500.00	$ 50,000.00
Bore and Jack 10-inch Non-Potable Water Pipe Casing	LF	100	$ 500.00	$ 50,000.00
Additional Backbone Infrastructure Cost Impacts Sub-Total				**$ 6,134,655.00**

SunCreek Plan Area Specific Plan

Wetland Preserve Alternative B3

Additional Avoidance Area Land Use and Cost Impacts for Preservation of Additional Wetlands/Waters of the United States

Backbone Infrastructure Cost Impacts	Units	Quantity	Unit Cost	Amount
Currently Planned Backbone Infrastructure That Will Not Be Constructed Due to Alternative				
Rancho Cordova Parkway (Northbound Half Section)				
Subgrade Preparation	SF	(186,000)	$ 0.15	$ (27,900.00)
Roadway Excavation	CY	(17,220)	$ 5.00	$ (86,100.00)
Curb & Gutter, Type 2 (Vertical Curb)	LF	(2,900)	$ 25.00	$ (72,500.00)
6" AC over 24" AB Pavement 60' wide 3,100' long = 186,000 SF	SF	(186,000)	$ 7.00	$ (1,302,000.00)
Median Curb, Type 3 (6" Barrier)	LF	(2,900)	$ 18.00	$ (52,200.00)
Erosion Control	SF	(186,000)	$ 0.25	$ (46,500.00)
Currently Planned Backbone Infrastructure That Will Not Be Constructed Sub-Total				**$ (1,587,200.00)**
Additional Backbone Infrastructure Cost Impacts Total				**$ 4,547,500.00**

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ATTACHMENT C

Alternative B4 (Cost Impact Analysis)

SunCreek Plan Area Specific Plan

Wetland Preserve Alternative B4

Additional Avoidance Area Land Use and Cost Impacts for Preservation of Additional Wetlands/Waters of the United States

Land Use Impacts	Proposed Project Land Use Areas (ac)	Alternative No. 5 Land Use Areas (ac)	Land Use Area Lost (ac)	Land Use Area Gained (ac)	Dwelling Units Lost
Residential					
CMDR (14.2du/ac)	1.9	0.4	1.5		21
MDR (7.8du/ac)	25.0	7.2	17.8		139
Miscellaneous					
DB	1.1	10.6		9.5	
Park	32.1	32.9		0.8	
PP	0.8	0.0	0.8		
School	80.0	80.0			
WB	4.7	8.7		4.0	
Wetland	14.0	19.8		5.8	
Minor Road	0.9	0.9			
Land Use Impacts Totals	**160.5**	**160.5**	**20.1**	**20.1**	**160**

SunCreek Plan Area Specific Plan

Wetland Preserve Alternative B4

Additional Avoidance Area Land Use and Cost Impacts for Preservation of Additional Wetlands/Waters of the United States

Backbone Infrastructure Cost Impacts	Units	Quantity	Unit Cost	Amount
New Backbone Infrastructure Construction Due to Alternative				
Detention Basin No. 5 A				
Clearing & Grubbing	SF	275,000	$ 0.10	$ 27,500.00
Excavation	AC-FT	30	$ 10,000.00	$ 300,000.00
Outfall Structure	EA	1	$ 20,000.00	$ 20,000.00
Outfall Pipes	LF	550	$ 50.00	$ 27,500.00
Percolation Trenches	LF	3,000	$ 40.00	$ 120,000.00
Maintenance Road	LF	2,500	$ 30.00	$ 75,000.00
Planting & Irrigation (Sides & Top)	SF	125,000	$ 4.00	$ 500,000.00
Hydro-Seeding (Basin Bottom)	SF	150,000	$ 0.20	$ 30,000.00
Post & Cable Barrier	LF	2,500	$ 2.00	$ 5,000.00
Erosion Control	SF	275,000	$ 0.25	$ 68,750.00
Emergency Spillway	EA	1	$ 20,000.00	$ 20,000.00
	Detention Basin No. 5 A Total			**$ 1,193,750.00**
Detention Basin No. 5 B				
Clearing & Grubbing	SF	183,000	$ 0.10	$ 18,300.00
Excavation	AC-FT	20	$ 10,000.00	$ 200,000.00
Outfall Structure	EA	1	$ 20,000.00	$ 20,000.00
Outfall Pipes	LF	550	$ 99.00	$ 54,450.00
Percolation Trenches	LF	1,800	$ 40.00	$ 72,000.00
Pump Station	CFS	5	$ 25,000.00	$ 125,000.00
Erosion Control Structure	EA	1	$ 10,000.00	$ 10,000.00
Maintenance Road	LF	2,150	$ 30.00	$ 64,500.00
Planting & Irrigation (Sides & Top)	SF	107,000	$ 4.00	$ 428,000.00
Hydro-Seeding (Basin Bottom)	SF	76,000	$ 0.20	$ 15,200.00
Post & Cable Barrier	LF	2,150	$ 20.00	$ 43,000.00
Erosion Control	SF	183,000	$ 0.25	$ 45,750.00
Emergency Spillway	EA	1	$ 20,000.00	$ 20,000.00
	Detention Basin No. 5 B Total			**$ 1,116,200.00**

SunCreek Plan Area Specific Plan

Wetland Preserve Alternative B4

Additional Avoidance Area Land Use and Cost Impacts for Preservation of Additional Wetlands/Waters of the United States

Backbone Infrastructure Cost Impacts	Units	Quantity	Unit Cost	Amount
Currently Planned Backbone Infrastructure That Will Not Be Constructed Due to Alternative				
Detention Basin No 5				
Clearing & Grubbing	SF	325,000	$ 0.10	$ 32,500.00
Excavation	AC-FT	47.7	$ 10,000.00	$ 477,000.00
Outfall Structure	EA	1	$ 20,000.00	$ 20,000.00
Outfall Pipes	LF	550	$ 99.00	$ 54,450.00
Percolation Trenches	LF	4,460	$ 40.00	$ 178,400.00
Pump Station	CFS	5	$ 25,000.00	$ 125,000.00
Erosion Control Structure	EA	1	$ 10,000.00	$ 10,000.00
Maintenance Road	LF	3,200	$ 30.00	$ 96,000.00
Planting & Irrigation (Sides & Top)	SF	175,000	$ 4.00	$ 700,000.00
Hydro-Seeding (Basin Bottom)	SF	150,000	$ 0.20	$ 30,000.00
Post & Cable Barrier	LF	3,200	$ 20.00	$ 64,000.00
Erosion Control	SF	325,000	$ 0.25	$ 81,250.00
Emergency Spillway	EA	1	$ 20,000.00	$ 20,000.00
Detention Basin No. 5 Total				**$ 1,888,600.00**
Total New Backbone Infrastructure Construction Due to Alternative				**$ 2,309,950.00**
Total Currently Planned Backbone Infrastructure That Will Not Be Constructed Due to Alternative				**$ 1,888,600.00**
Total Additional Construction Cost Due To This Alternative				**$ 421,400.00**

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ATTACHMENT D

Alternative B7 (Cost Impact Analysis)

SunCreek Plan Area Specific Plan

Wetland Preserve Alternative B7

Additional Avoidance Area Land Use and Cost Impacts for Preservation of Additional Wetlands/Waters of the United States

Land Use Impacts	Proposed Project Land Use Areas (ac)	Alternative No. 8 Land Use Areas (ac)	Land Use Area Lost (ac)	Land Use Area Gained (ac)	Dwelling Units Lost
Residential					
LDR (5.31du/ac)	33.9	24.2	9.7		52
MDR (7.8du/ac)	62.1	61.0	1.1		9
Miscellaneous					
DB	10.8	13.8		3.0	
PC	1.6	0.5	1.1		
WB	7.0	10.7		3.7	
Wetland	0	5.2		5.2	
Land Use Impacts Totals	**115.4**	**115.4**	**11.9**	**11.9**	**60**

SunCreek Plan Area Specific Plan

Wetland Preserve Alternative B7

Additional Avoidance Area Land Use and Cost Impacts for Preservation of Additional Wetlands/Waters of the United States

Backbone Infrastructure Cost Impacts	Units	Quantity		Unit Cost		Amount
Additional Backbone Infrastructure Construction Due to Alternative						
Additional Detention Basin No. 2						
Additional Clearing & Grubbing	SF	77,000	$	0.10	$	7,700.00
Additional Excavation	AC-FT	7	$	10,000.00	$	70,000.00
Additional Maintenance Road	LF	700	$	30.00	$	21,000.00
Additional Planting & Irrigation (Sides & Top)	SF	53,000	$	4.00	$	212,000.00
Additional Hydro-Seeding (Basin Bottom)	SF	24,000	$	0.20	$	4,800.00
Additional Post & Cable Barrier	LF	700	$	2.00	$	1,400.00
Additional Erosion Control	SF	77,000	$	0.25	$	19,250.00
Additional Detention Basin No. 2 Total					**$**	**336,150.00**
Additional Detention Basin No. 3						
Additional Clearing & Grubbing	SF	74,000	$	0.10	$	7,400.00
Additional Excavation	AC-FT	5	$	10,000.00	$	50,000.00
Additional Maintenance Road	LF	1,300	$	30.00	$	39,000.00
Additional Planting & Irrigation (Sides & Top)	SF	40,000	$	4.00	$	160,000.00
Additional Hydro-Seeding (Basin Bottom)	SF	34,000	$	0.20	$	6,800.00
Additional Post & Cable Barrier	LF	1,300	$	20.00	$	26,000.00
Additional Erosion Control	SF	74,000	$	0.25	$	18,500.00
Additional Detention Basin No. 3 Total					**$**	**307,700.00**
Americanos Boulevard						
Bridge: Add 120ft. of length (120ft.long x 104ft. wide)	SF	12,480	$	250.00	$	3,120,000.00
Bore and Jack 12-inch Water Pipe Casing	LF	300	$	500.00	$	150,000.00
Bore and Jack 24-inch Water Pipe Casing	LF	300	$	500.00	$	150,000.00
Bore and Jack 24-inch Water Pipe Casing	LF	300	$	500.00	$	150,000.00
Bore and Jack 36-inch Sanitary Sewer Pipe Casing	LF	300	$	500.00	$	150,000.00
Bore and Jack 10-inch Non-Potable Water Pipe Casing	LF	300	$	500.00	$	150,000.00
Additional Americanos Boulevard Cost Total					**$**	**3,870,000.00**
Additional Backbone Infrastructure Construction Cost Total					**$**	**4,513,900.00**

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Section 404(b)(1) On-Site Alternatives Analysis

For

Jaeger Ranch

Sacramento County, California

3 May 2012

Prepared For:
Investek Properties LLC

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

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CONTENTS

Section 404(b)(1) On-Site Alternative Analysis

Jaeger Ranch

INTRODUCTION 1

PROJECT PROPONENT 1

PROJECT LOCATION 1

PROJECT DESCRIPTION 2

Existing Conditions 2

Wetlands/Waters of the U.S 2

REGULATORY BACKGROUND 3

Clean Water Act, Section 404 Application 3

Purpose of Alternatives Analysis 3

ALTERNATIVES 6

ALTERNATIVES ANALYSIS 7

Alternative 1 7

Alternative 2 7

Proposed Project 8

Analysis of Alternatives 9

Factors Affecting Practicability 9

Alternative 1 11

Overview 11

Project Purpose 11

Logistics 11

Cost Impacts Analysis 11

Environmental Impacts 12

Summary 12

Alternative 2 12

Overview 12

Project Purpose 13

Logistics 13

Cost Impacts Analysis 13

Environmental Impacts 13

DRAFT

Summary.....14

SUMMARY/CONCLUSION.....14

LIST OF TABLES

Table 1 – Jurisdictional and Non-Jurisdictional Wetlands and Waters 3
Table 2 – Proposed Project Impact/Preservation..... 8
Table 3 – Alternatives Land Use and Wetland Summary 8
Table 4 – Proposed Impact Acreages and Alternative 1 12
Table 5 – Proposed Impact Acreages and Alternative 2 14
Table 6 – Summary of Analysis of Alternative to Minimize Impacts to Wetlands and Waters of the U.S.....15

LIST OF FIGURES

Figure 1. Site and Vicinity
Figure 2. Natural Resources Conservation Service Soil Types
Figure 3. Wetland Delineation
Figure 4. Proposed Impact Plan
Figure 5. Alternatives – Overview

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INTRODUCTION

The proposed 240-acre Jaeger Ranch Project is located in southern Sacramento County, California within the SunCreek Specific Plan Area (SPA). The subject property is situated south of Douglas Road and west of Jaeger Road.

This analysis is being submitted concurrently with the application for a Department of the Army permit under the authority of Section 404 of the Clean Water Act for the discharge of dredged or fill material. The application is not inclusive of the SPA backbone infrastructure impacts on-site, which are being addressed in a separate application. The applicant is seeking authorization for the fill of 1.672 acres of jurisdictional waters of the United States (U.S.) at the ±240-acre proposed Jaeger Ranch project site. In addition, the project proposes a 39-acre on site preserve, which will protect 3.072 acres of waters of the U.S., as well as potential special-status species habitat.

PROJECT PROPONENT

Project:

Jaeger Ranch Project

Applicant:

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PROJECT LOCATION

The proposed 240-acre Jaeger Ranch Project is located in southern Sacramento County, California (Figure 1. *Project Site and Vicinity*). The subject property is situated south of Douglas Road and west of Jaeger Road within Section 21, Township 8 North, Range 7 East, on

the "Buffalo Creek, California" 7.5 minute topographic quadrangle (U.S. Department of the Interior, Geological Survey, photorevised 1981) (Lat.:38° 31′ 45″ N, Long.: 121° 13′ 00″W).

PROJECT DESCRIPTION

The project proposes to develop approximately 240 acres of land in southeast Sacramento County, currently planned for residential development in accordance with the SunCreek Specific Plan. In addition, the project proposes a 39-acre on site wetland preserve, which will protect 3.072 acres of waters of the U.S., as well as potential special-status species habitat. The plan provides for a mix of land uses and residential densities designed to serve the increasing employment growth in the Highway 50 corridor.

Existing Conditions

The project site is comprised of rolling annual grasslands and pastures that are frequently grazed by cattle. Plant species found within the upland portions of the site include filaree (*Erodium botrys*), sticky tarweed (*Holocarpha virgata*), medusahead grass (*Taeniatherum caput-medusae*), California bur clover (*Medicago polymorpha*), ripgut brome (*Bromus diandrus*), clover (*Trifolium* sp.), and smooth cats-ear (*Hypochaeris glabra*).

The soil units mapped for the site include Corning-Redding complex, 8-30% slopes; Hedge loam, 0-2% slopes; Hicksville gravelly loam, 0-2% slopes, occasionally flooded; Red Bluff-Redding complex, 0-5% slopes; Redding loam, 2-8% slopes; Redding gravelly loam 0-8% slopes; San Joaquin silt loam, 0-3% slopes and San Joaquin silt loam, 3-8% slopes. All of these soils contain some type of hydric composition or inclusion. (Figure 2. *Natural Resources Conservation Service Soil Types*).

Wetlands/Waters of the U.S.

A jurisdictional delineation of waters of the U.S. was conducted by Davis^2 Consulting Earth Scientists (Davis^2) during March and April 2000, and submitted for verification to the Corps on June 2001. At the request of the Corps, Davis submitted revised delineations on 22 August

2000, 5 September 2000 and again in 2004. During April 2007, ECORP Consulting, Inc. (ECORP) conducted a field verification site visit with Ms. Anna Sutton of the Sacramento District. The revised wetland acreages are presented in Figure 3. *Wetland Delineation*. Approximately 4.744 acres of waters of the U.S. have been mapped on the project site (Table 1), inclusive of 2.611 acres of vernal pools, 0.362 acre of seasonal wetlands, 0.220 acre of seasonal wetland swale, and 1.551 acres of stream.

Table 1. Jurisdictional and Non-Jurisdictional Wetlands and Waters

Type	Acreage
Wetlands:	
Vernal Pools	2.611
Seasonal Wetland	0.362
SW Swale	0.220
Other Waters:	
Stream	1.551
Total:	**4.744**

REGULATORY BACKGROUND

Clean Water Act, Section 404 Application

The Applicant is submitting a permit application to the U.S. Army Corps of Engineers (Corps) to obtain authorization to discharge dredged and/or fill materials into waters of the U.S. under the authority of the Corps pursuant to Section 404 of the Clean Water Act on. Pursuant to these requirements, the Corps will conduct a two-part analysis: 1) the Corps will determine consistency with Section 404 (b)(1) Guidelines to consider practicable alternatives to the dredge or fill of waters of the U.S.; and 2) the Corps will conduct a public interest review. This document provides the analysis of practicable alternatives.

Purpose of Alternatives Analysis

The purpose of this analysis is to objectively evaluate the practicability of several alternatives to the proposed project and provide the Corps with documentation to be used in evaluating the proposed project permit application for compliance with Section 404(b)(1) (guidelines). The guidelines require that the alternatives analysis be adequate to establish that the project is the

least environmentally damaging practicable alternative (LEDPA). This is accomplished by comparing the proposed project with other alternatives in terms of practicability, project purpose, and overall environmental effects. For this analysis, a reasonable statement of purpose has been developed and the alternatives have been evaluated in light of that purpose.

While it is understood that the information provided in this document must be verified by the Corps, the analysis is consistent with federal regulations and provides a fair and objective evaluation of alternatives.

This section presents an overview of the requirements of the 404(b)(1) guidelines and a discussion of the implementing guidance issued by the Corps. The 404(b)(1) guidelines are the substantive criteria used by the Corps in evaluating discharges of dredged or fill material into waters of the U.S. under Section 404 of the Clean Water Act. The guidelines require that four criteria be satisfied in order for the Corps to make a decision that a proposed discharge is in compliance. These criteria are:

1. *The discharge must be the least environmentally damaging practicable alternative*: This alternatives analysis evaluates a range of alternatives to the proposed project, in terms of environmental effects, practicability and consistency with the overall project purposes.
2. *The discharge must not violate any water quality standard, toxic effluent standard or jeopardize the continued existence of a threatened or endangered species*: Through the environmental review process, mitigation measures will be developed to insure that water quality and toxic effluent standards will not be violated. The U.S. Fish and Wildlife Service will be consulted regarding potential effects to federally listed species.
3. *The discharge must not result in a significant degradation of the waters of the United States*: Water quality impacts and potential impacts will be minimized through implementation of water quality management and erosion control plans as approved by the Regional Water Quality Control Board and the local planning jurisdiction.
4. *Unavoidable impacts to the aquatic ecosystem must be mitigated*: Based on an agreement between the Corps and EPA, efforts must first be directed at avoiding and reducing impacts to waters of the United States prior to the evaluation of potential compensatory mitigation measures. Mitigation may be applied only to unavoidable

impacts. In keeping with this guidance, this alternatives analysis does not attempt to substitute mitigation for avoidance wherever the project goals may concurrently be met. Unavoidable impacts to biological resources associated with waters of the United States will be mitigated by either on-site construction of compensation wetlands, through the purchase of appropriate mitigation credits from agency-approved sources, or by a combination of mitigation measures acceptable to the regulatory agencies.

Before the Corps can issue a permit, they must find that the requirements of the guidelines have been satisfied. The key criteria for most permit applicants, and the focus of this analysis, is the requirement that the discharge be the least environmentally damaging, practicable alternative. The pertinent section of the regulation states:

"Except as provided under Section 404(b)(2), no discharge of dredged of fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have a less adverse impact on the aquatic ecosystem so long as discharge does not have other significant adverse environmental consequences.

a. For the purposes of this requirement, practicable alternatives include, but are not limited to:

    1) On-site activities that do not include a discharge into waters of the United States or ocean waters,
    2) Discharges of dredged or fill material at other locations in waters of the United States or ocean waters,

b. An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology and logistics in light of overall project purposed. If it is otherwise a practicable alternative, an area not presently owned by the applicant which could reasonably be obtained, utilized, expanded, or managed in order to fulfill the basic purpose of the proposed activity may be considered;

c. Where the activity associated with a discharge which is proposed for a special aquatic site does not require access or proximity to or citing within the special aquatic site in question to fulfill its basic purpose (i.e., is not "water dependent"), practicable alternatives that do not involve special aquatic sites are presumed to be available unless clearly demonstrated otherwise. In addition, where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise."

The key provisions in the language are practicability and overall project purposes. An alternative is practicable if it is available to the applicant and capable of being accomplished by the applicant after consideration of costs, existing technology and logistics, in light of overall purposes. If a practicable alternative would have less impact on the aquatic ecosystem, and does not include other significant adverse impact, then the proposed project is not the least damaging practicable alternative.

ALTERNATIVES

The proposed project (excluding backbone infrastructure) would directly impact 1.672 acres of wetlands and waters, which are special aquatic sites as described above (Figure 4. *Proposed Impact Plan)*. None of the proposed project components are considered to be water dependent. Therefore, according to the guidelines, less damaging alternatives are presumed to be available unless demonstrated otherwise. The following discussion presents the methodology of the analysis, followed by an evaluation of the alternatives for determination of the least damaging practicable alternative as compared to the proposed project. Alternatives have been developed and evaluated with the goals of practicability, consistency with the overall project purposes, and avoiding and minimizing impacts to waters of the U.S..

ALTERNATIVES ANALYSIS

The alternatives analyzed in this document were developed in consultation with the Corps. Overall land use configurations of the project were evaluated in an analysis of alternatives studied for the entire SunCreek Specific Plan Area (SPA), which was conducted to support the Environmental Impact Statement/Environmental Impact Report (EIS/EIR) being prepared for the SPA. Following review of that document, the Corps identified specific areas on the property for which it requested a project-specific analysis to determine if additional avoidance was practicable. As such, the following alternatives were analyzed to determine if there were less environmentally damaging alternatives (Figure 5. *Alternative Overview*):

Alternative 1

Alternative 1 evaluates the possibility of avoiding 0.136 acre of wetlands/waters, within an additional 1.236-acre preserve area. Avoiding impacts to this area would result in the loss of 1.236 acres of planned development. Alternative 1 on Jaeger Ranch is the southernmost portion of a larger potential additional avoidance area contemplated on the Kamilos property that would preserve a swale (and adjacent vernal pools) that runs from the northwest corner of Jaeger Ranch to the proposed project preserve in the northwest corner of the Kamilos property. The larger alternative would extend the existing open space preserve to the south and would add approximately 16.59 acres to the overall open space preserve and the additional avoidance of 1.041 acres of waters of the U.S.

Alternative 2

Alternative 2 evaluates the possibility of avoiding 0.092 acre of wetlands/waters, within an additional 6.597 acre preserve area. Avoiding impacts to this area would result in the loss of 6.6 acres of planned development. Alternative 1 is part of a larger potential additional avoidance area that connects to the proposed project preserve on the Jaeger Ranch property and preserves an ephemeral stream, swale and vernal pool habitat within a potential open space corridor that extends to the east across the adjacent Sierra Sunrise project. The portions of this alternative that fall within the Sierra Sunrise property and Backbone Infrastructure

footprint are not discussed here. Modifications to the Sierra Sunrise project design and Alternative B6 of the Backbone Alternatives Analysis would also be required in order to fully achieve the additional avoidance contemplated by this. Modifications to the other project designs will not be discussed here.

Proposed Project

The Proposed Project avoids 3.072 acres of wetlands including vernal pools, seasonal wetlands, seasonal wetland swales, and stream. Unavoidable impacts to wetlands and waters of the U.S. total 1.672 acres for the project (not inclusive of the Backbone Infrastructure) within the project area (Table 2).

Table 2 – Proposed Project Impact/Preservation

Type	Existing (Acres)	Preserve (Acres)	Impact (Acres)
Wetlands:			
Vernal Pools	2.611	1.369	1.242
Seasonal Wetland	0.362	0.185	0.177
SW Swale	0.220	0.070	0.150
Other Waters:			
Stream	1.551	1.448	0.103
Total:	**4.744**	**3.072**	**1.672**

A summary of the proposed project and each alternatives evaluated is presented below in Table 3.

Table 3 – Alternatives Land Use and Wetland Summary

	Open Space acreage (acre±)	Developable Net acreage (acre±)	Preserved Waters of U.S.	Impacts to Waters of the U.S. *	Additional Avoidance of Waters of the U.S.
Alternative 1	40.236	199.764	3.208	1.536	0.136
Alternative 2	45.597	194.403	3.164	1.580	0.092
Proposed Project	39.000	201.000	3.072	1.672	0

* Not inclusive of Backbone Infrastructure Impacts on-site.

Analysis of Alternatives

The practicability of on-site alternatives is analyzed using three basic criteria. First, the analysis considers whether the alternative would meet the Project Purpose; secondly, if any logistical issues would render the alternative impracticable. This analysis primarily considers whether the infrastructure necessary to support the alternative could be feasibly installed. Next, the analysis considers basic cost factors, including an estimation of the cost of infrastructure and other development costs per developable acre for the Proposed Project and the other project alternatives. The analysis addresses project level costs that would make an alternative impracticable or otherwise incapable of being done. Each alternative is also analyzed in regards to environmental factors (impacts to wetlands/waters and federally listed species); and finally other factors that should be considered in regards to regional needs. To summarize, in an effort to determine the least environmentally damaging practicable alternative for the project, the applicant analyzed the alternatives based on the following criteria:

Factors Affecting Practicability

1. **Project Purpose** – does the alternative contain sufficient acres of developable area in an appropriate configuration to support the project purpose?

   The project purpose of the Sierra Sunrise Project is to provide residential development and wetland preservation as proposed in the overall SunCreek Specific Plan and to accommodate major transportation corridors, utilities, water quality, storm water detention and other components of the Plan Area's Backbone Infrastructure.

2. **Logistics** – does the alternative conform to the land use plan circulation design and school and park, water treatment, and flood control standards? Are there any other logistical constraints that would preclude the alternative from being implemented?

3. **Costs Impact Analysis** – does the alternative result in additional costs? Are the additional costs reasonable in relation to the amount of additional wetland avoidance that could be achieved. Does the alternative have a development cost per net developable acre that is not substantially more than that of the proposed project alternative?

4. **Environmental Impacts** – does the alternative have significantly less impacts on waters of the U.S. than the proposed project alternative? Does the alternative have significantly less impacts on federally listed species than the proposed project alternative?

   A wetland delineation has been conducted and submitted for the property. Based upon the best available information, approximately 4.744 acres of wetlands and waters of the U.S. have been delineated within the site (not inclusive of the backbone infrastructure area). Of the acreage mapped on-site, the proposed project would result in direct impacts to approximately 1.672 acres of wetlands and waters of the U.S. and avoidance/preservation of approximately 3.072 acres of waters of the U.S.

   Vernal pools and other seasonal wetlands found on-site may be considered by the USFWS to constitute potential habitat for vernal pool fairy shrimp (*Branchinecta lynchi*) (federal threatened status) and/or the vernal pool tadpole shrimp (*Lepidurus packardi*) (federal endangered status). Further consultation with the USFWS is needed to rule out any direct or indirect impacts that may occur with the implementation of the proposed project.

5. **Overall** – an alternative is considered not practicable if does not meet all of the above criteria.

Alternative 1

Overview

Alternative 1 is comprised of 1.236 acres located in the northwestern corner of Jaeger Ranch. This alternative includes portions of four vernal pools, which would add approximately 0.136 acre of wetlands. This alternative would not be connected to any other proposed preserve unless Alternative B3 of the Backbone Infrastructure project is determined to be practicable. Avoiding impacts to the wetlands would result in the loss of 1.236 acres of prime commercial development located at the corner of Rancho Cordova Parkway and a major east-west thoroughfare. Alternative 1 would significantly reduce the only area designated as Commercial Mixed Use (CMU).

Project Purpose

Alternative 1 would effectively eliminate approximately one-quarter of the sole proposed commercial area in the in the northwest corner of the project site, especially the prime commercial corner location.

Logistics

Establishing a 1.236 acre preserve area in this portion of the project is logistically feasible, however, the modifications that would be required of the Backbone Infrastructure project are not. Without the northern portion of the overall alternative, this area would essential be an empty lot at a corner of two major roadways.

Costs Impact Analysis

This alternative would not significantly increase costs.

Environmental Impacts

Alternative 1 would result in a reduction of impacts to a small amount of wetlands (0.136 acre of vernal pool) and establishes an additional 1.236 acres of wetland preserve and open space. The vernal pools in the resultant open space preserve may still be considered directly impacted, as portions of all but the smallest pool will be directly impacted by the roadway improvements required in the Backbone Infrastructure project.

Table 4 – Proposed Impact Acreages and Alternative 1

		Proposed Project		Alternative	
Type	**Existing***	**Avoidance**	**Project Impacts**	**Alternative Avoidance**	**Impacts**
Wetlands:					
Vernal Pools	2.611	1.369	1.242	1.505	1.106
Seasonal Wetland	0.362	0.185	0.177	0.185	0.177
SW Swale	0.220	0.070	0.150	0.070	0.150
Other Waters:					
Stream	1.551	1.448	0.103	1.448	0.103
Total:	**4.744**	**3.072**	**1.672**	**3.208**	**1.536**

*Not inclusive of delineated areas within the Backbone Infrastructure areas

Summary

The addition of a preserve area in the northwest corner of the project site to protect a minimal amount (0.136 acre) of wetland features would preclude a successful, competitively-priced commercial area from being implemented. The avoided wetlands would be considered indirectly, if not directly, impacted bye Backbone Infrastructure improvements..

Alternative 2

Overview

Alternative 2 is comprised of 6.597 acres located in the northeastern portion of Jaeger Ranch Waters of the U.S. within the proposed alternative include a vernal pool and an ephemeral stream. The vernal pool is approximately 0.020 acre and the stream is 0.072 acre in size. In total, this alternative will protect an additional 0.092 acre of waters of the U.S. This alternative

is adjacent to the proposed preserve to the west. Avoiding impacts to the wetlands would result in the loss of 6.597 acres of planned development. In order for the potential additional avoidance contemplated by the overall Alternative for this are to be realized, modification to the Backbone Infrastructure project and the Sierra Sunrise project would be necessary.

Project Purpose

Alternative 2 would eliminate approximately 4.169 acres of Park adjacent to the proposed school and 2.428 acres of Medium Density Residential (MDR) in the east-central area of the project site. As the park is a required component of the Jaeger Ranch project, it would need to be relocated, further reducing the amount or residential development on the project.

Logistics

Preserving the small acreage (0.092 acre) of wetlands and ephemeral stream is logistically feasible, however, Backbone Infrastructure components that cannot be relocated (sewer line, storm drain pipe and recreational trail) would be installed between the potential open space area and the proposed project preserve, precluding the are from having a physical connection to other planned open space.

Cost Impact Analysis

This alternative would not significantly increase costs.

Environmental Impacts

Alternative 2 would result in an insignificant amount of additional avoidance. This alternative would result in avoiding direct impacts to only 0.092 acre of vernal pool and ephemeral drainage (noted as "stream" in the Table 3) and establishes an additional 6.597 acre of wetland preserve and open space. This area of potential avoidance may also result in indirect impacts to the avoided aquatic features. The open space/wetland preserve of the proposed project was designed using detailed topographic mapping, LIDAR analysis of the avoided wetlands and their

associated watersheds. This area has not been analyzed to determine if a sufficient watershed remains to support the avoided wetland features.

Table 5 – Proposed Impact Acreages and Alternative 2

		Proposed Project		Alternative	
Type	**Existing***	**Avoidance**	**Project Impacts**	**Alternative Avoidance**	**Impacts**
Wetlands:					
Vernal Pools	2.611	1.369	1.242	1.389	1.222
Seasonal Wetland	0.362	0.185	0.177	0.185	0.177
SW Swale	0.220	0.070	0.150	0.070	0.150
Other Waters:					
Stream	1.551	1.448	0.103	1.520	0.031
Total:	**4.744**	**3.072**	**1.672**	**3.164**	**1.580**

*Not inclusive of delineated areas within the Backbone Infrastructure areas

Summary

Alternative 2 would eliminate approximately 4.169 acres of Park adjacent to the proposed school and 2.428 acres of Medium Density Residential (MDR) in the east-central area of the project site. Relocation of the park would further impact residential development. In addition, this alternative would result in avoiding direct impacts to only 0.092 acre of vernal pool and ephemeral drainage, which is an insignificant reduction to environmental impacts. Backbone Infrastructure improvements that cannot be relocated would preclude this area from being contiguous with the propose project wetland preserve.

SUMMARY/CONCLUSION

An evaluation of the possibility of revising the proposed project to further avoid wetlands/waters at two locations within the project area was conducted at the request and in consultation with the Corps of Engineers. Neither of the two alternatives appears to be practicable. A summary of land use and wetland impact acreages for the proposed project and each alternatives evaluated is presented below in Table 6.

Table 6 – Summary of Analysis of Alternatives to Minimize Impacts to Wetlands and Waters of the U.S.*

	Potential Wetland Avoidance	Development Land Lost	Additional Cost to Avoid Impact Reasonable?	Project Purpose	Logistics	Environmental/Waters	Practicable?
Alternative 1	0.136 ac.	1.236 ac.	NO	YES	YES	YES	NO
Alternative 2	0.092 ac.	6.597 ac.	NO	YES	YES	NO	NO

*See individual alternative analysis for Alternative-specific details

Project Purpose

– Can the alternative be implemented in a location or configuration that would support the project purpose?

Cost

– Can the alternative be implemented without costing substantially more than that of the proposed project alternative?
– Is the additional cost reasonable related to amount of additional wetland avoidance?
– Can the alternative be implemented without increasing the cost per developable acre to point where the project component is no longer economically feasible?

Logistics

– Does the alternative conform to the land use plan circulation design without presenting other logistical challenges?

Environmental/Waters

– Does the alternative have significantly less impacts on waters of the United States than the proposed project alternative?

Practicable?

– Does the Alternative represent the Least Environmentally Damaging Practicable Alternative?

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LIST OF FIGURES

Figure 1. Site and Vicinity

Figure 2. Natural Resources Conservation Service Soil Types

Figure 3. Wetland Delineation

Figure 4. Proposed Impact Plan

Figure 5. Alternatives – Overview

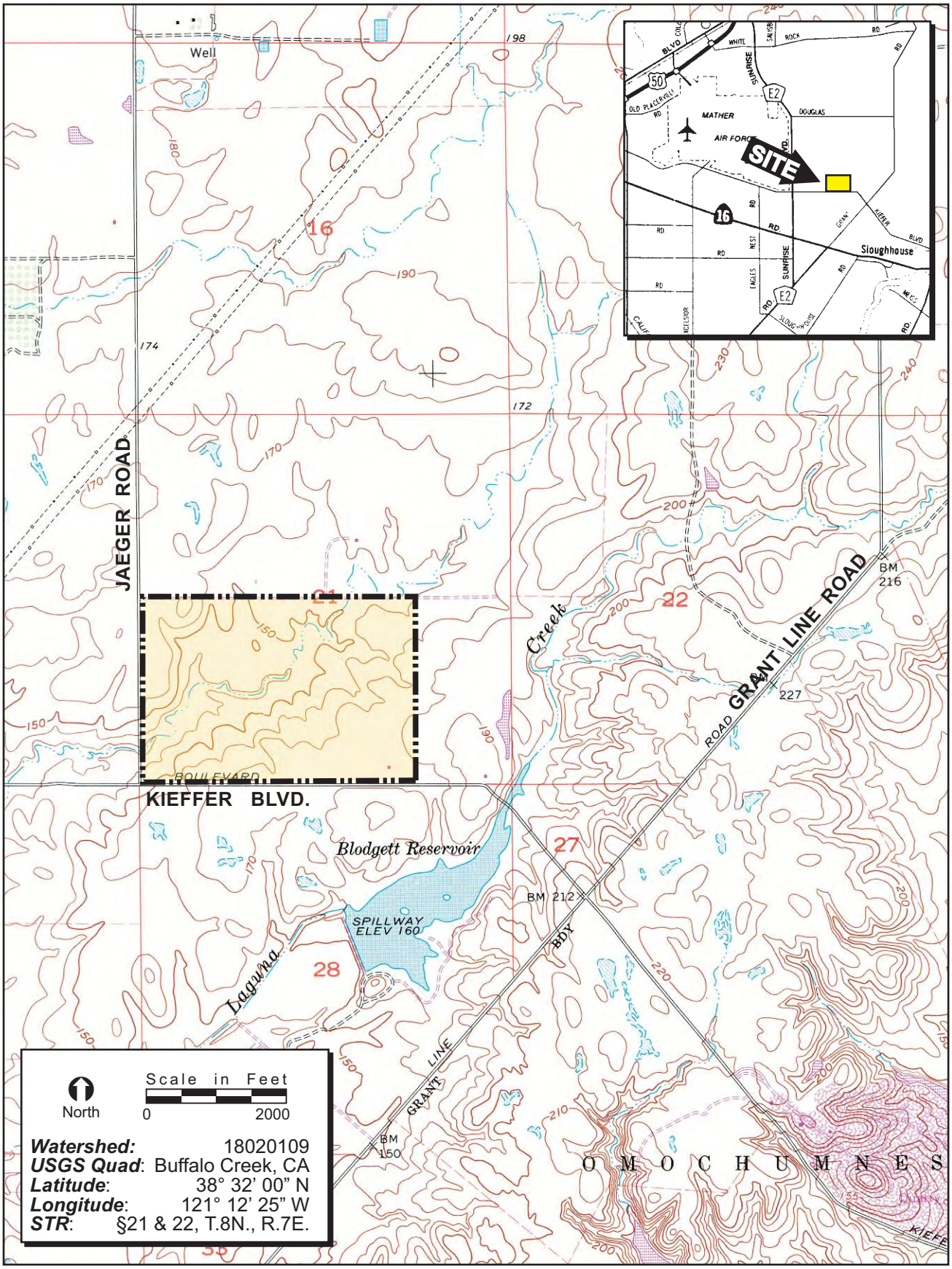

FIGURE 1. Project Site and Vicinity - Jaeger Ranch

2009-142 Suncreek SP

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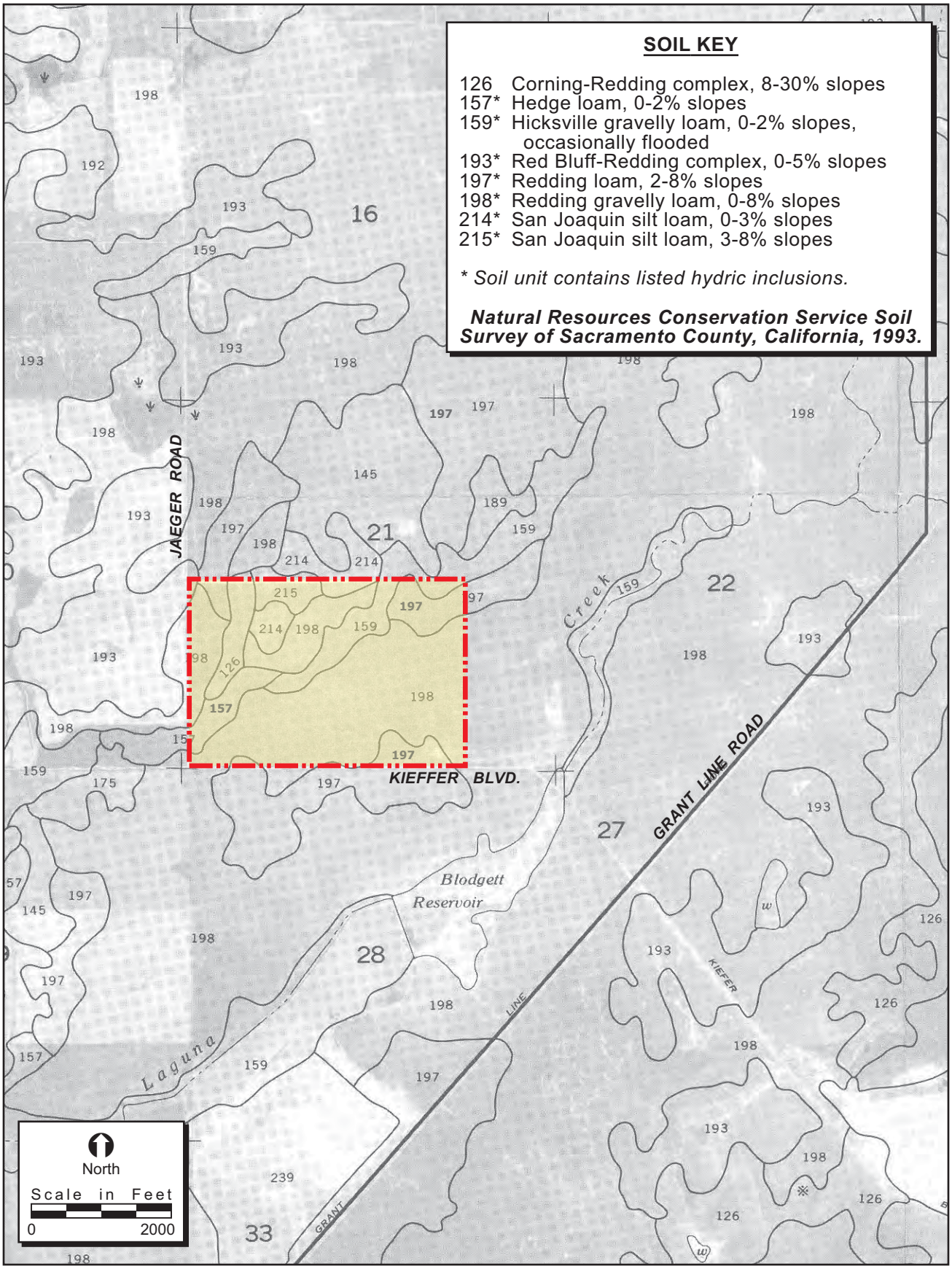


FIGURE 2. Natural Resources Conservation Service Soil Types - Jaeger Ranch

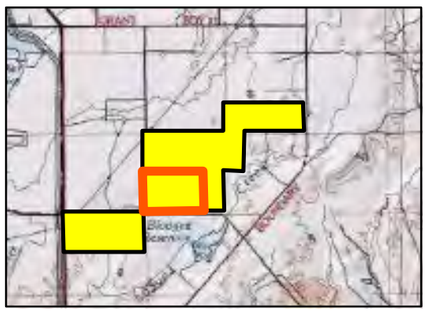
Figure 3. Wetland Delineation

Jaeger Ranch

Project Boundary

Property Boundaries

	Existing Acreage
Vernal Pool	3.661
Seasonal Wetland	0.455
Swale	0.291
Ephemeral Drainage	0.000
Intermittent Drainage	0.000
Pond	0.000
Stream	2.000
Isolated Vernal Pool	0.000
Total	*6.407*



Scale in Feet

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1 " = 400 '

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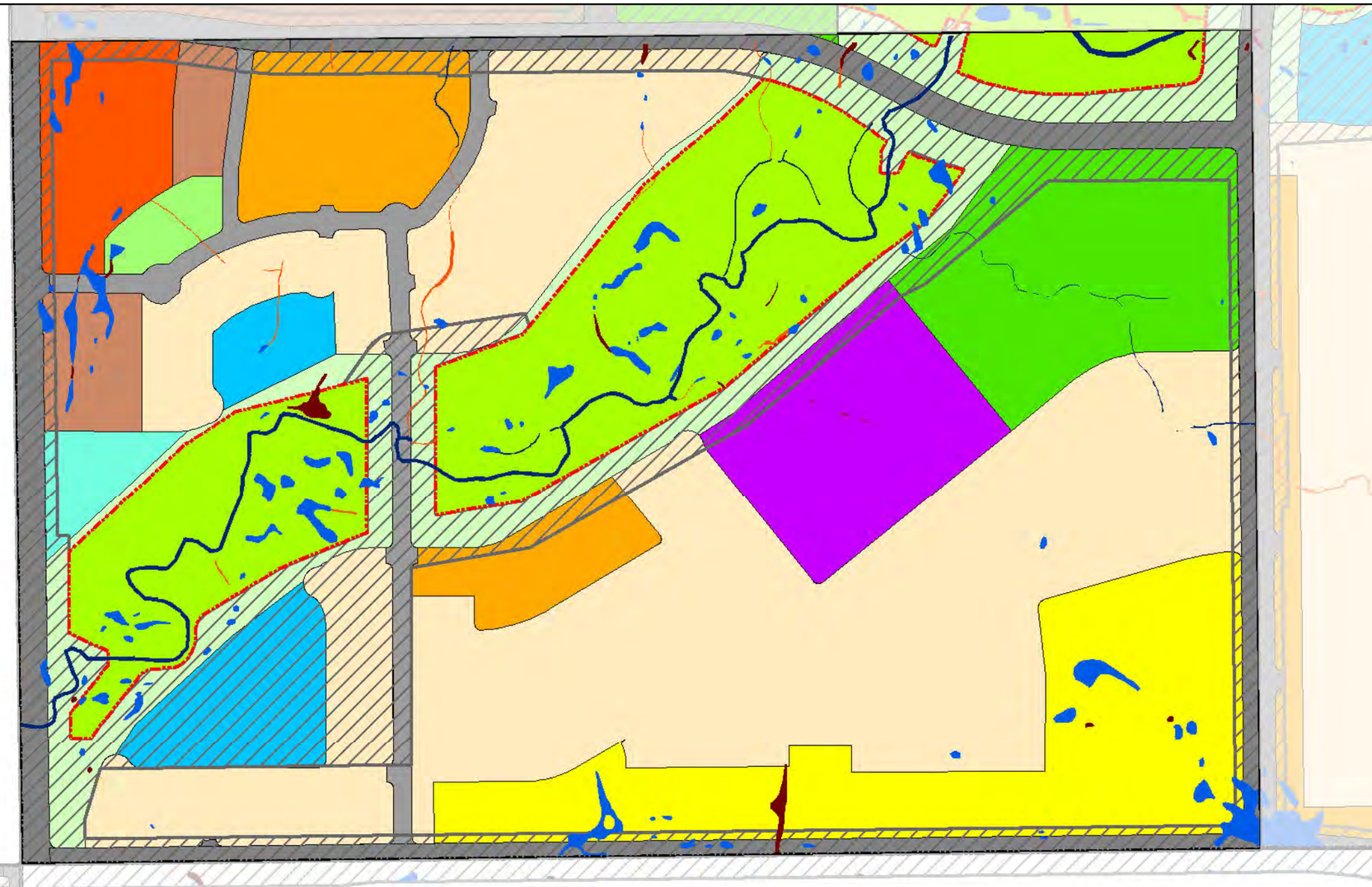
Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\WETLAND_DELINEATION\V3\SCSP_Jaeger_WD_11x17.mxd (KOrtega 12/7/2010)

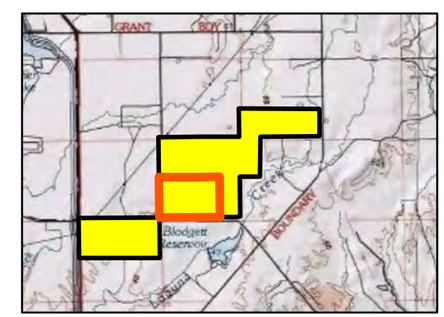
Map Date: 12/7/2010

Figure 4. Proposed Impact Plan

Jaeger Ranch



- Project Boundary
- Property Boundaries
- Preserve Boundary
- Proposed Backbone
- Boulevard
- Compact MDR
- CMU
- Canal
- Detention Basin
- HDR
- LDR
- LTC
- MDR
- MinorRoad
- Ped Corr
- Pkt Park
- PQP
- Park
- School
- Wetland Buffer



Scale in Feet

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1 " = 400 '

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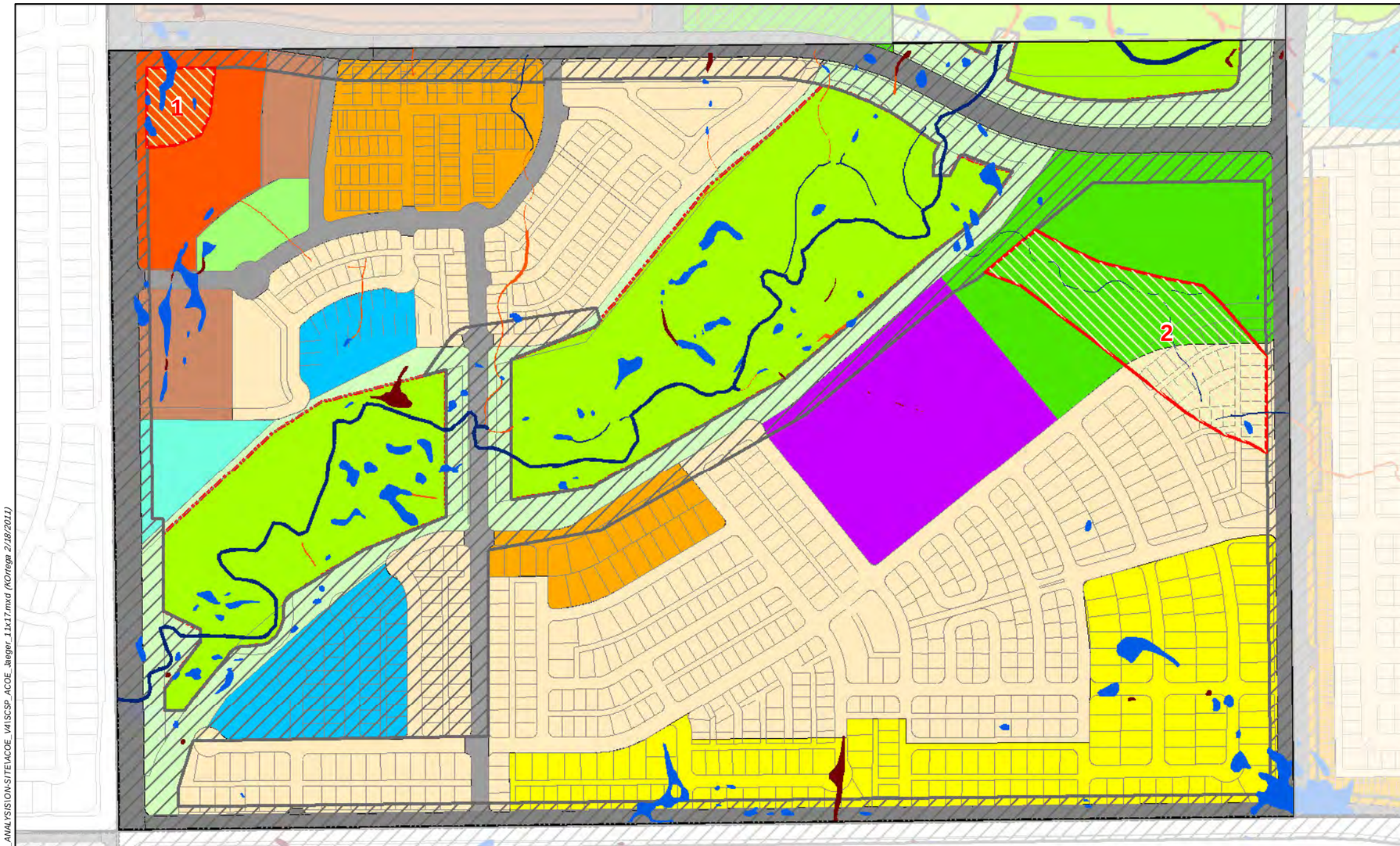
	Jaeger Ranch			
	Avoided	*Direct Impacts*	Existing Acreage	**Backbone Impacts**
Vernal Pool	1.369	1.242	2.611	1.083
Seasonal Wetland	0.185	0.177	0.362	0.130
Swale	0.070	0.150	0.220	0.072
Ephemeral Drainage	0.000	0.000	0.000	0.000
Intermittent Drainage	0.000	0.000	0.000	0.000
Pond	0.000	0.000	0.000	0.000
Stream	1.448	0.103	1.551	0.448
Isolated Vernal Pool	0.000	0.000	0.000	0.000
Total	*3.072*	*1.672*	4.744	1.733

Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\404\404_v3\INDIVIDUAL\SCSP_Jaeger_Imp_11x17.mxd (KOrtega 2/18/2011)

Map Date: 2/3/2011

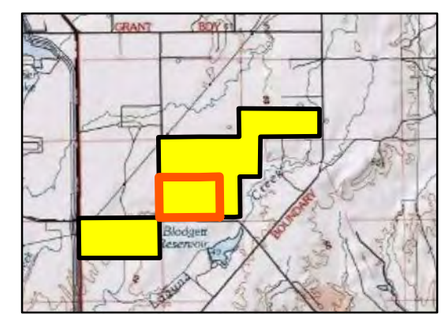
Figure 5. Sun Creek Specific Plan Preserve Alternative Overview

Jaeger Ranch



	Jaeger Ranch				Additional Wetlands Within Preserve Alternatives		
	Avoided	*Direct Impacts*	Existing Acreage	**Backbone Impacts**	1	2	Total
Vernal Pool	1.369	1.242	2.611	1.083	0.136	0.020	0.157
Seasonal Wetland	0.185	0.177	0.362	0.130	0.000	0.000	0.000
Swale	0.070	0.150	0.220	0.072	0.000	0.000	0.000
Ephemeral Drainage	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Intermittent Drainage	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pond	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Stream	1.448	0.103	1.551	0.448	0.000	0.072	0.072
Isolated Vernal Pool	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	*3.072*	*1.672*	4.744	1.733	0.136	0.092	0.229

Project Boundary
Property Boundaries
Preserve Boundary
ACoE Alternative Preserves
Proposed Backbone
Boulevard
Compact MDR
CMU
Canal
Detention Basin
HDR
LDR
LTC
MDR
MinorRoad
Ped Corr
Pkt Park
PQP
Park
School
Wetland Buffer



Scale in Feet
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1 " = 400 '

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\ON-SITE\ACOE_V4\SCSP_ACOE_Jaeger_11x17.mxd (KOrtega 2/18/2011)

Map Date: 2/18/2011

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404(b)(1) Off-Site Alternatives Analysis

For

SunCreek Specific Plan

Sacramento County, California

25 April 2012

Prepared For:
SunCreek Property Owners Group

CONTENTS

404(b)(1) Off-Site Alternative Analysis

SunCreek Specific Plan

INTRODUCTION 1
PROJECT PROPONENT(S) 1
PROJECT LOCATION 2
PROJECT DESCRIPTION 2
EXISTING CONDITIONS 3
Vegetative Communities 3
Shalako 3
Jaeger Ranch 3
Smith 4
Sierra Sunrise 4
Backbone Infrastructure 5
Kamilos 5
Grantline 5
Soils 5
Service Soil Types 6
Waters of the United States 6
IMPACTS TO WATERS OF THE U.S. 7
On-Site Avoidance 8
CLEAN WATER ACT, SECTION 404 APPLICATION 11
Purpose of Alternative Analysis 11
Application of the 404(b)(1) Guidelines of the Project 11
SUMMARY OF PROPOSED PROJECT 12
Overall Project Purpose 12
Regulatory Background 12
ALTERNATIVES 15
Off-Site Alternatives 15
Primary Screening Criteria 15
Geographic Location 15
Parcel Size 16

Existing Development 16
Provision of Services 16
Application of Primary Screening Criteria 17
Secondary Screening Criteria 17
Availability 17
Logistics 18
Cost 18
Results of Off-Site Alternatives 19
Off-Site Alternative 1 19
Availability 19
Logistics 19
Cost 20
Impacts to Aquatic Resources 20
Off-Site Alternative 2 21
Availability 21
Logistics 21
Cost 22
Impacts to Aquatic Resources 22
Off-Site Alternative 3 22
Availability 23
Logistics 23
Cost 23
Impacts to Aquatic Resources 24
Off-Site Alternative 4 24
Availability 25
Logistics 25
Cost 26
Impacts to Aquatic Resources 26
Off-Site Alternative 5 27
Availability 27
Logistics 27
Cost 28

Impacts to Aquatic Resources....28
SunCreek Project Site (Preferred Alternative) 29
Availability....29
Logistics....29
Impacts to Aquatic Resources....29
CONCLUSION....30

LIST OF TABLES

Table 1 – Soil Units Mapped Within the Specific Plan Area.... 6
Table 2 – Wetland Delineations within the SCSP (Participating Properties only) 6
Table 3 – Waters of the U.S. Acreages 7
Table 4 – Proposed Direct Impact Acreages.... 8
Table 5 – Screening Criteria 30

LIST OF FIGURES

Figure 1. Project Site and Vicinity
Figure 2. Proposed Impact Plan
Figure 3. Natural Resources Conservation Service Soil Types
Figure 4. Off-Site Alternatives
Figure 5. Off-Site Alternative 1 - Aerial
Figure 6. Off-Site Alternative 1 - Aerial Assessment of Aquatic Resources
Figure 7. Off-Site Alternative 2 - Aerial
Figure 8. Off-Site Alternative 2 - Aerial Assessment of Aquatic Resources
Figure 9. Off-Site Alternative 3 - Aerial
Figure 10. Off-Site Alternative 3 - Aerial Assessment of Aquatic Resources
Figure 11. Off-Site Alternative 4 - Aerial
Figure 12. Off-Site Alternative 4 - Aerial Assessment of Aquatic Resources
Figure 13. Off-Site Alternative 5 - Aerial
Figure 14. Off-Site Alternative 5 - Aerial Assessment of Aquatic Resources

INTRODUCTION

The SunCreek Property Owners Group, inclusive of the applicants listed below, are applying to fill approximately 24.192 acres of these waters to construct the project. Based on preliminary assessment and discussions with the Corps of Engineers, approximately 1.26 acres of jurisdictional wetlands/waters may be indirectly impacted onsite, and 1.20 acres may be indirectly impacted off-site. A total of 198 acres of wetland preserve would be created throughout the project area. The preserve(s) would contain approximately 19.498 acres of waters of the United States (U.S.).

PROJECT PROPONENT(S)

Applicants:

Project	Applicant
Jaeger Ranch	Investek Properties LLC P.O. Box 586 Burlingame, California 94011 Contact: William Trevor
Shalako Property	Shalako Investors, a California Limited Partnership 11290 Pyrites Way, Suite 100 Gold River, CA 95670 Contact: Larry Gilzean
Sierra Sunrise	Lennar 1420 Rocky Ridge Drive, Suite 320 Roseville, CA 95661 Contact: Bob Shattuck
Smith Property	Sierra Holdings, LLC 3445 American River Drive, Suite A Sacramento, CA 95864 Contact: Vinton J. Hawkins
Backbone Infrastructure	City of Rancho Cordova 2729 Prospect Park Drive Rancho Cordova, CA 95670 Contact: Bret Sampson

The SPA includes two additional development projects known as the Grantline property (220 acres) and the Kamilos property (160 acres); however, the owners of those projects are not participating in the Section 404 application process at this time. It is anticipated that they will submit applications at a later date.

Agent:

Attn: ECORP Consulting, Inc.
Mr. Bjorn Gregersen
2525 Warren Drive
Rocklin, California 95677
Phone: (916) 782-9100
Fax: (916) 728-9134

PROJECT LOCATION

The SunCreek Specific Plan Area (SPA) proposes the development of approximately 1,265 acres and the construction of associated on-site and off-site infrastructure. A map illustrating the total project area is shown as Figure 1. *Project Site and Vicinity*. The proposed SunCreek SPA is located in southern Rancho Cordova, Sacramento County, California, east of Sunrise Boulevard, south of Douglas Boulevard, west of Grant Line Road and north of Laguna Creek. The SPA corresponds to portions of Sections 15, 21 and 29 of Township 8N, Range 7E of the "Buffalo Creek, California" 7.5-minute quadrangles (U.S. Department of the Interior, Geological Survey, 1980. Coordinates for the approximate center of the SPA are 38° 32′ 00″ North and 121° 12′ 45″ West within the Lower Sacramento River Watershed (#18020109).

PROJECT DESCRIPTION

The applicants are applying for Department of the Army permits under Section 404 of the Clean Water Act to construct a mixed-use development project (Figure 2. *Proposed Impact Plan*). The proposed project would be developed on approximately 1,265 acres south of Douglas Road, north of Jackson Highway (State Route 16), west of Grant Line Road, and east of Sunrise Boulevard. The proposed project consists of approximately 5,000 residential homes, 50 acres of retail/commercial offices, six parks, four schools, and wetland preserve and other open space

areas. The proposed project site is generally undeveloped and has a history of occasional use for dry land farming and grazing on spring grasses.

EXISTING CONDITIONS

Vegetative Communities

The SPA is comprised of gently rolling terrain and is situated at an elevational range of approximately 120 to 190 feet above mean sea level (MSL). The predominant vegetation community throughout the SPA is annual grassland which is used for cattle grazing. Interspersed throughout the annual grassland is a matrix of ephemeral aquatic habitat including vernal pools, seasonal wetlands, swales, drainages and streams.

The vegetation communities present throughout the SPA are described in detail below.

Shalako

The Shalako property is comprised of gently sloping to semi-flat terrain, and is situated at an elevation of approximately 120 to 150 feet above MSL. Annual grassland is the predominant vegetation community on-site. The property has historically been utilized for cattle grazing and it is currently used for this purpose. There is a seasonal stream that bisects the project area vertically into two relatively equal halves. Another ephemeral stream occurs in the southwestern corner of the site. The property supports several aggregations of vernal pools. Many of the vernal pools are associated with the seasonal stream in the center of the property and other are scattered randomly throughout the site. In addition to vernal pools, the property also supports several seasonal wetlands and small stretches of swale and ephemeral drainage within its boundaries.

Jaeger Ranch

The Jaeger Ranch property is comprised of rolling annual grasslands and pastures at elevations ranging from approximately 140 to 170 feet above MSL. Annual grassland is the predominant

vegetation community on-site, and it is frequently grazed by cattle. There is a seasonal stream that bisects the property diagonally into two unequal portions from the northeastern corner to the southwestern corner. Vernal pool complexes are found along the stream and also scattered throughout the site with concentrations along the southern border, the southeastern corner, and the northwestern corner of the property. The property also supports seasonal wetlands and swales within its boundaries.

Smith

The Smith property is comprised of relatively flat to slightly rolling topography, and is situated at an elevation of approximately 160 to 170 feet above MSL. A single rural residence is located in the south-central portion of the site. The predominant vegetation community on-site is annual grassland, and it is frequently grazed by cattle. The property is divided by several swale systems that run vertically from north to south through the property. Vernal pools and seasonal wetlands are scattered throughout the property along these swale systems.

Sierra Sunrise

The project site is comprised of gently rolling terrain, and is situated at elevation ranges of approximately 150 to 190 feet above mean sea level. A single rural residence is located in the southern portion of the site, and two abandoned rural residences and a barn occur in the central part of the project site. The majority of the site is heavily grazed and is currently being utilized as horse and cattle pasture. The predominant vegetation community within the project site is annual grassland. There are two stock ponds present on-site. One is located in the southeastern corner of the site, and the other is located near the east-central boundary. An intermittent drainage system bisects the northern half of the property. Several vernal pool complexes, seasonal wetland and swales are located adjacent to the drainage. Vernal pools and seasonal wetlands are also scattered throughout the rest of the property.

Backbone Infrastructure

The majority of the Backbone Infrastructure area is confined within the SPA; however, portions of the infrastructure area do occur off-site and within the two non-participating properties (Kamilos and Grantline).

Kamilos

The Kamilos property is comprised of gently sloping to semi-flat terrain, and is situated at an elevation of approximately 150 to 180 feet above MSL. Annual grassland is the predominant vegetation community on-site. There is a large swale system in the western half of the property with several large vernal pools associated with it. The eastern half of the property has a mixture of vernal pools, seasonal wetlands and seasonal wetland swales scattered throughout the annual grassland. The dominant plant species found within the annual grassland and aquatic features are similar to those found on the other properties.

Grantline

The Grantline property is comprised of gently rolling terrain, and is situated at an elevation of approximately 170 to 240 feet above MSL. Annual grassland is the predominant vegetation community on-site. An ephemeral drainage/swale system occurs within the western half of the property. Several vernal pools are scattered along this system. A large aggregate of vernal pools occurs throughout the eastern half of the site. Scattered seasonal wetlands, swales and another ephemeral drainage divides the southwest corner from the rest of the property. The dominant plant species found within the annual grassland and aquatic features are similar to those found on the other properties.

Soils

According to the *Soil Survey of Sacramento County, California* (U.S. Department of Agriculture, Soil Conservation Service 1993) and the *Soil Survey of the El Dorado Area, California* (U.S.

Department of Agriculture, Soil Conservation Service 1974), thirteen soil units, or types, have been mapped within the Action Area (Table 1 and Figure 3. *Natural Resources Conservation Service Soil Types.*

Table 1 – Soil Units Mapped Within the Specific Plan Area[1]

Map Symbol	Map Unit Name	Hydric	Hydric Inclusions
125	Corning complex, 0-8% slopes	Y	N
126	Corning-Redding complex, 8-30% slopes	N	N
145	Fiddyment fine sandy loam, 1-8% slopes	N	N
157	Hedge loam, 0-2% slopes	N	Y
158	Hicksville loam, 0-2% slopes	N	Y
159	Hicksville gravelly loam, 0-2% slopes	N	Y
175	Madera loam, 2-8% slopes	Y	N
189	Peters clay, 1-8% slopes	N	N
193	Red Bluff-Redding complex, 0-5% slopes	N	Y
197	Redding loam, 2-8% slopes	N	Y
198	Redding gravelly loam, 0-8% slopes	N	Y
214	San Joaquin silt loam, 0-3% slopes	N	Y
215	San Joaquin silt loam, 3-8% slopes	N	Y

[1] Source: Sacramento County Hydric Soils List and El Dorado Area Hydric Soils List.

Waters of the United States

Four separate wetland delineations have been conducted and verified within the participating properties of the SPA, as detailed below in Table 2.

Table 2 – Wetland Delineations within the SCSP (Participating Properties only)

Property Name	Wetland Consultant	Date WD Submitted	Date WD Verified	Corps Reg. Number
Shalako	ECORP Consulting	2001	9/10/2007	200600605
Jaeger Ranch	Davis 2, ECORP Consulting	2001	9/11/2007	200600602
Smith	ECORP Consulting	12/21/2005*	9/19/2007	200000414
Sierra Sunrise	ECORP Consulting	12/21/2005	9/19/2007	200000414

* submitted as part of Sierra Sunrise Wetland Delineation

In addition, delineations have been conducted on the non-participating properties (Grantline and Kamilos), and those acreages have been included in the SPA's total waters of the U.S. calculations. However, assessment data was used to determine potential waters of the U.S.

acreage within the off-site areas. This data was not included in the total "existing" acreage, but was addressed under the project's off-site impacts.

A total of 43.690 acres of waters of the U.S. have been identified within the SPA and offsite Infrastructure Area, including 27.29 acres of vernal pools, 2.638 acres of seasonal wetland, 6.464 acres of seasonal wetland swale, 0.903 acre of ephemeral drainage, 0.982 acre of intermittent drainage, 2.056 acres of ponds, 3.416 acres of stream, and 0.012 acre of non-jurisdictional (isolated) vernal pool. Wetland acreage within the project boundaries and within the off-site infrastructure areas are presented in Table 3 below.

Table 3 – Waters of the U.S. Acreages

Type	Onsite	Offsite	Total
Vernal Pool	26.289	0.930	27.219
Seasonal Wetland	2.545	0.093	2.638
Swale	6.349	0.115	6.464
Ephemeral Drainage	0.903	0.000	0.903
Intermittent Drainage	0.982	0.000	0.982
Pond	2.056	0.000	2.056
Stream	3.338	0.078	3.416
Isolated Vernal Pool	0.012	0.000	0.012
Total:	**42.474**	**1.216**	**43.690**

IMPACTS TO WATERS OF THE U.S.

Approximately 22.976 acres of waters of the U.S. would be directly impacted on-site due to project construction. In addition, approximately 1.216 acres of jurisdictional wetlands/waters would be directly impacted offsite. A total of 198 acres of wetland preserve would be created throughout the project area. The preserve(s) would contain approximately 19.498 acres of waters of the U.S. (Table 4).

Table 4 – Proposed Direct Impact Acreages*				
Type	**Existing**	**Preserved**	**Impacted**	
			On-site	**Off-site**
Vernal pool	27.219	12.716	13.573	0.930
Seasonal wetland	2.638	1.524	1.021	0.093
Swale	6.464	1.943	4.406	0.115
Ephemeral Drainage	0.903	0	0.903	0
Intermittent drainage	0.982	0.808	0.174	0
Pond	2.056	0	2.056	0
Stream	3.416	2.507	0.831	0.078
Isolated vernal pool	0.012	0	0.012	0
Total:	**43.690**	**19.498**	**22.976**	**1.216**

* Includes all impacts associated with required off-site infrastructure and improvements.

Approximately 24.192 acres of waters of the U.S. will be impacted (inclusive of on- and off-site areas and includes 0.012 acres of isolated vernal pool). For these waters that are not protected within the Open Space and cannot practicably be avoided, compensatory mitigation will be provided. The Applicants propose to mitigate unavoidable impacts to waters of the U.S. through a combination of the on-site enhancement, on-site creation or restoration, and the purchase of credits at Corps-approved mitigation facilities. This compensatory mitigation proposal will offset the loss of functions and values caused by unavoidable impacts to waters of the U.S. and will implement the Corps' Mitigation Rule. In addition, the Project Applicants will ensure that there is no net increase in floodwater surface elevations downstream of the project in accordance with the LAFCO Resolution.

On-Site Avoidance

The wetland preserve/open space areas within the SunCreek Specific Plan Area were designed to preserve and protect vernal pool complexes and drainage corridors, consistent with the objectives of the 2004 Conceptual-Level Strategy for Avoiding, Minimizing & Preserving Aquatic Resource Habitat in the Sunrise-Douglas Community Plan Area (Conceptual Strategy). Preliminary Open Space boundaries, developed through consultation with regulatory agencies, were refined to address logistical constraints while following the Principles and Standards set forth in the Conceptual Strategy. Light Detection and Ranging (LIDAR) technology and GIS modeling were also used to conduct detailed analyses of vernal pool complex characteristics and assist development of preserve design criteria through assessment of surface flows and

watershed requirements. Brief descriptions of the cluster and watershed analyses are provided below.

In an effort to identify wetland complexes, a GIS model was built that identified the spatial relationships between individual seasonal wetlands and vernal pools based on pool distance and density. The model accomplished this by delineating buffers around individual pools at a set interval, dissolving the boundaries between those buffers that overlapped and then grouping wetlands within each discrete dissolved buffer polygon to create distinct wetland cluster polygons. Spatial statistics and pool counts were calculated for each new polygon. Spatial statistics included polygon size, perimeter, and wetlands density. The model was run at multiple search distances including 50′, 100′, 150′, 200′ and 250′ and the results of each model iteration were merged into a single GIS database and displayed on a map, which was used by the biologist team to identify geospatial and statistical patterns in the data.

In an effort to differentiate major wetland complexes from small clusters of pools specific search criteria were developed. These included evaluating wetland clusters for their number of pools and wetland densities, and excluding those clusters that did not meet the necessary thresholds from the final analysis. Threshold criteria for pool counts and wetland density values for cluster polygons were developed separately for each search distance. This is due to the inverse relationship between buffer distance and wetland density (i.e. the bigger the buffer, the more upland in the final polygon) and the positive correlation between buffer distance and pool count. A single set of threshold values would not work for each search distance as smaller search distances tend to contain fewer pools but higher wetland densities and larger search distances contain higher pool counts by lower wetland densities. However, by evaluating each model iteration independently a pattern of pool clustering was developed.

The threshold values that create polygons that best represent a logical, definitive pattern of pool clustering and identify major grouping of seasonal wetlands and vernal pools were used to generate the base open space preserve areas, which were then refined using project infrastructure constrains and pool watershed analysis.

In addition to wetland cluster analysis, the open space preserve area boundary was created by evaluating the individual wetland watersheds. Watersheds were calculated for each depressional seasonal wetland and vernal pool on the project site using a sink modified version of the industry standard D8 flow model developed by Jenson and Domingue (1988) with the Sacramento County LIDAR data (2004) and project wetland delineation as inputs. The flow model generates a layer which describes discrete watershed areas and likely water flow paths across the entire project site, where each discrete watershed represents the drainage area for an individual depressional wetland. These watersheds show the detailed flow patterns across the vernal pool landscape and can be used to identify where micro-topology directs flows. This information allows for the development of an open space preserve that minimizes changes to wetland hydrology within the preserve area. The wetland watershed data were utilized to refine the base open space preserve areas to assure that wetlands within the preserve areas would have minimal indirect impacts associated with the grading within the remaining open space and the development areas.

By utilizing LIDAR data and GIS modeling tools, in addition to information collected in the field by biologists, the open space/wetland preserves within the SunCreek Specific Plan Area were designed and configured to maximize preservation of vernal pool habitat functions and values. The proposed preserves have captured the primary drainages and highest value vernal pools and complexes and are ensuring that future development on adjacent properties will maintain appropriate watersheds for the preserved habitat, provide sufficient buffers, and minimize potential indirect impacts. It is estimated that of the 15.083 acres of wetlands that will be avoided and preserved within the proposed open space areas, only 1.26 acres are subject to potential indirect impacts as a result of project implementation affecting the watersheds and hydrology of the aquatic features. Similarly, approximately 1.2 acres of wetlands located offsite and adjacent to the SunCreek Specific Plan Area may be indirectly impacted by project implementation. These are features that are in proposed open space areas on other properties/projects or on adjacent parcels with no proposed development. More detailed studies of both potential onsite and offsite indirect impacts will occur through consultation with the Corps of Engineers as a component of the Section 404(b)(1) Alternative Analysis process.

CLEAN WATER ACT, SECTION 404 APPLICATION

The project proponents have applied to the U.S. Army Corps of Engineers (Corps) for a permit to discharge dredged and/or fill materials into waters of the U.S. under authority of the Corps pursuant to Section 404 of the Clean Water Act and its implementing regulations (33 USC §1311, et seq.; 33 CFR, Parts 320-330; 40 CFR, Part 230). Pursuant to these requirements, the Corps will conduct a two-part analysis: to determine consistency with Section 404 (b)(1) guideline requirements to consider practicable alternatives to dredge or fill of waters of the U.S.; and a public interest review. This document provides an analysis of potential alternatives.

Purpose of Alternatives Analysis

The purpose of this analysis is to objectively evaluate practicability of several alternatives to the proposed project and provide the Corps with documentation to be used in evaluating the proposed project permit application in compliance with 404(b)(1) guidelines. 404(b)(1) guidelines require that alternatives analysis be adequate to establish the project as the Least Environmentally Damaging Practicable Alternative (LEDPA). This is accomplished by comparing the proposed project with other alternatives in terms of project purpose, overall environmental effects, and practicability. For this analysis, a reasonable statement of overall project purpose has been developed, and several alternatives have been evaluated in light of that purpose. This alternatives analysis has been prepared to be consistent with the guidelines.

Application of the 404(b)(1) Guidelines to the Project

The project, as proposed, would result in the discharge of dredged and fill material into 24.192 acres of waters of the U.S. (including 0.012 ac. of isolated vernal pool). As proposed, a total of 19.498 acres of waters of the U.S. (vernal pool, seasonal wetlands, seasonal wetland swales, intermittent drainage, and stream) would be preserved on-site. In addition to requiring the identification of the LEDPA, the Guidelines mandate that a project must not violate any applicable toxic effluent standard or prohibition, 40 CFR § 230.10(b)(2), jeopardize the continued existence of any endangered or threatened species (or destroy or adversely modify critical habitat), 40 CFR § 230.10(b)(1), or cause or contribute to significant degradation of

waters of the U.S., 40 CFR § 230.10(c). Prior to completing its review, the Corps must also evaluate the proposed project in light of the public interest. Finally, the Corps must ensure that its environmental review complies with the National Environmental Policy Act (NEPA) codified at 42 USC § 4321 *et seq.*

The 404(b)(1) guidelines express project objectives in terms of basic and overall purpose. In practical application, these terms are generally defined as presented in the following paragraphs.

SUMMARY OF PROPOSED PROJECT

Overall Project Purpose

The overall purpose of the project is to provide high, medium, and low-density residential and non-residential development to serve the needs of eastern Sacramento County, California.

Regulatory Background

This section presents an overview of the requirements of the 404(b)(1) guidelines and a discussion of the implementing guidance issued by the Corps. The 404(b)(1) guidelines are the substantive criteria used by the Corps in evaluating discharges of dredged or fill material into waters of the United States under Section 404 of the Clean Water Act. The guidelines require that four criteria be satisfied in order for the Corps to make a decision that a proposed discharge is in compliance. These criteria are:

1. The discharge must be the least LEDPA: This alternatives analysis evaluates a range of alternatives to the proposed project in terms of environmental effects, practicability, and consistency with the overall project purposes.

2. The discharge must not violate any water quality standard, toxic effluent standard, or jeopardize the continued existence of a threatened or endangered species: Through the environmental review process, mitigation measures will be developed to insure that

water quality and toxic effluent standards will not be violated. The U.S. Fish and Wildlife Service will be consulted regarding potential effects to federally listed species.

3. The discharge must not result in a significant degradation of the waters of the United States: Water quality impacts and potential impacts will be minimized through implementation of water quality management and erosion control plans as approved by the Regional Water Quality Control Board and the local planning jurisdiction.

4. Unavoidable impacts to the aquatic ecosystem must be mitigated: Based on an agreement between the Corps and EPA, efforts must first be directed at avoiding and reducing impacts to waters of the U.S. prior to the evaluation of potential compensatory mitigation measures. Mitigation may be applied only to unavoidable impacts. In keeping with this guidance, this alternatives analysis does not attempt to substitute mitigation for avoidance wherever the project goals may concurrently be met. Unavoidable impacts to biological resources associated with waters of the U.S. will be mitigated by either on-site construction of compensation wetlands, through the purchase of appropriate mitigation credits from agency-approved sources, or by a combination of mitigation measures acceptable to the regulatory agencies.

Before the Corps can issue a permit, it must find that the requirements of the guidelines have been satisfied. The key criterion for most permit applicants, and the focus of this analysis, is the requirement that the discharge be the least environmentally damaging, practicable alternative. The pertinent section of the regulation states:

> "Except as provided under Section 404(b)(2), no discharge of dredged of fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have a less adverse impact on the aquatic ecosystem so long as discharge does not have other significant adverse environmental consequences.
>
> a. For the purposes of this requirement, practicable alternatives include, but are not limited to:

1) On-site activities that do not include a discharge into waters of the United States or ocean waters,

2) Discharges of dredged or fill material at other locations in waters of the United States or ocean waters.

b. An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purpose. If it is otherwise a practicable alternative, an area not presently owned by the applicant which could reasonably be obtained, utilized, expanded, or managed in order to fulfill the basic purpose of the proposed activity may be considered;

c. Where the activity associated with a discharge which is proposed for a special aquatic site does not require access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose (i.e., is not "water dependent"), practicable alternatives that do not involve special aquatic sites are presumed to be available unless clearly demonstrated otherwise. In addition, where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise."

The key provisions in the language are practicability and overall project purposes. An alternative is practicable if it is available to the applicant and capable of being accomplished by the applicant after consideration of costs, existing technology and logistics, in light of overall purposes. If a practicable alternative would have less impact on the aquatic ecosystem, and does not include other significant adverse impact, then the proposed project is not the LEDPA.

ALTERNATIVES

Off-Site Alternatives

Site selection criteria represent the first level of evaluation for determining availability of potential alternatives to the SunCreek Specific Plan area that achieve the project purpose. These sites that could potentially support the proposed project and its purpose as specified by the Section 404(b)(1) guidelines were identified to determine if practicable, less damaging alternatives to the project as proposed exist. A series of screening criteria were used to identify potential off-site alternative locations that could meet the project purpose and that may represent the LEDPA.

Primary Screening Criteria

A series of primary screening criteria were used to identify viable off-site alternatives to the SunCreek Specific Plan project, including geographic location, size, existing development, and provision of services. These criteria are discussed in greater detail in the following sections.

Geographic Location

As an initial screening criterion, identification of off-site alternatives focused on southeastern Sacramento County, within the Sacramento County's Urban Services Boundary, U.S. 50 to the north and Highway 99 to the west. This is consistent with the general project purpose, which is to provide a large-scale mixed-use community within eastern Sacramento County.

The alternative site must also be zoned for low to high density residential (greater than rural residential), as well as commercial / mixed use and not represent leapfrog development (i.e. must have proposed or current developments along one border of the proposed site). The proposed project must also provide a community focal point by being in proximity to existing job centers, neighborhood-serving retail, community parks, and/or other community centers.

Parcel Size

Parcels under consideration as viable alternatives must be a minimum of 1,000 acres in size (or combinations of adjacent parcels that totaled 1,000 acres or more). However, larger sites were also evaluated to determine if they would support a project with features of comparable scale, or if development of a portion of the property would not create leapfrog development.

Existing Development

Land with existing development was also eliminated from further consideration. Using Sacramento County Land Data and proposed project information, large portions of the City of Elk Grove, the City of Folsom, the City of Rancho Cordova, Sunrise Douglas Specific Plan, Vineyard Springs, the Florin Gap Areas, and North Vineyard Station were identified as previously developed or proposed for development. Other constraints and existing development included Mather Field, federally owned land south of Mather Field, existing and proposed Preserves, and USFWS critical habitat areas. A visual aerial assessment of existing aerial photographs and online resources such as Google Earth was also conducted to identify rural residential areas that contained single family housing on a large number of parcels, which would preclude acquisition and project development efforts. By using existing Sacramento County parcel data, rural residential areas with many parcels and dwelling units were identified and eliminated from further review.

Provision of Services

Areas that are outside of Sacramento County's Urban Services Boundary (USB) were excluded from further analysis. The Urban Services Boundary is intended by the County to be a permanent boundary not subject to modification except under extraordinary circumstances. County policy expressly prohibits consideration of applications for urban development for areas outside of the USB. Areas outside of the USB would generally be considered leap-frog development and would require extension of infrastructure and utilities, that would in turn result in additional impacts to biological resources and increase costs significantly.

Application of Primary Screening Criteria

Initial site selection criteria were applied and resulted in the identification of five off-site alternatives (Figure 4. *Off-Site Alternatives Location*). A summary of the potential sites are as follows. Detailed descriptions of each of the five alternatives are provided below (see *Results of Off-Site Alternatives Analysis* section).

- Off-site Alternative 1: This ~1,491-acre site is approximately 3.3 miles west of the proposed project site
- Off-site Alternative 2: This ~1,692-acre site is approximately 5 miles west of the proposed project site
- Off-site Alternative 3: This ~1,489-acre site is approximately 1 mile northeast of the proposed project site
- Off-site Alternative 4: This ~1,097-acre site is approximately 0.6 mile northeast of the proposed project site
- Off-site Alternative 5: This ~1,028-acre site is approximately 1.6 miles south-southwest of the proposed project site

Secondary Screening Criteria

The five potential off-site alternatives were next evaluated for suitability based on their availability and logistical constraints and potential impacts to aquatic resources.

Availability

The 404(b)(1) guidelines provide that sites must be available to be considered a practicable alternative. Various factors were considered in determining the availability of alternatives, such as: whether the land is readily obtained; whether the land is encumbered by easements, leases or contracts; whether development on the site has already been approved or an application is pending. Land that is not available for sale or land that is already in the process of obtaining local entitlements for development was considered unavailable.

Logistics

An alternative that is available may not be practicable due to logistical constraints. These logistical constraints relate to the alternative site's ability to support the design, implementation, and operation of the proposed project. Factors to consider include:

- Utility Services – Can sewer, water and other utilities be provided to the site in a reasonable manner?
- Parcel Configuration – Would the alternative site's size and configuration allow for orderly development?
- Access – Does the site have appropriate access to roads? Are there physical or regulatory constraints that would constrain access to the site?

Cost

Are development costs the same as or less than the currently proposed SunCreek site? Are the additional costs reasonable in relation to the additional wetland avoidance that may be possible?

Assessment of Impacts to Aquatic Habitat

Alternatives that were identified as potentially practicable were further analyzed to determine if they had greater impacts to aquatic habitat. The purpose of preparing an alternatives analysis pursuant to the 404(b)(1) guidelines is to examine whether there are less LEDPAs. As such, alternatives that would have a greater negative impact on the aquatic environment are eliminated from further consideration as they would not be less environmentally damaging.

Five off-site alternatives were considered for this alternatives analysis, chosen based on location, availability, provision of services, proximity to major transportation corridors, and parcel size. The alternatives were mapped, and nearby land uses, infrastructure, relationships to preserved open spaces, and key constraints were assessed. A variety of reference materials were consulted, most notably the South Sacramento Habitat Conservation Plan Wetland Assessment data aerial photographs, biological resource assessment information previously conducted on

properties in Sacramento County by ECORP, and Google Earth. ECORP consulted aerial assessments for aquatic resources for each of the alternatives to determine the nature and approximate quantity of waters of the U.S. potentially affected under each alternative. Aerial assessments are not jurisdictional wetland delineations as accepted by Corps, and thus are approximations of the wetlands present on a property. Ownership of parcels within an alternative was not a consideration in this analysis, and several alternatives have several to many private residences or commercial enterprises within their mapped boundaries. All alternatives considered here feature large, relatively undisturbed expanses of open land, generally used for grazing.

Results of Off-Site Alternatives Analysis

Off-Site Alternative 1

Alternative Site 1 (Figure 5) is a 1,491-acre area, located west of Excelsior Road, east of Bradshaw Road, north of Elder Creek Road, and south of Kiefer Boulevard. The site is comprised of 74 parcels and consists of developed and disturbed areas. Commercial and industrial uses include two cemeteries, a sand and gravel mining operation, and other smaller businesses. The area also includes rural residential developments, agricultural fields, and cleared and graded areas. A wetland delineation was not conducted on this site. However, an aerial wetland assessment was performed to estimate the extent of potentially jurisdictional wetlands within the boundaries of Off-Site Alternative 1.

Availability

This alternative appears to be available, although it is comprised of 74 separate parcels. The possibility of securing all necessary parcels is unlikely.

Logistics

The Bradshaw Sewer Interceptor is adjacent to the site within Bradshaw Road therefore additional cost associated with sewer would be minimal. Water and other utilities would need to

be brought to the site, approximately 1.5 miles from the west (City of Sacramento) and 1.5 miles south (Florin Vineyard Community Plan and North Vineyard Station Specific Plan Areas) to create a looped water system. The additional cost to extend services (water, electrical, and gas services) creates a hardship on the project, which would make the alternative infeasible. The associated costs have been outlined below.

The site contains adequate access from Highway 16, which crosses through the northern portion of the site, and other connectors, such as Elder Creek Road and Bradshaw Road that would provide access from the west.

Cost

To estimate the additional costs associated with this off-site alternative it has been assumed that water, electrical, and gas services are required to be extended to the site and that the installation of such utilities will require resurfacing of roadways. Based on a cursory review of typical costs to design and install such utilities, it is assumed that the cost to extend these services is approximately $3,100,000/mile ($2,400,000/mile for water and $700,000/mile for electrical and gas). Using those assumptions, the cost to extend services from the west and south would be $9,300,000. Note: These estimates are for general evaluation purposes only. Actual distances and costs would require a significant amount of research and design effort to conduct site-specific studies.

Impacts to Aquatic Resources

A wetland assessment of this 1,491-acre area indicates approximately 39.71 acres of wetlands and other waters may occur within the alternative's boundaries. Approximately 12.89 acres of vernal pools, 2.08 acres of seasonal impoundments, 10.86 acres of swales, 7.26 acres of streams and creeks, 5.98 acres of freshwater marsh, and 0.64 acre of open water occur (Figure 6). Development on this alternative site would likely result in more impacts to waters of the U.S. than the proposed project.

Off-Site Alternative 2

Alternative Site 2 (Figure 7) is a 1,692-acre area, comprised of approximately 351 parcels, and is located west of Bradshaw Road, east of Hedge Avenue, north of Elder Creek Road, and south of Kiefer Boulevard. The site consists of developed and disturbed areas. Commercial and industrial developments within the area include sand and gravel operations, a wholesale florist enterprise, construction building services, and other smaller commercial businesses. The area also includes the Cordova Golf Course, agricultural land, and rural residential areas. A wetland delineation was not conducted on this site. However, an aerial wetland assessment was performed to estimate the extent of potentially jurisdictional wetlands within the boundaries of Off-Site Alternative 2.

Availability

This alternative appears to be available, although it is comprised of 243 separate parcels. The possibility of securing all necessary parcels is unlikely.

Logistics

The Bradshaw Sewer Interceptor is adjacent to the site within Bradshaw Road therefore additional cost associated with sewer would be minimal. Other infrastructure and utilities could be brought to the site from the north, west, or south. The site is directly adjacent to existing development; therefore, the additional costs associated with this off-site alternative in regards to the extension and installation of sewer, electrical, and gas services will likely be minimal. A looped water system will be required. Water would need to be brought to the site, approximately 1.5 miles from the south (Florin Vineyard Community Plan and North Vineyard Station Specific Plan Areas) and approximately 0.5 miles from the west (City of Sacramento). The associated costs have been outlined below.

The site contains adequate access from Highway 16, which crosses through the northern portion of the site, and other connectors, such as Elder Creek Road, Hedge Avenue, and Bradshaw Road that would provide access from the west.

Costs

The site is directly adjacent to existing development; therefore, the additional costs associated with this off-site alternative in regards to the extension and installation of sewer, electrical, and gas services will likely be minimal. To estimate the additional costs associated with this off-site alternative it has been assumed that water is required to be extended to the site and that the installation of such utilities will require resurfacing of roadways. Based on a cursory review of typical costs to design and install such utilities, it is assumed that the cost to extend the water services is approximately $2,400,000/mile. Using those assumptions, the cost to extend service from the south would be $4,800,000. Note: These estimates are for general evaluation purposes only. Actual distances and costs would require a significant amount of research and design effort to conduct site-specific studies.

Impacts to Aquatic Resources

A wetland assessment of this 1,692-acre area indicates approximately 19.17 acres of wetlands and other waters may occur within the parcel boundaries (Figure 8). Approximately 3.95 acre of seasonal wetlands, 3.03 acre of seasonal impoundments, 1.93 acres of swale, 5.88 acres of streams and creeks, and 4.38 acres of open water. In addition, an established conservation area is located in the southwestern quadrant of the alternative area. This project would likely not result in more impacts to waters of the U.S. than the proposed project, but would not likely result in significantly less impacts as impacts associated with extending Infrastructure and Utilities have not been quantified.

Off-Site Alternative 3

This alternative site is 1,489 acres in size and is comprised of 19 separate parcels (Figure 9). Grant Line Road and the Sunrise Douglas Community Plan area is approximately one mile to the west. Aggregate mining occurs to the north and directly adjacent to the area. A large ranch facility is located off of Pleasant Hill Lane. The land is primarily grassland and used for cattle grazing. The site includes the Grantline Pilatus (Richland) Property and Van Vleck Resources for

which entitlements and development agreements are currently being sought with both the County of Sacramento and the City of Rancho Cordova.

Availability

This alternative site is comprised of 19 parcels, the majority of which are not available. Approximately 882 acres of the south-central portion of this site is already proposed for development (Cordova Hills Project, SPK-2004-00116), which would affect availability. Therefore, securing all necessary parcels would be infeasible.

Logistic

Infrastructure and utilities would need to be brought to the site from the west. The lack of sewer and water capacity within the utilities located two mile west, within the existing development in Rancho Cordova, requires the need for the project to bring utilities from alternative locations. There are a number of alternatives for bringing sewer to the site with various costs and timing issues, of which bringing additional sewer capacity approximately 10 miles from the Bradshaw Interceptor with a connection along Sunrise Boulevard south of White Rock Road seems to be the most feasible (including a pump station and force main). Similarly, additional water facilities would have to be brought approximately 12 miles from the Vineyard Surface Water Treatment Plant (including a portion of the North Service Area Pipeline, along with storage tanks, booster pumps...) since the location of this alternative site is outside the 2030 service area/Zone 40 boundary and not included within the C.I.P. The additional cost to extend services (sewer, water, electrical, and gas services) creates a hardship on the project, which would make the alternative infeasible. The associated costs have been outlined below. In addition, there is no direct access to the Alternative 3 site. The only access to this alternative site is Grantline Road two miles to the west.

Cost

To estimate the additional costs associated with this off-site alternative it has been assumed that sewer, water, electrical, and gas services are required to be extended to the site and that the

installation of such utilities will require resurfacing of roadways. Based on a cursory review of typical costs to design and install such utilities, it is assumed that the cost to extend the sewer services is approximately $3,700,000/mile, including the pipe system, pump station, and force main), and the cost to extend the water services is approximately $2,820,000/mile, including the pipe system, storage tanks, and booster pumps. It is assumed the other utilities (electrical and gas) could be extended from the existing development in Rancho Cordova for approximately $700,000/mile. Using those assumptions, the cost to extend services from the west would be $72,240,000. Note: These estimates are for general evaluation purposes only. Actual distances and costs would require a significant amount of research and design effort to conduct site-specific studies.

Impacts to Aquatic Resources

Approximately 31.87 acres of wetlands and other waters were mapped within the alternative's boundaries, including 8.31 acres of vernal pools, 1.14 acres of seasonal impoundments, 3.50 acres of seasonal wetlands, 11.15 acres of seasonal wetland swales, and 5.33 acres of streams/creeks (Figure 10). A network of large seasonal wetland swales and streams/creeks crisscrosses the area.

Given the acreage, linear characteristics, and distribution of wetlands, any configuration of residential and commercial development on this alternative site would likely result in greater impacts to waters of the U.S. than the proposed project.

Off-Site Alternative 4

Off-site Alternative 4 is a 1,097-acre plot of land east of Grant Line Road and the existing Sunrise Douglas Community Plan Area, and south of Prairie City State Vehicular Recreation Area and an aggregate mine (Figure 11). It is located just east of the City of Rancho Cordova boundary. Glory Lane demarcates the southern boundary of the site. Approximately one residence or structure exist within the area, including four cell phone towers, all in association with Grant Line Road or Glory Lane. The vast majority of the landscape features flat-to-gently rolling annual grasslands, while in the southeastern quadrant steeper topography asserts itself,

along with oak woodland. Most of the area is managed as rangeland. A small area in the northwest was historically placer-mined (which remains apparent as exposed cobble). A wetland delineation was not conducted on this site. However, an aerial wetland assessment was performed to estimate the extent of potentially jurisdictional wetlands within the boundaries of Off-Site Alternative 4.

Availability

This alternative consists primary on two parcels that are referred to as the Tracy Bypass Property, and portions of three additional parcels that are part of the Grantline Pilatus (Richland) project area, for which entitlements and development agreements are currently sought with both the County of Sacramento and the City of Rancho Cordova.

Logistics

Infrastructure and utilities would need to be brought to the site from the west (approximately one mile from developments along Douglas Boulevard). The lack of sewer and water capacity within the utilities located within the development along Douglas Boulevard requires the need for the project to bring utilities from alternative locations. There are a number of alternatives for bringing sewer to the site with various costs and timing issues, of which bringing additional sewer capacity approximately 10 miles from the Bradshaw Interceptor with a connection along Sunrise Boulevard south of White Rock Road seems to be the most feasible (including a pump station and force main). Similarly, additional water facilities would have to be brought approximately 12 miles from the Vineyard Surface Water Treatment Plant (including a portion of the North Service Area Pipeline, along with storage tanks, booster pumps...) since the location of this alternative site is outside the 2030 service area/Zone 40 boundary and not included within the C.I.P. The additional cost to extend services (sewer, water, electrical, and gas services) creates a hardship on the project, which would make the alternative infeasible. The associated costs have been outlined below.

The site contains good access from Grantline Road and Douglas Boulevard on the western boundary. However, the site is adjacent to an operating aggregate mine, which is incompatible with residential land uses and could preclude development on a significant portion of the site.

Cost

To estimate the additional costs associated with this off-site alternative it has been assumed that sewer, water, electrical, and gas services are required to be extended to the site and that the installation of such utilities will require resurfacing of roadways. Based on a cursory review of typical costs to design and install such utilities, it is assumed that the cost to extend the sewer services is approximately $3,000,000/mile, including the pipe system, pump station, and force main), and the cost to extend the water services is approximately $2,820,000/mile, including the pipe system, storage tanks, and booster. It is assumed the other utilities (electrical and gas) could be extended from the existing development along Douglas Road is approximately $700,000/mile. Using those assumptions, the cost to extend services from the west would be approximately $71,540,000. Note: These estimates are for general evaluation purposes only. Actual distances and costs would require a significant amount of research and design effort to conduct site-specific studies.

Impacts to Aquatic Resources

Approximately 58.17 acres of wetlands and other waters were mapped within the alternative's boundaries, including 41.61 acres of vernal pools, 3.27 acres of seasonal impoundments, 10.86 acres of swales, and 2.43 acres of streams/creeks (Figure 12). Vernal pools occur in dense clusters throughout the site. A network of large seasonal wetland swales and streams/creeks crisscrosses the area.

Given the acreage, linear characteristics, and distribution of wetlands, any configuration of residential and commercial development on this alternative site would likely result in greater impacts to waters of the U.S. than the proposed project.

Off-Site Alternative 5

Alternative Site 5 is 1,028 acres in aerial extent and comprised of 18 separate parcels (Figure 13). Securing all 18 parcels would be a difficult task, if possible. The site is located south of Rancho Cordova, and bound by Florin Road to the north, the Folsom-South canal to the east, and Grant Line Road to the south and southeast. Preserved conservation lands are located west and north of the site. Approximately 14 rural residences and other structures occur within the area. Irrigated pasture is the dominant land use in the area, with grazed annual grasslands being the second-dominant land use. Aggregate mining occurs to the northeast of the site. A wetland delineation has not been conducted in this area, but an aerial assessment was conducted to assess the extent of potentially jurisdictional wetlands.

Availability

This alternative is comprised of 18 separate parcels and the possibility of securing all necessary parcels is unknown, and, at best, it would be a difficult task.

Logistics

Infrastructure and utilities would need to be brought to the site from the west (2.5 miles from existing developments within Florin Vineyard Community Plan and North Vineyard Station Specific Plan Areas). Although the site is adjacent to the future Laguna Interceptor alignment, this interceptor is unlikely to be developed due to downstream capacity constraints. An alternative solution for sewer would be to connect into the existing developments previously described which connect into the Bradshaw Interceptor, (including additional pump station and force main). Water requires the addition of a well site due to the conjunctive use requirement within the area. The additional cost to extend services (sewer, water, electrical, and gas services) creates a hardship on the project, which would make the alternative infeasible. The associated costs have been outlined below.

The site contains good access from Florin Road to the north and Grantline Road to the South. However, there is an existing, operating aggregate mine bordering the northeastern corner. Mining activities there would not be compatible with residential development.

Cost

To estimate the additional costs associated with this off-site alternative it has been assumed that sewer, water, electrical, and gas services are required to be extended to the site and that the installation of such utilities will require resurfacing of roadways. Based on a cursory review of typical costs to design and install such utilities, it is assumed that the cost to extend these services is approximately $3,200,000/mile, including the pipe system, pump station, and force main), and the cost to extend the water services is approximately $5,800,000/mile, including the pipe system and well site facilities. It is assumed the other utilities (electrical and gas) could be extended from the existing development along Gerber Road is approximately $700,000/mile. Using those assumptions, the cost to extend services from the west would be $24,250,000. Note: These estimates are for general evaluation purposes only. Actual distances and costs would require a significant amount of research and design effort to conduct site-specific studies.

Impacts to Aquatic Resources

Within the site's 1,028 acres, approximately 50.95 acres of wetlands and other waters occur, including approximately 13.14 acres of vernal pools, 11.36 acres of swale, 0.56 acres of seasonal impoundments, 8.09 acres of intermittent drainages, 3.96 acres of marshes, and 13.84 acres of open water/ponds (Figure 14). A substantial intermittent drainage, Elder Creek (and associated marshes) drains from east to west through the middle of the site, eventually draining into Stone Lakes and into the Sacramento Delta. Approximately half of the site is in current crop production, primarily alfalfa, but also other row crops. The area is essentially treeless, except for the riparian corridor associated with Elder Creek.

The northwestern portion of the site is a patchwork of vernal pools and seasonal wetlands, with other waters occurring in smaller proportion. Marshes, seasonal wetlands, and ponds dominate most of the other undeveloped portions of the site, with an area in the southeast (bordering

Grant Line Road) consisting of seasonal wetlands and seasonal wetland swales. The density of wetlands in some areas of this alternative site is very high, and its proximity adjacent to conservation areas to the north and west render it potentially important from a conservation planning point of view. Given the acreage, linear characteristics, and distribution of wetlands, any configuration of residential and commercial development on this alternative site would likely result in greater impacts to waters of the U.S. than the proposed project.

SunCreek Project Site (Preferred Alternative)

The proposed SunCreek project would be developed on approximately 1,265 acres south of Douglas Road, north of Jackson Highway (State Route 16), west of Grant Line Road, and east of Sunrise Boulevard. The proposed project consists of approximately 5,000 residential homes, 50 acres of retail/commercial offices, six parks, four schools, and wetland preserve and other open space areas. The proposed project site is generally undeveloped and has a history of occasional use for dry land farming and grazing on spring grasses.

Availability

The proposed project is owned by the applicant.

Logistics

The site is owned by the applicant and currently zoned for development. Infrastructure and utilities are readily available from existing development in the City of Ranch Cordova to the west and the City of Folsom to northeast. The site contains good access from Sunrise Avenue to the west, Grantline Road to the east and Kiefer Boulevard via a proposed connection in the south-central portion of the project.

Impacts to Aquatic Resources

Approximately 43.690 acres of waters of the U.S. have been mapped within the project boundaries (and within the study areas of off-site infrastructure, refer to Figure 2) of which

19.498 acres would be preserved through project implementation. As proposed, the SunCreek project would directly impact 24.192 acres of jurisdictional waters of the U.S (including 0.012 acres of isolated vernal pool).

CONCLUSION

Of the five off-site alternatives that were evaluated as potential alternative locations for the proposed project, none are considered to be a practicable alternative that would result in less impacts to waters of the U.S., or are otherwise viable options to the preferred Alternative. Alternatives 3 and 4 were considered unavailable as they were currently seeking entitlements and development agreements with both the County of Sacramento and the City of Rancho Cordova. Alternatives 3, and 5 did not meet the secondary screening criterion for Infrastructure/Utility Services as they would require significant efforts/costs to extend existing services to their respective locations. Alternatives 1, 2, 3, and 5 were considered to have parcel configurations that would preclude acquisition of enough parcels to allow for development to occur within a timeframe that met the objectives of the proposed project. All of the alternative sites except Alternative 2 would likely result in greater impacts to aquatic resources in addition to being inferior in location, existing infrastructure, utilities, and cost to implement. Table 5 below summarizes the suitability of the off-site alternative locations in relation to the primary and secondary screening criteria.

Table 5 – Screening Criteria

	Primary Screening Criteria			Secondary Screening Criteria					
					Logistical Constraints			Wetlands	
Alternative	**Geographic Location (USB)**	**Provision of Service**	**Parcel Size**	**Availability**	**Infrastructure/ Utility Services**	**Parcel Config-uration**	**Access**	**Existing Ac.**	**Significantly Less Impacts**
1	YES	YES	YES	YES	YES	**NO**	YES	92.20	**NO**
2	YES	YES	YES	YES	YES	**NO**	YES	50.95	YES
3	YES	YES	YES	**NO**	**NO**	**NO**	**NO**	64.70	**NO**
4	YES	YES	YES	**NO**	YES	YES	YES	79.71	**NO**
5	YES	**NO**	YES	**NO**	**NO**	**NO**	YES	64.32	**NO**
SunCreek	YES	YES	YES	YES	YES	YES	YES	43.690	**NO**

LIST OF FIGURES

Figure 1. Project Site and Vicinity
Figure 2. Proposed Impact Plan
Figure 3. Natural Resources Conservation Service Soil Types
Figure 4. Off-Site Alternatives
Figure 5. Off-Site Alternative 1 - Aerial
Figure 6. Off-Site Alternative 1 - Aerial Assessment of Aquatic Resources
Figure 7. Off-Site Alternative 2 - Aerial
Figure 8. Off-Site Alternative 2 - Aerial Assessment of Aquatic Resources
Figure 9. Off-Site Alternative 3 - Aerial
Figure 10. Off-Site Alternative 3 - Aerial Assessment of Aquatic Resources
Figure 11. Off-Site Alternative 4 - Aerial
Figure 12. Off-Site Alternative 4 - Aerial Assessment of Aquatic Resources
Figure 13. Off-Site Alternative 5 - Aerial
Figure 14. Off-Site Alternative 5 - Aerial Assessment of Aquatic Resources

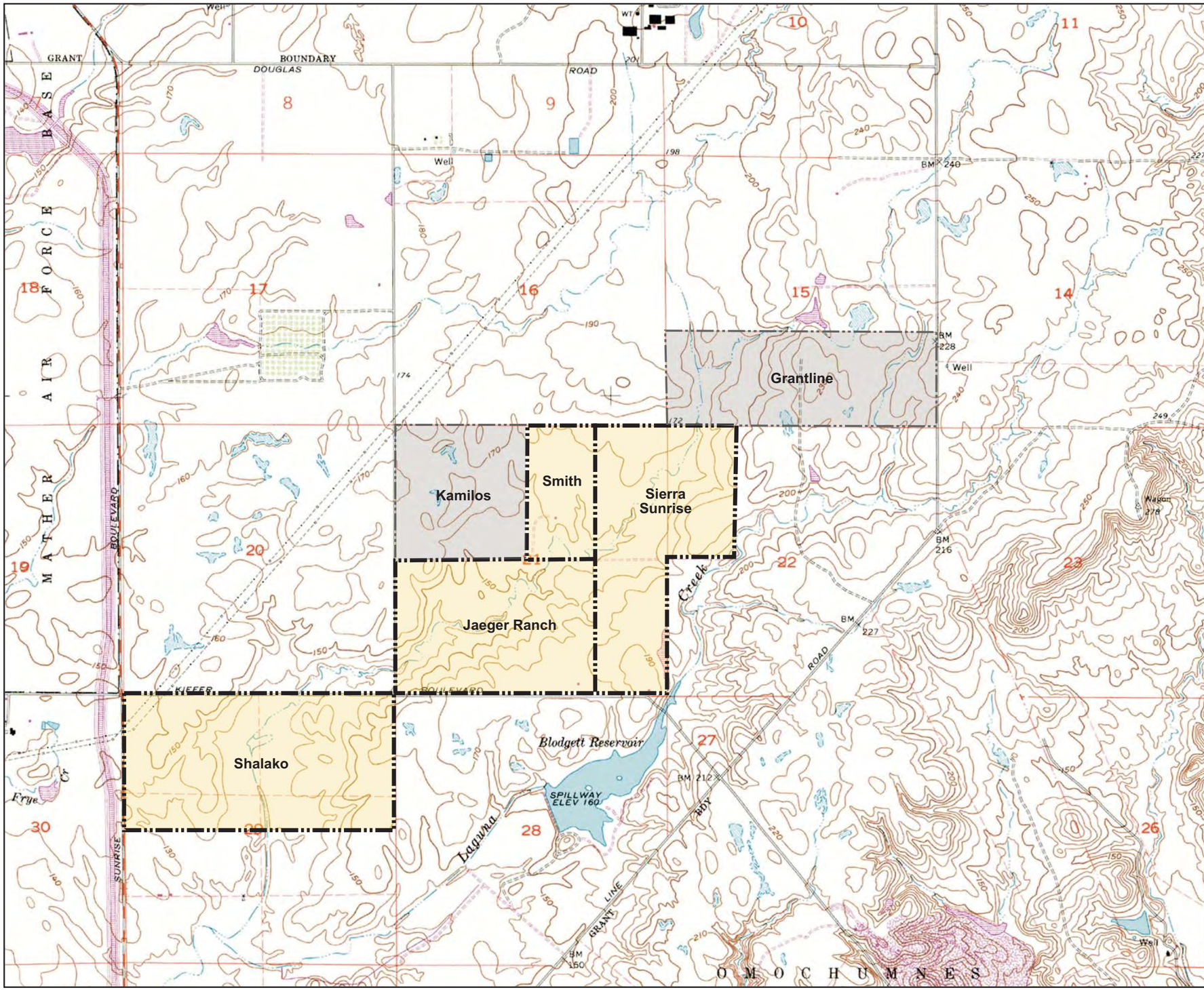


Figure 1.
Project Site and Vicinity

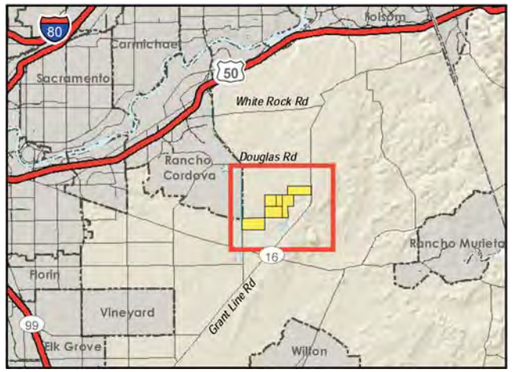
§15, 21, & 29, T.8N., R.7E., MDBM
Latitude 38° 32' 00" N
Longitude 121° 12' 45" W
Lower Sacramento Watershed (18020109)

Participating Properties

Non-participants

Scale in Feet
0 2000

Buffalo Creek, California, 7.5 minute topographic quadrangle, US Geological Survey, 1980.



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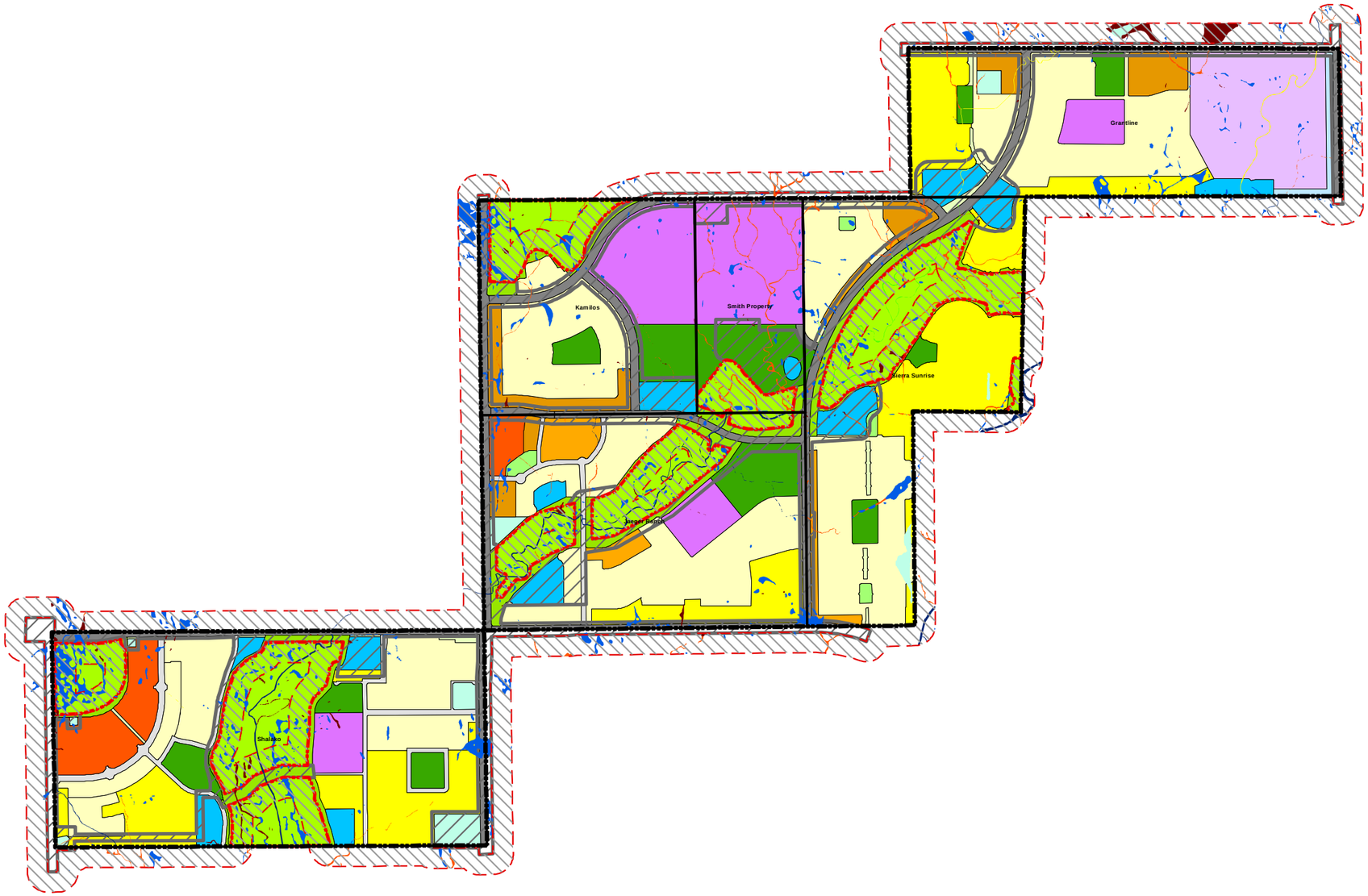
ENVIRONMENTAL CONSULTANTS

2009-142 Suncreek SP

Figure 2.
Proposed Impact Plan



Preserve Boundary

250' Indirect Impact Area

Land Use

- CMDR
- CMU
- Canal
- DB
- HDR
- LDR
- LTC
- MDR
- MinorRoad
- PC
- PP
- PQP
- Park
- Road
- School
- Wetland Buffer
- Proposed Backbone

Scale in Feet

0 1,500

1 " = 1,500 '

ECORP Consulting, Inc.
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Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\404\404_v4\COMPILATION\SCSP_ProposedImpact_v4_11x17.mxd (KOrtega 10/7/2011)

2009-142 SunCreek

Map Date: 10/7/2011

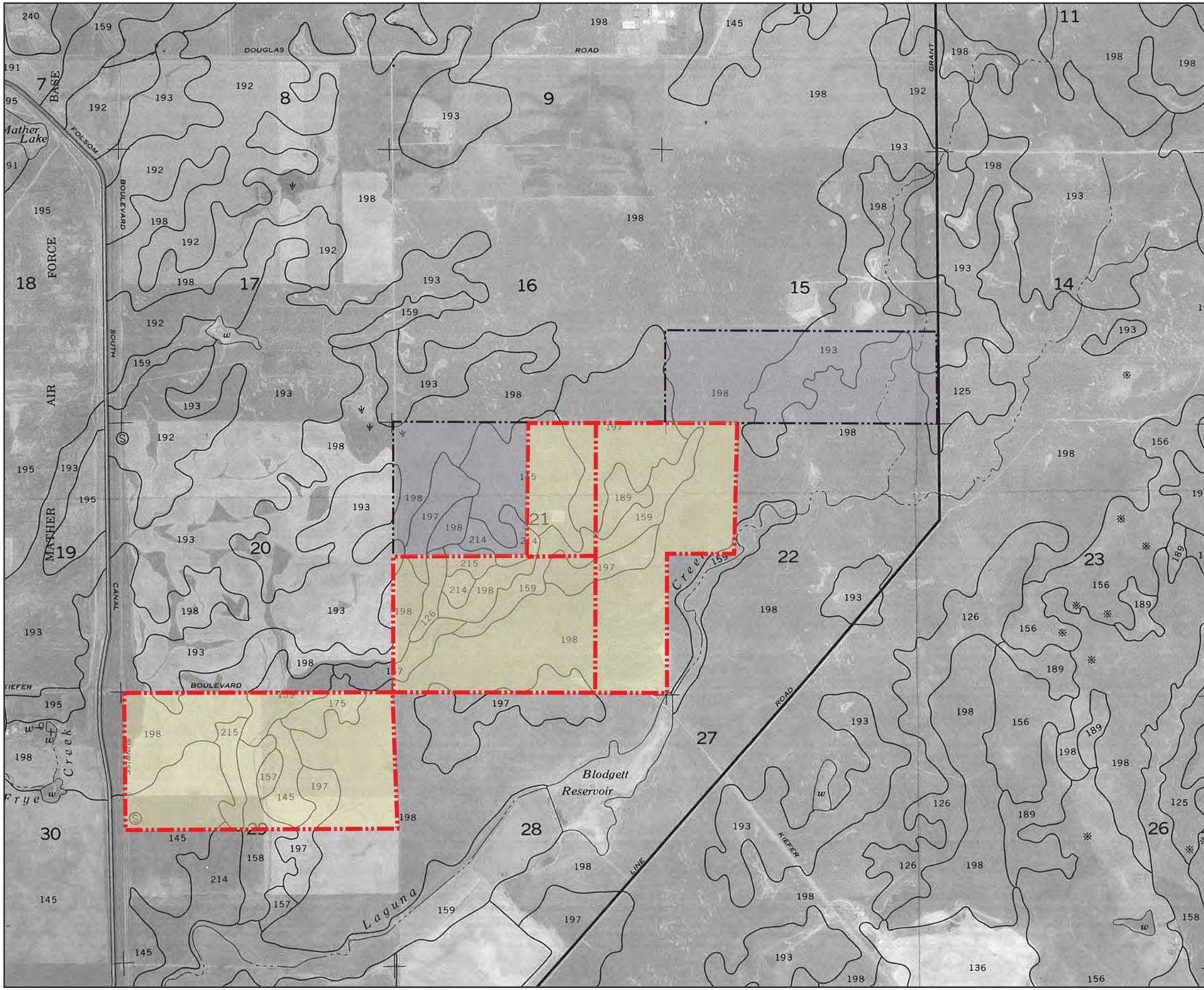

Figure 3.
Natural Resources Conservation Service Soil Types

Participating Properties

Non-participants

SOIL KEY

125*	Corning complex, 0-8% slopes
126	Corning-Redding complex, 8-30% slopes
145	Fiddyment fine sandy loam, 1-8% slopes
157**	Hedge loam, 0-2% slopes
158**	Hicksville loam, 0-2% slopes
159**	Hicksville gravelly loam, 0-2% slopes
175*	Madera loam, 2-8% slopes
189	Peters clay, 1-8% slopes
193**	Red Bluff-Redding complex, 0-5% slopes
197**	Redding loam, 2-8% slopes
198**	Redding gravelly loam, 0-8% slopes
214**	San Joaquin silt loam, 0-3% slopes
215**	San Joaquin silt loam, 3-8% slopes

** Soil unit consists of listed hydric components.*
*** Soil unit contains listed hydric inclusions.*

Scale in Feet
0 2000

Natural Resources Conservation Service Soil Survey of Sacramento County, California 1993.

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2009-142 Suncreek SP

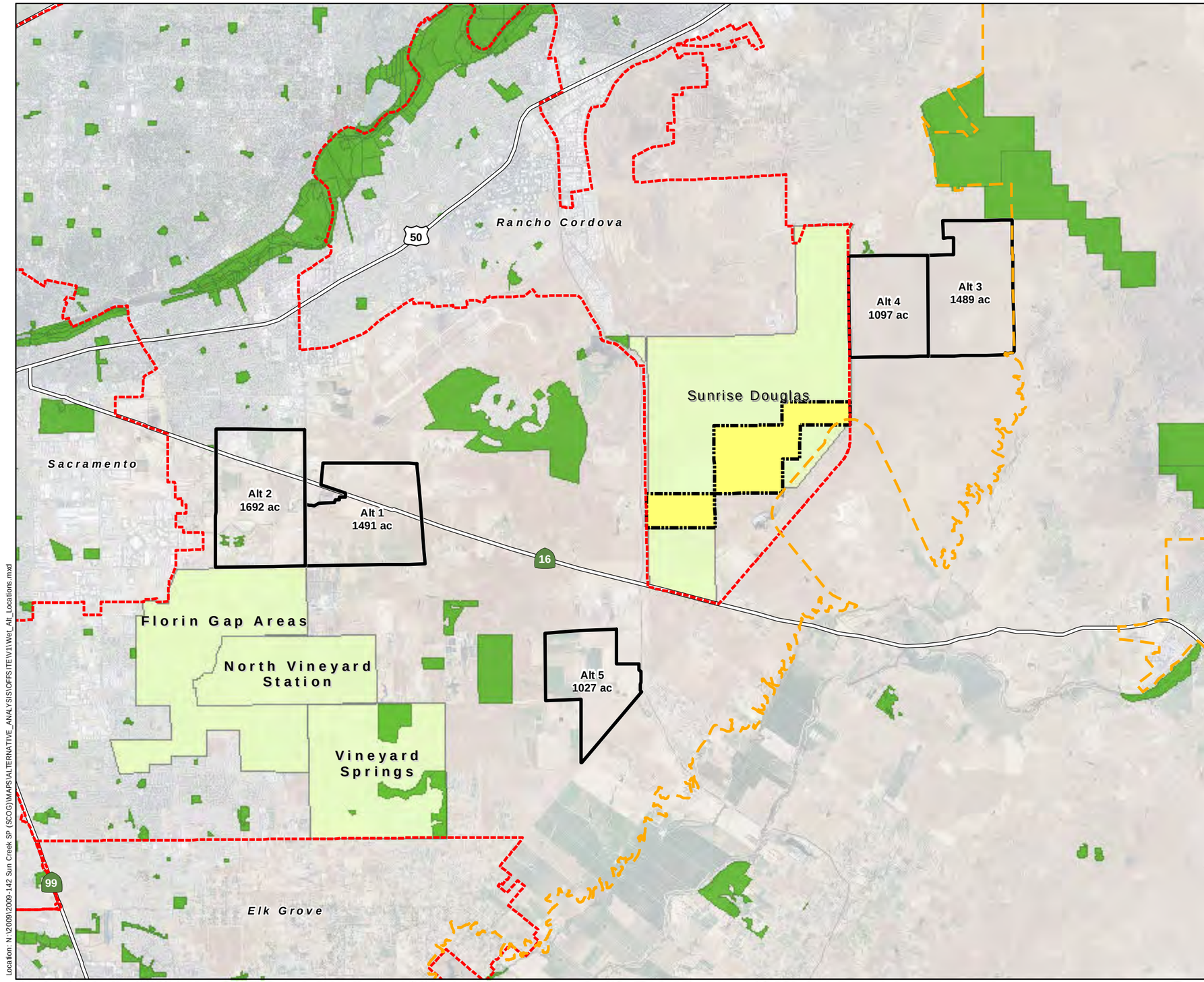

Figure 4.

Off-Site Alternative Locations

Map Features

- Proposed Sun Creek Specific Plan Boundary
- Alternative Boundaries
- Conservation Areas
- City Boundaries
- Sacramento Urban Services Boundary

Miles

0 1.5 3

1 "=1.5 miles

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ENVIRONMENTAL CONSULTANTS

Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\OFFSITE\V1\Wel_Alt_Locations.mxd

Map Date: 10/22/2010

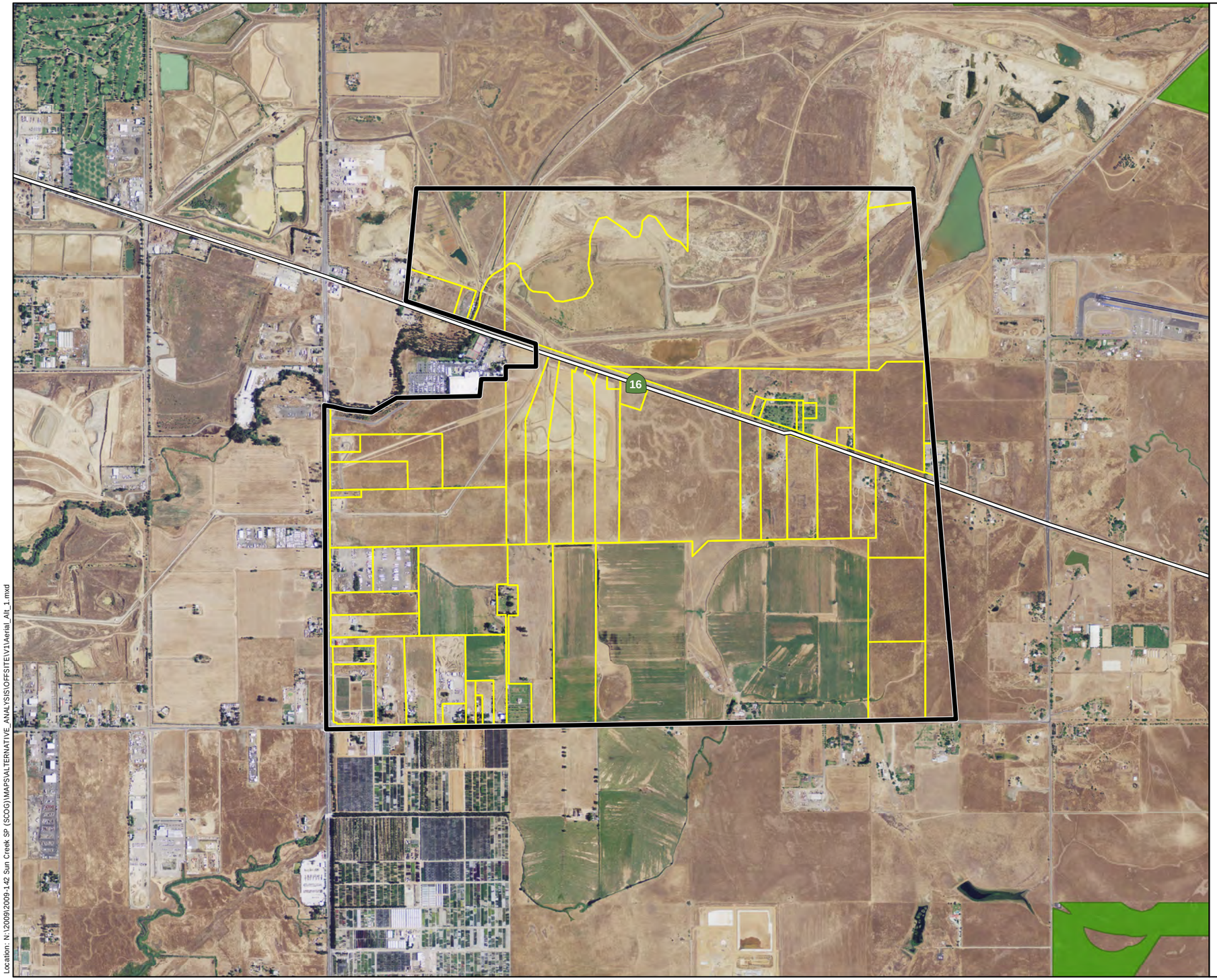

Figure 5.

Off-Site Alternative 1 - Aerial

Map Features

- Alternative Boundary
- Sacramento Urban Services Boundary
- Conservation Areas
- Parcel Boundary

SCALE IN FEET

0 1,500 3,000

1 "=1,500 '

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2009\2009-142 Sun Creek SP (SOOG)\MAPS\ALTERNATIVE_ANALYSIS\OFFSITE\V1\Aerial_Alt_1.mxd

Map Date: 11/2/2010

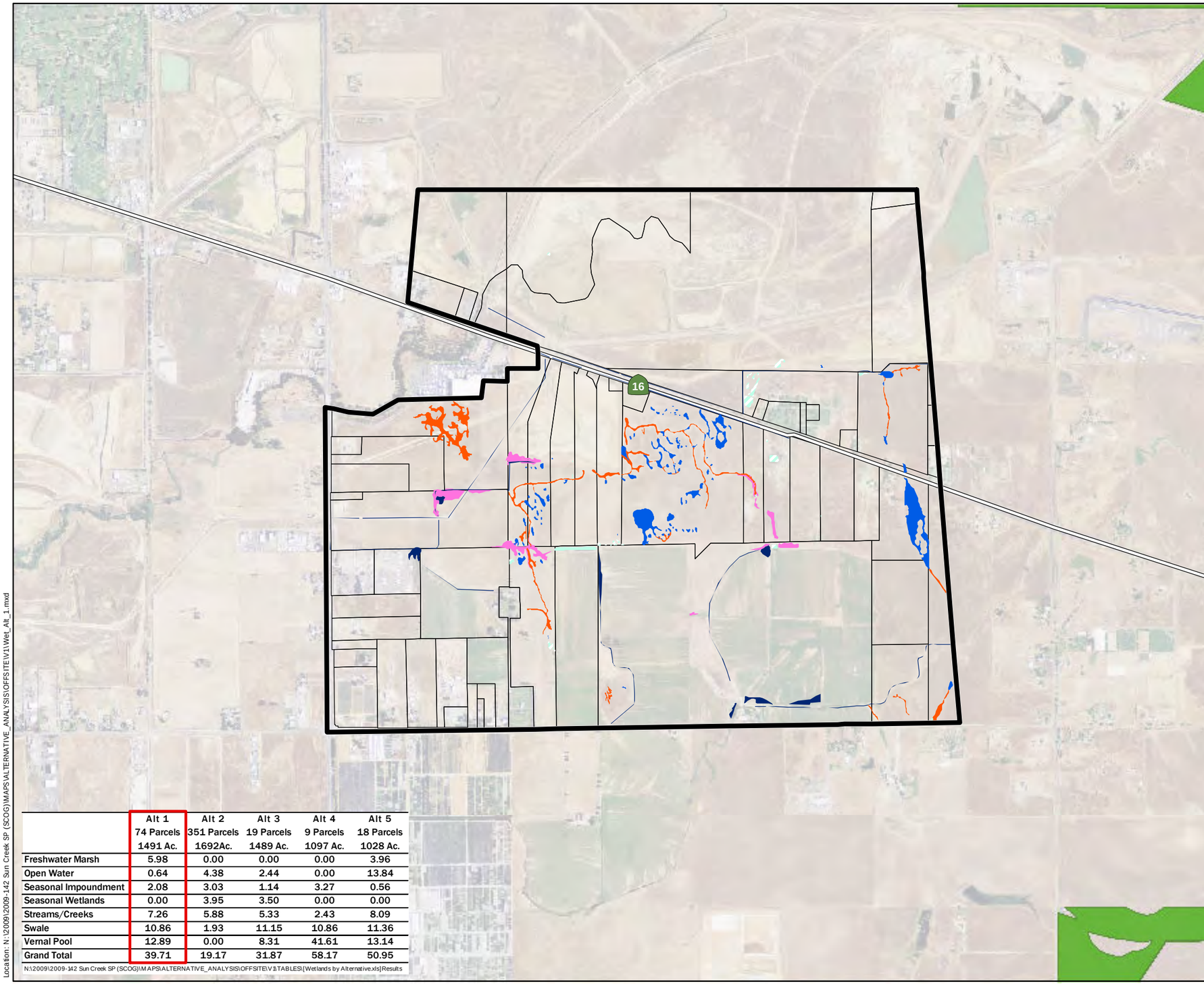

Figure 6.

Off-Site Alternative 1 - Aerial Assessment of Aquatic Resources

Map Features

- Alternative Boundary
- Conservation Areas
- Parcel Boundary

Waters/Wetlands

- Freshwater Marsh
- Open Water
- Seasonal Impoundment
- Seasonal Wetlands
- Streams/Creeks
- Swale
- Vernal Pool

Note: Wetland data/acreages are derived from the South Sacramento Habitat Conservation Plan (SSHCP) land cover GIS database. An Army Corps wetland delineation for this property may have been conducted.

SCALE IN FEET

0 1,500 3,000

1 "=1,500 '

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

	Alt 1 74 Parcels 1491 Ac.	Alt 2 351 Parcels 1692Ac.	Alt 3 19 Parcels 1489 Ac.	Alt 4 9 Parcels 1097 Ac.	Alt 5 18 Parcels 1028 Ac.
Freshwater Marsh	5.98	0.00	0.00	0.00	3.96
Open Water	0.64	4.38	2.44	0.00	13.84
Seasonal Impoundment	2.08	3.03	1.14	3.27	0.56
Seasonal Wetlands	0.00	3.95	3.50	0.00	0.00
Streams/Creeks	7.26	5.88	5.33	2.43	8.09
Swale	10.86	1.93	11.15	10.86	11.36
Vernal Pool	12.89	0.00	8.31	41.61	13.14
Grand Total	39.71	19.17	31.87	58.17	50.95

N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\OFFSITE\V1\TABLES\[Wetlands by Alternative.xls]Results

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Map Date: 11/2/2010

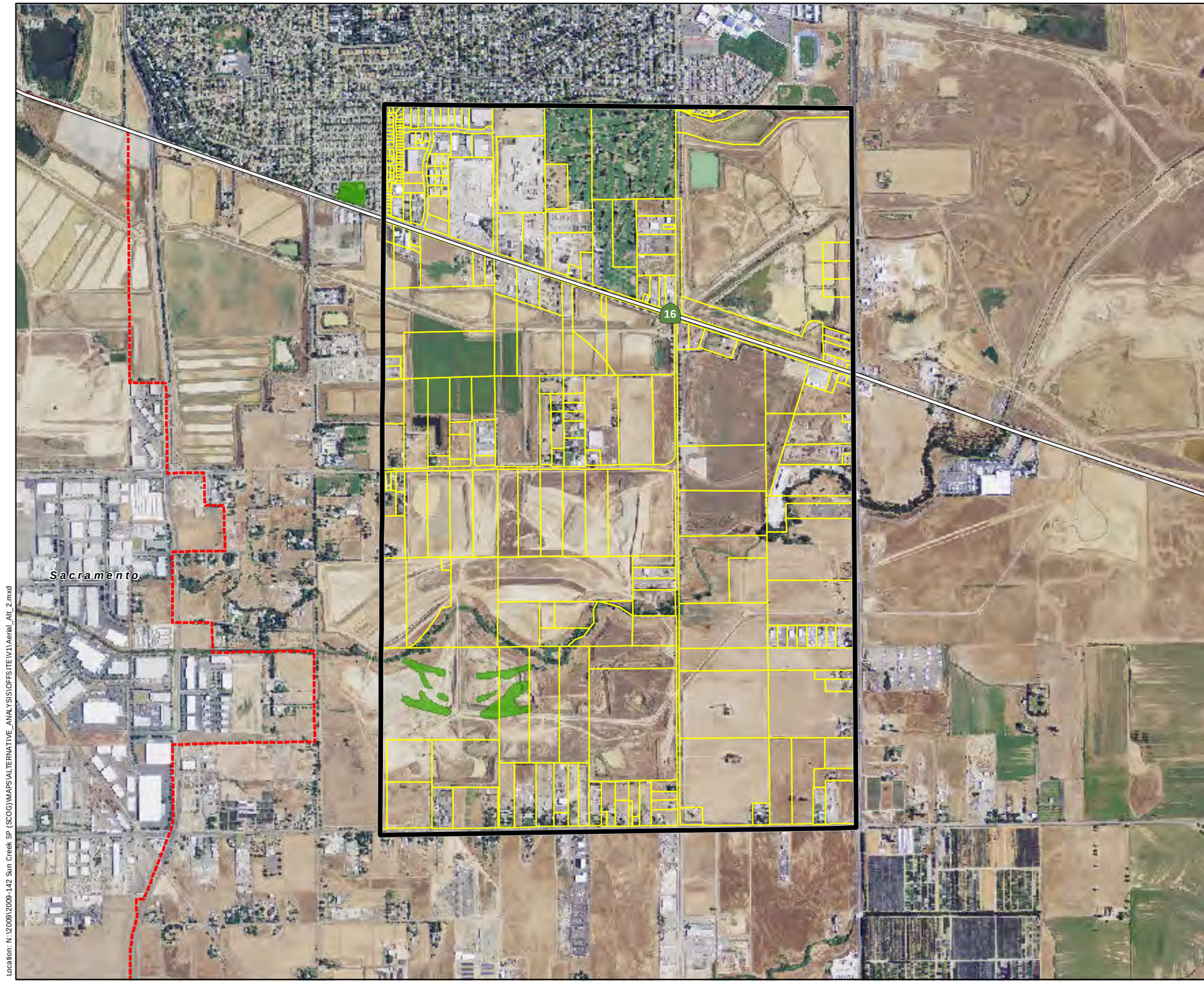

Figure 7.

Off-Site Alternative 2 - Aerial

Map Features

- Alternative Boundary
- Sacramento Urban Services Boundary
- City Boundaries
- Conservation Areas
- Parcel Boundary

SCALE IN FEET

0 1,500 3,000

1 "=1,500 '

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\OFFSITE\V1\Aerial_Alt_2.mxd

Map Date: 11/2/2010

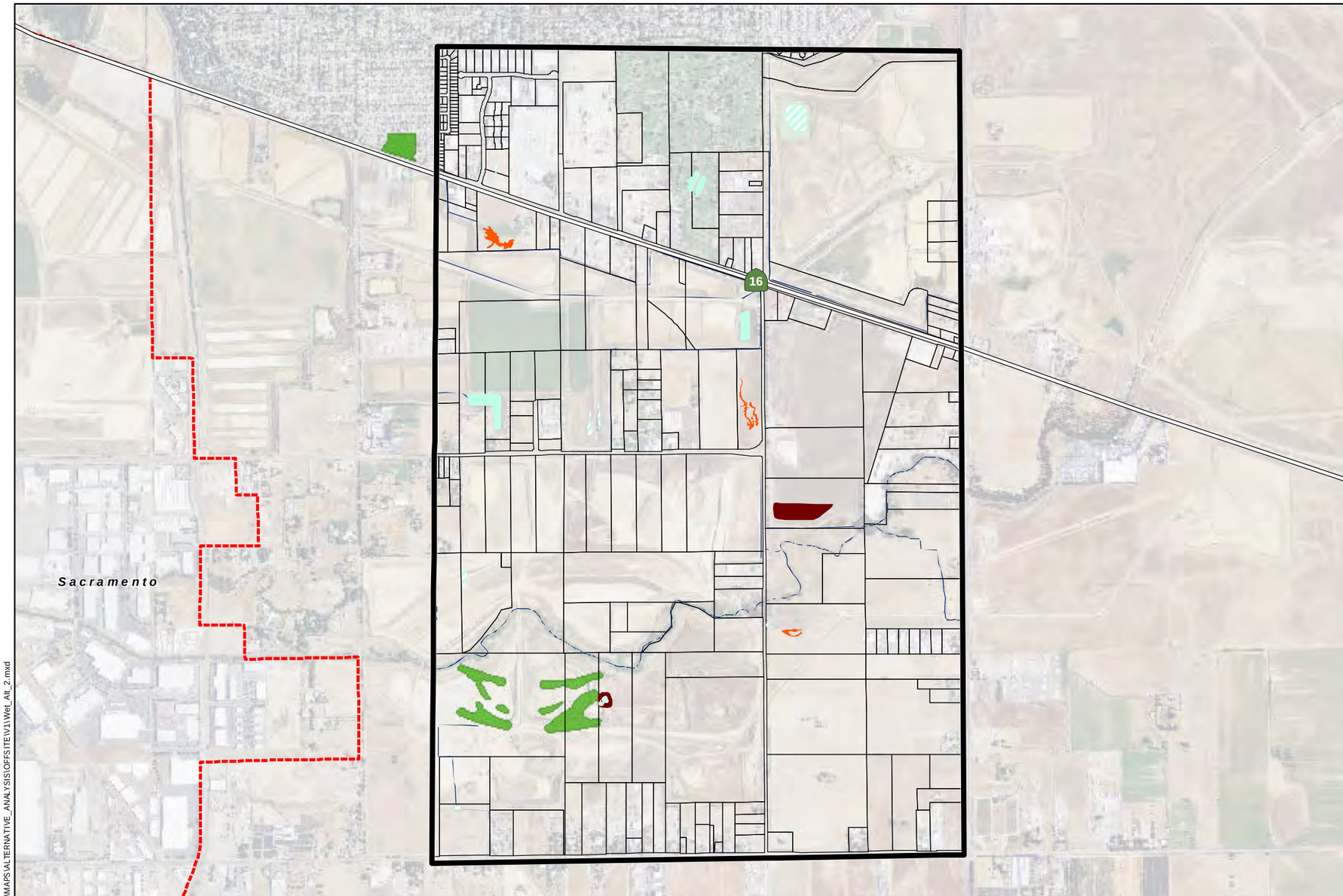

Figure 8.

Off-Site Alternative 2 - Aerial Assessment of Aquatic Resources

Map Features

- Alternative Boundary
- Conservation Areas
- Parcel Boundary
- City Boundaries

Waters/Wetlands

- Freshwater Marsh
- Open Water
- Seasonal Impoundment
- Seasonal Wetlands
- Streams/Creeks
- Swale
- Vernal Pool

Note: Wetland data/acreages are derived from the South Sacramento Habitat Conservation Plan (SSHCP) land cover GIS database. An Army Corps wetland delineation for this property may have been conducted.

SCALE IN FEET

0 1,500 3,000

1 "=1,500 '

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

	Alt 1 74 Parcels 1491 Ac.	Alt 2 351 Parcels 1692Ac.	Alt 3 19 Parcels 1489 Ac.	Alt 4 9 Parcels 1097 Ac.	Alt 5 18 Parcels 1028 Ac.
Freshwater Marsh	5.98	0.00	0.00	0.00	3.96
Open Water	0.64	4.38	2.44	0.00	13.84
Seasonal Impoundment	2.08	3.03	1.14	3.27	0.56
Seasonal Wetlands	0.00	3.95	3.50	0.00	0.00
Streams/Creeks	7.26	5.88	5.33	2.43	8.09
Swale	10.86	1.93	11.15	10.86	11.36
Vernal Pool	12.89	0.00	8.31	41.61	13.14
Grand Total	39.71	19.17	31.87	58.17	50.95

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Map Date: 11/2/2010

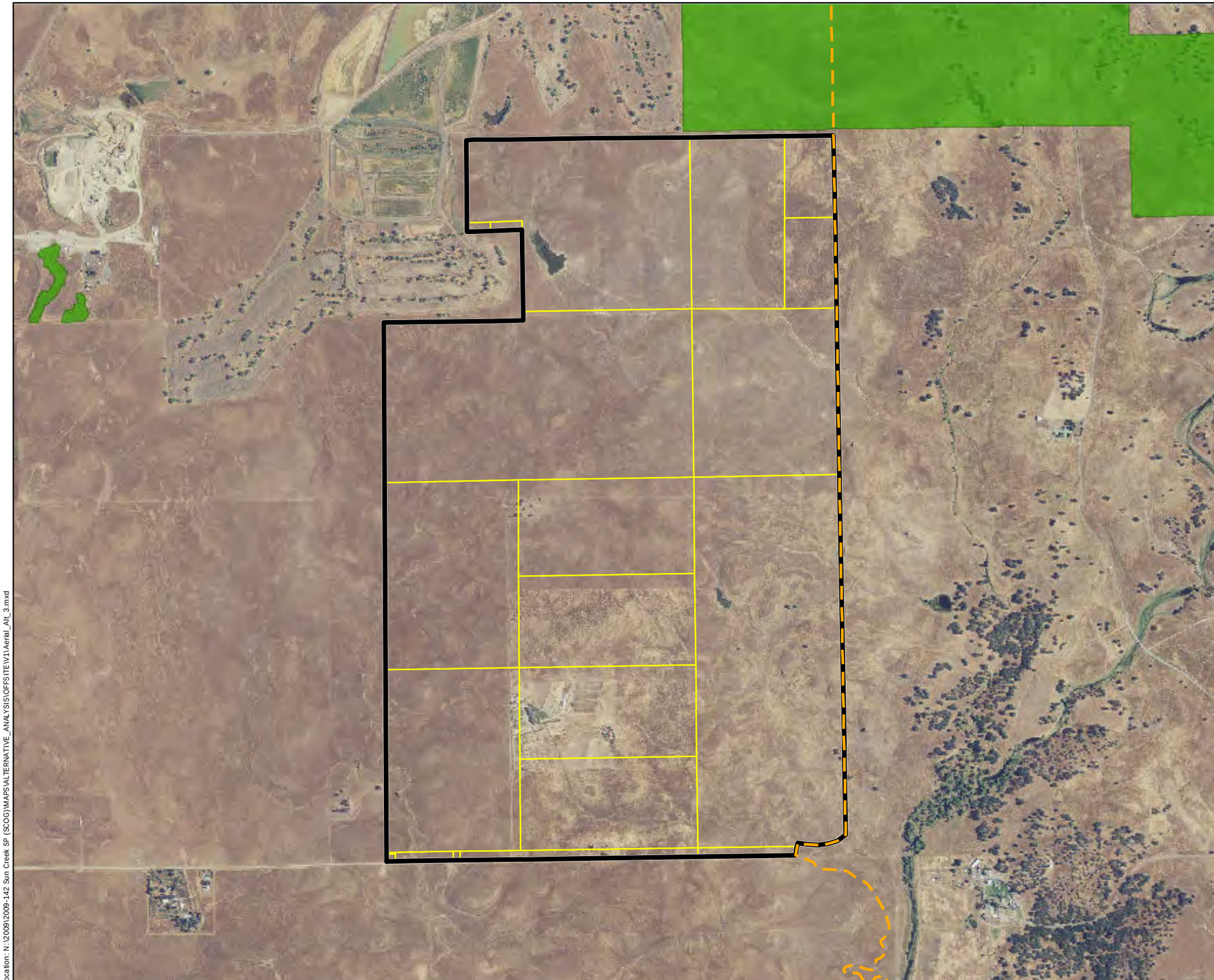


Figure 9.

Off-Site Alternative 3 - Aerial

Map Features

- Alternative Boundary
- Sacramento Urban Services Boundary
- Conservation Areas
- Parcel Boundary

SCALE IN FEET

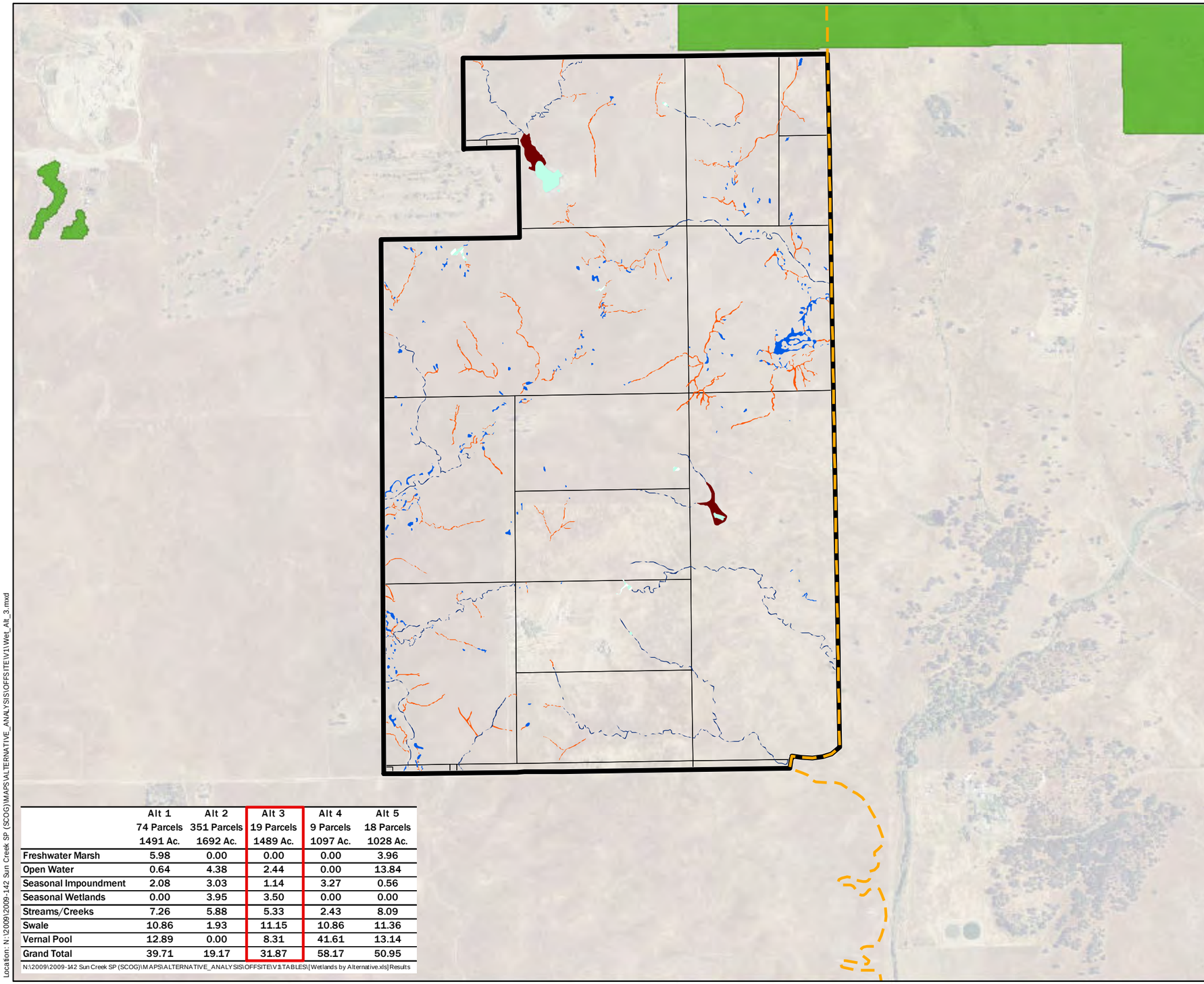
0 1,500 3,000

1 "=1,500 '

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\OFFSITE\V1\Aerial_Alt_3.mxd

Map Date: 11/2/2010



	Alt 1 74 Parcels 1491 Ac.	Alt 2 351 Parcels 1692 Ac.	Alt 3 19 Parcels 1489 Ac.	Alt 4 9 Parcels 1097 Ac.	Alt 5 18 Parcels 1028 Ac.
Freshwater Marsh	5.98	0.00	0.00	0.00	3.96
Open Water	0.64	4.38	2.44	0.00	13.84
Seasonal Impoundment	2.08	3.03	1.14	3.27	0.56
Seasonal Wetlands	0.00	3.95	3.50	0.00	0.00
Streams/Creeks	7.26	5.88	5.33	2.43	8.09
Swale	10.86	1.93	11.15	10.86	11.36
Vernal Pool	12.89	0.00	8.31	41.61	13.14
Grand Total	39.71	19.17	31.87	58.17	50.95

N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\OFFSITE\V1\TABLES\[Wetlands by Alternative.xls]Results

Figure 10.

Off-Site Alternative 3 - Aerial Assessment of Aquatic Resources

Map Features

- Alternative Boundary
- Conservation Areas
- Parcel Boundary
- Sacramento Urban Services Boundary

Waters/Wetlands

- Freshwater Marsh
- Open Water
- Seasonal Impoundment
- Seasonal Wetlands
- Streams/Creeks
- Swale
- Vernal Pool

Note: Wetland data/acreages are derived from the South Sacramento Habitat Conservation Plan (SSHCP) land cover GIS database. An Army Corps wetland delineation for this property may have been conducted.

SCALE IN FEET

0 1,500 3,000

1 "=1,500 '

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\OFFSITE\V1\Wet_Alt_3.mxd

Map Date: 11/2/2010

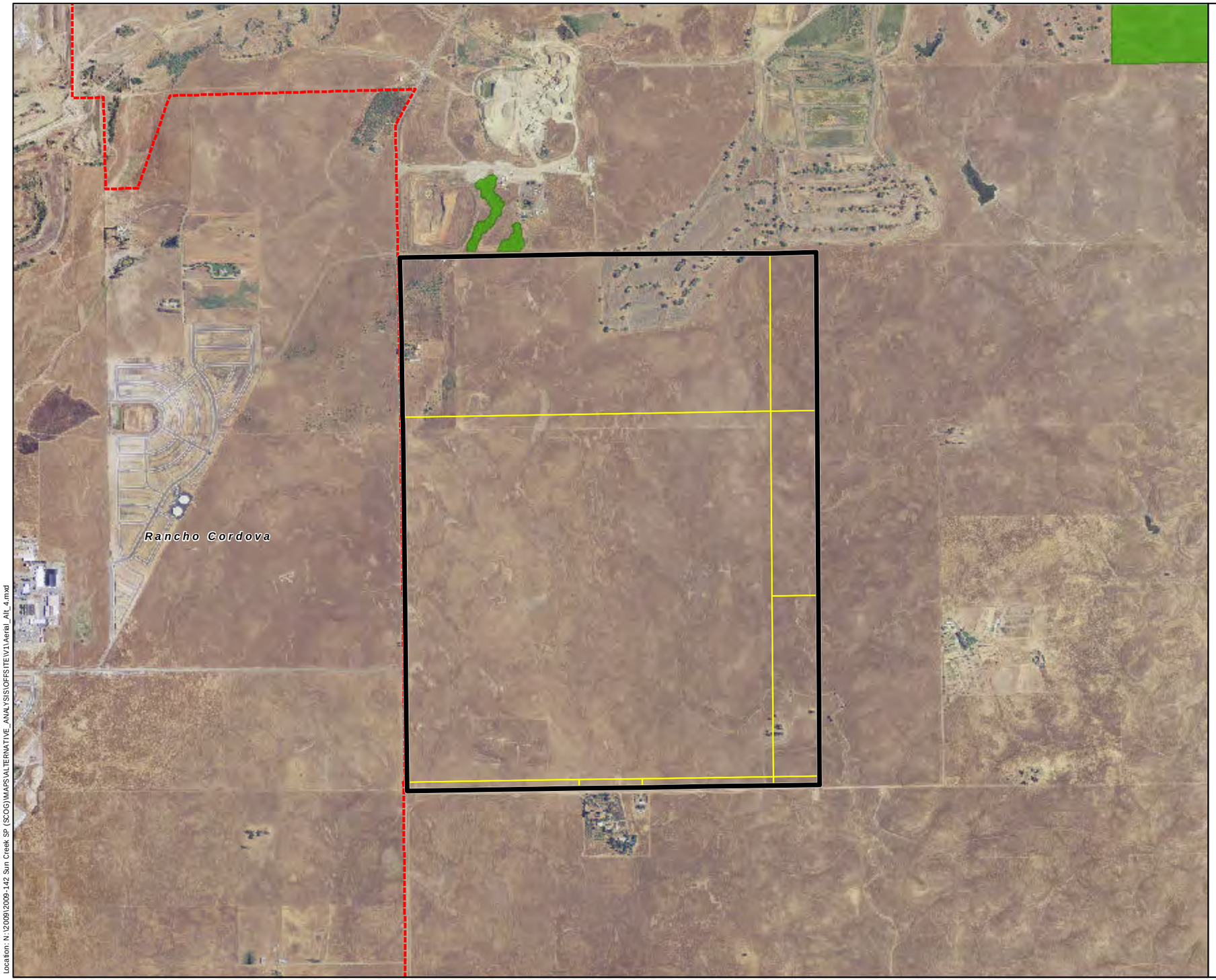


Figure 11.

Off-Site Alternative 4 - Aerial

Map Features

- Alternative Boundary
- Sacramento Urban Services Boundary
- City Boundaries
- Conservation Areas
- Parcel Boundary

SCALE IN FEET

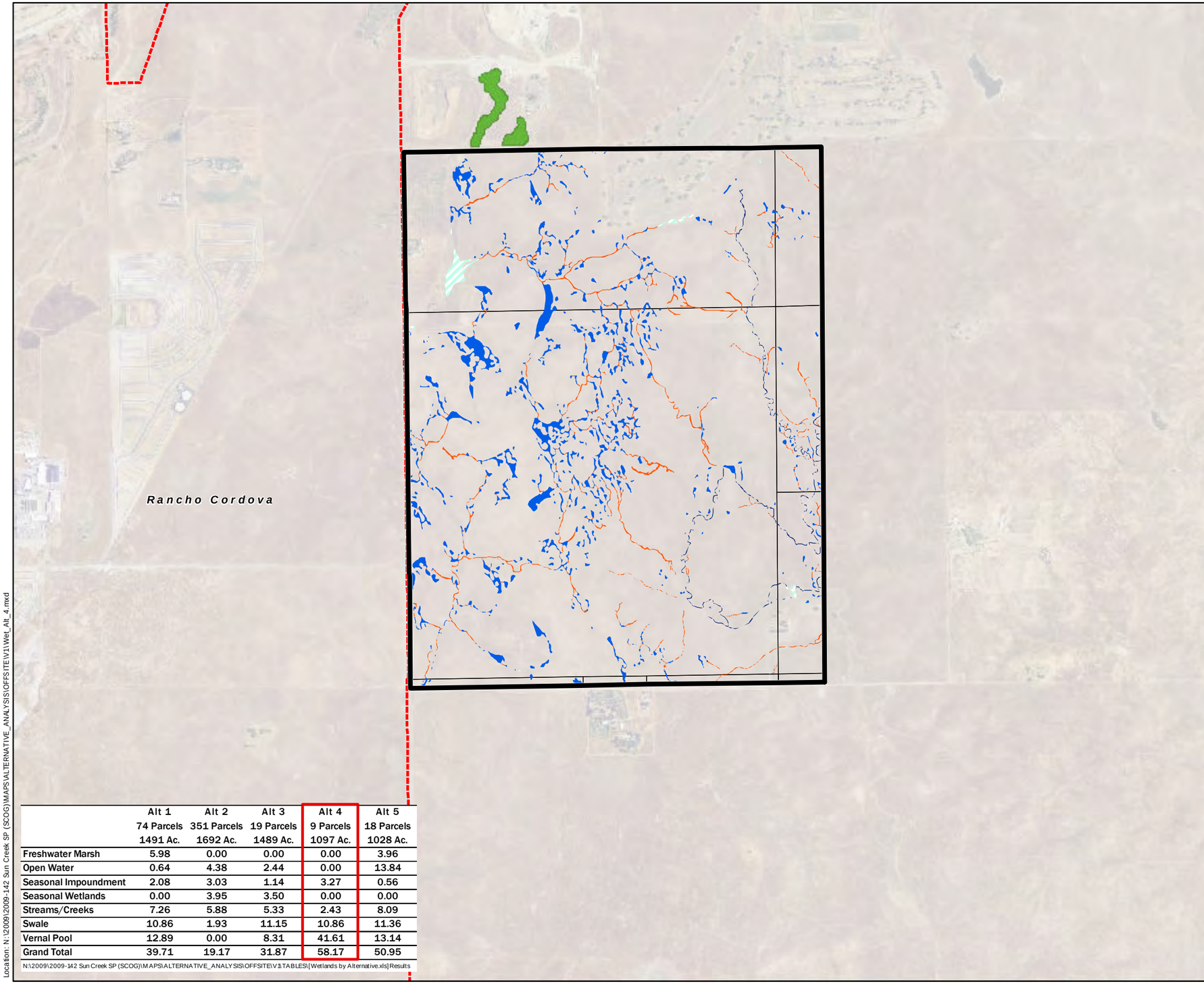
0 1,500 3,000

1 "=1,500 '

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\OFFSITE\V11\Aerial_Alt_4.mxd

Map Date: 11/2/2010



	Alt 1 74 Parcels 1491 Ac.	Alt 2 351 Parcels 1692 Ac.	Alt 3 19 Parcels 1489 Ac.	Alt 4 9 Parcels 1097 Ac.	Alt 5 18 Parcels 1028 Ac.
Freshwater Marsh	5.98	0.00	0.00	0.00	3.96
Open Water	0.64	4.38	2.44	0.00	13.84
Seasonal Impoundment	2.08	3.03	1.14	3.27	0.56
Seasonal Wetlands	0.00	3.95	3.50	0.00	0.00
Streams/Creeks	7.26	5.88	5.33	2.43	8.09
Swale	10.86	1.93	11.15	10.86	11.36
Vernal Pool	12.89	0.00	8.31	41.61	13.14
Grand Total	39.71	19.17	31.87	58.17	50.95

N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\OFFSITE\V1\TABLES\[Wetlands by Alternative.xls]Results

Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\OFFSITE\V1\Wet_Alt_4.mxd

Figure 12.

Off-Site Alternative 4 - Aerial Assessment of Aquatic Resources

Map Features

- Alternative Boundary
- Conservation Areas
- Parcel Boundary
- City Boundaries

Waters/Wetlands

- Freshwater Marsh
- Open Water
- Seasonal Impoundment
- Seasonal Wetlands
- Streams/Creeks
- Swale
- Vernal Pool

Note: Wetland data/acreages are derived from the South Sacramento Habitat Conservation Plan (SSHCP) land cover GIS database. An Army Corps wetland delineation for this property may have been conducted.

SCALE IN FEET

0 1,500 3,000

1 "=1,500 '

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Map Date: 11/2/2010

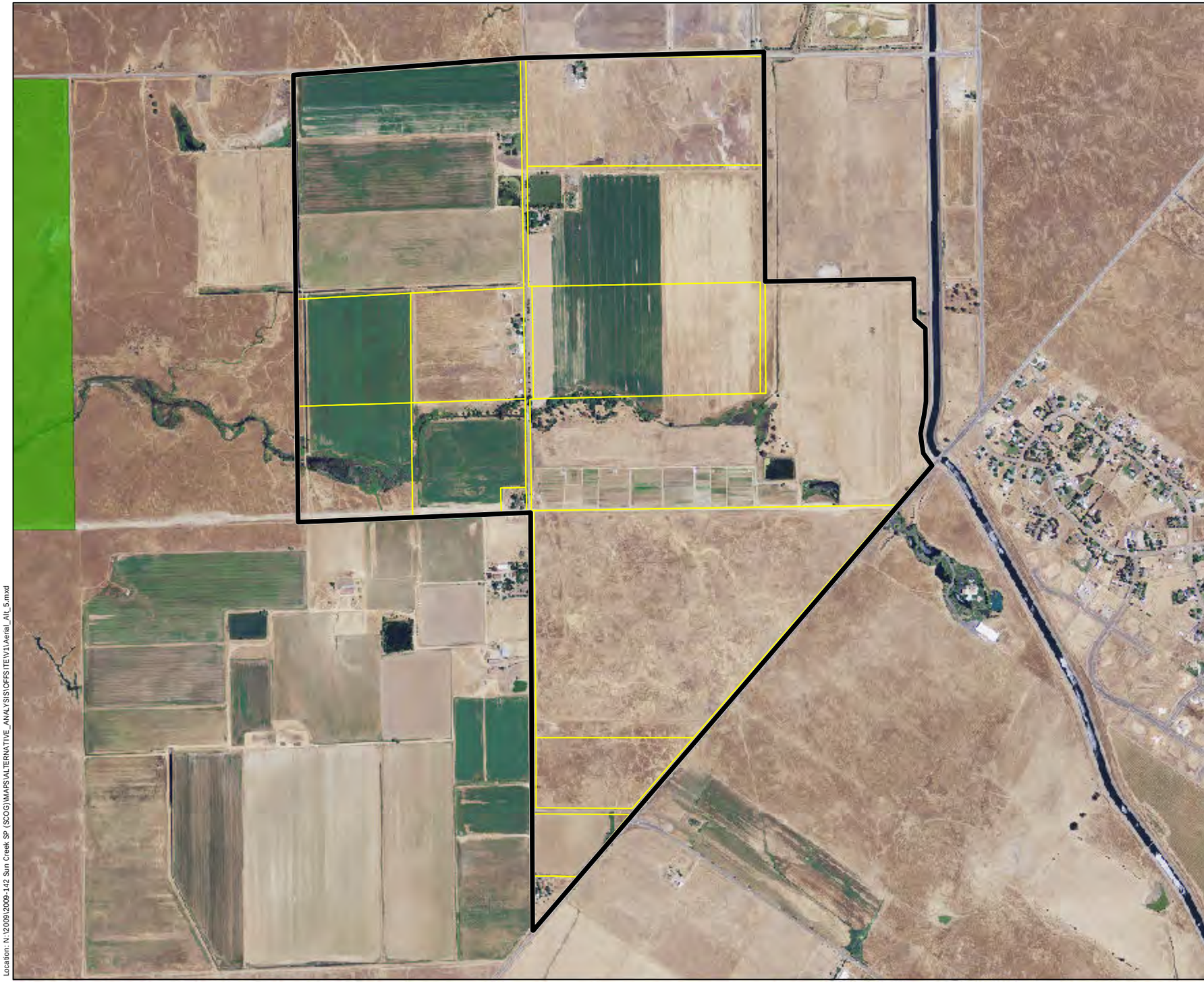


Figure 13.

Off-Site Alternative 5 - Aerial

Map Features

- Alternative Boundary
- Sacramento Urban Services Boundary
- City Boundaries
- Conservation Areas
- Parcel Boundary

SCALE IN FEET

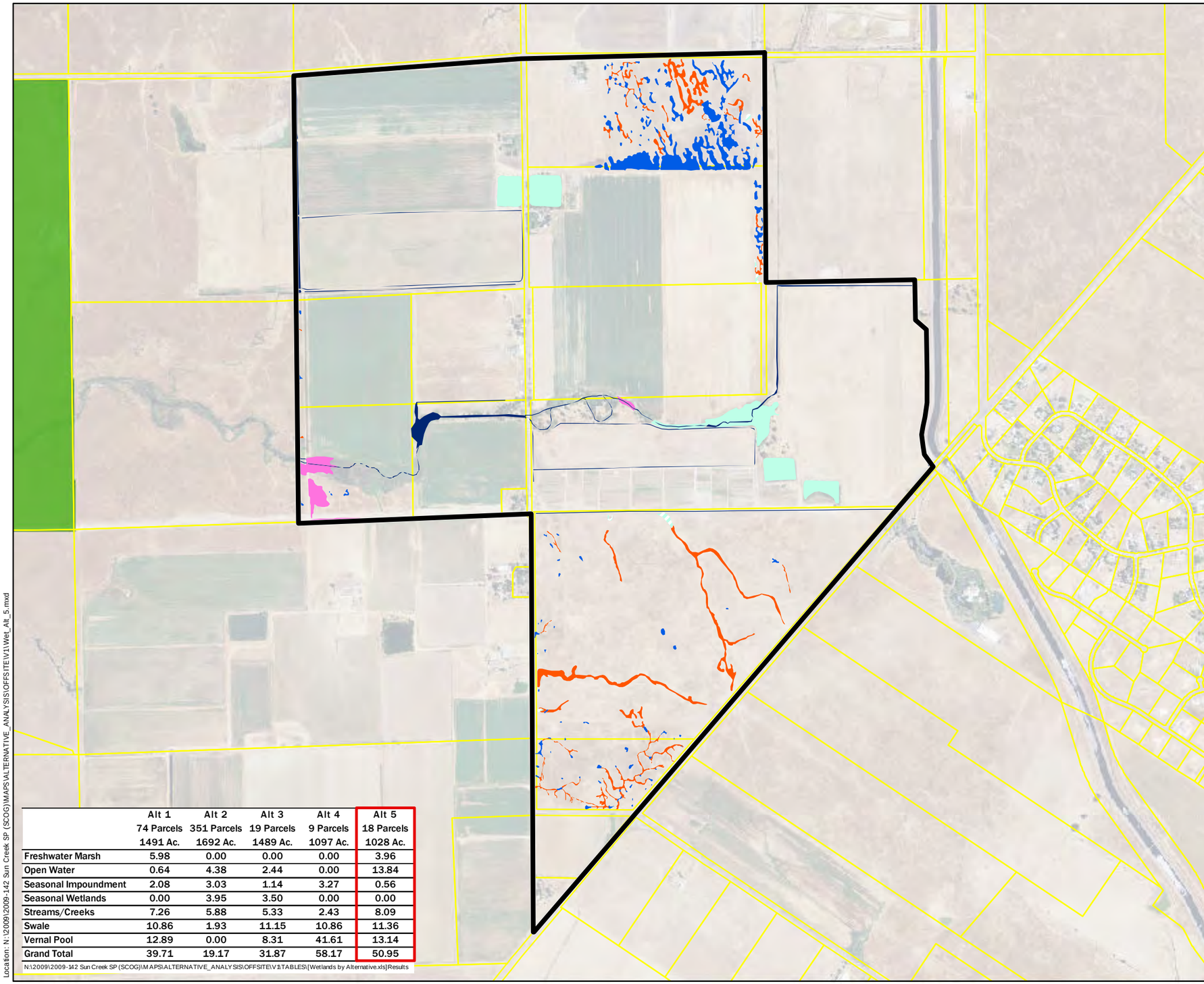
0 1,200 2,400

1 "=1,200 '

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\OFFSITE\V11\Aerial_Alt_5.mxd

Map Date: 11/2/2010



	Alt 1 74 Parcels 1491 Ac.	Alt 2 351 Parcels 1692 Ac.	Alt 3 19 Parcels 1489 Ac.	Alt 4 9 Parcels 1097 Ac.	Alt 5 18 Parcels 1028 Ac.
Freshwater Marsh	5.98	0.00	0.00	0.00	3.96
Open Water	0.64	4.38	2.44	0.00	13.84
Seasonal Impoundment	2.08	3.03	1.14	3.27	0.56
Seasonal Wetlands	0.00	3.95	3.50	0.00	0.00
Streams/Creeks	7.26	5.88	5.33	2.43	8.09
Swale	10.86	1.93	11.15	10.86	11.36
Vernal Pool	12.89	0.00	8.31	41.61	13.14
Grand Total	39.71	19.17	31.87	58.17	50.95

N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\OFFSITE\V3\TABLES\[Wetlands by Alternative.xls]Results

Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\OFFSITE\V1\Wet_Alt_5.mxd

Figure 14.

Off-Site Alternative 5 - Aerial Assessment of Aquatic Resources

Map Features

- Alternative Boundary
- Conservation Areas
- Parcel Boundary

Waters/Wetlands

- Freshwater Marsh
- Open Water
- Seasonal Impoundment
- Seasonal Wetlands
- Streams/Creeks
- Swale
- Vernal Pool

Note: Wetland data/acreages are derived from the South Sacramento Habitat Conservation Plan (SSHCP) land cover GIS database. An Army Corps wetland delineation for this property may have been conducted.

SCALE IN FEET

0 1,200 2,400

1 "=1,200 '

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Section 404(b)(1) On-Site Alternatives Analysis

For

Shalako Project

Sacramento County, California

3 May 2012

Prepared For:
Shalako Investors

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

CONTENTS

Section 404(b)(1) On-Site Alternative Analysis

Shalako Project

INTRODUCTION 1

PROJECT PROPONENT 1

PROJECT LOCATION 1

PROJECT DESCRIPTION 2

Existing Conditions 3

Wetlands/Waters of the U.S 4

REGULATORY BACKGROUND 5

Clean Water Act, Section 404 Application 5

Purpose of Alternatives Analysis 5

ALTERNATIVES 8

ALTERNATIVES ANALYSIS 8

Proposed Project 9

Analysis of Alternatives 10

Factors Affecting Practicability 10

Alternative 1 12

Overview 12

Project Purpose 12

Logistics 13

Cost Impacts Analysis 13

Environmental Impacts 13

Summary 14

Alternative 2 14

Overview 14

Project Purpose 15

Logistics 15

Cost Impacts Analysis 15

Environmental Impacts 15

Summary 16

SUMMARY/CONCLUSION 16

LIST OF TABLES

Table 1 – Jurisdictional and Non-Jurisdictional Wetlands and Waters 5
Table 2 – Proposed Project Impact/Preservation 9
Table 3 – Alternatives Land Use and Wetland Summary 10
Table 4 – Proposed Impact Acreages and Alternative 1 14
Table 5 – Proposed Impact Acreages and Alternative 2 16
Table 6 – Summary of Analysis of Alternative to Minimize Impacts to Wetlands and Waters of the U.S.....18

LIST OF FIGURES

Figure 1. Site and Vicinity
Figure 2. Natural Resources Conservation Service Soil Types
Figure 3. Wetland Delineation
Figure 4. Proposed Impact Plan
Figure 5. Alternatives – Overview

INTRODUCTION

The proposed ±321-acre project area subject property is located in the southern part of the City of Rancho Cordova, approximately five miles southeast of US Highway 50, bordered by Kiefer Boulevard to the north, Jaeger Road to the east and Sunrise Boulevard to the west within the SunCreek Specific Plan Area (SPA).

This analysis is being submitted concurrently with the application for a Department of the Army permit under the authority of Section 404 of the Clean Water Act for the discharge of dredged or fill material. The application is not inclusive of the SPA backbone infrastructure impacts on-site, which are being addressed in a separate application. The applicant is seeking authorization for the fill of 2.286 acres of jurisdictional waters of the U.S. at the proposed Shalako project site (not inclusive of the Backbone Infrastructure). The Proposed Project avoids approximately 10.014 acres of wetlands including vernal pools, seasonal wetland, seasonal wetland swales, and stream.

PROJECT PROPONENT

Project:

Shalako Project

Applicant:	**Agent:**
Shalako Investors, a California Limited Partnership	ECORP Consulting, Inc.
11290 Pyrites Way, Suite 100	Mr. Bjorn Gregersen
Gold River, CA 95670	2525 Warren Drive
Contact: Larry Gilzean	Rocklin, California 95677
Phone:	Phone: (916) 782-9100
Fax:	Fax: (916) 728-9134

PROJECT LOCATION

The proposed ±321-acre project area subject property is located at 38°31′20″ North and 121°14′00″ in the southern part of the City of Rancho Cordova, approximately five miles

southeast of U.S. Highway 50, bordered by Kiefer Boulevard to the north, Jaeger Road to the east and Sunrise Boulevard to the west (Figure 1. *Project Site and Vicinity*). Undeveloped pastureland, commercial and suburban residential development surround the project area. The site corresponds to a portion of Section 29, Township 8 North, Range 7 East (MDBM) of the "Buffalo Creek, California" 7.5-minute quadrangle (U.S. Department of the Interior, Geological Survey, 1980).

PROJECT DESCRIPTION

The project proposes to construct a new residential community. While still in its early planning stages, the current land use plan includes single-family homes, multi-family homes, parks, a school, a fire station, light commercial development, associated infrastructure, and two distinct wetland preserve areas totaling 75.5 acres that will permanently preserve and protect 10.014 acres of waters of the U.S.

It is projected that growth in Sacramento County will add more than 1.7 million people and 1 million new jobs in the next 45 years. In December of 2004 the Sacramento Area Council of Governments Board of Directors adopted a bold vision for growth that promotes compact, mixed-use development and more transit choices as an alternative to low-density development. Since 1980, the communities of Folsom and Rancho Cordova have experienced significant increases in housing demand due to rapid expansions of high technology, electronics and service industries in the area. The project objectives focus on minimizing overall vehicle miles traveled by city residents, encouraging a sense of place and social interaction, providing a pleasing urban landscape with aesthetic and visual quality, promoting development in an orderly and cohesive manner for the entire project site. The proposed project will support this vision and will provide an expanded economic base for the City of Rancho Cordova by generating substantial property and sales taxes, fee revenue, and employment opportunities for residents. The overall objective of this project is to address this growth and help maintain a long-term balance between jobs and housing and meeting anticipated needs for low-density and high-density housing in south Sacramento County along the Highway 50 corridor.

Existing Conditions

The project area is comprised of gently sloping to semi-flat terrain, and is situated at an elevation of approximately 120 to 150 feet above mean sea level. According to the *Soil Survey of Sacramento County, California* (U.S. Department of Agriculture, Soil Conservation Service 1993), nine soil units have been mapped within the site (Figure 2. *Natural Resources Conservation Service Soil Types*). These are: (145) Fiddyment fine sandy loam, 1-8% slopes, (157) Hedge loam, 0-2% slopes, (158) Hicksville loam, 0-2% slopes, (159) Hicksville gravelly loam, 0-2% slopes, occasionally flooded, (175) Madera loam, 2-8% slopes, (193) Red Bluff-Redding complex, 0-5% slopes, (197) Redding loam, 2-8% slopes, (198) Redding gravelly loam, 0-8% slopes, and (215) San Joaquin silt loam, leveled, 0-1% slopes. Annual grassland is the predominant vegetation community on-site. The property has historically been utilized for cattle grazing and it is currently used for this purpose. There is a seasonal stream that bisects the project area vertically into two relatively equal halves. Another ephemeral stream occurs in the southwestern corner of the site. The property supports several aggregations of vernal pools. Many of the vernal pools are associated with the seasonal stream in the center of the Project Area and others are scattered randomly throughout the site. In addition to vernal pools, the project area also supports several seasonal wetlands and small stretches of ephemeral stream within its boundaries.

The dominant plant species observed within the seasonal wetlands on-site included ryegrass (*Lolium multiflorum*), Mediterranean barley (*Hordeum marinum*), curly dock (*Rumex crispus*), annual rabbit-foot grass (*Polypogon monspeliensis*), hyssop loosestrife (*Lythrum hyssopifolium*), and creeping spikerush (*Eleocharis macrostachya*). Other non-native annual grasses that occurred in abundance in these features within the project area were Bermuda grass (*Cynodon dactylon*) and mannagrass (*Glyceria declinata*). Some of the plant species documented in the seasonal streams within the project area were water star-wort (*Callitriche marginata*), brass buttons (*Cotula coronopifolia*), water primrose (*Ludwigia peploides*), water plantain (*Alisma plantago-aquatica*) and white water buttercup (*Ranunculus aquatilis*).

The vernal pools within the project area hosted a variety of characteristic vegetation. Downingia (*Downingia bicornuta* and *D. ornatissima*), hedge hyssop (*Gratiola ebracteata*),

goldfields (*Lathenia fremontii* and *L. glaberrima*), tidy-tips (*Layia fremontii*), white meadowfoam (*Limnanthes alba*), vernal pool monkey flower (*Mimulus tricolor*), and white-headed navarretia (*Navarretia leucocephala*) were several of the plant species documented within the vernal pools on-site. Other plant species frequently observed throughout the vernal pools within the project area were coyote thistle (*Eryngium vaseyi*), Carter's buttercup (*Ranunculus bonariensis*), slender popcorn flower (*Plagiobothrys stipitatus*), and wooly marbles (*Psilocarphus brevissimus*).

Some of the dominant plant species comprising the annual grassland community on-site were soft brome (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), nit grass (*Gastridium ventricosum*), and wild oat (*Avena fatua*). Bindweed (*Convolvulus arvensis*), yellow star-thistle (*Centauria solstitialis*), sticky tarweed (*Holocarpha virgata*), and hairy hawkbit (*Leontodon taraxacoides*) were some of the other dominant plant species that occurred within the annual grassland community in the Project Area.

Wetlands/Waters of the U.S.

There are 12.300 acres of waters of the U.S. on the project site including vernal pools, seasonal wetlands, seasonal wetland swales, and seasonal drainage. The wetland delineation report for the site was submitted to the Corps for verification in 2001, with an update submitted in 2004, and a revision in August of 2007 (Figure 3. *Wetland Delineation)*. The wetland delineation verification letter was received from the Corps on 10 September 2007.

Approximately 12.300 acres of waters of the U.S. have been mapped on the project site (Table 1), inclusive of 9.575 acres of vernal pools, 1.303 acres of seasonal wetlands, 0.167 acre of seasonal wetland swale, 0.038 acre of ephemeral drainage, and 1.217 acres of stream.

Table 1 – Jurisdictional and Non-Jurisdictional Wetlands and Waters	
Type	**Acreage**
Wetlands:	
Vernal Pools	9.575
Seasonal Wetland	1.303
SW Swale	0.167
Other Waters:	
Ephemeral drainage	0.038
Stream	1.217
Total:	**12.300**

REGULATORY BACKGROUND

Clean Water Act, Section 404 Application

The Applicant is submitting a permit application to the U.S. Army Corps of Engineers (Corps) to obtain authorization to discharge dredged and/or fill materials into waters of the U.S. under the authority of the Corps pursuant to Section 404 of the Clean Water Act. Pursuant to these requirements, the Corps will conduct a two-part analysis: 1) the Corps will determine consistency with Section 404 (b)(1) Guidelines to consider practicable alternatives to the dredge or fill of waters of the U.S.; and 2) the Corps will conduct a public interest review. This document provides the analysis of practicable alternatives.

Purpose of Alternatives Analysis

The purpose of this analysis is to objectively evaluate the practicability of several alternatives to the proposed project and provide the Corps with documentation to be used in evaluating the proposed project permit application for compliance with Section 404(b)(1) (guidelines). The guidelines require that the alternatives analysis be adequate to establish that the project is the least environmentally damaging practicable alternative (LEDPA). This is accomplished by comparing the proposed project with other alternatives in terms of practicability, project purpose, and overall environmental effects. For this analysis, a reasonable statement of purpose has been developed and the alternatives have been evaluated in light of that purpose.

While it is understood that the information provided in this document must be verified by the Corps, the analysis is consistent with federal regulations and provides a fair and objective evaluation of alternatives.

This section presents an overview of the requirements of the 404(b)(1) guidelines and a discussion of the implementing guidance issued by the Corps. The 404(b)(1) guidelines are the substantive criteria used by the Corps in evaluating discharges of dredged or fill material into waters of the U.S. under Section 404 of the Clean Water Act. The guidelines require that four criteria be satisfied in order for the Corps to make a decision that a proposed discharge is in compliance. These criteria are:

1. *The discharge must be the least environmentally damaging practicable alternative*: This alternatives analysis evaluates a range of alternatives to the proposed project, in terms of environmental effects, practicability and consistency with the overall project purposes.
2. *The discharge must not violate any water quality standard, toxic effluent standard or jeopardize the continued existence of a threatened or endangered species*: Through the environmental review process, mitigation measures will be developed to insure that water quality and toxic effluent standards will not be violated. The U.S. Fish and Wildlife Service will be consulted regarding potential effects to federally listed species.
3. *The discharge must not result in a significant degradation of the waters of the United States*: Water quality impacts and potential impacts will be minimized through implementation of water quality management and erosion control plans as approved by the Regional Water Quality Control Board and the local planning jurisdiction.
4. *Unavoidable impacts to the aquatic ecosystem must be mitigated*: Based on an agreement between the Corps and EPA, efforts must first be directed at avoiding and reducing impacts to waters of the United States prior to the evaluation of potential compensatory mitigation measures. Mitigation may be applied only to unavoidable impacts. In keeping with this guidance, this alternatives analysis does not attempt to substitute mitigation for avoidance wherever the project goals may concurrently be met. Unavoidable impacts to biological resources associated with waters of the United States will be mitigated by either on-site construction of compensation wetlands, through the

purchase of appropriate mitigation credits from agency-approved sources, or by a combination of mitigation measures acceptable to the regulatory agencies.

Before the Corps can issue a permit, they must find that the requirements of the guidelines have been satisfied. The key criteria for most permit applicants, and the focus of this analysis, is the requirement that the discharge be the least environmentally damaging, practicable alternative. The pertinent section of the regulation states:

"Except as provided under Section 404(b)(2), no discharge of dredged of fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have a less adverse impact on the aquatic ecosystem so long as discharge does not have other significant adverse environmental consequences.

a. For the purposes of this requirement, practicable alternatives include, but are not limited to:

    1) On-site activities that do not include a discharge into waters of the United States or ocean waters,
    2) Discharges of dredged or fill material at other locations in waters of the United States or ocean waters,

b. An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology and logistics in light of overall project purposed. If it is otherwise a practicable alternative, an area not presently owned by the applicant which could reasonably be obtained, utilized, expanded, or managed in order to fulfill the basic purpose of the proposed activity may be considered;

c. Where the activity associated with a discharge which is proposed for a special aquatic site does not require access or proximity to or citing within the special aquatic site in question to fulfill its basic purpose (i.e., is not "water dependent"), practicable alternatives that do not involve special aquatic sites are presumed to be available unless clearly demonstrated otherwise. In addition, where a discharge is proposed for a special

aquatic site, all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise."

The key provisions in the language are practicability and overall project purposes. An alternative is practicable if it is available to the applicant and capable of being accomplished by the applicant after consideration of costs, existing technology and logistics, in light of overall purposes. If a practicable alternative would have less impact on the aquatic ecosystem, and does not include other significant adverse impact, then the proposed project is not the least damaging practicable alternative.

ALTERNATIVES

The proposed project (excluding backbone infrastructure) would directly impact 2.286 acres of wetlands and waters, which are special aquatic sites as described above (Figure 4. *Proposed Impact Plan)*. None of the proposed project components are considered to be water dependent. Therefore, according to the guidelines, less damaging alternatives are presumed to be available unless demonstrated otherwise. The following discussion presents the methodology of the analysis, followed by an evaluation of the alternatives for determination of the least damaging practicable alternative as compared to the proposed project. Alternatives have been developed and evaluated with the goals of practicability, consistency with the overall project purposes, and avoiding and minimizing impacts to waters of the U.S..

ALTERNATIVES ANALYSIS

The alternatives analyzed in this document were developed in consultation with the Corps. Overall land use configurations of the project were evaluated in an analysis of alternatives studied for the entire SunCreek Specific Plan Area (SPA), which was conducted to support the Environmental Impact Statement/Environmental Impact Report (EIS/EIR) being prepared for the SPA. Following review of that document, the Corps identified specific areas on the property for which it requested a project-specific analysis to determine if additional avoidance was

practicable. As such, the following alternatives were analyzed to determine if there were less environmentally damaging alternatives (Figure 5. *Alternatives Overview*):

- **Alternative 1**

  Alternative 1 evaluates the possibility of avoiding 0.066 acre of wetlands/waters within an additional 0.301 acre preserve area. Avoiding impacts to this area would result in the loss of 0.301 acre of planned development. This potential additional avoidance area would only be considered on the Shalako project if relocating a well and access road is determined to be practicable for the Backbone Infrastructure project.

- **Alternative 2**

  Alternative 2 evaluates the possibility of avoiding 0.207 acre of wetlands/waters within an additional 4.081-acre preserve area. Avoiding impacts to this area would result in the loss of 4.081 acres of planned development. This potential additional avoidance impacts a school site and a park site .

Proposed Project

The Proposed Project avoids approximately 10.014 acres of wetlands including vernal pools, seasonal wetland, seasonal wetland swales, and stream. Unavoidable impacts to wetlands and waters of the U.S. total 2.286 acres for the project (not inclusive of the Backbone Infrastructure) within the project area. The applicant is seeking authorization for the fill of 2.286 acres of jurisdictional waters of the U.S. at the proposed Shalako project site (Table 2).

Table 2 – Proposed Project Impact/Preservation

Type	Existing (Acres)	Preserve (Acres)	Impact (Acres)
Wetlands:			
Vernal Pools	9.575	7.897	1.678
Seasonal Wetland	1.303	1.038	0.265
SW Swale	0.167	0.021	0.146
Other Waters:			
Ephemeral drainage	0.038	0	0.038
Stream	1.217	1.058	0.159
Total:	**12.300**	**10.014**	**2.286**

A summary of land use and wetland impact acreages for the proposed project and each alternatives evaluated is presented below in Table 3.

Table 3 – Alternatives Land Use and Wetland Summary

	Open Space acreage (acre±)	Developable Net acreage (acre±)	Preserved Waters of U.S.	Impacts to Waters of the U.S. *	Additional Avoidance of Waters of the U.S.
Alternative 1	75.801	245.199	10.080	2.220	0.066
Alternative 2	79.581	241.419	10.221	2.079	0.207
Proposed Project	75.500	245.500	10.014	2.286	0

* Not inclusive of Backbone Infrastructure Impacts on-site.

Analysis of Alternatives

The practicability of on-site alternatives is analyzed using three basic criteria. First, the analysis considers whether the alternative would meet the Project Purpose; secondly, if any logistical issues would render the alternative impracticable. This analysis primarily considers whether the infrastructure necessary to support the alternative could be feasibly installed. Next, the analysis considers basic cost factors, including an estimation of the cost of infrastructure and other development costs per developable acre for the Proposed Project and the other project alternatives. The analysis addresses project level costs that would make an alternative impracticable or otherwise incapable of being done. Each alternative is also analyzed in regards to environmental factors (impacts to wetlands/waters and federally listed species); and finally other factors that should be considered in regards to regional needs. To summarize, in an effort to determine the least environmentally damaging practicable alternative for the project, the applicant analyzed the alternatives based on the following criteria:

Factors Affecting Practicability

1. **Project Purpose** – does the alternative contain sufficient acres of developable area in an appropriate configuration to support a large-scale master planned multi-use, density diverse community with regional commercial uses in a transit and pedestrian friendly environment in the SunCreek Specific Plan area.

The purpose of the SCSP is: (1) to construct a large-scale, mixed-use master-planned community consisting of mixed-density residential uses, a regional shopping center, and other employment-generating uses; (2) to provide associated supporting infrastructure including on-site backbone infrastructure, a water treatment plant, schools, parks, and open space.

2. **Logistics** – does the alternative conform to the land use plan circulation design and school and park, water treatment, and flood control standards? Are there any other logistical constraints that would preclude the alternative from being implemented?

3. **Costs Impact Analysis** – does the alternative result in additional costs? Are the additional costs reasonable in relation to the amount of additional wetland avoidance that could be achieved. Does the alternative have a development cost per net developable acre that is not substantially more than that of the proposed project alternative?

4. **Environmental Impacts** – does the alternative have significantly less impacts on waters of the U.S. than the proposed project alternative? Does the alternative have significantly less impacts on federally listed species than the proposed project alternative?

A wetland delineation has been conducted and submitted for the property. Based upon the best available information, approximately 12.300 acres of wetlands and waters of the U.S. (not inclusive of the Backbone Infrastructure areas) have been delineated within the site. Of the acreage mapped on-site, the proposed project would result in direct impacts to approximately 2.286 acres of wetlands and waters of the U.S. and avoidance/preservation of approximately 10.014 acres of waters of the U.S.

Special-status plant surveys were conducted in 2005 and 2008 on the Shalako property. The portions of the Infrastructure area that occurs within the property was also surveyed in 2005 and 2008. No federally listed or proposed plant species

were observed during these surveys. An additional survey of the property will be conducted in the spring of 2011. Surveys for federally listed vernal pool branchiopods have not been conducted within the property. The applicant is assuming presence for vernal pool tadpole shrimp and vernal pool fairy shrimp within vernal pools, seasonal wetland, and seasonal wetland swale features. Elderberry shrubs have not been observed on the property including the Infrastructure portion of the property. As a result, Valley elderberry longhorn beetle (VELB) surveys were not conducted. Please refer to overall SunCreek Biological Assessment for additional information

5. **Overall** – an alternative is considered not practicable if does not meet all of the above criteria.

Alternative 1

Overview

Alternative 1 is located in the northwestern corner of the site south of the existing preserve and would preserve an additional 0.066 acre of vernal pool. Avoiding impacts to the wetland would result in the loss of 0.301 acre of planned development. This potential additional avoidance area would only be considered on the Shalako project if relocating a well and access road is determined to be practicable for the Backbone Infrastructure project. Establishing a 1/3 acre preserve that is separated from other planned open space and is adjacent to Sunrise Blvd, does not provide any benefit that could justify the impact it would have on the Commercial Mixed Use development planned in this area.

Project Purpose

This alternative would not affect the overall project purpose.

Logistics

Alternative 1 is located just east of Sunrise Boulevard, located within a Commercial Mixed-Use (CMU) land use. Although logistically feasible, the location of the alternative would preclude construction of commercial buildings in a high-profile location adjacent to Sunrise Boulevard.

Costs Impacts Analysis

Avoidance of the 0.066 acre of wetlands would not result in additional cost, although this alternative is not practicable without relocating the adjacent well and access road which may result in increased costs. Although not quantified, additional costs may occur if the relocated well site requires additional access road construction and/or if other structure(s) would be required to make the well site compatible with the adjacent Commercial Mixed Use land plan into which the well site would be required to be relocated.

Environmental Impacts

Alternative 1 would result in an insignificant reduction of impacts (0.066 acre) to a single vernal pool feature, that will be partially impacted by adjacent infrastructure construction. As stated above, the infrastructure would create a barrier to the greater preserve area to the north if relocating the well is not determined to be practicable for the Backbone Infrastructure project.

The overall affect of this alternative would be the additional avoidance of only 0.066-acre of impact to jurisdictional waters of the U.S., and an increase in preserve acreage of only 0.301 acre (Table 4). The avoided vernal pool would most likely be considered indirectly impacted due to its proximity to Sunrise Blvd and the planned future commercial development. It the well access road is not relocated, the vernal pool would be considered directly impacted as portions of it would be filled to install the well's access road.

Table 4 – Proposed Impact Acreages and Alternative 1					
		Proposed Project		Alternative	
Type	Existing*	Avoidance	Project Impacts	Alternative Avoidance	Impacts
Wetlands:					
Vernal Pools	9.575	7.897	1.678	7.963	1.612
Seasonal Wetland	1.303	1.038	0.265	1.038	0.265
SW Swale	0.167	0.021	0.146	0.021	0.146
Other Waters:					
Ephemeral Drainage	0.038	0	0.038	0	0.038
Stream	1.217	1.058	0.159	1.058	0.159
Total:	**12.300**	**10.014**	**2.286**	**10.080**	**2.220**

*Not inclusive of delineated areas within the Backbone Infrastructure area

Summary

This alternative is not considered a practicable alternative as it preserves an insignificant amount of vernal pool (that may be partially impacted by infrastructure construction) in the CMU land use area. As proposed, this alternative would result in avoiding only 0.066 acre of additional vernal pool habitat (which would be considered indirectly, if not directly, impacted by adjacent improvements.

Alternative 2

Overview

Alternative 2 is located in the center of the site and evaluates the possibility of extending the proposed preserve to the east to preserve and protect 0.207 acre of vernal pools (0.077 ac.) and seasonal wetlands (0.130 ac.). Six vernal pools and four seasonal wetlands constitute the potential additional avoidance for this alternative. Avoiding impacts to the wetlands would result in the loss of 1.501 acres of park and 2.580 acres of a school site.

Project Purpose

Although this alternative would not preclude the overall project purpose, avoiding the wetlands in Alternative 2 would significantly impact a major component of the project purpose (school) and the adjacent park. It is estimated that approximately 2.580 acres of the proposed school site and 1.501 acre of the adjacent park would be lost as a result of this alternative. These project components would need to be relocated to other locations within the project site, affecting the planned design of commercial and/or residential development.

Logistics

The area of potential addition is logistically feasible, however relocating the school and park site may present issues with circulation and design of other land uses that are key elements of the project purpose.

Cost Impacts Analysis

Avoiding the 0.207 acre of wetlands in this alternative would not result in additional costs, other than the costs to redesign the land use plan to accommodate the open space. However, the additional cost to preserve these features should considered on a cumulative basis. The proposed project is preserving nearly 80% of the site's wetlands within over 75 acres of open space. The acreage of lost development, when considered with the significant amount of developable land the Shalako property has already lost to preserving wetlands and open space is not practicable. This is especially true given the fact that only 0.207 ac. of additional wetland avoidance would be realized.

Environmental Impacts

Alternative 2 would result in the additional avoidance of 0.207 acre of jurisdictional waters of the U.S. and special-status species habitat and an increase of designated wetland preserve and open space by an additional 4.081 acres (Table 5). The majority of the project's wetland impacts occur within a small complex of vernal pools on the eastern boundary of the project in

an area that would result in an isolated preserve area, if avoided. The proposed project wetland preserve was established using detail analysis of topography and watersheds, using LIADR and GIS technology. The wetlands and open space configuration considered in this alternative have not been analyzed to determine if the potential additional open space would provide sufficient watersheds and the appropriate hydrology to support the wetland features. The additional cost to achieve the additional avoidance of only 0.207 acre is not reasonable.

Table 5 – Proposed Impact Acreages and Alternative 2

		Proposed Project		Alternative	
Type	**Existing***	**Avoidance**	**Project Impacts**	**Alternative Avoidance**	**Impacts**
Wetlands:					
Vernal Pools	9.575	7.897	1.678	7.974	1.601
Seasonal Wetland	1.303	1.038	0.265	1.168	0.135
SW Swale	0.167	0.021	0.146	0.021	0.146
Other Waters:					
Ephemeral Drainage	0.038	0	0.038	0	0.038
Stream	1.217	1.058	0.159	1.058	0.159
Total:	**12.300**	**10.014**	**2.286**	**10.221**	**2.079**

*Not inclusive of delineated areas within the Backbone Infrastructure areas

Summary

This alternative is not practicable for a number of reasons. The insignificant amount of additional avoidance (0.207 ac.) is considered unreasonable in relation to the impacts it would have on a school and park site – key elements of the project purpose. These are required elements of the project and would need to be relocated, which in turn would displace and disrupt other components of the proposed project. In addition to the 75 acres of open space protecting approximately 80% of the site wetlands, the Shalako project is also accommodating four detention basins, a water treatment plant, wells, and other key elements of the Backbone Infrastructure required for the Specific Plan. Additional avoidance is not practicable.

SUMMARY/CONCLUSION

An evaluation of the possibility of revising the proposed project to further avoid wetlands/waters at two locations within the project area was conducted at the request and in

consultation with the Corps of Engineers. Neither of the two alternatives is considered practicable. Results of the analysis of each Alternative are summarized in Table 6 below.

Table 6 – Summary of Analysis of Alternatives to Minimize Impacts to Wetlands and Waters of the U.S.*

	Potential Wetland Avoidance	Development Land Lost	Additional Cost to Avoid Impact Reasonable?	Project Purpose	Logistics	Environmental/Waters	Practicable?
Alternative 1	0.066 ac.	0.301 ac.	NO	YES	YES	NO	NO
Alternative 2	0.207 ac.	4.081 ac.	NO	YES	YES	NO	NO

*See individual alternative analysis for Alternative-specific details

Project Purpose

– Can the alternative be implemented in a location or configuration that would support the project purpose?

Cost

– Can the alternative be implemented without costing substantially more than that of the proposed project alternative?

– Is the additional cost reasonable related to amount of additional wetland avoidance?

– Can the alternative be implemented without increasing the cost per developable acre to point where the project component is no longer economically feasible?

Logistics

– Does the alternative conform to the land use plan circulation design without presenting other logistical challenges?

Environmental/Waters

– Does the alternative have significantly less impacts on waters of the United States than the proposed project alternative?

Practicable?

– Does the Alternative represent the Least Environmentally Damaging Practicable Alternative?

LIST OF FIGURES

Figure 1. Site and Vicinity

Figure 2. Natural Resources Conservation Service (NRCS) Soil Types

Figure 3. Wetland Delineation

Figure 4. Proposed Impact Plan

Figure 5. Alternatives Overview

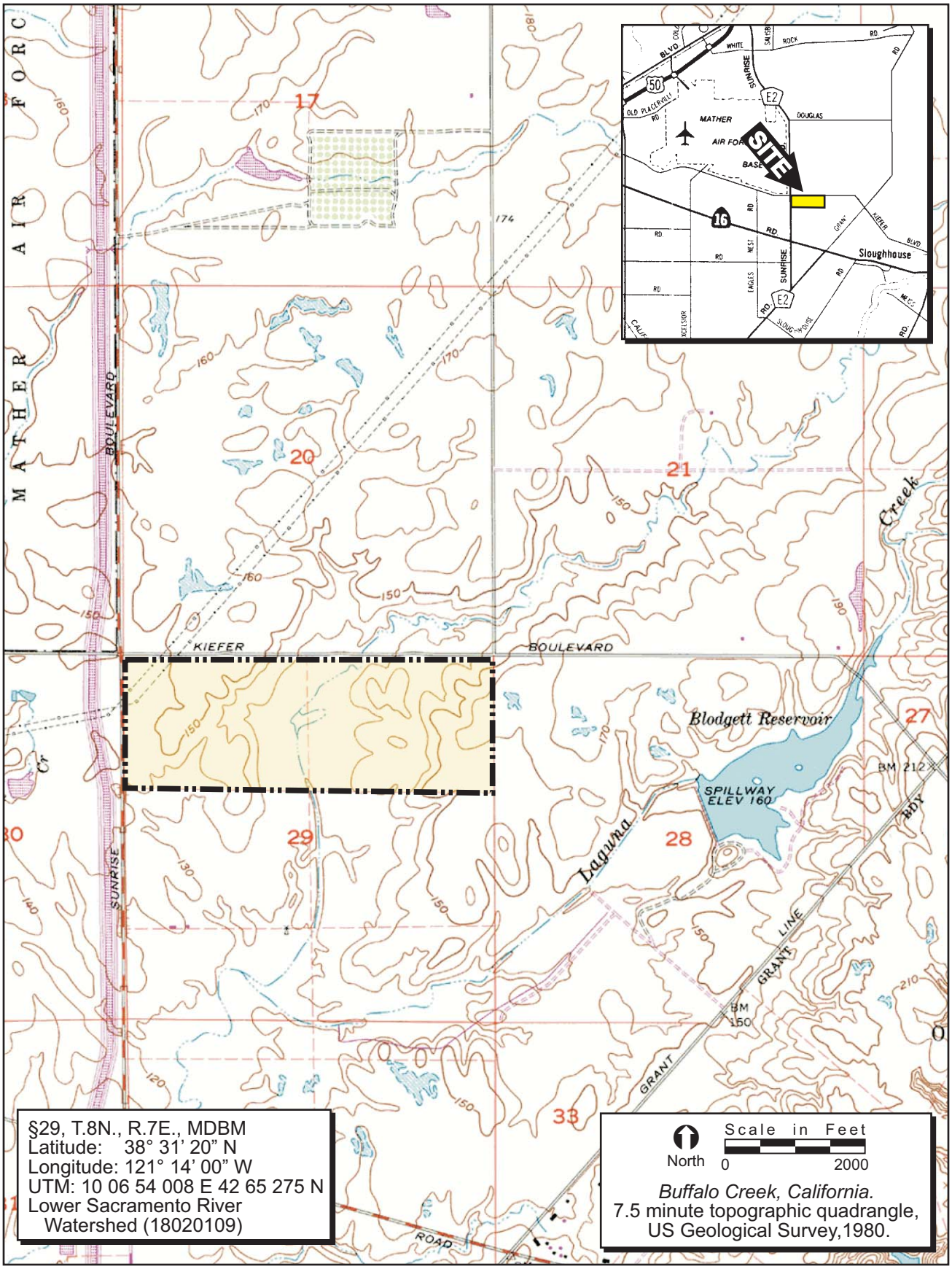


FIGURE 1. Project Site and Vicinity - Shalako

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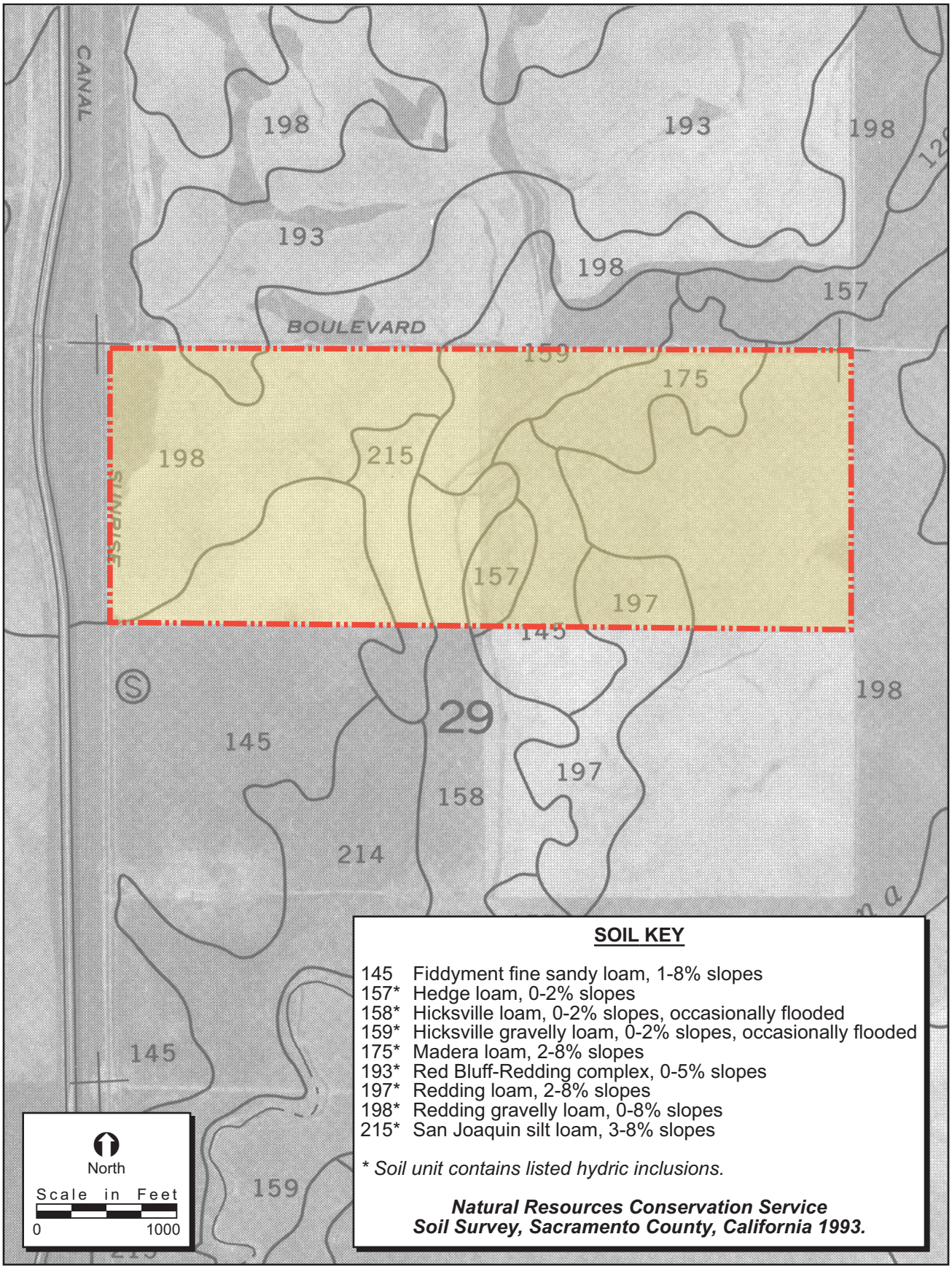


FIGURE 3. Natural Resources Conservation Service Soil Types - Shalako

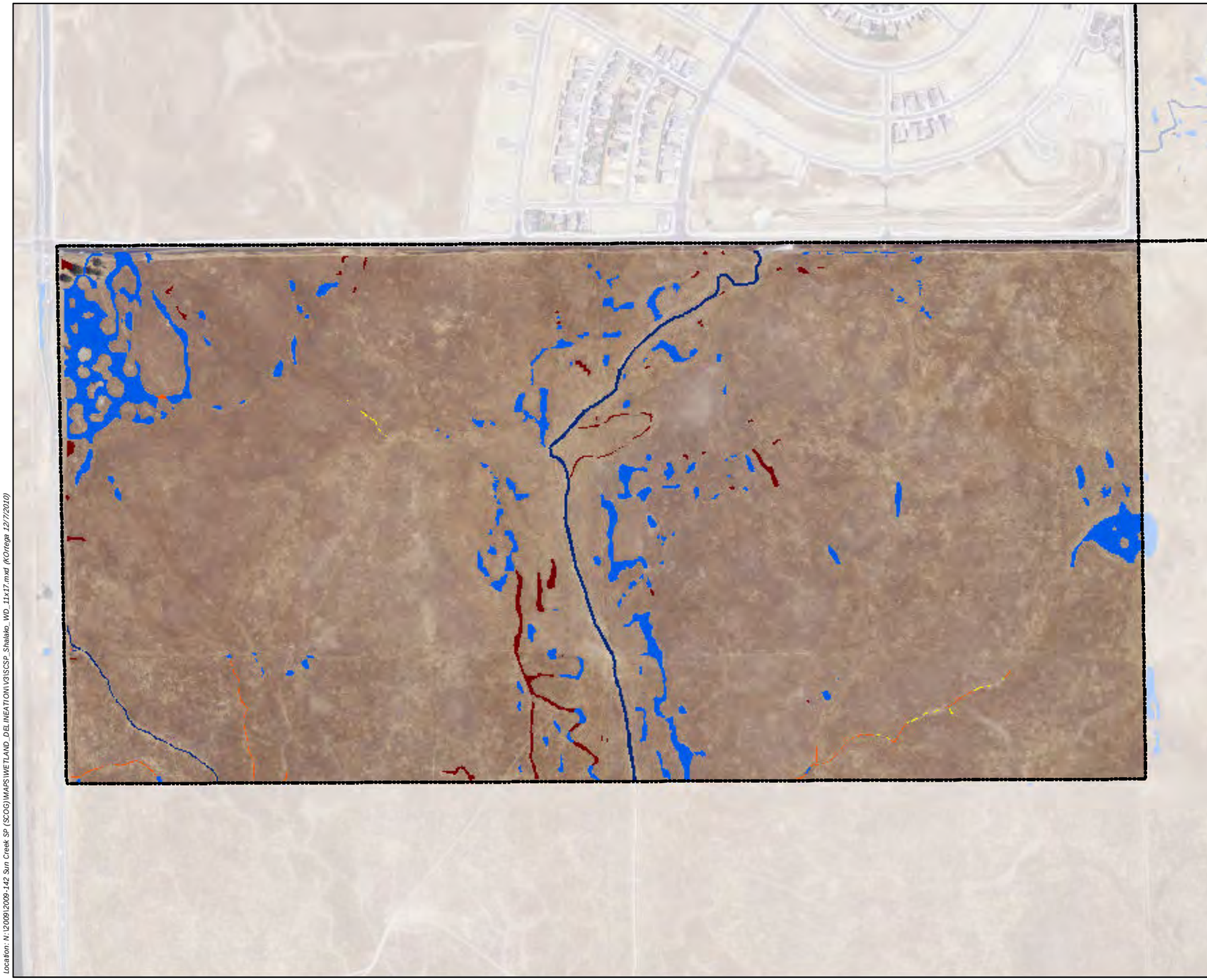


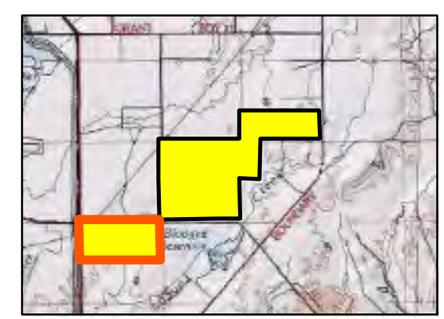
Figure 3. Wetland Delineation

Shalako Property

Project Boundary

Property Boundaries

	Existing Acreage
Vernal Pool	10.654
Seasonal Wetland	1.502
Swale	0.225
Ephemeral Drainage	0.038
Intermittent Drainage	0.000
Pond	0.000
Stream	1.338
Isolated Vernal Pool	0.000
Total	*13.757*



Scale in Feet

0 500

1 " = 500 '

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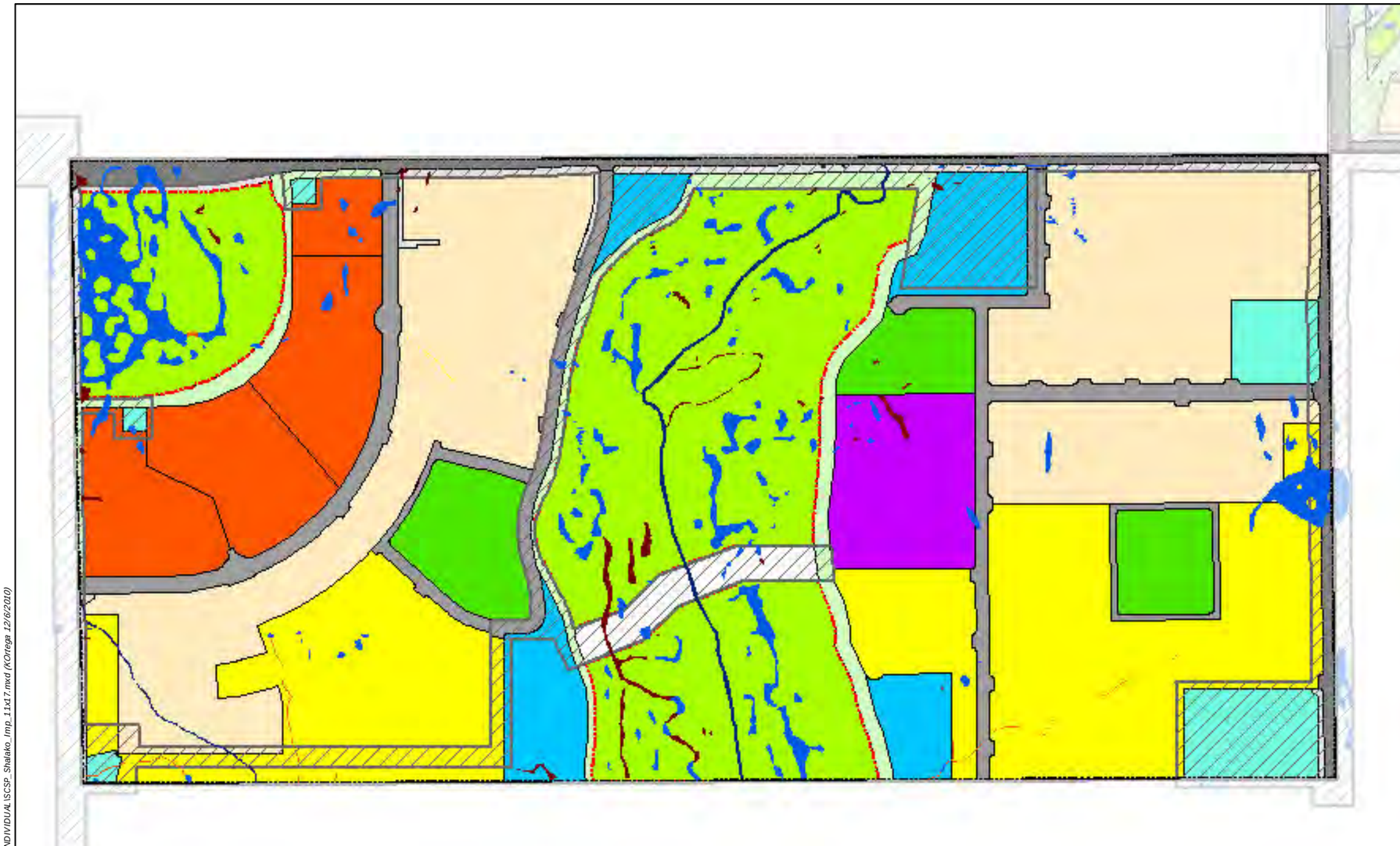
Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\WETLAND_DELINEATION\V3\SCSP_Shalako_WD_11x17.mxd (KOrtega 12/7/2010)

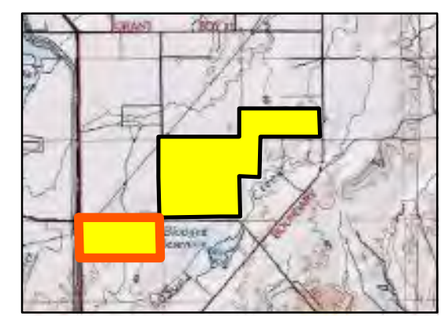
Map Date: 12/7/2010

Figure 4. Proposed impact Plan

Shalako Property



- Project Boundary
- Property Boundaries
- Preserve Boundary
- Proposed Backbone
- Boulevard
- Compact MDR
- CMU
- Canal
- Detention Basin
- HDR
- LDR
- LTC
- MDR
- MinorRoad
- Ped Corr
- Pkt Park
- PQP
- Park
- School
- Wetland Buffer



Scale in Feet

0 500

1 " = 500 '

	Shalako Property			
	Avoided	*Direct Impacts*	Existing Acreage	**Backbone Impacts**
Vernal Pool	7.897	1.678	9.575	1.883
Seasonal Wetland	1.038	0.265	1.303	0.200
Swale	0.021	0.146	0.167	0.057
Ephemeral Drainage	0.000	0.038	0.038	0.000
Intermittent Drainage	0.000	0.000	0.000	0.000
Pond	0.000	0.000	0.000	0.000
Stream	1.058	0.159	1.217	0.121
Isolated Vernal Pool	0.000	0.000	0.000	0.000
Total	*10.014*	*2.286*	12.300	2.261

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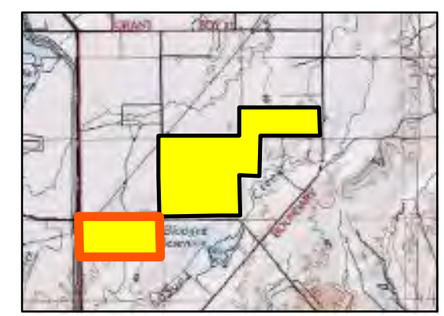
Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\404\404_v2\INDIVIDUAL\SCSP_Shalako_Imp_11x17.mxd (KOrtega 12/6/2010)

Figure 5. Sun Creek Specific Plan Preserve Alternative Overview

Shalako Property

- Project Boundary
- Property Boundaries
- Preserve Boundary
- ACoE Alternative Preserves
- Proposed Backbone
- Boulevard
- Compact MDR
- CMU
- Canal
- Detention Basin
- HDR
- LDR
- LTC
- MDR
- MinorRoad
- Ped Corr
- Pkt Park
- PQP
- Park
- School
- Wetland Buffer



Scale in Feet

0 500

1 " = 500 '

	Shalako Property				Additional Wetlands Within Preserve Alternatives		
	Avoided	*Direct Impacts*	Existing Acreage	**Backbone Impacts**	1	2	Total
Vernal Pool	7.897	1.678	9.575	1.883	0.066	0.077	0.143
Seasonal Wetland	1.038	0.265	1.303	0.200	0.000	0.130	0.130
Swale	0.021	0.146	0.167	0.057	0.000	0.000	0.000
Ephemeral Drainage	0.000	0.038	0.038	0.000	0.000	0.000	0.000
Intermittent Drainage	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pond	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Stream	1.058	0.159	1.217	0.121	0.000	0.000	0.000
Isolated Vernal Pool	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	*10.014*	*2.286*	12.300	2.261	0.066	0.207	0.273

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\ON-SITE\ACOE_V3\SCSP_ACOE_Shalako_11x17.mxd (KOrtega 12/7/2010)

DRAFT

Section 404(b)(1) On-Site Alternatives Analysis

For

Sierra Sunrise

Sacramento County, California

02 May 2012

Prepared For:

Lennar

DRAFT

CONTENTS

Section 404(b)(1) On-Site Alternative Analysis

Sierra Sunrise

INTRODUCTION 1

PROJECT PROPONENT 1

PROJECT LOCATION 1

PROJECT DESCRIPTION 2

Existing Conditions 2

Wetlands/Waters of the U.S 2

REGULATORY BACKGROUND 3

Clean Water Act, Section 404 Application 3

Purpose of Alternatives Analysis 3

ALTERNATIVES 6

ALTERNATIVES ANALYSIS 6

Proposed Project 7

Analysis of Alternatives 8

Factors Affecting Practicability 9

Alternative 1 10

Overview 10

Project Purpose 11

Logistics 11

Cost Impacts Analysis 11

Environmental Impacts 12

Summary 13

Alternative 2 13

Overview 13

Project Purpose 13

Logistics 14

Cost Impacts Analysis 14

Environmental Impacts 15

Summary 15

Alternative 3 .....

DRAFT

Overview .....

Summary .....

SUMMARY/CONCLUSION .....

LIST OF TABLES

Table 1 – Jurisdictional and Non-Jurisdictional Wetlands and Waters 3
Table 2 – Proposed Project Impact/Preservation 8
Table 3 – Alternatives Land Use and Wetland Summary 8
Table 4 – Proposed Impact Acreages and Alternative 1 12
Table 5 – Proposed Impact Acreages and Alternative 2 15
Table 6 – Summary of Analysis of Alternative to Minimize Impacts to Wetlands and Waters of the U.S.....17

LIST OF FIGURES

Figure 1. Site and Vicinity
Figure 2. Natural Resources Conservation Service Soil Types
Figure 3. Wetland Delineation
Figure 4. Proposed Impact Plan
Figure 5. Alternatives – Overview

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INTRODUCTION

The proposed ±242-acre Sierra Sunrise (project) site (formerly known as Sunridge) is located in southern Rancho Cordova. The subject property is situated east of Jaeger Boulevard, west of Grant Line Road, and north of Kiefer Boulevard within portions of Sections 21 and 22, Township 8 North, Range 7 East, of the "Buffalo Creek, California" 7.5 minute topographic quadrangle (U.S. Department of the Interior, Geological Survey, photorevised 1981) (Figure 1. *Project Site and Vicinity*). The project is located at approximately 38° 32′ 00″ North and 121° 12′ 25″ West within the Lower Sacramento watershed (#18020109).

The site is currently planned for residential development in accordance with the SunCreek Specific Plan Area (SPA). The Sierra Sunrise project would provide for a mix of land uses and residential densities designed to serve the increasing employment growth and housing needs in the Highway 50 corridor. The project was designed in general compliance with the *Conceptual – Level Strategy for Avoiding, Minimizing and Preserving Aquatic Resource Habitat in the Sunrise Douglas Community Plan Area*.

This analysis is being submitted concurrently with the application for a Department of the Army permit under the authority of Section 404 of the Clean Water Act for the discharge of dredged or fill material. The application is not inclusive of the SPA Backbone Infrastructure impacts on-site, which are being addressed in a separate application.

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PROJECT PROPONENT

Project:

Sierra Sunrise

Applicant:	**Agent:**
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PROJECT LOCATION

The proposed ±242-acre Sierra Sunrise (project) site (formerly known as Sunridge) is located in southern Rancho Cordova, California. The subject property is situated east of Jaeger Boulevard, west of Grant Line Road, and north of Kiefer Boulevard within portions of Sections 21 and 22, Township 8 North, Range 7 East, of the "Buffalo Creek, California" 7.5 minute topographic quadrangle (U.S. Department of the Interior, Geological Survey, photorevised 1981) (Figure 1. *Project Site and Vicinity*). The project is located at approximately 38° 32′ 00″ North and 121° 12′ 25″ West within the Lower Sacramento watershed (#18020109).

PROJECT DESCRIPTION

The project proposes to develop approximately 242 acres of land in southeast Sacramento County, currently planned for residential development in accordance with the SunCreek Specific Plan. This includes a 48±-acre on site preserve, which will protect 3.307 acres of waters of the U.S., as well as potential special-status species habitat. The plan provides for a mix of land uses and residential densities designed to serve the increasing employment growth and housing needs in the Highway 50 corridor. The project was designed in general compliance with the *Conceptual – Level Strategy for Avoiding, Minimizing and Preserving Aquatic Resource Habitat in the Sunrise Douglas Community Plan Area*.

Existing Conditions

The project site is comprised of gently rolling terrain, and is situated at elevation ranges of approximately 150 to 190 feet above mean sea level. A single lane dirt road bisects the property horizontally into two unequal halves. A barn and an abandoned residence exist within the northern half of the Project Area, which is heavily grazed. Several other rural residences exist in the southern half of the site, and much of this region is utilized as horse pasture.

According to the *Soil Survey of Sacramento County, California* (U.S. Department of Agriculture, Soil Conservation Service 1993), four soil units have been mapped within the site (Figure 2. *Natural Resources Conservation Service Soil Types*). These are: (159) Hicksville gravelly loam, 0-2% slopes, occasionally flooded, (189) Peters clay, 1-8% slopes, (197) Redding loam, 2-8% slopes, and (198) Redding gravelly loam, 0-8% slopes.

The predominant vegetation community within the Project Area is annual grassland. This community is comprised of non-native species such as soft brome (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), ryegrass (*Lolium multiflorum*), wild oat (*Avena fatua*), medusahead grass (*Taeniatherum caput-medusae*), and barley (*Hordeum murinum*). Other species that occur within the grassland community on-site are bindweed (*Convolvulus arvensis*), filaree (*Erodium botrys*), sticky tarweed (*Holocarpha virgata*), bur clover (*Medicago polymorpha*), and rose clover (*Trifolium hirtum*).

Wetlands/Waters of the U.S.

A jurisdictional delineation of waters of the U.S. was conducted by ECORP Consulting, Inc. (ECORP) during March and April 2000, and submitted for verification to the U.S. Army Corps of Engineers (Corps) on 12 June 2000. At the request of the Corps, ECORP submitted revised delineations on 22 August 2000 and 5 September 2000, which were verified by the Corps on 23 October 2000; however, the verification expired on 23 October 2005. ECORP biologists revisited the site during November and December 2005 and updated the 2000 delineation. The Corps requested additional site visits / field verifications during April and May 2007. ECORP

subsequently submitted a revised delineation to the Corps on 21 August 2007. The updated delineation was verified by the Corps in a letter dated 19 September 2007.

Existing waters of the U.S. with the project boundaries, not inclusive of the SunCreek Specific Plan Area (SPA) Backbone Infrastructure (which is addressed in a separate application), total 7.992 acres, as shown in Table 1 and Figure 3. *Wetland Delineation*.

Table 1. Jurisdictional and Non-Jurisdictional Wetlands and Waters

Type	Acreage
Wetlands:	
Vernal Pools	3.031
Seasonal Wetland	0.226
Swale	1.877
Other Waters:	
Intermittent drainage	0.802
Pond	2.056
Total:	**7.992**

REGULATORY BACKGROUND

Clean Water Act, Section 404 Application

The Applicant is submitting a permit application to the U.S. Army Corps of Engineers (Corps) to obtain authorization to discharge dredged and/or fill materials into waters of the U.S. under the authority of the Corps pursuant to Section 404 of the Clean Water Act. Pursuant to these requirements, the Corps will conduct a two-part analysis: 1) the Corps will determine consistency with Section 404 (b)(1) Guidelines to consider practicable alternatives to the dredge or fill of waters of the U.S.; and 2) the Corps will conduct a public interest review. This document provides the analysis of practicable on-site alternatives.

Purpose of Alternatives Analysis

The purpose of this analysis is to objectively evaluate the practicability of several alternatives to the proposed project and provide the Corps with documentation to be used in evaluating the proposed project permit application for compliance with Section 404(b)(1) (guidelines). The guidelines require that the alternatives analysis be adequate to establish that the project is the least environmentally damaging practicable alternative (LEDPA). This is accomplished by comparing the proposed project with other alternatives in terms of practicability, project purpose, and overall environmental effects. For this analysis, a reasonable statement of purpose has been developed and the alternatives have been evaluated in light of that purpose.

While it is understood that the information provided in this document must be verified by the Corps, the analysis is consistent with federal regulations and provides a fair and objective evaluation of alternatives.

This section presents an overview of the requirements of the 404(b)(1) guidelines and a discussion of the implementing guidance issued by the Corps. The 404(b)(1) guidelines are the substantive criteria used by the Corps in evaluating discharges of dredged or fill material into waters of the U.S. under Section 404 of the Clean Water Act. The guidelines require that four criteria be satisfied in order for the Corps to make a decision that a proposed discharge is in compliance. These criteria are:

1. *The discharge must be the least environmentally damaging practicable alternative*: This alternatives analysis evaluates a range of alternatives to the proposed project, in terms of environmental effects, practicability and consistency with the overall project purposes.
2. *The discharge must not violate any water quality standard, toxic effluent standard or jeopardize the continued existence of a threatened or endangered species*: Through the environmental review process, mitigation measures will be developed to insure that water quality and toxic effluent standards will not be violated. The U.S. Fish and Wildlife Service will be consulted regarding potential effects to federally listed species.
3. *The discharge must not result in a significant degradation of the waters of the United States*: Water quality impacts and potential impacts will be minimized through

implementation of water quality management and erosion control plans as approved by the Regional Water Quality Control Board and the local planning jurisdiction.

4. *Unavoidable impacts to the aquatic ecosystem must be mitigated*: Based on an agreement between the Corps and EPA, efforts must first be directed at avoiding and reducing impacts to waters of the United States prior to the evaluation of potential compensatory mitigation measures. Mitigation may be applied only to unavoidable impacts. In keeping with this guidance, this alternatives analysis does not attempt to substitute mitigation for avoidance wherever the project goals may concurrently be met. Unavoidable impacts to biological resources associated with waters of the United States will be mitigated by either on-site construction of compensation wetlands, through the purchase of appropriate mitigation credits from agency-approved sources, or by a combination of mitigation measures acceptable to the regulatory agencies.

Before the Corps can issue a permit, they must find that the requirements of the guidelines have been satisfied. The key criteria for most permit applicants, and the focus of this analysis, is the requirement that the discharge be the least environmentally damaging, practicable alternative. The pertinent section of the regulation states:

"Except as provided under Section 404(b)(2), no discharge of dredged of fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have a less adverse impact on the aquatic ecosystem so long as discharge does not have other significant adverse environmental consequences.

a. For the purposes of this requirement, practicable alternatives include, but are not limited to:

    1) On-site activities that do not include a discharge into waters of the United States or ocean waters,
    2) Discharges of dredged or fill material at other locations in waters of the United States or ocean waters,

b. An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology and logistics in light of overall project purposed. If it is otherwise a practicable alternative, an area not presently owned by the applicant which could reasonably be obtained, utilized, expanded, or managed in order to fulfill the basic purpose of the proposed activity may be considered;

c. Where the activity associated with a discharge which is proposed for a special aquatic site does not require access or proximity to or citing within the special aquatic site in question to fulfill its basic purpose (i.e., is not "water dependent"), practicable alternatives that do not involve special aquatic sites are presumed to be available unless clearly demonstrated otherwise. In addition, where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise."

The key provisions in the language are practicability and overall project purposes. An alternative is practicable if it is available to the applicant and capable of being accomplished by the applicant after consideration of costs, existing technology and logistics, in light of overall purposes. If a practicable alternative would have less impact on the aquatic ecosystem, and does not include other significant adverse impact, then the proposed project is not the least damaging practicable alternative.

ALTERNATIVES

The proposed project (excluding the Backbone Infrastructure portion of the property) would directly impact 4.685 acres of wetlands and waters, which are special aquatic sites as described above (Figure 4. *Proposed Impact Plan*). None of the proposed project components are considered to be water dependent. Therefore, according to the guidelines, less damaging alternatives are presumed to be available unless demonstrated otherwise. The following discussion presents the methodology of the analysis, followed by an evaluation of the alternatives for determination of the least damaging practicable alternative as compared to the proposed project. Alternatives have been developed and evaluated with the goals of

practicability, consistency with the overall project purposes, and avoiding and minimizing impacts to waters of the U.S.

ALTERNATIVES ANALYSIS

The alternatives analyzed in this document were developed in consultation with the Corps. Overall land use configurations of the project were evaluated in an analysis of alternatives studied for the entire SunCreek Specific Plan Area (SPA), which was conducted to support the Environmental Impact Statement/Environmental Impact Report (EIS/EIR) being prepared for the SPA. Following review of that document, the Corps identified specific areas on the property for which it requested a project-specific analysis to determine if additional avoidance was practicable. As such, the following alternatives were analyzed to determine if there were less environmentally damaging alternatives to the proposed project (Figure 5. *Alternatives - Overview*).

The Alternatives identified in Figure 5 represent portions of the areas of potential additional avoidance that were identified by the Corps on the overall SPA that fell within the Sierra Sunrise Property. Other alternatives that are not related to the Sierra Sunrise Property or are entirely within the Backbone Infrastructure footprint are not shown on the map and will not be discussed here, but will be discussed within the Alternatives Analysis for the appropriate project component. Three alternatives (SS1-SS3) occur within the Sierra Sunrise Property project boundary. A summary of each is provided below and is followed by a detailed analysis of each alternative.

Alternative Overview

Alternative 1

Alternative 1 is part of a larger potential additional avoidance area that connects to the proposed project preserve on the Jaeger Ranch property. The portions of this alternative that fall within the Jaeger Ranch property and Backbone Infrastructure footprint are not discussed here. Alternative 1 bisects the southern portion of the Sierra Sunrise project from the western boundary to the eastern boundary (Figure 5). This alternative evaluates the avoidance of

approximately 1.092 acres of waters of the U.S. in the approximately 8.32-acre preserve alternative. Modifications to the Jaeger project design and Alternative B6 of the Backbone Alternatives Analysis would also be required in order to fully achieve the additional avoidance contemplated by this Alternative and establish an open space area that is contiguous with other planned open space. Modifications to the other project designs will not be discussed here.

Alternative 2

Alternative 2 is located in the upper southeastern corner of the site. This 1.48 acre alternative evaluates the potential avoidance of the approximately 0.181 acre of waters of the U.S. The intent of this alternative is to evaluate the possibility of avoiding a small vernal pool/swale by extending the open space area in that portion of project that was provided as a buffer to Laguna.

Alternative 3

Alternative 3 is a small part (3.7 acre) of a larger potential additional avoidance area (37 acre) that contemplates avoiding a swale on the southern portion of the adjacent Smith Property and extends northward, with tributary swales branching out to the west and east. The majority of this Alternative falls within the Smith property and the Backbone Infrastructure projects. The portion of this Alternative that falls within the Sierra Sunrise project would serve primarily as buffer to avoided wetlands on the Smith property, should the Alternative 1a/1c of that Project be determined to be practicable.

Proposed Project

Existing waters of the U.S. with the project boundaries, not inclusive of the SunCreek Specific Plan Area (SPA) Backbone Infrastructure (which will be addressed in a separate application), total 7.992 acres. This includes approximately 3.031 acres of vernal pools, 0.226 acre of seasonal wetland, 1.877 acres of swale, 0.802 acre of intermittent drainage, and 2.056 acres of pond.

The proposed project avoids 3.307 acres of wetlands and other waters including vernal pools, seasonal wetland, seasonal wetland swales, seep, marsh, creek/channel, and ditch.

Unavoidable impacts to waters of the U.S. total 4.685 acres (not including the Backbone Infrastructure) within the project area (Table 2).

Table 2. Proposed Impact Acreages

Type	Existing (Acres)	Preserve (Acres)	Impact (Acres)
Wetlands:			
Vernal Pools	3.031	1.259	1.772
Seasonal Wetland	0.226	0.222	0.004
Swale	1.877	1.032	0.845
Other Waters:			
Intermittent drainage	0.802	0.794	0.008
Pond	2.056	0	2.056
Total:	**7.992**	**3.307**	**4.685**

Analysis of Alternatives

The practicability of on-site alternatives is analyzed using three basic criteria. First, the analysis considers whether the alternative would meet the Project Purpose; secondly, if any logistical issues would render the alternative impracticable. This analysis primarily considers whether the infrastructure necessary to support the alternative could be feasibly installed. Next, the analysis considers basic cost factors, including an estimation of the cost of infrastructure and other development costs per developable acre for the Proposed Project and the other project alternatives. The analysis addresses project level costs that would make an alternative impracticable or otherwise incapable of being done. Each alternative is also analyzed in regards to environmental factors (impacts to wetlands/waters and federally listed species); and finally other factors that should be considered in regards to regional needs. To summarize, in an effort to determine the least environmentally damaging practicable alternative for the project, the applicant analyzed the alternatives based on the following criteria:

Factors Affecting Practicability

1. **Project Purpose** – does the alternative contain sufficient acres of developable area in an appropriate configuration to support the project purpose?

The project purpose of the Sierra Sunrise Project is to provide residential development and wetland preservation as proposed in the overall SunCreek Specific Plan and to accommodate major transportation corridors, utilities, water quality, storm water detention and other components of the Plan Area's Backbone Infrastructure.

2. **Logistics** – does the alternative conform to the land use plan circulation design and school and park, water treatment, and flood control standards? Are there any other logistical constraints that would preclude the alternative from being implemented?

3. **Costs Impact Analysis** – does the alternative result in additional costs? Are the additional costs reasonable in relation to the amount of additional wetland avoidance that could be achieved. Does the alternative have a development cost per net developable acre that is not substantially more than that of the proposed project alternative?

4. **Environmental Impacts** – does the alternative have significantly less impacts on waters of the U.S. than the proposed project alternative? Does the alternative have significantly less impacts on federally listed species than the proposed project alternative?

   A wetland delineation has been conducted and submitted for the property. Based upon the best available information, approximately 7.992 acres of wetlands and waters of the U.S. have been delineated within the site (not inclusive of the Backbone Infrastructure area). Of the acreage mapped on-site, the proposed project would result in direct impacts to approximately 4.685 acres of wetlands and waters of the U.S. and avoidance/preservation of approximately 3.307 acres of waters of the U.S.

Special-status plant surveys were conducted in 2005 and 2008 on the Sierra Sunrise property. The portions of the Backbone Infrastructure area that occurs within the property was also surveyed in 2005 and 2008. No federally listed or proposed plant species were observed during these surveys. An additional survey of the property will be conducted in the spring of 2011. Surveys for federally listed vernal pool branchiopods have not been conducted within the property. The applicant is assuming presence for vernal pool tadpole shrimp and vernal pool fairy shrimp within vernal pools, seasonal wetland, and seasonal wetland swale features. Elderberry shrubs have not been observed on the property including the Infrastructure portion of the property. As a result, Valley elderberry longhorn beetle (VELB) surveys were not conducted. Please refer to overall SunCreek Biological Assessment for additional information

5. **Overall** – an alternative is considered not practicable if does not meet all of the above criteria.

Alternative 1

Overview

Alternative 1 occurs within the southern half of the Sierra Sunrise Property. This Alternative evaluated the possibility of avoiding six vernal pools and four seasonal wetlands swales. The vernal pools total approximately 0.933 acre and the swales total approximately 0.159 for a total of 1.092 acres of additional preserved wetlands. The Alternative would result in the loss of 8.32 acres of developable land to accommodate the potential open space. Additional developable land would be lost due to the fact that additional water quality basins and/or detention basins would need to be designed and implemented on the south side of the newly established preserve area. The increased cost of the additional infrastructure would be spread among fewer lots. Preliminary assessment of the land use proposed for this area shows that approximately 70 lots and a neighborhood park would be lost. The park would need to be relocated, further impacting the number of lots that could be developed. This Alternative is

only practicable if the western portion of the potential additional avoidance area is found to be practicable on the adjacent Jaeger Property.

Project Purpose

Alternative 1 would effectively eliminate 0.222 acre of Compact Medium Density Residential (MDR), 0.057 acre of Low Density Residential (LDR), 5.837 acre of MDR, and 2.204 acre of Park. The 6.116 acres of residential development that would be lost can not be relocated elsewhere on the property as the Sierra Sunrise property has already been burdened with providing 48-acres of wetland preserve, all or portions of three detention basins, portions of major thoroughfares and pedestrian corridors (totaling ~40 acres) – all of which are key components of the Backbone Infrastructure for the entire Specific Plan Area (as well as components of the overall project purpose).

Logistics

Although implementing the alternative is logistically feasible, the potential additional open space would significantly disrupt the intent of the residential land use plan circulation design. The only northwest roadway would be the major roadway (Americanos Blvd.) located on the western boundary of the Sierra Sunrise project. Americanos would also be required to be redesigned to clear span the potential open space.

Costs Impacts Analysis

There would be significant increased costs to accommodate the potential additional avoidance contemplated in Alternative 1. Additional water quality/detention basins would be required on the southern side of the potential open space to ensure that no untreated or unseasonable waters are released into the open space area. To be consistent with the land use design throughout the SCSP, the open space area would also need to be bordered by single-loaded roads, which would further impact the number of lots available and increase infrastructure costs. Although the span that would be required for Americanos Blvd. is part of the Backbone Infrastructure costs, it should be noted that all the Infrastructure costs are allocated to the

individual projects. All of these Infrastructure costs would be allocated to significantly fewer lots on the Sierra Sunrise property.

Environmental Impacts

Alternative 1 would result in the reduction of wetland impacts by 1.092 acres and would establish an additional 8.320 acres of wetland preserve/open space. The additional open space contemplated in Alternative 1 would be essentially a small, isolated peninsula should the western portion on Jaeger Ranch not be determined to be practicable. This area of potential avoidance may also result in indirect impacts to the avoided aquatic features. The open space/wetland preserve of the proposed project was designed using detailed topographic mapping, LIDAR analysis of the avoided wetlands and their associated watersheds.

Table 4 – Proposed Impact Acreages and Alternative 1

		Proposed Project		Alternative	
Type	**Existing***	**Avoidance**	**Project Impacts**	**Alternative Avoidance**	**Impacts**
Wetlands:					
Vernal Pools	3.031	1.259	1.772	2.192	0.839
Seasonal Wetland	0.226	0.222	0.004	0.222	0.004
SW Swale	1.877	1.032	0.845	1.191	0.686
Other Waters:					
Intermittent Drainage	0.802	0.794	0.008	0.794	0.008
Pond	2.056	0	2.056	0	2.056
Total:	**7.992**	**3.307**	**4.685**	**4.399**	**3.593**

*Not inclusive of delineated areas within the Backbone Infrastructure areas

Summary

Alternative 2 is superior to the proposed project in regards to environmental impacts. However, adding an open space corridor to protect the wetland features would preclude a successful, competitively-priced residential neighborhood from being implemented as infrastructure cost would increase significantly to the point where they may not be economically supported by the remaining development.

Alternative 2

Overview

Alternative 2 occurs in the southeastern corner of the Sierra Sunrise Property. This Alternative evaluates the possibility of avoiding four vernal pools and a connecting swale. The vernal pools are approximately 0.077 acre and the swale is approximately 0.104 acre for a total of 0.181 acre of potential additional wetland avoidance. Avoiding impacts to the wetlands would result in the loss of 1.475 acres of planned residential development and a portion of the pedestrian corridor.

Project Purpose

The actual footprint of the additional open space contemplated in Alternative 2 would eliminate 0.898 acre of low density residential (LDR) and 0.577 acre of pedestrian corridor. However, the adjacent residential development would need to be redesigned to accommodate the preserve with a single-loaded road and additional lots would be lost to accommodate the pedestrian corridor that would be displaced by this alternative. The loss of residential development could not be relocated in other areas of the project.

Logistics

Although the potential additional avoidance contemplated in Alternative 2 is logistically feasible, the Alternative would preclude the construction of a portion of the pedestrian corridor just west of the proposed preserve area. Realignment of the pedestrian corridor around the alternative area would result in additional loss of residential units.

Cost Impacts Analysis

This alternative would not result in significantly higher costs.

Environmental Impacts

Alternative 2 would result in the reduction of wetland impacts by 0.181 acres and would establish an additional 1.475 acres of wetland preserve/open space. This would be considered a minimal decrease in environmental impacts (Table 5).

Table 5 – Proposed Impact Acreages and Alternative 2

		Proposed Project		Alternative	
Type	**Existing***	**Avoidance**	**Project Impacts**	**Alternative Avoidance**	**Impacts**
Wetlands:					
Vernal Pools	3.031	1.259	1.772	1.336	1.695
Seasonal Wetland	0.226	0.222	0.004	0.222	0.004
SW Swale	1.877	1.032	0.845	1.136	0.741
Other Waters:					
Intermittent Drainage	0.802	0.794	0.008	0.794	0.008
Pond	2.056	0	2.056	0	2.056
Total:	**7.992**	**3.307**	**4.685**	**3.488**	**4.504**

*Not inclusive of delineated areas within the Backbone Infrastructure areas

Summary

Under Alternative 2, the avoidance of 0.181 acre of impacts to wetland features would result in the loss of a minimum of 1.475 acres of planned residential development and a portion of the pedestrian corridor. Additional residential development would be lost as the road and pedestrian corridor in this area would need to be relocated on the project site. The wetlands that may be avoided by implementing this alternative would most likely be considered indirectly impacted as the watershed for these features would remain impacted by the proposed development. Enlarging the open space area would have even further adverse affects on the project design and developable acreage. The insignificant amount of additional wetland avoidance is not practicable given the adverse affects on the proposed land use plan – especially given that fact that the Sierra Sunrise projects is already designating over 48 acres of open space to preserve and protect the highest value wetlands on the project site.

Alternative 3

Overview

Alternative 3 is a small part (3.7 acre) of a larger potential additional avoidance area (37 acre) that contemplates avoiding a swale on the southern portion of the adjacent Smith Property and extends northward, with tributary swales branching out to the west and east. The majority of this Alternative falls within the Smith property and the Backbone Infrastructure projects. The portion of this Alternative that falls within the Sierra Sunrise project would serve primarily as buffer to avoided wetlands on the Smith property, should the Alternative 1a/1c of that Project be determined to be practicable.

Project Purpose

Alternative 3 would not affect the project purpose

Logistics

Alternative 3 is logistically feasible, however it is not practicable if the potential additional avoidance on the Smith property is determined to be practicable.

Cost Impacts Analysis

This alternative would not result in significantly higher cost, however it would result in the loss of a significant number of residential lots, thereby increasing the cost per developable lot on the project site.

Environmental Impacts

Alternative 3 would result in the reduction of impacts 0.134 acres and would establish an additional 3.275 acres of wetland preserve/open space. This would be considered a minimal decrease in environmental impacts (Table 6).

Table 6 – Proposed Impact Acreages and Alternative 3

		Proposed Project		Alternative	
Type	**Existing***	**Avoidance**	**Project Impacts**	**Alternative Avoidance**	**Impacts**
Wetlands:					
Vernal Pools	3.031	1.259	1.772	1.318	1.713
Seasonal Wetland	0.226	0.222	0.004	0.222	0.004
SW Swale	1.877	1.032	0.845	1.107	0.770
Other Waters:					
Intermittent Drainage	0.802	0.794	0.008	0.794	0.008
Pond	2.056	0	2.056	0	2.056
Total:	**7.992**	**3.307**	**4.685**	**3.441**	**4.551**

*Not inclusive of delineated areas within the Backbone Infrastructure areas

Summary

Alternative 3 would preserve portions of vernal pool (0.059 acre) and seasonal wetland swale (0.075 acre), for a total of 0.134 acre of additional preservation. Alternative 3 would effectively eliminate 3.213 acres of medium density residential (MDR) units. The amount of wetlands avoided does not justify the amount of loss development, and this Alternative will not even be considered should the high school (a key component of the Specific Plan's project purpose) be constructed on the adjacent Smith property.

SUMMARY/CONCLUSION

An evaluation of the possibility of revising the proposed project to further avoid wetlands/waters at three locations within the project area was conducted at the request and in consultation with the Corps of Engineers. A summary of land use and wetland impact acreages for the proposed project and each alternatives evaluated is presented below in Table 3.

Table 3. Alternatives Land Use and Wetland Summary

	Open Space acreage (acre±)	Developable Net acreage (acre±)	Preserved Waters of U.S.	Impacts to Waters of the U.S. *	Additional Avoidance of Waters of the U.S.
Alternative 1	56.660	185.340	4.399	3.593	1.092
Alternative 2	49.815	192.185	3.488	4.504	0.181
Alternative 3	51.615	190.385	3.441	4.551	0.134
Proposed Project	48.340	193.660	3.307	4.685	0

* Not inclusive of Backbone Infrastructure Impacts on-site.

Table 4 – Summary of Analysis of Alternatives to Minimize Impacts to Wetlands and Waters of the U.S.*

	Potential Wetland Avoidance	Development Land Lost	Additional Cost to Avoid Impact Reasonable	Project Purpose	Logistics	Environmental/Waters	Practicable?
Alternative 1	1.092 ac.	8.320 ac.	NO	NO	NO	YES	NO
Alternative 2	0.181 ac.	1.475 ac.	YES	YES	YES	NO	NO
Alternative 3	0.134 ac.	3.275 ac.	NO	YES	NO	NO	NO

*See individual alternative analysis for Alternative-specific details

Project Purpose

– Can the alternative be implemented in a location or configuration that would support the project purpose?

Cost

– Can the alternative be implemented without costing substantially more than that of the proposed project alternative?

– Is the additional cost reasonable related to amount of additional wetland avoidance?

– Can the alternative be implemented without increasing the cost per developable acre to point where the project component is no longer economically feasible?

Logistics

– Does the alternative conform to the land use plan circulation design without presenting other logistical challenges?

Environmental/Waters

– Does the alternative have significantly less impacts on waters of the United States than the proposed project alternative?

Practicable?

– Does the Alternative represent the Least Environmentally Damaging Practicable Alternative?

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LIST OF FIGURES

Figure 1. Site and Vicinity

Figure 2. Natural Resources Conservation Service Soil Types

Figure 3. Wetland Delineation

Figure 4. Proposed Impact Plan

Figure 5. Alternatives Overview

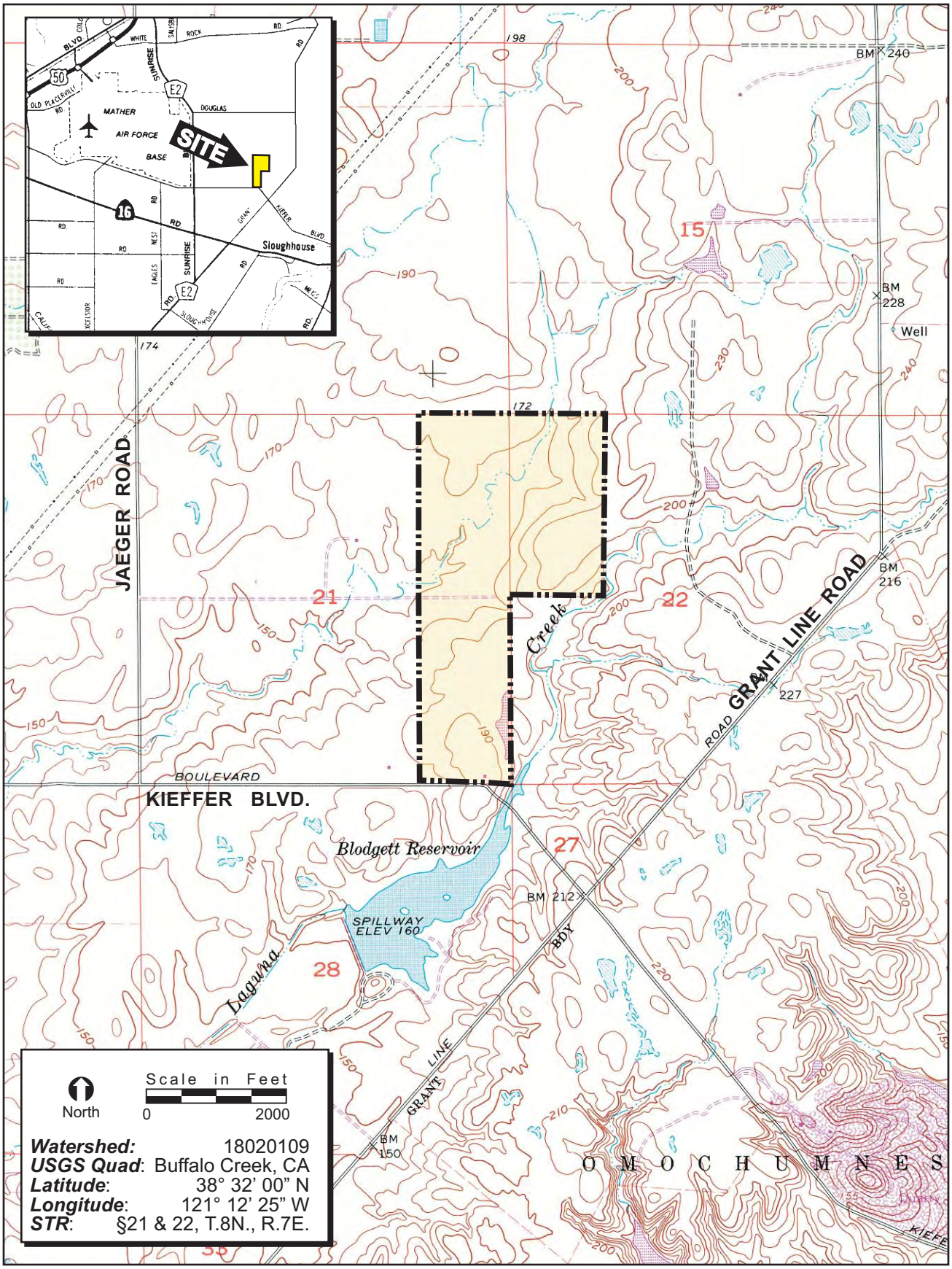

FIGURE 1. Project Site and Vicinity - Sierra Sunrise

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2009-142 Suncreek SP

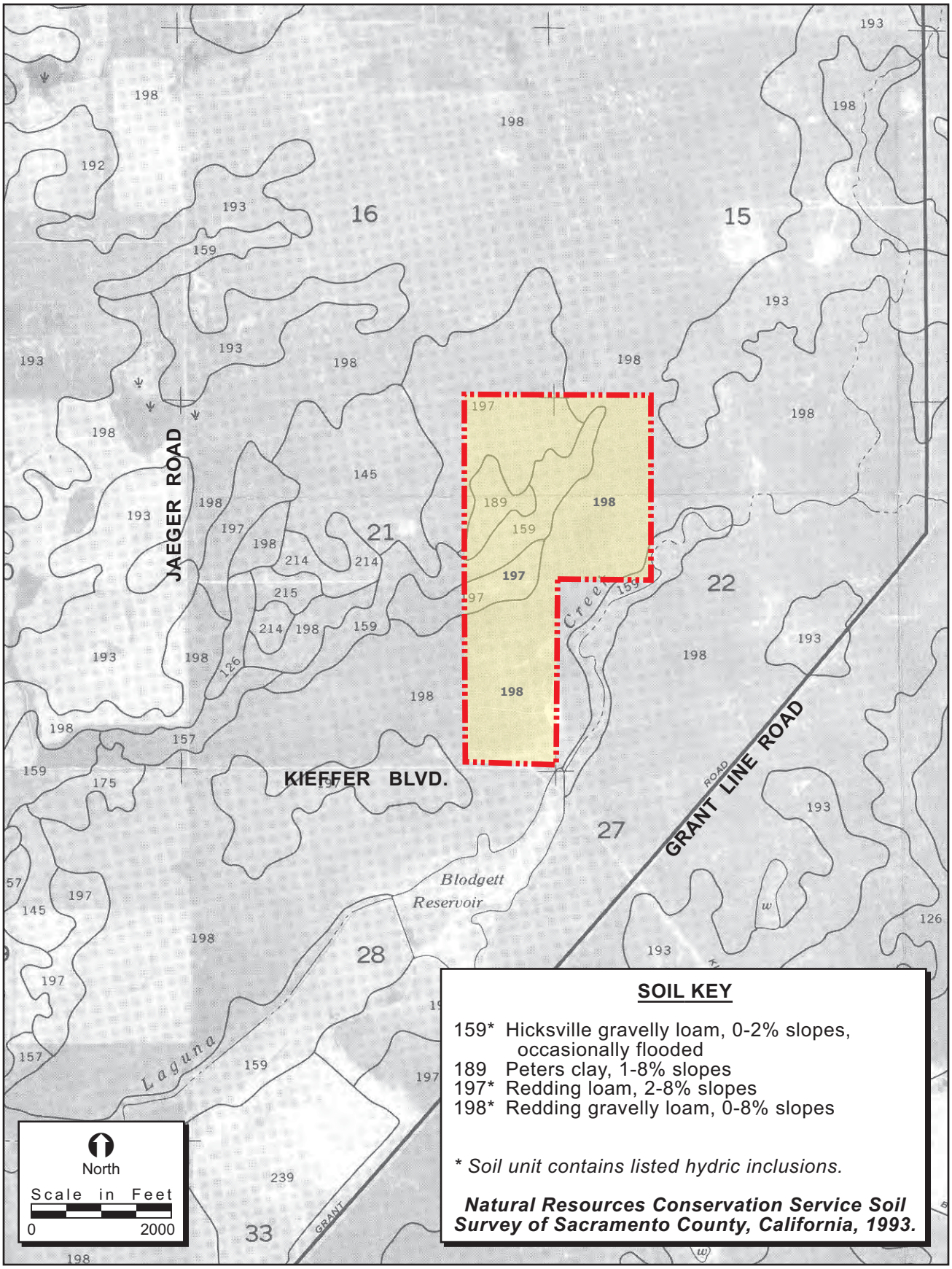
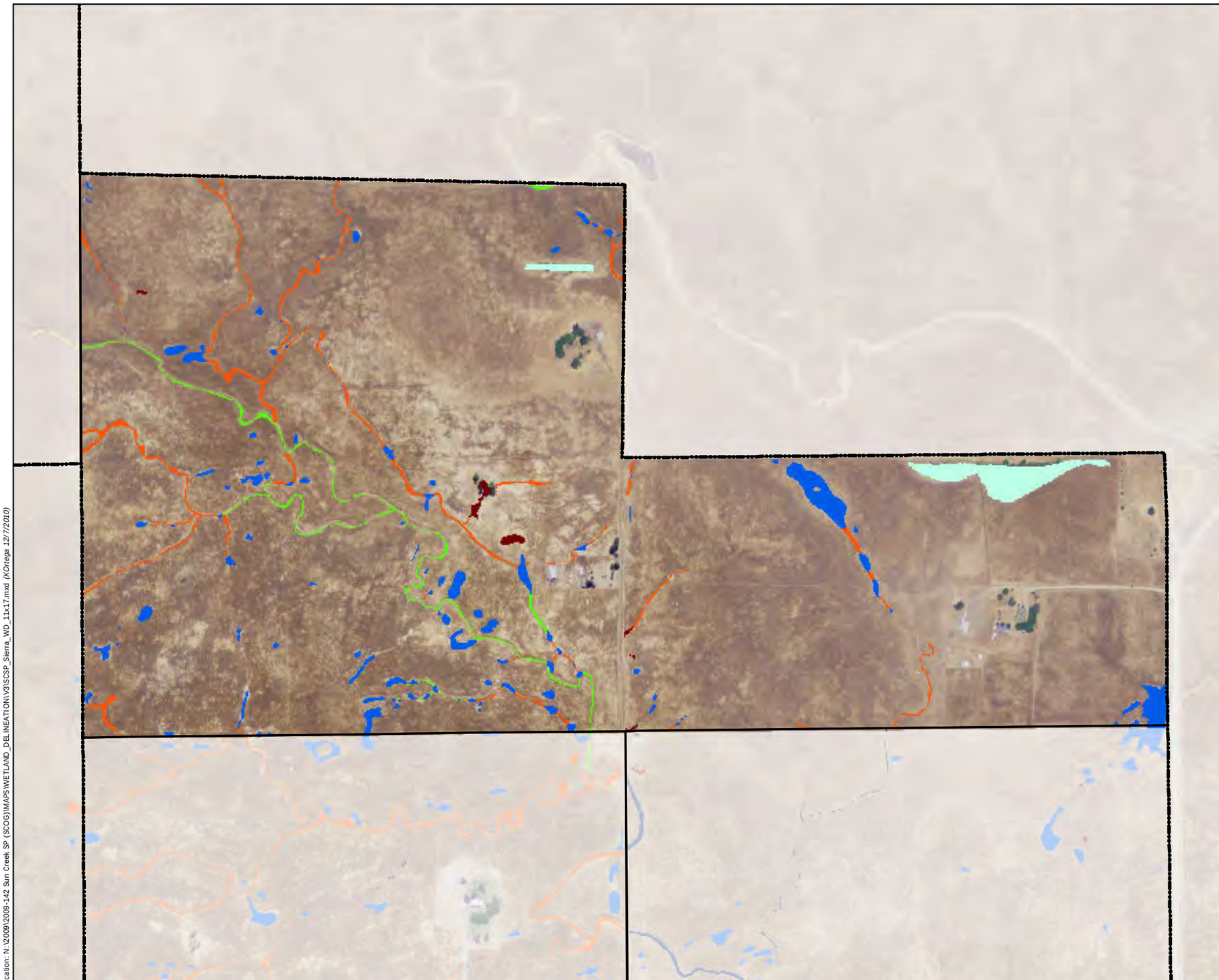


FIGURE 2. Natural Resources Conservation Service Soil Types - Sierra Sunrise

Figure 3. Wetland Delineation

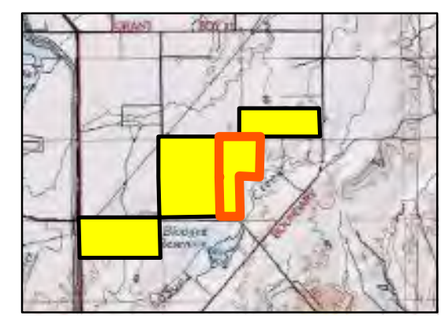
Sierra Sunrise



Project Boundary

Property Boundaries

		Existing Acreage
	Vernal Pool	4.060
	Seasonal Wetland	0.289
	Swale	2.584
	Ephemeral Drainage	0.000
	Intermittent Drainage	0.943
	Pond	2.056
	Stream	0.000
	Isolated Vernal Pool	0.000
	Total	*9.932*



Scale in Feet

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1 " = 500 '

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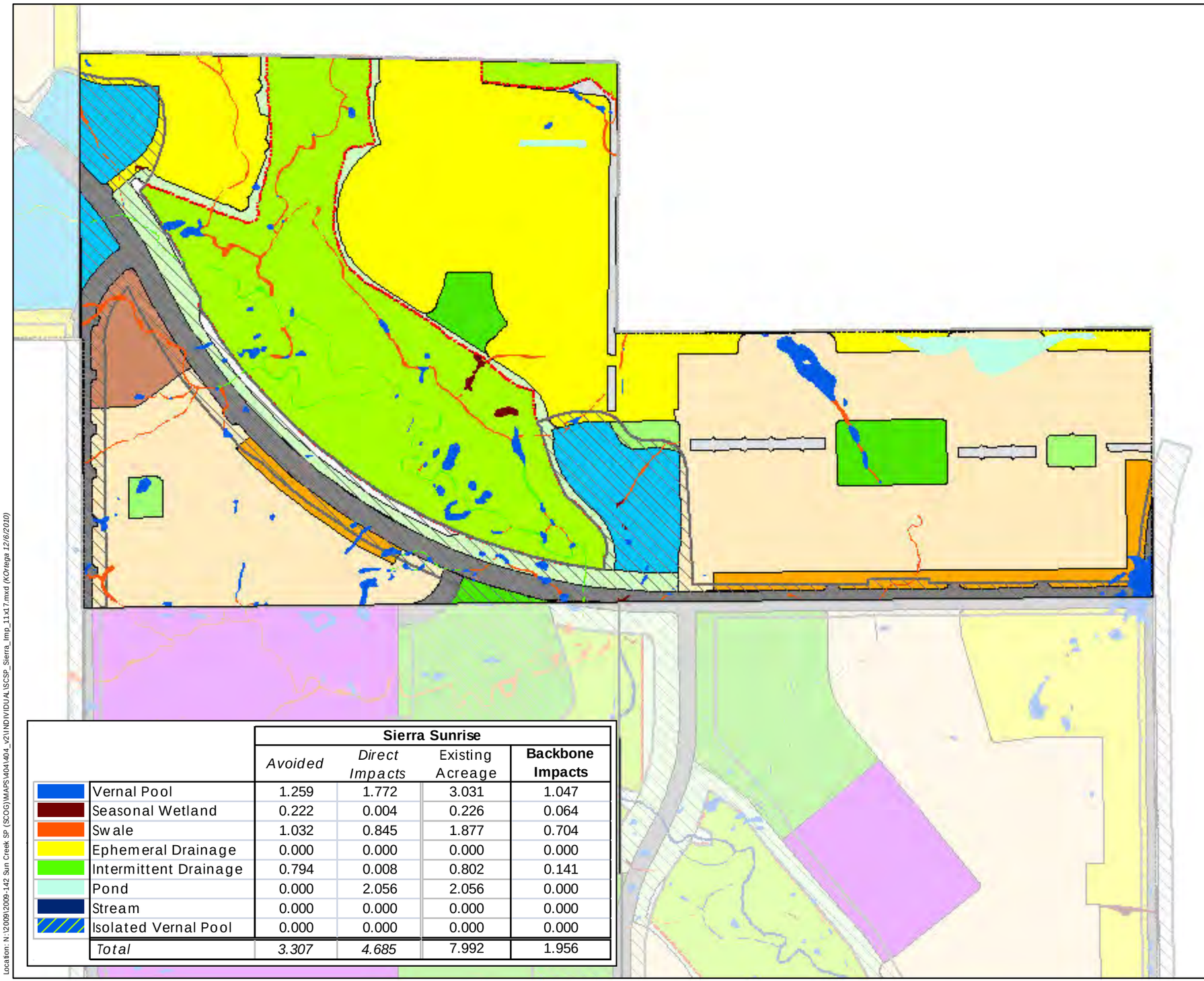
Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\WETLAND_DELINEATION\V3\SCSP_Sierra_WD_11x17.mxd (KOrtega 12/7/2010)

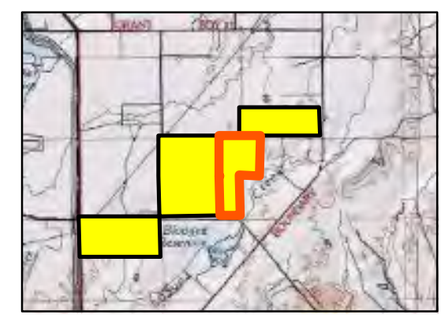
Figure 4. Proposed Impact Plan

Sierra Sunrise



	Sierra Sunrise			
	Avoided	*Direct Impacts*	Existing Acreage	**Backbone Impacts**
Vernal Pool	1.259	1.772	3.031	1.047
Seasonal Wetland	0.222	0.004	0.226	0.064
Swale	1.032	0.845	1.877	0.704
Ephemeral Drainage	0.000	0.000	0.000	0.000
Intermittent Drainage	0.794	0.008	0.802	0.141
Pond	0.000	2.056	2.056	0.000
Stream	0.000	0.000	0.000	0.000
Isolated Vernal Pool	0.000	0.000	0.000	0.000
Total	*3.307*	*4.685*	7.992	1.956

- Project Boundary
- Property Boundaries
- Preserve Boundary
- Proposed Backbone
- Boulevard
- Compact MDR
- CMU
- Canal
- Detention Basin
- HDR
- LDR
- LTC
- MDR
- MinorRoad
- Ped Corr
- Pkt Park
- PQP
- Park
- School
- Wetland Buffer



Scale in Feet

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1 " = 500 '

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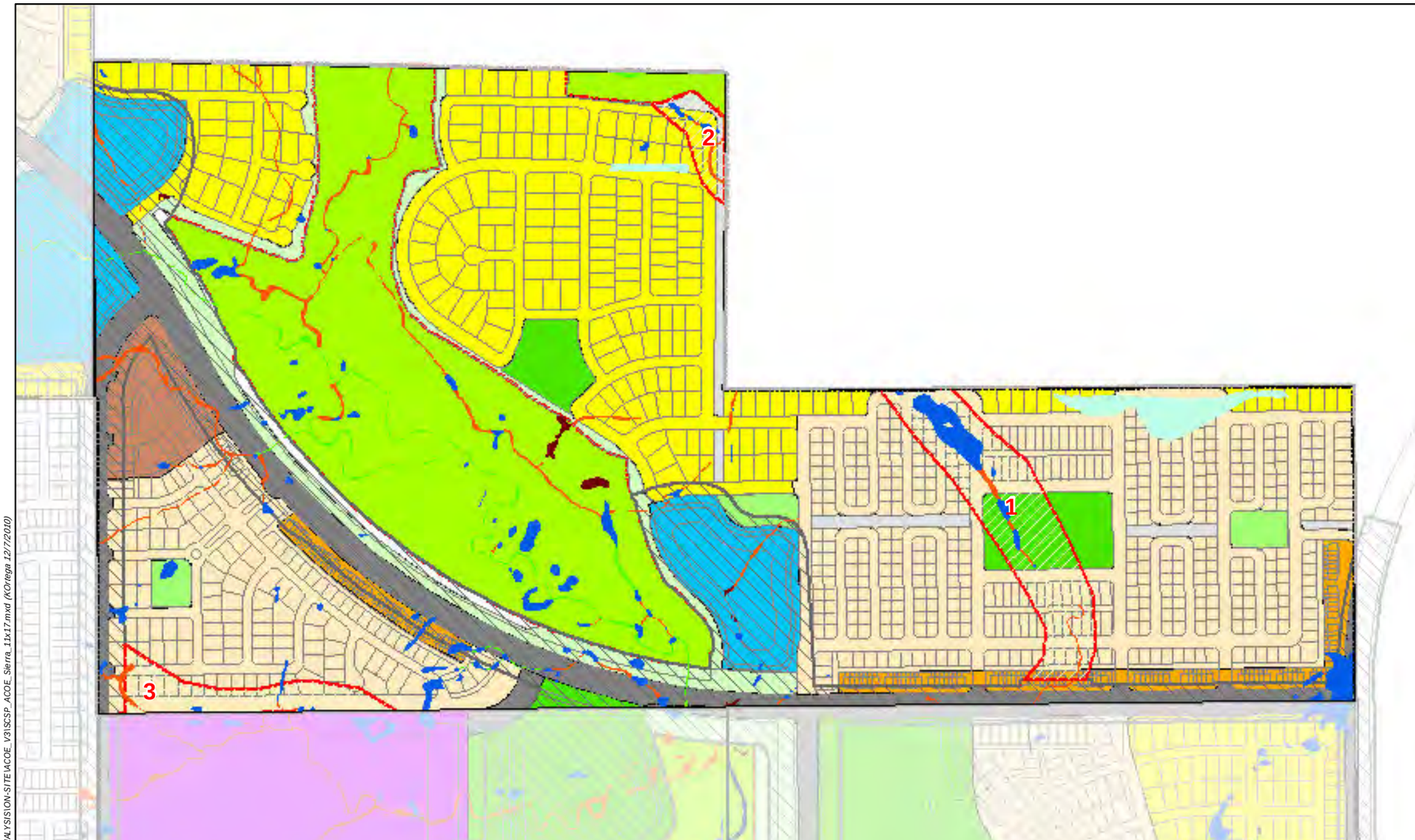
Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\404\404_v2\INDIVIDUAL\SCSP_Sierra_Imp_11x17.mxd (KOrtega 12/6/2010)

Map Date: 12/6/2010

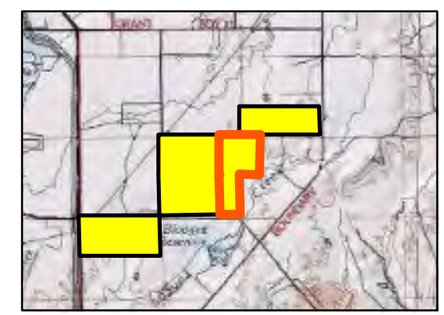
Figure 5. Sun Creek Specific Plan Preserve Alternative Overview

Sierra Sunrise



	Sierra Sunrise				Additional Wetlands Within Preserve Alternatives			
	Avoided	*Direct Impacts*	Existing Acreage	**Backbone Impacts**	1	2	3	Total
Vernal Pool	1.259	1.772	3.031	1.047	0.933	0.077	0.059	1.069
Seasonal Wetland	0.222	0.004	0.226	0.064	0.000	0.000	0.000	0.000
Swale	1.032	0.845	1.877	0.704	0.159	0.104	0.075	0.338
Ephemeral Drainage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Intermittent Drainage	0.794	0.008	0.802	0.141	0.000	0.000	0.000	0.000
Pond	0.000	2.056	2.056	0.000	0.000	0.000	0.000	0.000
Stream	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Isolated Vernal Pool	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	*3.307*	*4.685*	7.992	1.956	1.092	0.181	0.134	1.407

Project Boundary
Property Boundaries
Preserve Boundary
ACoE Alternative Preserves
Proposed Backbone
Boulevard
Compact MDR
CMU
Canal
Detention Basin
HDR
LDR
LTC
MDR
MinorRoad
Ped Corr
Pkt Park
PQP
Park
School
Wetland Buffer



Scale in Feet
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1 " = 500 '

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\ALTERNATIVE_ANALYSIS\ON-SITE\ACOE_V3\SCSP_ACOE_Sierra_11x17.mxd (KOrtega 12/7/2010)

Map Date: 12/7/2010

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Section 404(b)(1) On-Site Alternatives Analysis

For

Smith Property

Sacramento County, California

2 May 2012

Prepared For:
Sierra Holdings, LLC

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

DRAFT

CONTENTS

Section 404(b)(1) On-Site Alternative Analysis

Smith Property

INTRODUCTION 1

PROJECT PROPONENT 1

PROJECT LOCATION 2

PROJECT DESCRIPTION 2

Existing Conditions 2

Wetlands/Waters of the U.S 3

REGULATORY BACKGROUND 4

Clean Water Act, Section 404 Application 4

Purpose of Alternatives Analysis 4

ALTERNATIVES 7

ALTERNATIVES ANALYSIS 7

Proposed Project 9

Analysis of Alternatives 9

Factors Affecting Practicability 9

Alternatives1,1a/1b, and 1a/1c 11

Overview 11

Project Purpose 11

Alternative 1 11

Alternative 1a/1b 12

Alternative 1a/1c 12

Logistics 12

Cost 13

Environmental Impacts 13

Summary 13

SUMMARY/CONCLUSION 14

DRAFT

LIST OF TABLES

Table 1 – Jurisdictional and Non-Jurisdictional Wetlands and Waters 3
Table 2 – Proposed Project Impact/Preservation 9
Table 3 – Alternatives Land Use and Wetland Summary 13
Table 5 – Summary of Analysis of Alternative to Minimize Impacts to Wetlands and Waters of the U.S. 16

LIST OF FIGURES

Figure 1. Site and Vicinity
Figure 2. Natural Resources Conservation Service Soil Types
Figure 3. Wetland Delineation
Figure 4. Proposed Impact Plan
Figure 5. Alternatives – Overview

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INTRODUCTION

The proposed ±84-acre Smith Property (project) site is located in southern Rancho Cordova, California. The subject property is situated east of Sunrise Boulevard and west of Grant Line Road and north of Kiefer Boulevard within the SunCreek Specific Plan Area (SPA). The project proposes to develop a high school site and a community park in accordance with land uses identified in the SunCreek Specific Plan. In addition, the project proposes a ±10.42-acre on site preserve, which will protect 0.932 acre of waters of the U.S., as well as potential special-status species habitat

This analysis is being submitted concurrently with the application for a Department of the Army permit under the authority of Section 404 of the Clean Water Act for the discharge of dredged or fill material. The application is not inclusive of the SPA backbone infrastructure impacts on-site, which are being addressed in a separate application. The Proposed Project would directly impact approximately 1.895 acres of waters of the U.S. (not inclusive of the Backbone Infrastructure) within the project area and avoid 0.932 acres of wetlands including vernal pools, seasonal wetland swale, and intermittent drainage.

PROJECT PROPONENT

Project:

Smith Property

Applicant:

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PROJECT LOCATION

The proposed ±84-acre Smith Property (project) site is located in southern Rancho Cordova, California. The subject property is situated east of Sunrise Boulevard and west of Grant Line Road and north of Kiefer Boulevard within portions of Sections 21, Township 8 North, Range 7 East, on the "Buffalo Creek, California" 7.5 minute topographic quadrangle (U.S. Department of the Interior, Geological Survey, photorevised 1981). The project is located at approximately 38° 32′ 00″ North and 121° 12′ 45″ West within the Lower Sacramento watershed (#18020109) (Figure 1. *Project Site and Vicinity*).

PROJECT DESCRIPTION

The project proposes to develop a high school site and a community park on approximately 84 acres of land in southeast Sacramento County in accordance with land uses identified in the SunCreek Specific Plan. In addition, the project proposes a ±10.42-acre on site preserve, which will protect 0.932 acre of waters of the U.S., as well as potential special-status species habitat. The plan provides for a mix of land uses designed to serve the increasing employment growth and housing needs in the Highway 50 corridor. The project was designed in general compliance with the *Conceptual – Level Strategy for Avoiding, Minimizing and Preserving Aquatic Resource Habitat in the Sunrise Douglas Community Plan Area.*

Existing Conditions

The Project Area is comprised of gently rolling terrain, and is situated at elevation ranges of approximately 150 to 175 feet above mean sea level. Most of the Project Area is heavily grazed and a large herd of cattle was present on-site at the time of the surveys.

According to the *Soil Survey of Sacramento County, California* (U.S. Department of Agriculture, Soil Conservation Service 1993), five soil units have been mapped within the site (Figure 2. *Natural Resources Conservation Service Soil Types*). These are: (145) Fiddyment fine sandy loam, 1-8% slopes, (159) Hicksville gravelly loam, 0-2% slopes, occasionally flooded, (189)

Peters clay, 1-8% slopes, (197) Redding loam, 2-8% slopes, and (214) San Joaquin silt loam, 0-3% slopes.

The predominant vegetation community within the Project Area is annual grassland. This community is comprised of non-native species such as soft brome (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), ryegrass (*Lolium multiflorum*), wild oat (*Avena fatua*), medusahead grass (*Taeniatherum caput-medusae*), and barley (*Hordeum murinum*). Other species that occur within the grassland community on-site are bindweed (*Convolvulus arvensis*), filaree (*Erodium botrys*), sticky tarweed (*Holocarpha virgata*), bur clover (*Medicago polymorpha*), and rose clover (*Trifolium hirtum*).

Wetlands/Waters of the U.S.

The Smith Property project was originally a part of the Sierra Sunrise project (U.S Army Corps of Engineers (Corps) Regulatory Branch No. 200000414), comprising the northwestern quarter of the "T-shaped" Sierra Sunrise project. The wetland delineation for the Sierra Sunrise project was verified before the Smith Property was excluded from the project area. As such, the wetland delineation for the Smith Property consists of a subset of the verified delineation of the Sierra Sunrise project. Existing waters of the U.S. within the project boundary total 2.827 acres, as shown in Table 1 and Figure 3. *Wetland Delineation*.

Table 1 – Potential Jurisdictional Waters of the U.S.

Type	Acreage
Wetlands:	
Vernal Pools	1.097
Seasonal Wetland	0.007
SW Swale	1.707
Other Waters:	
Intermittent drainage	0.016
Total:	**2.827**

REGULATORY BACKGROUND

Clean Water Act, Section 404 Application

The Applicant is submitting a permit application to the U.S. Army Corps of Engineers (Corps) to obtain authorization to discharge dredged and/or fill materials into waters of the U.S. under the authority of the Corps pursuant to Section 404 of the Clean Water Act. Pursuant to these requirements, the Corps will conduct a two-part analysis: 1) the Corps will determine consistency with Section 404 (b)(1) Guidelines to consider practicable alternatives to the dredge or fill of waters of the U.S.; and 2) the Corps will conduct a public interest review. This document provides the analysis of practicable alternatives.

Purpose of Alternatives Analysis

The purpose of this analysis is to objectively evaluate the practicability of several alternatives to the proposed project and provide the Corps with documentation to be used in evaluating the proposed project permit application for compliance with Section 404(b)(1) (guidelines). The guidelines require that the alternatives analysis be adequate to establish that the project is the least environmentally damaging practicable alternative (LEDPA). This is accomplished by comparing the proposed project with other alternatives in terms of practicability, project purpose, and overall environmental effects. For this analysis, a reasonable statement of purpose has been developed and the alternatives have been evaluated in light of that purpose.

While it is understood that the information provided in this document must be verified by the Corps, the analysis is consistent with federal regulations and provides a fair and objective evaluation of alternatives.

This section presents an overview of the requirements of the 404(b)(1) guidelines and a discussion of the implementing guidance issued by the Corps. The 404(b)(1) guidelines are the substantive criteria used by the Corps in evaluating discharges of dredged or fill material into waters of the U.S. under Section 404 of the Clean Water Act. The guidelines require that four

criteria be satisfied in order for the Corps to make a decision that a proposed discharge is in compliance. These criteria are:

1. *The discharge must be the least environmentally damaging practicable alternative*: This alternatives analysis evaluates a range of alternatives to the proposed project, in terms of environmental effects, practicability and consistency with the overall project purposes.
2. *The discharge must not violate any water quality standard, toxic effluent standard or jeopardize the continued existence of a threatened or endangered species*: Through the environmental review process, mitigation measures will be developed to insure that water quality and toxic effluent standards will not be violated. The U.S. Fish and Wildlife Service will be consulted regarding potential effects to federally listed species.
3. *The discharge must not result in a significant degradation of the waters of the United States*: Water quality impacts and potential impacts will be minimized through implementation of water quality management and erosion control plans as approved by the Regional Water Quality Control Board and the local planning jurisdiction.
4. *Unavoidable impacts to the aquatic ecosystem must be mitigated*: Based on an agreement between the Corps and EPA, efforts must first be directed at avoiding and reducing impacts to waters of the United States prior to the evaluation of potential compensatory mitigation measures. Mitigation may be applied only to unavoidable impacts. In keeping with this guidance, this alternatives analysis does not attempt to substitute mitigation for avoidance wherever the project goals may concurrently be met. Unavoidable impacts to biological resources associated with waters of the United States will be mitigated by either on-site construction of compensation wetlands, through the purchase of appropriate mitigation credits from agency-approved sources, or by a combination of mitigation measures acceptable to the regulatory agencies.

Before the Corps can issue a permit, they must find that the requirements of the guidelines have been satisfied. The key criteria for most permit applicants, and the focus of this analysis, is the requirement that the discharge be the least environmentally damaging, practicable alternative. The pertinent section of the regulation states:

"Except as provided under Section 404(b)(2), no discharge of dredged of fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have a less adverse impact on the aquatic ecosystem so long as discharge does not have other significant adverse environmental consequences.

a. For the purposes of this requirement, practicable alternatives include, but are not limited to:

    1) On-site activities that do not include a discharge into waters of the United States or ocean waters,
    2) Discharges of dredged or fill material at other locations in waters of the United States or ocean waters,

b. An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology and logistics in light of overall project purposed. If it is otherwise a practicable alternative, an area not presently owned by the applicant which could reasonably be obtained, utilized, expanded, or managed in order to fulfill the basic purpose of the proposed activity may be considered;

c. Where the activity associated with a discharge which is proposed for a special aquatic site does not require access or proximity to or citing within the special aquatic site in question to fulfill its basic purpose (i.e., is not "water dependent"), practicable alternatives that do not involve special aquatic sites are presumed to be available unless clearly demonstrated otherwise. In addition, where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise."

The key provisions in the language are practicability and overall project purposes. An alternative is practicable if it is available to the applicant and capable of being accomplished by the applicant after consideration of costs, existing technology and logistics, in light of overall purposes. If a practicable alternative would have less impact on the aquatic ecosystem, and

does not include other significant adverse impact, then the proposed project is not the least damaging practicable alternative.

ALTERNATIVES

The proposed project (excluding backbone infrastructure) would directly impact 1.895 acres of wetlands and waters, which are special aquatic sites as described above (Figure 4. *Proposed Impact Plan)*. None of the proposed project components are considered to be water dependent. Therefore, according to the guidelines, less damaging alternatives are presumed to be available unless demonstrated otherwise. The following discussion presents the methodology of the analysis, followed by an evaluation of the alternatives for determination of the least damaging practicable alternative as compared to the proposed project. Alternatives have been developed and evaluated with the goals of practicability, consistency with the overall project purposes, and avoiding and minimizing impacts to waters of the U.S.

ALTERNATIVES ANALYSIS

The alternatives analyzed in this document were developed in consultation with the Corps. Overall land use configurations of the project were evaluated in an analysis of alternatives studied for the entire SunCreek Specific Plan Area (SPA), which was conducted to support the Environmental Impact Statement/Environmental Impact Report (EIS/EIR) being prepared for the SPA. Following review of that document, the Corps identified specific areas on the property for which it requested a project-specific analysis to determine if additional avoidance was practicable. The requested that the applicant evaluate the potential avoidance of a swale that extends north from the proposed project preserve and its tributary swales to north, as well as scattered vernal pools adjacent to the swale system. This area was broken down into three sections (1a, 1b, 1c) for the purpose of determining if smaller portions of the potential additional avoidance in this area could be accomplished, should the entire area not be practicable. As such, the following alternatives were analyzed to determine if there were less environmentally damaging alternatives (Figure 5. *Alternatives - Overview*):

- **Alternative 1 (1a, 1b, 1c collectively)**

  Alternative 1 evaluates the possibility of avoiding an additional 1.395 acres of wetlands/waters within a 27.31 acre preserve area that would connect to a potential additional preserve in the southern portion of the Smith property (this area is evaluated under the Backbone Infrastructure 404(b)(1), as it is proposed within the footprint of a detention basin that serves several project within the Specific Plan).

- **Alternative 1a/1b**

  Alternative 1a and 1b are evaluated together as Alternative 1b would not be practical without Alternative 1a also being implemented to provide some sort of connectivity to the potential preserve (Backbone Infrastructure) in the southern portion of the Smith and ultimately to the preserve at the southern boundary which is part of the proposed project. Alternative 1b contemplates the additional avoidance of the system and associated vernal pools that branches off in the western portion of the overall potential additional avoidance area. Alternative 1a/1b evaluates the possibility of avoiding an additional 0.724 acre of wetlands/waters within 13.599 acres of additional open space

- **Alternative 1a/1c**

  Alternative 1a and 1c are evaluated together as Alternative 1c would not be practical without Alternative 1a also being implemented to provide some sort of connectivity to the potential preserve (Backbone Infrastructure) in the southern portion of the Smith and ultimately to the preserve at the southern boundary which is part of the proposed project. Alternative 1c contemplates the additional avoidance of the system and associated vernal pools that branches off in the eastern portion of the overall potential additional avoidance area. Alternative 1a/1c evaluates the possibility of avoiding an additional 0.598 acre of wetlands/waters within 15.357 acres of additional open space.

- **Alternative 1a**

  Alternative 1a evaluates the possibility of avoiding an additional 0.073 acre of wetlands/waters within 1.646 acres of additional open space. This alternative area extends the area evaluated in the Backbone Infrastructure northward to allow connectivity to Alternatives 1b and 1c.

Proposed Project

The Proposed Project avoids 0.932 acres of wetlands including vernal pools, seasonal wetland swale, and intermittent drainage. Unavoidable impacts to wetlands and waters of the U.S. total 1.895 acres for the project (not inclusive of the Backbone Infrastructure) within the project area as shown in Table 2 below..

Table 2 – Proposed Impact Acreages

Type	Existing (Acres)	Preserve (Acres)	Impact (Acres)
Wetlands:			
Vernal Pools	1.097	0.329	0.768
Seasonal Wetland	0.007	0	0.007
SW Swale	1.707	0.589	1.118
Other Waters:			
Intermittent drainage	0.016	0.014	0.002
Total:	**2.827**	**0.932**	**1.895**

Analysis of Alternatives

The practicability of on-site alternatives is analyzed using three basic criteria. First, the analysis considers whether the alternative would meet the Project Purpose; secondly, if any logistical issues would render the alternative impracticable. This analysis primarily considers whether the infrastructure necessary to support the alternative could be feasibly installed. Next, the analysis considers basic cost factors, including an estimation of the cost of infrastructure and other development costs per developable acre for the Proposed Project and the other project alternatives. The analysis addresses project level costs that would make an alternative impracticable or otherwise incapable of being done. Each alternative is also analyzed in regards to environmental factors (impacts to wetlands/waters and federally listed species); and finally other factors that should be considered in regards to regional needs. To summarize, in an effort to determine the least environmentally damaging practicable alternative for the project, the applicant analyzed the alternatives based on the following criteria:

Factors Affecting Practicability

1. **Project Purpose** – does the alternative contain sufficient acres of developable area in an appropriate configuration to support a large-scale master planned multi-use,

density diverse community with regional commercial uses in a transit and pedestrian friendly environment in the SunCreek Specific Plan area.

The purpose of the SCSP is: (1) to construct a large-scale, mixed-use master-planned community consisting of mixed-density residential uses, a regional shopping center, and other employment-generating uses; (2) to provide associated supporting infrastructure including on-site backbone infrastructure, a water treatment plant, schools, parks, and open space.

2. **Logistics** – does the alternative conform to the land use plan circulation design and school and park, water treatment, and flood control standards? Are there any other logistical constraints that would preclude the alternative from being implemented?

3. **Costs Impact Analysis** – does the alternative result in additional costs? Are the additional costs reasonable in relation to the amount of additional wetland avoidance that could be achieved. Does the alternative have a development cost per net developable acre that is not substantially more than that of the proposed project alternative?

4. **Environmental Impacts** – does the alternative have significantly less impacts on waters of the U.S. than the proposed project alternative? Does the alternative have significantly less impacts on federally listed species than the proposed project alternative?

A wetland delineation has been conducted and submitted for the property. Based upon the best available information, approximately 2.827 acres of wetlands and waters of the U.S. have been delineated within the site (not inclusive of the Backbone Infrastructure area). Of the acreage mapped on-site, the proposed project would result in direct impacts to approximately 1.895 acres of wetlands and waters of the U.S. and avoidance/preservation of approximately 0.932 acres of waters of the U.S.

Special-status plant surveys were conducted in 2005 and 2008 on the Smith Property. The portions of the Infrastructure area that occurs within the property was also surveyed in 2005 and 2008. No federally listed or proposed plant species were observed during these surveys. An additional survey of the property will be conducted in the spring of 2011. Surveys for federally listed vernal pool branchiopods have not been conducted within the property. The applicant is assuming presence for vernal pool tadpole shrimp and vernal pool fairy shrimp within vernal pools, seasonal wetland, and seasonal wetland swale features. Elderberry shrubs have not been observed on the property including the infrastructure portion of the property. As a result, Valley elderberry longhorn beetle (VELB) surveys were not conducted. Please refer to overall SunCreek Biological Assessment for additional information

5. **Overall** – an alternative is considered not practicable if does not meet all of the above criteria.

Alternatives 1, 1a/1b, and 1a/1c

Overview

Alternative 1 is one contiguous area of potential additional avoidance identified by the Corps within the Smith Property; however, it is composed of three separate subsections. Subsection 1a is the lower half of the watershed for subsections 1b and 1c. Subsections 1b and 1c consists of two forks of the swale system found in subsection 1a.

Project Purpose

<u>Alternative 1</u>

Avoiding the wetlands in Alternative 1 would significantly impact a major component of the project purpose. The proposed high school/middle school could not be implemented should the potential additional avoidance area(s) be required. The high school/middle school (which is

planned for the Smith property and the eastern portion of the adjacent project) requires a contiguous parcel of not less than 80 acres. It is estimated that approximately 26.694 acres of the proposed high school site and 0.616 acre of park adjacent to the site's detention basin would be lost as a result of this alternative. The northern portion of the Smith property is the only location for the proposed schools as the southern portion consists of the proposed wetland preserve, and the water quality/hydro-modification/detention basin that is designed as a joint use basin within a portion of the Community Park Site.

Alternative 1a/1b

Alternative 1a/1b would not allow for the project purpose to be implemented for the same reason as Alternative 1 above. It is estimated that approximately 12.983 acres of the proposed high school site and 0.616 acre of park adjacent to the site's detention basin would be lost as a result of this alternative.

Alternative 1a/1c

Alternative 1a/1c would not allow for the project purpose to be implemented for the same reason as Alternative 1 above. It is estimated that approximately 14.741 acres of the proposed high school site and 0.616 acre of park adjacent to the site's detention basin would be lost as a result of this alternative.

Logistics

The construction of the high school/middle school within the Smith Property project is the primary development goal. The implementation of Alternative 1, 1a/1b, or 1a/1c would not leave sufficient development area for school construction. As discussed above, there are no practicable alternative locations within the Smith Property to which the loss developable land could be relocated.

Costs

Alternatives 1, 1a/1b, and 1a/1c would all reduce project costs as the high school/middle school would not be constructed.

Environmental Impacts

Alternative 1 would result an additional 27.309 acres of open space protecting 1.395 acres of additional wetland avoidance. This includes 0.506 acre of vernal pool and 0.889 acre of seasonal wetland swale. Developable land and wetland acreage summaries for Alternative 1 , 1a/1b, 1a/1c and 1a are presented in Table 3 below.

It should also be noted that there is no planned open space north of the Smith Property and the alternative analysis conducted for the Backbone Infrastructure project indicates that relocating the water quality/hydro-modification/detention basin that is designed as a joint use basin within a portion of the Community Park Site is not practicable. The potential additional avoidance areas evaluated here, even if practicable, would ultimately be isolated in nature, with no hydrologic connection the preserve area of the proposed project or to the north.

Table 3 – Alternatives Land Use and Wetland Summary

	Open Space acreage (acre±)	Developable Net acreage (acre±)	Preserved Waters of U.S.	Impacts to Waters of the U.S. *	Additional Avoidance of Waters of the U.S.
Alternative 1a	12.066	71.934	1.005	1.822	0.073
Alternative 1a/1b	24.019	59.981	1.656	1.171	0.724
Alternative 1a/1c	25.777	58.223	1.530	1.297	0.598
Alternative 1 (1a/1b/1c)	37.729	46.271	2.327	0.500	1.395
Proposed Project	10.420	73.580	0.932	1.895	0

* Not inclusive of Backbone Infrastructure Impacts on-site.

Summary

Although Alternative 1 (inclusive of subsections 1a, 1b, and 1c) would be superior in regards to avoidance of waters of the U.S., it is not considered a practicable alternative as it would essentially eliminate the construction of the high school planned for this area of the Smith

Property project, and would therefore, not meet the project purpose. Subsections 1a/1b would preserve approximately 1.220 acres of additional wetlands. Subsections 1a/1b would result in a loss of 0.616 acre of park and 12.983 acres of land allotted for school development (for a total loss of 13.599 acres of developable land). The loss of developable land would render this component of the project alternative infeasible in that the remaining land would not be sufficient for the construction of the planned educational facilities.

Subsections 1a/1c would preserve approximately 1.297 acre of additional wetlands. Subsections 1a/1c would result in the loss of 0.616 acre of park and 14.741 acres of land allotted for school development (for a total loss of 15.357 acres of developable land). As with the previous subsection alternative, the additional project costs and the loss of developable land would render this component of the project alternative infeasible in that the remaining land would not be sufficient for the construction of the planned educational facilities.

Subsection 1a would preserve approximately 0.073 acre of additional wetlands. Subsection 1a would result in the loss of 0.616 acre of park and 1.031 acres of land allotted for school development (for a total loss of 1.646 acres of developable land). Alternative 1a, by itself, is not practicable, in that it would adversely affect the design of the high school/middle school while protecting only 0.073 acres of wetland habitat in an isolated, 1.646-acre open space area. The small amount wetlands avoided would most likely be considered indirectly impacted by adjacent development.

SUMMARY/CONCLUSION

A thorough evaluation of the possibility of revising the proposed project to further avoid wetlands/waters at one location (with 3 subsections) within the project area was conducted at the request and in consultation with the Corps of Engineers. None of the three alternatives is practicable in that all would preclude the project purpose from being implemented.

It should also be noted again that there is no planned open space north of the Smith Property and the alternative analysis conducted for the Backbone Infrastructure project indicates that relocating the water quality/hydro-modification/detention basin that is designed as a joint use

basin within a portion of the Community Park Site is not practicable. The potential additional avoidance areas evaluated here, even if practicable, would ultimately be isolated in nature, with no hydrologic connection the preserve area of the proposed project or to the north.

Table 4 below presents a summary of the alternatives analysis.

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Table 4 – Summary of Analysis of Alternatives to Minimize Impacts to Wetlands and Waters of the U.S.*

	Potential Wetland Avoidance	Development Land Lost	Additional Cost Reasonable?	Project Purpose	Logistics	Environmental/Waters		Practicable
Alternative 1 (1a/1b/1c)	1.395 ac.	27.309	YES	NO	NO	YES		NO
Alternative 1a/1b	0.724 ac.	13.599	YES	NO	NO	YES		NO
Alternative 1a/1c	0.598 ac.	15.357	YES	NO	NO	YES		NO
Alternative 1a	0.073 ac.	1.646	YES	NO	NO	NO		NO

*See individual alternative analysis for Alternative-specific details N

Project Purpose

– Can the alternative be implemented in a location or configuration that would support the project purpose?

Cost

– Can the alternative be implemented without costing substantially more than that of the proposed project alternative?
– Is the additional cost reasonable related to amount of additional wetland avoidance?
– Can the alternative be implemented without increasing the cost per developable acre to point where the project component is no longer economically feasible?

Logistics

– Does the alternative conform to the land use plan circulation design without presenting other logistical challenges?

Environmental/Waters

– Does the alternative have fewer impacts on waters of the United States than the proposed project alternative?

Practicable

– Is the Alternative Practicable (i.e. does it satisfy all the other criteria)?

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LIST OF FIGURES

Figure 1. Site and Vicinity

Figure 2. Natural Resources Conservation Service Soil Types

Figure 3. Wetland Delineation

Figure 4. Proposed Impact Plan

Figure 5. Alternatives – Overview

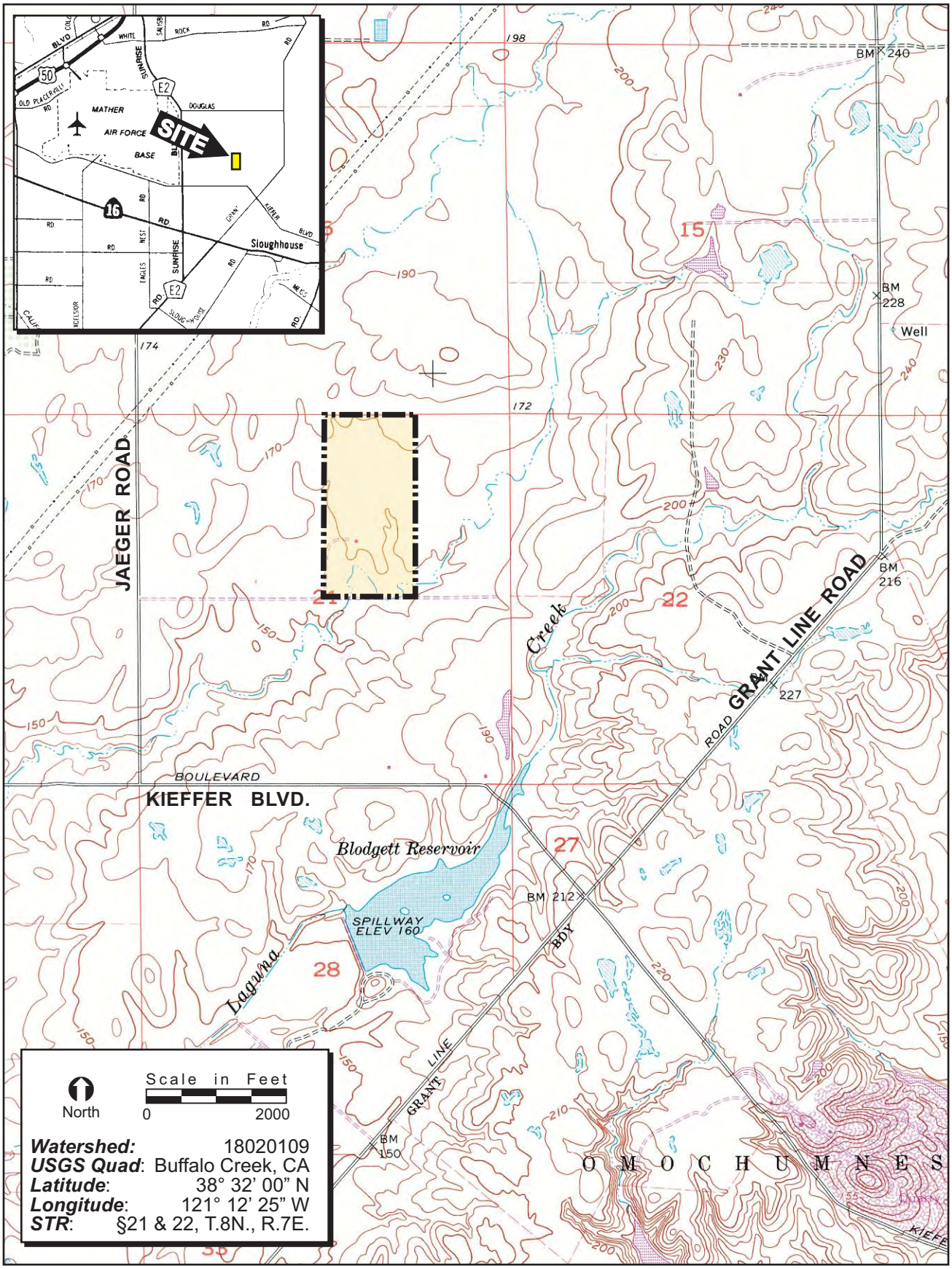

FIGURE 1. Project Site and Vicinity - Smith

2009-142 Suncreek SP

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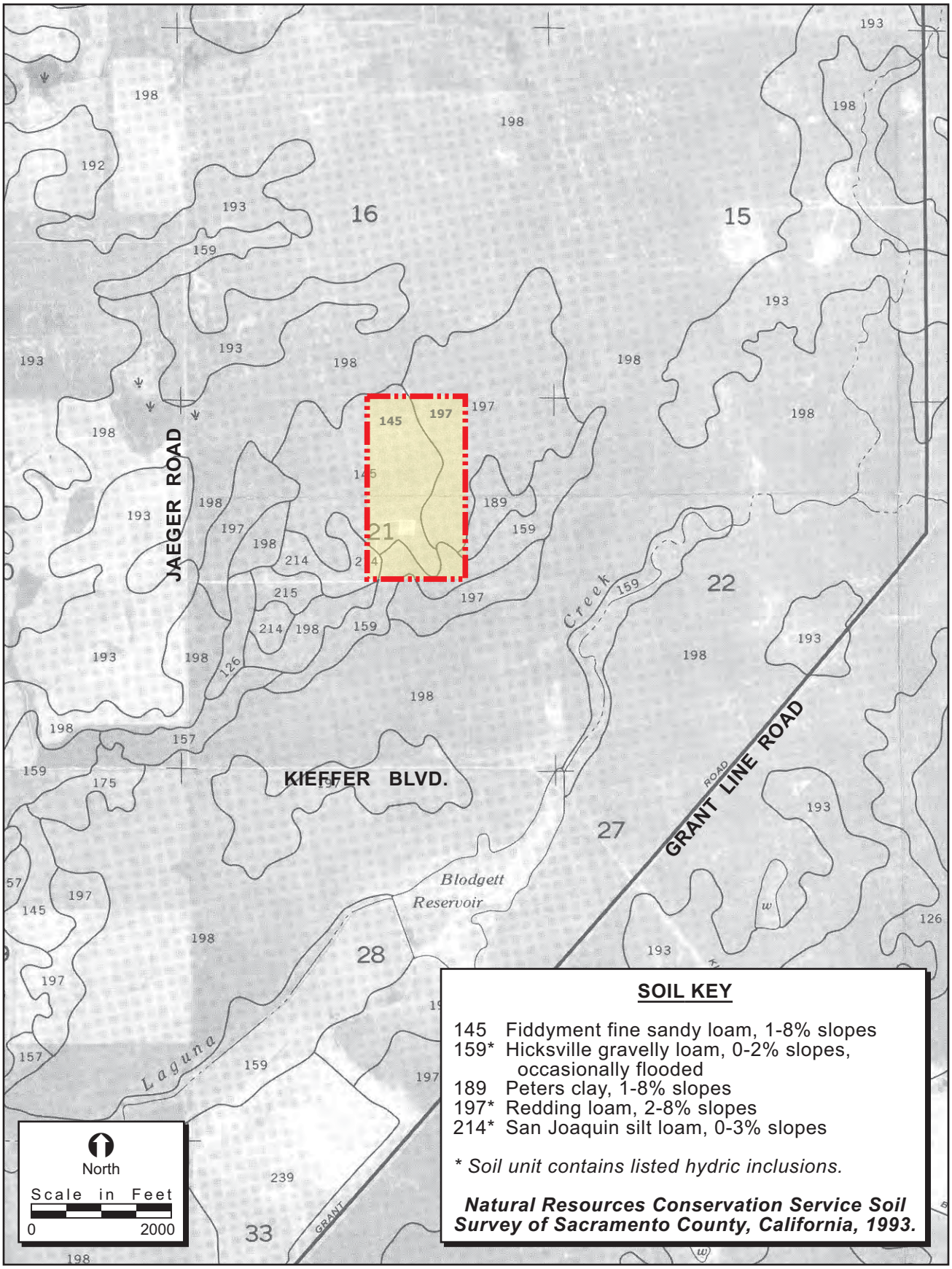
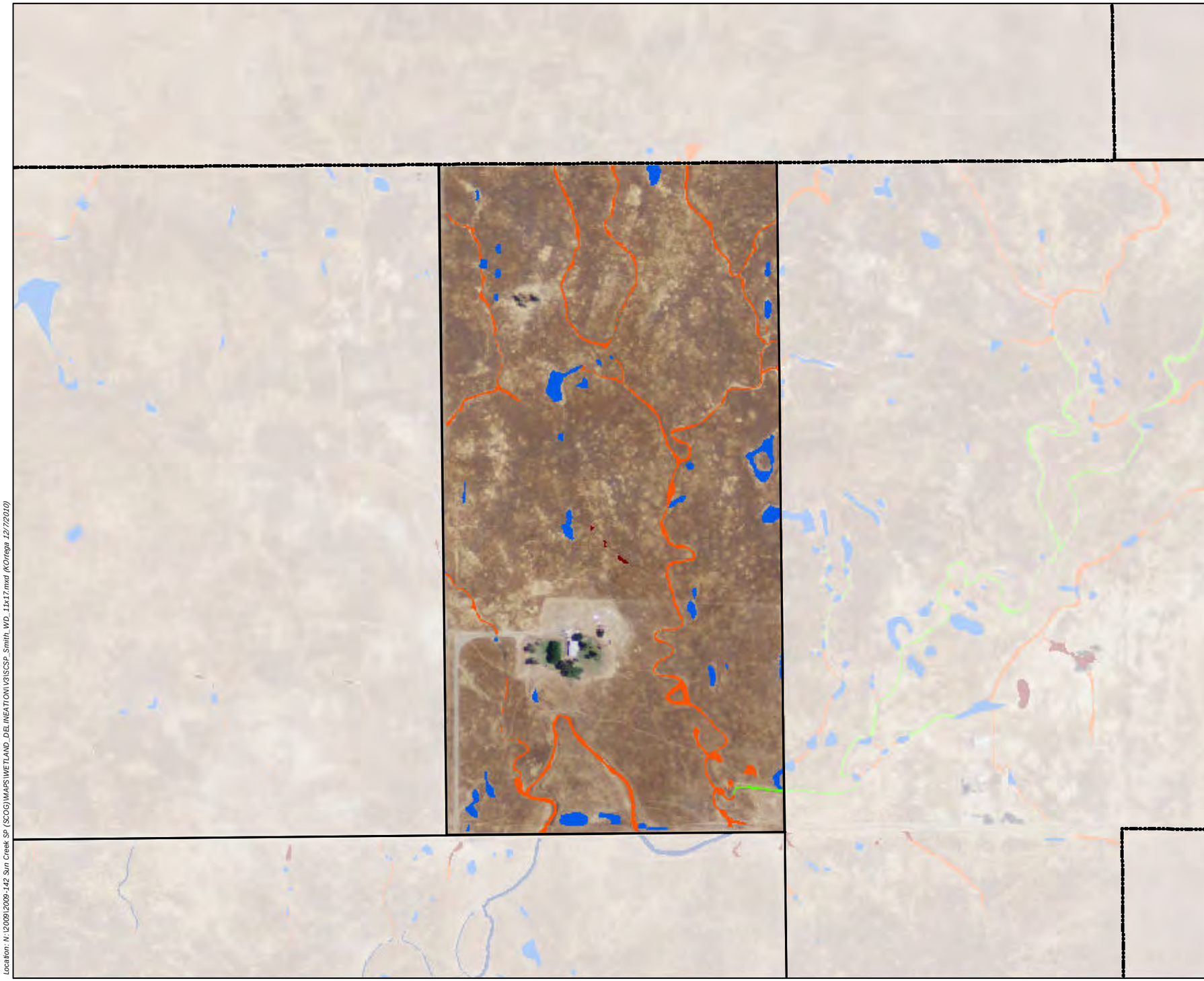


FIGURE 2. Natural Resources Conservation Service Soil Types - Smith

Figure 3. Wetland Delineation

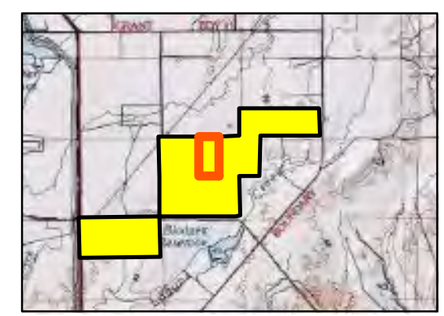
Smith Property



Project Boundary

Property Boundaries

	Existing Acreage
Vernal Pool	1.350
Seasonal Wetland	0.023
Swale	2.181
Ephemeral Drainage	0.000
Intermittent Drainage	0.039
Pond	0.000
Stream	0.000
Isolated Vernal Pool	0.000
Total	*3.593*



Scale in Feet

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1 " = 400 '

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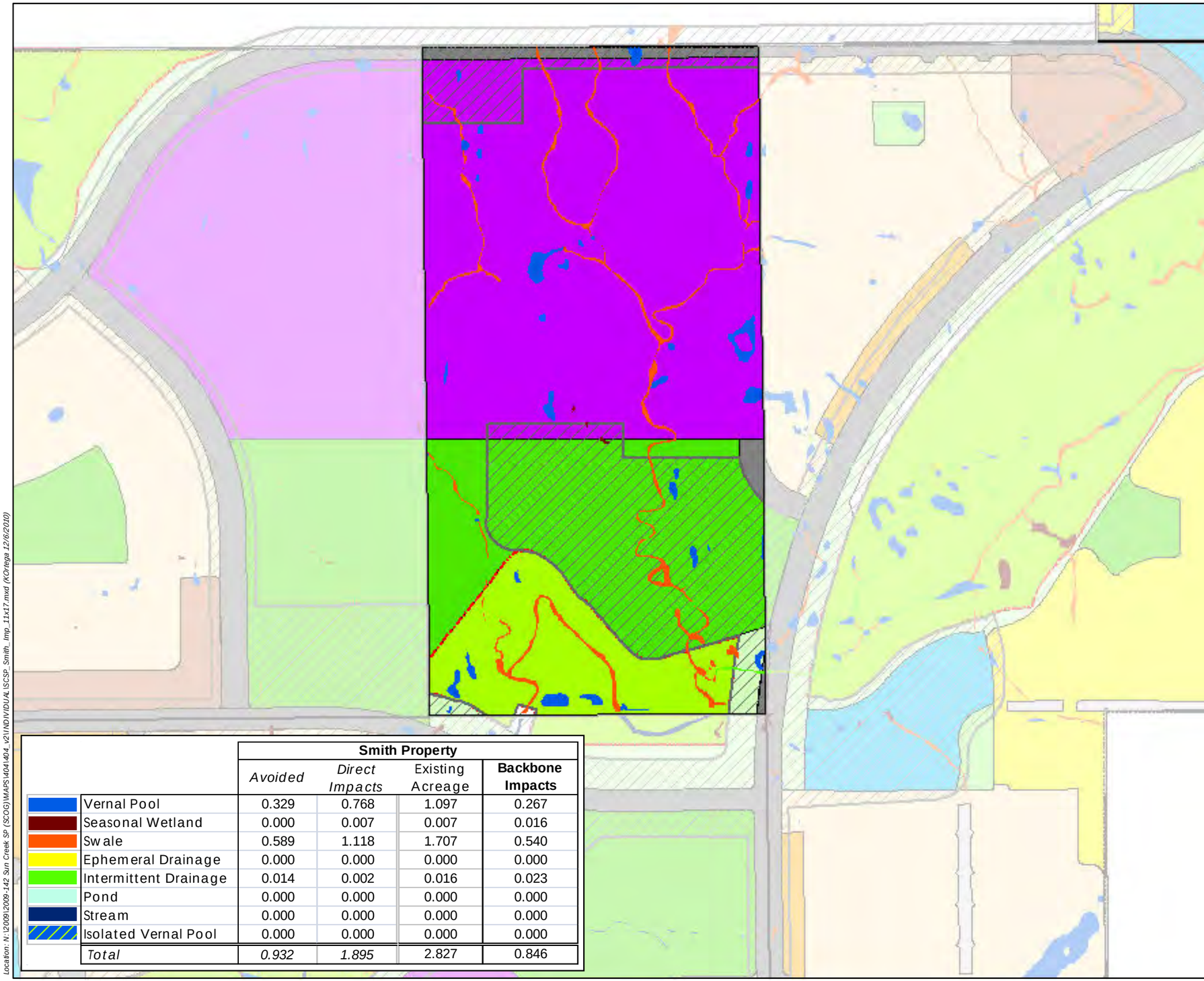
Location: N:\2009\2009-142 Sun Creek SP (SCOG)\MAPS\WETLAND_DELINEATION\V3\SCSP_Smith_WD_11x17.mxd (KOrtega 12/7/2010)

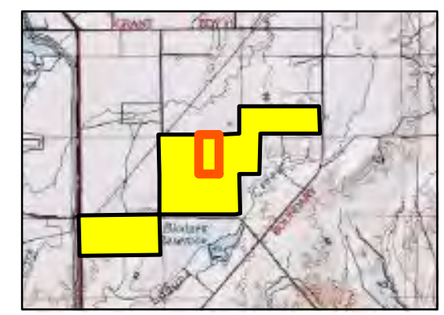
Figure 4. Proposed Impact Plan

Smith Property



	Smith Property			
	Avoided	*Direct Impacts*	Existing Acreage	**Backbone Impacts**
Vernal Pool	0.329	0.768	1.097	0.267
Seasonal Wetland	0.000	0.007	0.007	0.016
Swale	0.589	1.118	1.707	0.540
Ephemeral Drainage	0.000	0.000	0.000	0.000
Intermittent Drainage	0.014	0.002	0.016	0.023
Pond	0.000	0.000	0.000	0.000
Stream	0.000	0.000	0.000	0.000
Isolated Vernal Pool	0.000	0.000	0.000	0.000
Total	*0.932*	*1.895*	2.827	0.846

Project Boundary
Property Boundaries
Preserve Boundary
Proposed Backbone
Boulevard
Compact MDR
CMU
Canal
Detention Basin
HDR
LDR
LTC
MDR
MinorRoad
Ped Corr
Pkt Park
PQP
Park
School
Wetland Buffer



Scale in Feet
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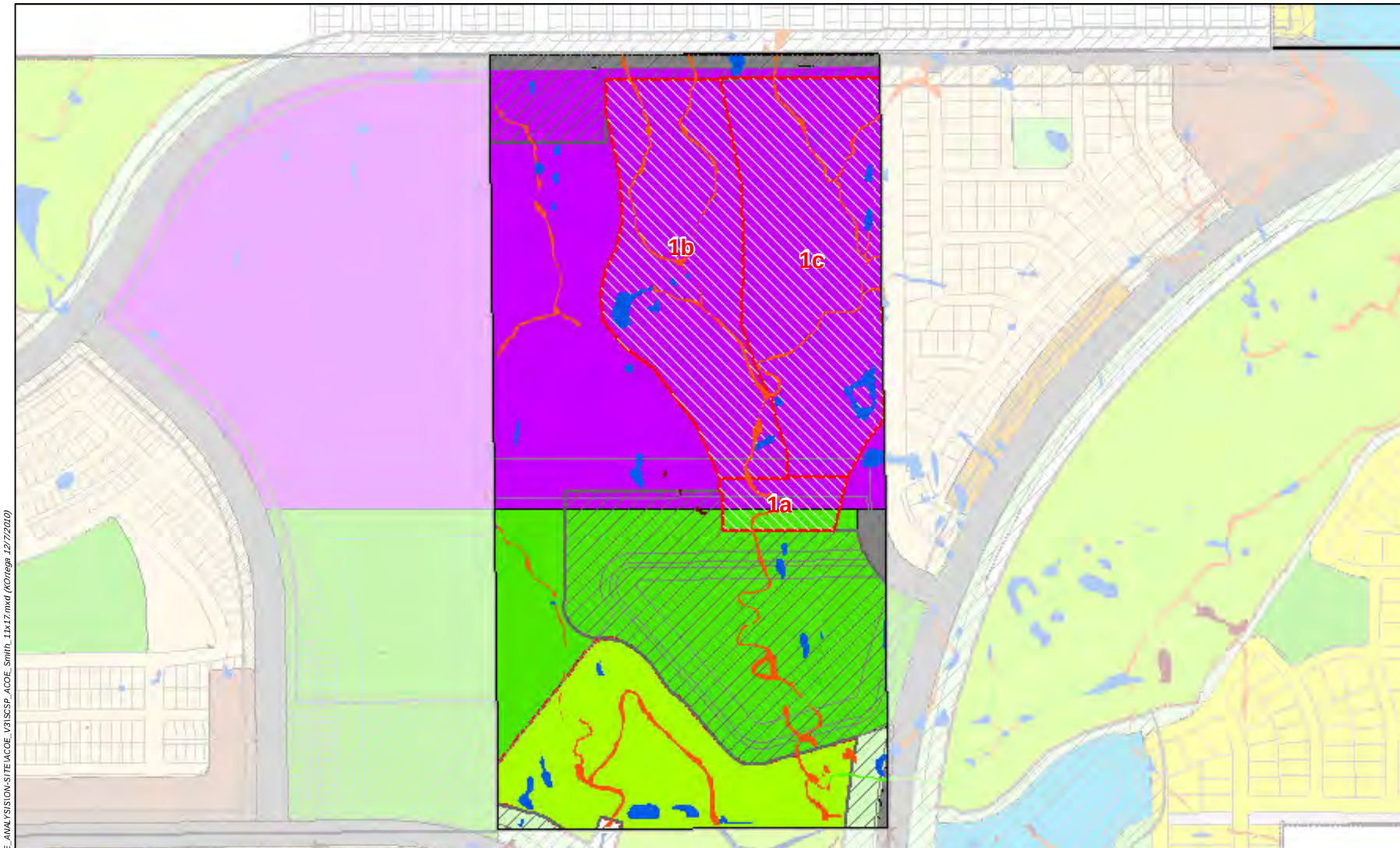
Map Date: 12/6/2010

Figure 5. Sun Creek Specific Plan Preserve Alternative Overview

Smith Property



	Smith Property				Additional Wetlands Within Preserve Alternatives			
	Avoided	*Direct Impacts*	Existing Acreage	**Backbone Impacts**	1a	1a1b	1a1c	1a1b1c
Vernal Pool	0.329	0.768	1.097	0.267	0.000	0.242	0.264	0.506
Seasonal Wetland	0.000	0.007	0.007	0.016	0.000	0.000	0.000	0.000
Swale	0.589	1.118	1.707	0.540	0.073	0.482	0.334	0.889
Ephemeral Drainage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Intermittent Drainage	0.014	0.002	0.016	0.023	0.000	0.000	0.000	0.000
Pond	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Stream	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Isolated Vernal Pool	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	*0.932*	*1.895*	2.827	0.846	0.073	0.724	0.598	1.395

Project Boundary
Property Boundaries
Preserve Boundary
ACoE Alternative Preserves
Proposed Backbone
Boulevard
Compact MDR
CMU
Canal
Detention Basin
HDR
LDR
LTC
MDR
MinorRoad
Ped Corr
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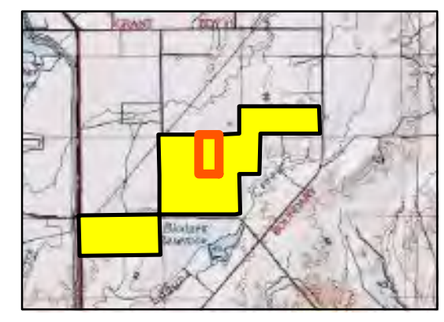
School
Wetland Buffer



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Map Date: 12/7/2010