

Final
Environmental Impact Report/Environmental Impact Statement
Volume II
Rio del Oro Specific Plan Project
State Clearinghouse #2003122057



Volume IV

Prepared for:
City of Rancho Cordova
and
U.S. Army Corps of Engineers,
Sacramento District

Prepared by:
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June 24, 2010

AECOM

Final
Environmental Impact Report/Environmental Impact Statement
Volume II

Rio del Oro Specific Plan Project
State Clearinghouse #2003122057



Volume IV

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June 24, 2010



TABLE OF CONTENTS

Section		Page
Volume I		
1	INTRODUCTION	1-1
1.1	Purpose and intended uses of the FEIR/FEIS	1-1
1.2	Project Location	1-2
1.3	Project Background	1-2
1.5	Resource Agency Coordination.....	1-4
1.6	Summary Description of the Project Alternatives	1-5
1.7	CEQA and NEPA Requirements for Responding to Comments.....	1-7
1.8	Requirements for document Certification and Future Steps in Project Approval	1-7
1.9	Organization and Format of the Final EIR/EIS	1-8
1.10	Summary of Impacts and Mitigation Measures.....	1-9
2	MINOR MODIFICATIONS TO THE PROPOSED PROJECT	2-1
2.1	Introduction	2-1
2.2	Summary of Modifications to the Project Description	2-1
3	MASTER RESPONSES.....	3-1
	Master Response 1: Adequacy of Long-Term Water Supply	3-1
	Master Response 2: Disagreement Regarding the Conclusions REACHED IN the DEIR/DEIS	3-2
	Master Response 3: Comments Outside the CEQA Public Review Period	3-3
4	COMMENTS AND INDIVIDUAL RESPONSES.....	4-1
4.1	Introduction	4-1
4.2	Format of Comments and Responses	4-1
4.3	Lists of Commenters	4-2
4.4	Comments and Responses on the 2006 DEIR/DEIS	4-5
	4.5 Comments and Responses on the 2008 RDEIR/SDEIS	4-7
5	CORRECTIONS AND REVISIONS TO THE 2006 DEIR/DEIS AND 2008 RDEIR/SDEIS	5-1
5.1	Introduction	5-1
5.2	Corrections and Revisions to the 2006 DEIR/DEIS.....	5-1
5.3	Corrections and Revisions to the 2008 RDEIR/SDEIS.....	5-63
6	REFERENCES	6-1
7	LIST OF FEIR/FEIS PREPARERS	7-1

Appendices (Included on CD at back of report)

K	Construction Emissions Mitigation Fee Matrix and Air Quality and Emissions Reduction Plan
Q	Wetland Mitigation and Monitoring Proposal
R	Valley Elderberry Longhorn Beetle Mitigation Plan
S	MWH Arsenic Memo
T	Groundwater Impact Evaluation Technical Memorandum
U	Traffic Count Comparison

Exhibits

2-1 Revised Phasing Plan 2-7

Revised Exhibits

2-1 Regional Location 5-3
2-4 Proposed Project Alternative Land Use Plan 5-9
2-10a On-Site Sewer Facilities 5-15
2-10b Existing Sewersheds and Off-Site Sewer Facilities 5-17
2-12 Roadway Circulation Plan 5-19
2-13 Bikeway and Trails Plan 5-21
3.13-1 Map of Areas Subject to Remedial Investigation and Feasibility Study (RI/FS) 5-47
3.14-4 Existing Transit Service 5-51
3.10-1 Habitat Types at the Rio del Oro Project Site 5-67
3.10-3 Proposed Preserves at the Rio del Oro Project Site 5-73

Tables

1-1 Summary of the Program and Project Level (Phase 1) Impacts and Mitigation Measures of the Proposed Project and Alternatives under Consideration, as Identified in the 2006 DEIR/DEIS 1-10
1-2 Summary of the Program and Project Level (Phase 1) Impacts and Mitigation Measures of the Proposed Project and Alternatives under Consideration, as Identified in the 2008 RDEIR/SDEIS 1-105
2-1 Land Uses Evaluated in the 2006 DEIR/DEIS and the 2008 RDEIR/SDEIS 2-1
2-2 Proposed 2009 Changes to Land Uses 2-1
2-3 Summary of Changes to the Rio del Oro Specific Plan (Prepared by the City of Rancho Cordova) 2-9
4-1 List of Commenters on the 2006 DEIR/EIS 4-2
4-2 List of Commenters on the 2008 RDEIR/SDEIS 4-4
2-1 Proposed Rio del Oro Project Land Uses 5-11
3.6-1 Folsom Cordova Unified School District Enrollment, 2003–2004a 5-24
3.12-3 Project Parkland Acreage Calculations 5-30
3.13-1 Summary of Primary Study Areas, Primary Constituents of Concern, and Regulatory and Investigation Status on the Rio del Oro Project Site 5-41
3.5-10 Water Demands for Rio del Oro Remaining Phase 1 Development 5-65
3.5-11 GSWC’s Options A and B Water Supply Compared to Water Demand Associated with the Remaining Phase 1 Development 5-65
3.10-3 Summary of Wetland Impacts and Proposed Mitigation Acreage 5-72

4.5 COMMENTS AND RESPONSES ON THE 2008 RDEIR/SDEIS

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SECTION A

Federal Agencies



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street
San Francisco, CA 94105-3901

July 11, 2008

Kathleen Dadey
U.S. Army Corps of Engineers
Regulatory Branch
1325 J Street, Room 1480
Sacramento, CA 95814-2922

Subject: Supplemental Draft Environmental Impact Statement for the Rio del Oro Specific Plan Project (CEQ# 20080172)

Dear Ms. Dadey:

The Environmental Protection Agency (EPA) has reviewed the Supplemental Draft Environmental Impact Statement (SDEIS) referenced above. Our review is pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act. Our detailed comments are enclosed.

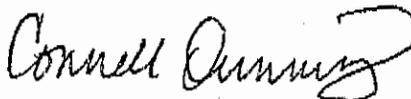
EPA provided comments on the DEIS in a February 15, 2007 letter. Our letter documented concerns about impacts to waters of the U.S., determination of the Least Environmentally Damaging Practicable Alternative (LEDPA), and habitat impacts. After review of the SDEIS, we have remaining concerns in these areas and have rated the SDEIS as EC-2, *Environmental Concerns - Insufficient Information* (see enclosed "Summary of Rating Definitions"). In addition, given the constraints and uncertainties related to future availability of water to serve the development, we recommend efforts to maximize water conservation and integrate water use efficiencies through "green infrastructure" into the design of the development.

As noted in our 2007 DEIS comment letter, EPA reviewed the Public Notice for this project and on March 29 2004, objected to the issuance of the Clean Water Act (CWA) permit associated with the project, recommending a thorough assessment of the impacts to waters of the U.S. We also recommended at that time that the DEIS demonstrate the project's compliance with the CWA Section 404(b)(1) Guidelines, including the LEDPA and mitigation for project impacts. After review of the DEIS, we expressed concerns that the DEIS did not demonstrate that wetlands have been avoided to the greatest extent practicable while achieving the basic project purpose. We were also concerned that adequate mitigation for project impacts to waters of the U.S. and habitat had not been included.

We reiterate that the FEIS should include several modifications to the Proposed Project Alternative: 1) demonstrate that waters of the U.S. have been avoided to the greatest extent practicable and/or make modifications to achieve this end, such as low impact development mitigation measures; 2) clearly document this avoidance; 3) support the selection of the Proposed Project Alternative as the LEDPA based on objective criteria; and 4) include a detailed analysis of the Impact Minimization Alternative to satisfy the CWA Section 404(b)(1) Guidelines.

We appreciate the opportunity to review the SDEIS. When the FEIS is released for public review, please send two hard copies to the address above (mailcode: CED-2) when the document is formally filed with our EPA Headquarters Office. We would be happy to discuss additional avoidance measures or low impact development measures with you during the preparation of the FEIS. If you have any questions, please contact me at 415-972-3846 or Carolyn Mulvihill, the lead reviewer for this project at 415-947-3554 or mulvihill.carolyn@epa.gov.

Sincerely,

For 
Nova Blazej, Manager
Environmental Review Office

Enclosures: Detailed Comments
Summary of EPA's Rating Definitions
Excerpt from Barbour *et al* Final Report

cc: Kelly Fitzgerald, USFWS

Impacts to Waters of the U.S.

In a letter dated March 29, 2004 responding to the Clean Water Act (CWA) Section 404 Permit Application Public Notice for the Rio Del Oro Project, EPA expressed concerns regarding the significant wetland impacts. The Supplemental Draft Environmental Impact Statement (SDEIS) indicates that 27.9 acres of jurisdictional waters of the U.S. will be impacted, a slight decrease from the estimate of 30.3 acres noted in the DEIS. The estimated impact on isolated waters remains the same at 12.9 acres. These impacts remain a major concern with respect to cumulative impacts, significant degradation, and an inordinately large compensatory mitigation burden. Approximately 41 acres of total waters are intended for fill, which is significant. Despite the proposed 60 acres of creation and 51 acres of preserved wetlands, we remain concerned over the loss of existing waters of the U.S.

Recommendation:

- Seek additional measures to minimize impacts to aquatic resources, particularly waters of the U.S. Document in the FEIS the acreage of wetlands and waters that will be preserved through avoidance and minimization measures.

Vernal Pools

Our February 15, 2007 comment letter on the DEIS expressed our concerns about the acreage of vernal pool impacts and the density of proposed vernal pool creation. We appreciate the hydrologic analysis of the topography of the proposed onsite preserve area, including Light Detection and Ranging (LIDAR) analysis, described in the SDEIS. We remain concerned, however, about the density of vernal pools proposed for construction in the existing vernal pool complexes. Almost 18 acres of vernal pools are proposed to be constructed within existing complexes, which will nearly double the existing density. While the proposed shapes and locations of new vernal pools, as illustrated in Figure 6 of the Mitigation and Monitoring Plan (MMP), appear natural, this proposed mitigation could be less effective than restoration of altered vernal pool landscapes to a more natural and dynamic ecosystem.

EPA recommends the use of reference pools for comparison with constructed vernal pool functions. Performance standards proposed by Barbour *et al.* are included in the attached excerpt from "Classification, Ecological Characterization, and Presence of Listed Plant Taxa of Vernal Pool Associations in California."¹ While the success criteria listed in Table 4 of the MMP are reasonable, the use of reference pool standards are preferable because they recognize natural variability and the qualities associated with the vernal pool community at the site, rather than utilizing more generic standards. The MMP states that naturally occurring vernal pools will be selected for comparison monitoring, but the number and method of selection are not proposed.

¹ Barbour *et al.*, "Classification, Ecological Characterization, and Presence of Listed Plant Taxa of Vernal Pool Associations in California, United State Fish and Wildlife Service Agreement/Study, May 2007.

Recommendations:

- Seek opportunities to restore altered vernal pool landscapes as part of proposed mitigation for impacts to vernal pools.
- Use criteria based on reference pools at the site to judge the success of constructed vernal pools, and describe proposed methodology for choosing reference pools in the FEIS.

Seasonal Wetlands

Our February 2007 DEIS comment letter also expressed concerns about wetland creation in detention basins for the purpose of both stormwater treatment and compensatory mitigation. Figure 7 of the MMP, the Conceptual Corridor Plan, indicates the location of the riverine (seasonal) wetlands that are proposed for mitigation. These features would be subjected to seasonal inundation by stormwater. EPA is concerned about the potential functions of these wetlands and consequently their value for compensatory mitigation, due to the fact that they would act as “polishing” wetlands and might become contaminated. As such, they could be “attractive nuisances” to wildlife, rather than aquatic resources that provide wildlife habitat and support native plant communities.

While the function of stormwater treatment is important, giving mitigation credit for these wetlands would mean allowing a shift in baseline conditions. Furthermore, the features should be viewed as avoidance and minimization measures to ensure the waters within and downstream of the project area continue to attain water quality standards and provide beneficial uses as appropriate.

The success criteria for seasonal wetlands (Table 7 of the MMP) indicate that “95% of the wetland acreage must be inundated or saturated for period of sufficient duration to support wetland vascular plants as the most prevalent and dominant component.” This criterion is in effect forfeiting 5% of the acreage required for mitigation. EPA recommends that a detailed Geographic Information Systems (GIS) analysis of the created wetlands be performed to determine the exact acreage of wetlands created, and the appropriate amount of credits to be granted, and so that additional creation can be initiated if necessary under an adaptive management plan.

As with the vernal pool creation, EPA recommends that the performance standards for seasonal wetlands and low-flow channels be evaluated against a reference condition. The success criteria proposed in the MMP are too broad.

Recommendations:

- We recommend that additional sites be identified for compensatory mitigation, as the current sites identified for creation of seasonal wetlands will also serve as stormwater treatment, diminishing their value as wildlife habitat. The FEIS should clearly establish the expected functions of all wetlands proposed for preservation or creation.

- Include in the MMP a requirement to perform a GIS analysis of created wetlands to determine the actual acreage of creation and to initiate additional creation under an adaptive management plan if the amount is less than stated in the MMP.
- As with the vernal pool creation, EPA recommends that the performance standards for seasonal wetlands and low-flow channels be evaluated against an onsite reference condition.

Overall Mitigation

EPA appreciates the fact that the majority of mitigation work is scheduled to be performed during Phase 1 of the project to avoid temporal losses.

For all proposed wetland creation areas, we recommend using the California Rapid Assessment Method (CRAM) tool as a supplemental source of information to gauge success of created wetlands. We appreciate that CRAM is proposed for use under Mitigation Measure 3.10-1a for baseline assessment; however, it can also be used in annual monitoring. Scores resulting from the analysis over time can be plotted to determine a rough estimate of the “restoration trajectory” for the created wetlands and waters. Although the SDEIS suggests that CRAM can be used to help establish baseline conditions at the onsite and offsite mitigation locations, this is not reflected in the MMP.

Recommendation:

- For all proposed wetland creation areas, we recommend use of the CRAM tool as a supplemental source of information to gauge success of created wetlands. Document all updates to proposed monitoring in the MMP.

Cumulative Impacts

Our February 2007 DEIS comment letter expressed our concerns about cumulative impacts to the aquatic ecosystem, including loss of vernal pools and habitat due to the numerous development projects proposed in the vicinity of the Rio del Oro project. We also recommended that sponsors of the Rio del Oro project coordinate with project sponsors in the Sunrise Douglas Community Planning Area (SDCPA) to undertake a comprehensive approach to conservation land management, possibly including the proposal to establish over 2,000 acres of wetland preserves in the SDCPA.

We remain concerned about significant degradation and cumulative impacts resulting from developments at Sunrise Douglas, Mather Air Field, the Waegell Family property, Excelsior Estates, Cordova Hills, and Walltown Quarry, all of which are in the vicinity or within the “Mather Core Recovery Area” as designated by U.S. Fish and Wildlife Service for vernal pool species. In particular, it is our understanding that the proposed Cordova Hills project will impact 52 acres of waters of the U.S., all of which are vernal pools, a large increase in impact from the 18 acres that we had previously reported in our February 2007 letter.

Recommendation:

- Include up-to-date information in the Cumulative Impacts section of the FEIS regarding impacts to resources from the various proposed projects in the vicinity of

the Rio del Oro project. Document coordination with project sponsors in the SDCPA and other projects in the vicinity to facilitate optimal wetland and other habitat preservation in the area.

LEDPA Determination

Our February 2007 DEIS comment letter expressed our disagreement with the statement in the DEIS that compliance with the CWA Section 404(b)(1) Guidelines had been shown (DEIS, page 2-3). Our disagreement was based on an insufficient alternatives analysis. Specifically, we questioned the criteria used to determine practicability of the Impact Minimization Alternative. In discussing this alternative, the DEIS briefly analyzed the potential for an increased preserve size, but noted that due to the decrease in retail and commercial development, "[t]he loss of these development impact fees could require a scaling back of the City's vision for added community amenities" (page 2-80). Page 2-81 stated that implementation of the Increased Preserve Alternative would "likely satisfy the USACE NEPA Section 404(b)(1) Guidelines, [but] it was eliminated from further detailed study because it would not achieve the key CEQA project objectives." As we stated in our DEIS comment letter, eliminating an alternative because it would not provide adequate impact fees to support increased community amenities is not reasonable under the CWA Section 404(b)(1) Guidelines.

We remain concerned that the Proposed Project Alternative does not appear to be the Least Environmentally Damaging Practicable Alternative (LEDPA). In particular, the DEIS and SDEIS did not demonstrate that more wetland areas cannot be avoided, such as in the Impact Minimization Alternative, while achieving the basic project purpose. The Impact Minimization Alternative may be practicable based on cost, logistical, and technical feasibility and EPA believes that the FEIS should include a more detailed analysis of the alternatives to determine the LEDPA.

Recommendations:

- The FEIS should analyze the Impact Minimization Alternative in detail in order to support the project's compliance with the CWA Section 404(b)(1) Guidelines and selection of the LEDPA. Clearly defined economic goals should be used to explain the rationale for eliminating the alternative.
- If possible, the Proposed Alternative should be modified to further avoid and minimize impacts to waters of the U.S. The FEIS should discuss how the applicant determined the proposed project is the LEDPA, using acceptable cost, logistical, and technical feasibility criteria, in light of concerns over significant degradation and cumulative impacts.

Consistency with Resource Plans

As stated in the SDEIS, the project site is located within the proposed South Sacramento County Habitat Conservation Plan (SSCHCP) area. While the SSCHCP has not yet been adopted, the project would contribute significantly to habitat impacts in the SSCHCP area and Sacramento County is relying on conservation measures in the proposed SSCHCP to support its planning and development decisions. For these reasons, EPA recommends that the FEIS include

a more detailed analysis of the project's contribution to habitat impacts in the area and its consistency with the SSCHCP.

The SDEIS also states that mitigation would preserve approximately 70% of the onsite vernal pool habitat that is within the Mather Core Area. This appears to be inconsistent with the U.S. Fish and Wildlife Service's *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon*, which recommends that 85-95% of vernal pool habitat within the Mather Core Area be protected. The FEIS should address this inconsistency.

Recommendations:

- Include in the FEIS a detailed analysis of the project's contribution to habitat impacts and describe whether it is consistent with the SSCHCP.
- Include in the FEIS a discussion of consistency with the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon*. Describe what measures have been used to avoid and minimize impacts to vernal pool ecosystems.

Conservation and Water Use Efficiency

In our February 2007 DEIS comment letter, EPA recommended the use of smart growth design and low impact development to minimize increases in traffic congestion and impacts to resources resulting from the project. While the SDEIS states that the proposed residential development would include various design features characteristic of low impact development such as retention ponds, EPA encourages project sponsors to include additional green infrastructure approaches. These features would serve both to protect water quality in the development and adjacent preserve, and assist in water use efficiencies. Examples of green infrastructure that should be considered for the project include permeable pavement, which reduces runoff and assists in groundwater recharge, and rain harvesting, which can utilize simple technologies to preserve and recycle rain water. Detailed information about these and other green infrastructure approaches is available at <http://cfpub.epa.gov/npdes/greeninfrastructure/technology.cfm>.

Efforts to maximize water conservation and water use efficiencies are essential in assuring a long-term, sustainable balance between available water supplies, demand, and ecosystem and public health. These efforts are even more urgent given the projected growth of population and development in California and the risk of multi-year droughts.

Recommendation:

- We recommend that the project include aggressive water use efficiency and conservation measures to ensure the most effective and appropriate use of scarce water supplies. The FEIS should provide specific information on proposed low impact development and water use efficiency, reuse, and conservation measures and which parties could best implement the identified measures. Efficient water use can be enhanced through development, green infrastructure, and drinking water policies. The following reports may be of assistance:

- *Growing Toward More Efficient Water Use: Linking Development, Infrastructure, and Drinking Water Policies.*
(http://www.epa.gov/dced/pdf/growing_water_use_efficiency.pdf)
- *Protecting Water Resources with Higher-Density Development.*
(http://www.epa.gov/smartgrowth/pdf/protect_water_higher_density.pdf)

SUMMARY OF EPA RATING DEFINITIONS

This rating system was developed as a means to summarize EPA's level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the EIS.

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

ADEQUACY OF THE IMPACT STATEMENT

Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

FINAL REPORT,

15 May 2007

**CLASSIFICATION, ECOLOGICAL
CHARACTERIZATION, AND PRESENCE OF LISTED
PLANT TAXA OF VERNAL POOL ASSOCIATIONS
IN CALIFORNIA**

UNITED STATES FISH AND WILDLIFE SERVICE AGREEMENT/STUDY

NO. 814205G238

UNIVERSITY OF CALIFORNIA, DAVIS

ACCOUNT NO. 3-APSF026, SUBACCOUNT NO. FMGB2

SUBMITTED BY:

PROFESSOR MICHAEL G. BARBOUR

PRINCIPAL INVESTIGATOR, DR. AYZIK I. SOLOMESHCH,

MS. JENNIFER J. BUCK

WITH CONTRIBUTIONS FROM:

ROBERT F. HOLLAND

CAROL W. WITHAM

RODERICK L. MACDONALD

SANDRA L. STARR

KRISTI A. LAZAR

Current restoration standards appropriately address hydrology and flora as the most important targets. However, in our opinion, some of the details in those standards are difficult to quantify because of the formulas used. We suggest the following changes:

(1) The current criterion specifies that created pools should not hold water longer and/or deeper than 125% of the values in reference pools. In order to make this criterion more consistent and statistically defensible, it should be amended to state, "Depth and/or duration of ponded water in created pools should not differ statistically ($p = 0.05$) from those in nearby natural pools." That is, the hydrologic variety of created pools should mirror that of the natural pools.

(2) The current criterion is that absolute and relative cover by vernal pool endemics in constructed pools should not be less than the minimum among reference pools. The minimum is not appropriate because that value will often be zero for any given species in at least one or some of the reference pools. Amend to read, "Absolute and relative cover of each vernal pool endemic in constructed pools should not be statistically different ($p = 0.05$) from the average values of each species in reference pools."

(3) The current criterion is that the number of vernal pool endemics in constructed pools should not be less than the lowest number of species among the reference pools. We suggest that the minimum should not be a measure for success because the floristically poorest reference pool may be an anomaly. Amend to read, "The number of vernal pool endemics in constructed pools should not be statistically lower ($p = 0.05$) than the average number of those taxa among reference pools."

(4) The current criterion is slightly modified by adding a statistical requirement: "The vigor (biomass accumulation) and reproductive activity (seed production) of vernal pool endemics in constructed pools should not be statistically lower ($p = 0.05$) than those of the same species in reference pools."

(5) Current criteria do not address exotic species, therefore, we propose a new criterion, "The number and cover of non-native species in any constructed pool should not be significantly higher ($p = 0.05$) than the average among reference pools."

(6) Current criteria are species-oriented rather than community oriented, therefore we propose a new criterion, "The identity of community types in created pools

and the mixture in which they occur should match that of reference pools (using a Sorensen Similarity Index formula where "matching" means an SSI >50%." In other words, constructed pools collectively should contain deep, shallow, and edge community types if reference pools have those community types, meaning that the depth, side slope, shape, and area of created pools should be as diverse as that of reference pools.

(7) A follow-up new criterion, based on (6) above, is that "Reference pools should be chosen subjectively so that collectively they represent the diversity of species and communities that exist in the pools to be taken." We add this criterion to avoid the random selection of inappropriate pools as reference targets, and to address the need to replicate community type diversity in addition to the presence of particular species.

(8) We recommend the deletion of the present criterion, "...any vernal pool endemic that is dominant (>20% relative cover) in at least 30% of the reference pools shall be present as a dominant species in all of the constructed pools." Again, this emphasis on common, widespread dominant species could result in the homogenization of constructed pools. Furthermore, many natural pools would fail to meet this criterion because of innate floristic differences.

TRAINING OPPORTUNITIES

In this report, we have provided names and attributes for an hierarchical series of plant community types, from local associations to more regional alliances, orders, and classes. The task yet to complete is demonstrating the degree of adequacy and usefulness of the classification. If the community types are too difficult to differentiate for the average field botanist, then the classification will not be used for long. If the classification is appropriate, it may still not be used unless it becomes institutionalized, meaning that its use is not only encouraged by agencies, but its use becomes routinely expected.

We propose to develop a training course, with the collaboration of USFWS, the California Department of Fish and Game, and the California Native Plant Society; that is offered on an annual basis. The course would train students on plant identification, sampling protocol for documenting plant community types, the use of an annotated key to

EPA-R-1 *The comment states that EPA provided comments on the 2006 DEIR/DEIS in a February 15, 2007, letter that documented concerns about impacts on waters of the United States, determination of the LEDPA, and habitat impacts.*

Previous comments presented in the letter from EPA dated February 15, 2007, are addressed in responses EPA-1 through EPA-12 of this FEIR/FEIS.

EPA-R-2 *The comment states that after reviewing the 2008 RDEIR/SDEIS, EPA has remaining concerns in the areas of impacts on waters of the United States, determination of the LEDPA, and habitat impacts and has rated the 2008 RDEIR/SDEIS as EC-2, Environmental Concerns—Insufficient Information.*

See response to comment EPA-1 for a discussion of impacts on waters of the United States and the LEDPA. The comment does not specify additional information needed or particular insufficiencies in the 2008 RDEIR/SDEIS.

EPA-R-3 *The commenter recommends efforts to maximize water conservation and integrate water use efficiencies through “green infrastructure” into the design of the development.*

The comment is noted. The project would comply with the Natural Resources Element of the City General Plan, which requires incorporation of all feasible and cost-effective options for conservation and water reuse into the project designs and installation of state-of-the-art irrigation systems that reduce water consumption (e.g., gray-water systems). (Natural Resources Element, Goal NR.5, Policy NR.5.1, and Actions NR.5.1.2 and NR.5.1.3.) In addition, the project would comply with Title 22, Chapter 32.180, “Water Use and Conservation,” of the City’s Municipal Code, which specifies design criteria for irrigation systems and requirements for plant selection. These requirements include but are not limited to installation of irrigation systems that minimize overspray and runoff, use of control valves to account for different site-specific characteristics and use of rain shutoff systems, and installation of plants that are suited to the local climate and require moderate amounts of water (Sections 22.180.070 and 22.180.080). The project applicant(s) have voluntarily agreed to participate in the GreenPoint Rated program for New Homes (or similar equivalent program). A “GreenPoint Rated New Home” is a recognizable and independent seal of approval for green homes that assures home buyers that a home is healthier, more energy efficient, and more resource efficient. One of the categories on which a GreenPoint Rated home is graded is water conservation, and mitigation will be incorporated to require the project to include the GreenPoint Rated label, including water conservation features such as water-efficient toilets. (See response to comment Kopper-R-34.)

The project would be designed and constructed consistent with the Stormwater Manual, published by the Cities of Rancho Cordova, Citrus Heights, Elk Grove, Folsom, Galt, Roseville, and Sacramento and the County of Sacramento (see response to comment EPA-19). The project also includes implementation of a nonpotable-water-use program in which all major landscaping and open space areas within the project site would be irrigated via a nonpotable-water system. The project proposes the use of reclaimed water and GET remediated water for nonpotable uses, as discussed in Impact 3.5-8 of the 2008 RDEIR/SDEIS. As stated in the 2008 RDEIR/SDEIS, the City adopted the Citywide

Recycled Water Distribution Ordinance (Resolution No. 11-2006) on February 6, 2006, stating that new development should install a “purple pipe” recycled-water distribution system (City of Rancho Cordova 2006c). Because of the City’s commitment to the use of recycled water, SCWA and the Sacramento Regional County Sanitation District (SRCSD) are investigating the feasibility of providing recycled-water service. In the long term, it is assumed that future supplies of nonpotable water would be provided by SRCSD or by GET remediated water facilities, when a sufficient supply of nonpotable water is available to meet project demands.

SRCSD has prepared a *Water Recycling Opportunities Study* (SRCSD 2007) to study the feasibility of meeting its goal to increase water recycling throughout the Sacramento region on the scale of 30–40 million gallons per day (mgd) over the next 20 years. A planned expansion of SRCSD’s water-recycling facility could serve new areas of planned and expected growth and areas of public open space, including Zone 40 and the city of Rancho Cordova. The expanded water-recycling facility and new water-recycling service areas will be called Phase II of the SRCSD Water Recycling Program. Phase II construction will be timed with the need for the higher capacity and is currently expected to be in service within 5–10 years. Off-site facilities (i.e., infrastructure, storage tanks, and booster pumps), including those that would serve the Rio del Oro project, would be constructed by SRCSD through Phase II of the SRCSD Water Recycling Program. Implementation of a large-scale water recycling program would be required to undergo a separate, comprehensive review of the program elements to satisfy CEQA requirements. The *Water Recycling Opportunities Study*, however, provides technical information to support a programmatic-level EIR/EIS for Rio del Oro.

Therefore, the project includes a component to implement a recycled-water-use program, although the program may not occur for many years. All major landscaping and open space areas within the project site would be irrigated via a recycled-water system that could be easily converted from a potable-water supply to a nonpotable-water supply at some future date. The draft *Rio del Oro Specific Plan Non-Potable Water Study* (Wood Rodgers 2007b) addressed the viability of providing supplies of nonpotable water to the project site, identified on- and off-site infrastructure needs, and evaluated designs for consistency with the existing Zone 40 WSMP (Wood Rodgers 2007a). The areas to be served by the nonpotable-water system include those with land uses designated as park, streetscape, landscape corridor, greenbelt, school, commercial, public/quasi-public, private recreation, and business park.

EPA-R-4

The comment states that EPA reviewed the public notice for this project and on March 29, 2004, objected to the issuance of a CWA permit, recommending a thorough assessment of impacts on waters of the United States.

The City and USACE believe that a thorough analysis of project impacts on waters of the United States is provided on pages 3.10-25 through 3.10-38 of the 2008 RDEIR/SDEIS.

EPA-R-5

The comment states that EPA also recommended that the 2006 DEIR/DEIS demonstrate the project’s compliance with the Section 404(b)(1) Guidelines, including the LEDPA and mitigation for project impacts.

Although the 2006 DEIR/DEIS did eliminate certain alternatives from further consideration because of their infeasibility and/or inability to meet project objectives, the document is not intended to satisfy the requirements of the CWA Section 404(b)(1) Guidelines. Before USACE approves any permit to fill waters of the United States, USACE must agree that the project applicant(s) have demonstrated that the fill is the

LEDPA. EPA will have an opportunity to review and comment on the Section 404(b)(1) LEDPA analysis. Please also refer to response to comment EPA-1.

EPA-R-6

The comment states that EPA expressed concern in its previous comment letter that the 2006 DEIR/DEIS did not demonstrate that wetlands have been avoided to the greatest extent practicable while achieving the basic project purpose.

See responses to comments EPA-1 and EPA-2.

EPA-R-7

The comment states that EPA also expressed concern in its previous comment letter that the 2006 DEIR/DEIS did not include adequate mitigation for project impacts on waters of the United States.

See response to comment EPA-1. Specific compensatory mitigation added in the 2008 RDEIR/SDEIS includes two elements: purchasing 16.67 acres of created vernal pool habitat at the Clay Station Mitigation Bank, and purchasing the 160-acre Cook Property for off-site compensatory mitigation that would involve preservation of 22.30 acres of naturally existing vernal pool and seasonal wetland habitat within the same core recovery area. The vernal pools present at Clay Station have been monitored for approximately 10 years and have already met success criteria. These wetlands exhibit functions similar to those of the wetland habitat to be affected at the project site and currently support both vernal pool fairy shrimp and vernal pool tadpole shrimp. The Cook Property is contiguous with a large conservation area that provides connectivity to other vernal pool grassland habitat that currently supports listed branchiopod crustaceans.

EPA-R-8

The comment reiterates EPA's previous concern that the FEIR/FEIS should include several modifications to the Proposed Project Alternative: (1) demonstrate that waters of the United States have been avoided to the greatest extent practicable, and/or make modifications to achieve this end, such as low-impact development mitigation measures; and (2) clearly document the avoidance.

See responses to comments EPA-1 and EPA-2.

EPA-R-9

The commenter suggests that the FEIR/FEIS should support the selection of the Proposed Project Alternative as the LEDPA based on objective criteria.

See responses to comments EPA-R-5 and EPA-1.

EPA-R-10

The commenter suggests that the FEIR/FEIS include a detailed analysis of the Impact Minimization Alternative to satisfy the Section 404(b)(1) Guidelines.

The Impact Minimization Alternative is evaluated at an equal level of detail as the Proposed Project Alternative in every section of the 2006 DEIR/DEIS, as well as in the 2008 RDEIR/SDEIS, as required under NEPA. See also response to comment EPA-11 regarding the Section 404(b)(1) Guidelines.

EPA-R-11

The comment states that in a letter dated March 29, 2004, responding to the public notice for the project's Section 404 permit application, EPA expressed concerns regarding the significant wetland impacts.

See responses to comments EPA-1 through EPA-12.

The comment further states that the 2008 RDEIR/SDEIS indicates that 27.9 acres of waters of the United States will be affected, a slight decrease from the estimate of 30.3 acres noted in the 2006 DEIR/DEIS, and that the impact on isolated waters remains the same at 12.9 acres.

The acreage numbers in the 2008 RDEIR/SDEIS have changed slightly from those in the 2006 DEIR/DEIS because the 2.2 acres of vernal pool habitat that would be indirectly affected by project implementation were erroneously added twice in the acreage calculation for the 2006 DEIR/DEIS. See page 3.10-25 of the 2008 RDEIR/SDEIS. The change however, does not alter the conclusions stated in the 2008 RDEIR/SDEIS.

The comment expresses concern about cumulative impacts, significant degradation, and an inordinately large compensatory mitigation burden and states that approximately 41 acres of total waters intended for fill is significant and, despite 60 acres of creation and 51 acres of preserved wetlands, EPA remains concerned about the loss of existing waters of the United States.

The 2008 RDEIR/SDEIS acknowledges that impacts related to loss of existing waters of the United States would be significant, and mitigation measures are provided. Although direct significant impacts would be reduced to a less-than-significant level, indirect impacts would remain significant and unavoidable after mitigation implementation (see Impact 3.10-1 on pages 3.10-25 through 3.10-45 of the 2008 RDEIR/SDEIS).

The comment recommends that additional measures to minimize impacts on aquatic resources, particularly waters of the United States, be sought and that the FEIR/FEIS document the acreage of wetlands and waters that will be preserved through avoidance and minimization measures.

Please refer to response to comment EPA-R-7 for additional measures included in the 2008 RDEIR/SDEIS to mitigate impacts on waters of the United States. Minimization measures include maintaining micro watersheds; providing a 250-foot buffer around preserved and created wetlands and urban development; and incorporating low-impact development features, water quality ponds, and retention/detention ponds to help maintain water quality, peak flows, runoff volumes, and runoff durations (see Mitigation Measures 3.10-1a and 3.10-1b on pages 3.10-40 through 3.10-45 of the 2008 RDEIR/SDEIS). The Impact Minimization and No Federal Action Alternatives, evaluated at an equal level of detail in the 2008 RDEIR/SDEIS, provide greater avoidance of waters of the United States.

EPA-R-12

The comment states that the EPA comment letter dated February 15, 2007, expressed concern about the acreage of vernal pool impacts and the density of vernal pools proposed to be created. The comment expresses appreciation for the hydrologic analysis described in the 2008 RDEIR/SDEIS, but states that concerns remain about the density of vernal pools proposed for construction in existing complexes, which would nearly double existing densities.

As indicated by the hydrologic analysis described on pages 3.10-33 through 3.10-35 of the 2008 RDEIR/SDEIS, project implementation is not expected to decrease the watershed ratios below levels necessary to sustain existing depressional wetlands or the proposed 13.5 acres of compensatory vernal pools. According to the model, the proposed on-site wetland preserve could accommodate and support an additional 50 acres of vernal pool habitat without compromising the existing hydrology. The commenter provides no

evidence that the hydrologic model is flawed or that creating 13.5 acres of compensatory vernal pools would compromise the integrity of existing pools.

The comment also states that although the proposed shapes and locations of new vernal pools provided in the draft wetland MMP appear natural, this proposed mitigation could be less effective than restoring altered vernal pool landscapes to a more natural and dynamic ecosystem. The comment recommends seeking opportunities to restore altered vernal pool landscapes as part of proposed mitigation for impacts on vernal pools.

As stated in the 2009 update to the 2007 draft wetland MMP (Appendix Q of the 2008 RDEIR/SDEIS), which is included as Appendix Q of this FEIR/FEIS, on-site compensatory vernal pools would be created wherever possible within the footprints of previously existing vernal pools that were eliminated through past land use activities. These historic pool footprints are visible on aerial photography, and a soils analysis conducted by Davis² Consulting Earth Scientists (Davis² 2007) indicates that soils here are still conducive to pool formation. GIS analysis of LIDAR-derived topography, review of historic aerial topography, and results of the soils analyses would be used to refine the configuration of the compensatory wetlands. The goal of such refinements would be to ensure that each wetland feature would contain an adequate watershed and that proposed compensatory wetlands would not compromise the microwatersheds of existing individual vernal pools. This strategy would provide optimal siting of compensatory pools and maximize the potential for successful creation. The commenter has provided no evidence that restoring altered vernal pools off-site would be more successful than planned on-site creation; nor is there any guarantee that suitable altered vernal pool habitat would even be available for restoration in the project vicinity. Therefore, the creation of on-site compensatory vernal pools within the footprints of previously existing vernal pools eliminated through past land use activities is appropriate mitigation.

The comment recommends the use of reference pools for comparison with constructed vernal pool functions and performance standards proposed by Barbour et al. (2007) in Classification, Ecological Characterization, and Presence of Listed Plant Taxa of Vernal Pool Associations in California. The comment states that success criteria listed in Table 4 of the draft wetland MMP (Appendix Q of the 2008 RDEIR/SDEIS) are reasonable, but that using reference pool standards is preferable to using more generic standards because reference pool standards recognize natural variability and the qualities associated with the vernal pool community at the site. The comment notes that the draft MMP states that naturally occurring vernal pools will be selected for comparison monitoring, but the number and method of selection are not proposed. The comment recommends using criteria based on reference pools at the site to judge the success of constructed vernal pools and recommends that the FEIR/FEIS describe the methodology for choosing reference pools.

As stated in the draft wetland MMP updated by ECORP in 2009 (see Appendix Q of this FEIR/FEIS), reference pools would be used for comparison monitoring. Mitigation Measure 3.10-1a of the 2008 RDEIR/SDEIS requires that the wetland creation section of the final wetland MMP include reference locations for comparison to compensatory vernal pools to document success. The reference wetlands will be analyzed according to methodology similar to that described by Barbour et al. (2007), but modified by discussions between EPA and ECORP staff. These data will establish baseline conditions for the preserved wetlands and provide a basis for comparisons with constructed and/or restored wetlands. Performance standards similar to these standards proposed by Barbour

et al. have also been incorporated into the 2009 MMP as success criteria for vernal pools as follows:

Hydrology:

- ▶ Depth and/or duration of ponded water in constructed pools and nearest neighbor pools should not differ statistically from that of the reference pools.

Vegetation:

- ▶ Absolute and relative cover of each vernal pool endemic in constructed pools and the nearest neighbor pools should not be statistically different from the average values of each species in reference pools.
- ▶ The number of vernal pool endemics in constructed pools and the nearest neighbor pools should not be statistically lower than the average number of those taxa among reference pools.
- ▶ The number and cover of nonnative species in any constructed pool and any nearest neighbor pools should not be significantly higher than the average among reference pools.

At the end of the 10-year monitoring period, the constructed pools and nearest-neighbor pools must meet the success criteria with 3 years of no human intervention for compensatory mitigation to be considered successful.

Mitigation methodology and standards are subject to USACE approval, and to approval by the City and the Central Valley RWQCB, as appropriate depending on agency jurisdiction, and as determined during the Section 401 and Section 404 permitting processes. A final MMP would be approved by these agencies before issuance of permits and before any ground-disturbing activity within 250 feet of wetlands or waters of the United States.

EPA-R-13

The comment states that in a letter dated February 15, 2007, EPA expressed concerns about creating wetlands in detention basins for the purpose of both stormwater treatment and compensatory mitigation. The commenter refers to Figure 7 of the draft wetland MMP, which indicates the locations of riverine (seasonal) wetlands proposed for mitigation. The comment stresses that EPA remains concerned about these wetlands' potential water quality treatment functions and their value as compensatory wetlands because they could become contaminated over time and be attractive nuisances to wildlife, rather than providing valuable wildlife habitat and supporting native plant communities.

The comment further states that although the function of stormwater treatment is important, giving mitigation credit for these wetlands would mean allowing a shift in baseline conditions. The comment recommends regarding these features as avoidance and minimization measures for ensuring that water quality standards and beneficial uses within and downstream of the project site are maintained.

The corridors would range from 200 to 300 feet wide and would consist of a meandering low-flow channel, adjacent wetlands, riparian plantings, and a bike trail. Moreover, these drainage corridors include water quality treatment swales and basins, for which no compensatory credit is sought. The swales and basins would provide a cleansing and

polishing function, treating stormwater and nuisance flows before their release into the proposed low-flow channels and adjacent wetland habitat that would be created. Increased flows caused by an increase in impervious surfaces would be directed to these drainage corridors and would not be connected to the vernal pool habitat that would be permanently preserved within the proposed 507-acre vernal pool preserve. Although it would be necessary to discharge a small amount of runoff into the preserve area because of the topography of Rancho Cordova Parkway, this water would be treated using a vegetated swale and trench system that would be constructed adjacent to the road within the preserve. LIDAR analysis confirms that this discharge would not affect the vernal pools within the preserve. Thus, the wetlands are not intended to act as “polishing” wetlands and there is minimal likelihood that these wetlands would become contaminated by stormwater. None of the current seasonal wetland creation sites identified for compensatory mitigation would serve as stormwater treatment.

The project would also implement the stormwater drainage system contained in the *Master Drainage Study for Rio del Oro* (Wood Rodgers 2005). In addition, the project would implement the storm water pollution prevention plan and associated water quality BMPs discussed in Mitigation Measure 3.4-3 of the 2006 DEIR/DEIS (e.g., permanent vegetative cover, drainage swales, ditches and earth dikes to control runoff). These measures are designed to meet the requirements established in the City’s joint NPDES permit, which controls water pollution by regulating point sources that discharge pollutants into waters of the United States and regulates all wet- and dry-weather runoff discharge in Sacramento County. Thus, before approval of the final small-lot subdivision map for all project phases, detailed hydrology plans and a water quality study would be required and prepared by a qualified engineer retained by the project applicant(s).

Drafts of these plans would be submitted to the City for review and approval concurrently with development of tentative subdivision maps for all project phases. These plans would finalize the water quality improvements and further detail the structural and nonstructural BMPs proposed for the project. The plans would include a quantitative analysis of proposed conditions, incorporating a combination of water quality bioswales and water quality detention basins that would connect with the main drainage channels. The water quality study would provide calculations showing that the proposed water quality BMPs would meet or exceed requirements established by the Central Valley RWQCB and would provide details regarding the size, geometry, and functional timing of storage and release (Mathies, pers. comm., 2005).

Moreover, in light of the commenter’s concerns, the currently proposed (June 2009) wetland MMP has altered the acreage of seasonal wetlands proposed for construction in the drainage parkways and detention basins. Specifically, compensatory wetlands are no longer proposed in the detention basins and the 2009 plan calls for the construction of 16.941 acres of compensatory seasonal wetlands within the drainage parkways instead of 20.785 acres proposed in the 2007 plan.

The preserve configuration would also be designed to maintain existing hydrology to preserve compensatory vernal pool habitat. Areas adjacent to the preserve generally flow away from the preserve; therefore, development of these areas would not compromise the hydrology of the protected resources. The project would incorporate measures to assure water quality in the preserve area. Under Mitigation Measure 3.4-1 in the 2006 DEIR/DEIS, water quality impacts would be reduced by requiring that drainage plans demonstrate that off-site upstream runoff would be appropriately conveyed through the project site, and that project-related on-site runoff would be appropriately contained in

detention basins. The project would include 187 acres of drainage corridors and open space.

The comment further states that success criteria for seasonal wetlands, as provided in the draft wetland MMP, indicate that 95% of wetland acreage must be inundated or saturated long enough to support wetland vascular plants as the most prevalent and dominant component and that, in effect, this criterion is forfeiting 5% of the acreage required for mitigation. The comment recommends performing a detailed GIS analysis of the created wetlands to determine the exact acreage of wetlands created and the amount of credits to be granted so that additional creation can be initiated, if necessary, under an adaptive management plan.

The final wetland MMP approved for the project by USACE would detail proposed wetland restoration, enhancement, and/or replacement activities that would ensure no net loss of aquatic functions in the project vicinity, as required by USACE, the Central Valley RWQCB, and Natural Resources Element of the City General Plan. The success criteria for seasonal wetlands provided in the MMP have been used in the past because a portion of naturally occurring wetlands and constructed wetlands is a transition zone sometimes referenced as a “wetland fringe.” This area typically saturates, but is generally not dominated by wetland plants; however, it is floristically different from the adjacent upland. USACE has previously used this approach. The intent of the criteria is not to lessen the amount of compensatory mitigation required, only to ensure that the hydrologic regime is appropriate for wetland species. In practice, a GPS unit accurate to less than 1 meter would be used to calculate the total functioning wetland acreage created. This area would be assessed against all of the criteria to determine whether the created habitat is successful. The total functioning acreage must equal the compensatory mitigation requirement.

The compensatory mitigation proposal includes the creation or restoration of in-kind aquatic habitats at a sufficient ratio of created to affected aquatic habitat to offset the functions of the aquatic environment that would be lost. Compensatory wetland mitigation would be completed in phases so that it would be in place and functioning before the associated impacts would occur. In this way, temporal losses would be minimized. The final MMP would identify corrective measures to be implemented if success criteria and compensatory mitigation ratios were not met.

The comment recommends identifying additional sites for compensatory mitigation because the current sites identified for creation of seasonal wetlands would also serve as stormwater treatment, diminishing their value as wildlife habitat. The comment states that the FEIS should clearly establish the expected functions of all wetlands proposed for preservation or creation.

As discussed above, the currently proposed (June 2009) wetland MMP does not propose compensatory wetland creation in the detention basins and the acreage of seasonal wetlands to be constructed in the drainage parkways has been reduced from 20.785 acres to 16.941 acres. Additional compensatory wetlands would be constructed in the 507-acre preserve and mitigation credits have been purchased at the Clay Station Mitigation Bank. The project applicant(s) would also preserve 22 acres of wetland habitat at an off-site location known as the Cook Property. The low flow channels and seasonal wetlands proposed within the drainage corridors have been designed to ensure that they do not serve as stormwater treatment through the creation of adjacent waterquality swales and basins, which would filter and store runoff prior to being released within the low flow channels and adjacent seasonal wetlands. In addition, under Mitigation Measure 3.4-1 the

project would also incorporate measures to ensure stormwater runoff does not negatively impact water quality in the preserve area. Therefore, no identification of additional sites for compensatory mitigation is necessary.

The comment also recommends performing a GIS analysis of created wetlands to determine the actual acreage of creation, and initiating additional creation under an adaptive management plan if the amount is less than stated in the MMP.

Construction as-built drawings would be prepared after completion of construction activities to ensure that the appropriate amount of wetland habitat was built. After the first rainy season after vernal pool construction, the acreage of the constructed vernal pool habitat would be mapped using field assessed topography, limits of ponding, and hydrophytic vegetation. Mapping would initially be digitized from an aerial photo, then ground-truthed to refine the boundaries. Any changes would be made to the digitized map using a GPS unit accurate to less than 1 meter. These data would be used to calculate that the total vernal pool acreage is functioning and functioning appropriately. The “constructed” as-built and “functioning” as-built drawings would be included in the annual monitoring reports and would verify that the acreage of wetland habitat required by the compensatory mitigation has been constructed. The final MMP, as approved by USACE, USFWS, and/or other applicable agencies, would include remediation and contingency measures to be followed if the success criteria of created waters of the United States and wetlands are not met or if there are fewer acres than required.

The comment further recommends evaluating the performance standards for seasonal wetlands and low-flow channels against an on-site reference condition.

A total of 30 historic preserved vernal pools within the wetland preserve would be used as reference vernal pools for the vernal pool compensatory mitigation and would be monitored along with the constructed and other historic nearby features. Success monitoring of the wetland preserve would be conducted to determine whether the overall goal of wetland construction was being accomplished and to develop and implement corrective measures, if necessary. California Rapid Assessment Method (CRAM) assessments would be conducted on the wetlands within the on-site wetland preserve to track changes in wetland function and values, and to help identify the source of any adverse conditions within the wetland preserve. CRAM data were collected in the wetland preserve in the early summer 2008 to provide a baseline (preproject condition) to which later data may be compared. No reference seasonal wetland or channel features, however, are proposed to be monitored for the wetlands constructed within the open space corridors. Using an on-site reference condition for seasonal wetlands would not be a valuable indicator of success because on-site seasonal wetlands are of low quality as a result of historic dredger mining. Thus, no reference seasonal wetlands are currently present to use as reference wetlands for the open space corridors.

EPA-R-14

The comment expresses appreciation that the majority of mitigation work is scheduled to be performed during Phase 1 of the proposed project to avoid temporal losses.

The comment is noted.

The comment goes on to recommend that CRAM for Wetlands be used as a supplemental source of information to gauge the success of created wetlands. The comment expresses appreciation that CRAM is proposed for use under Mitigation Measure 3.10-1a for baseline assessment, but suggests that CRAM would also be useful in annual monitoring

because CRAM scores can be plotted over time to determine a rough estimate of the “restoration trajectory” for the created wetlands and waters.

As indicated in Mitigation Measure 3.10-1a of the 2008 RDEIR/SDEIS, CRAM data would be used to evaluate current conditions and serve as a baseline for future monitoring. As noted in response to comment EPA-R-13, the initial CRAM analysis was conducted during early summer 2008. The CRAM data collected during the initial assessment would serve as the baseline (preproject condition) to which data collected during future monitoring efforts would be compared. As shown in Chapter 5 of this FEIR/FEIS, the following sentence is hereby added to Mitigation Measure 3.10-1a on pages 3.10-40 and 3.10-41 of the 2008 RDEIR/SDEIS:

Monitoring reports shall include baseline CRAM scores and the CRAM scores from all previous years shall be plotted to show the “restoration trajectory.”

The comment further states that although the 2008 RDEIR/SDEIS suggests that CRAM can be used to help establish baseline conditions at the on-site and off-site mitigation locations, this is not reflected in the MMP. The commenter recommends documenting all updates to future monitoring in the MMP.

The commenter’s suggested use of CRAM is required as part of Mitigation Measure 3.10-1a of the 2008 RDEIR/SDEIS. The initial CRAM baseline investigation has been completed and the use of CRAM has been incorporated into the 2009 draft MMP, which is attached as Appendix Q to this FEIR/FEIS.

EPA-R-15

The comment states that EPA remains concerned about cumulative impacts on the aquatic ecosystem, including loss of vernal pools and habitat from the numerous development projects proposed in the vicinity of the Rio del Oro project site, including those at Sunrise Douglas, Mather Air Field, the Waegell Family Property, Excelsior Estates, Cordova Hills, and Walltown Quarry, all of which are within or in the vicinity of the Mather Core Recovery Area as designated by USFWS for vernal pool species. The comment also states that the February 15, 2007, letter recommended that sponsors of the Rio del Oro project coordinate with sponsors of the Sunrise Douglas Community Planning Area to undertake a comprehensive approach to conservation land management, possibly including a proposal to establish more than 2,000 acres of wetland preserves in the Sunrise Douglas Community Plan area.

See responses to comments EPA-6 and EPA-7.

The comment expresses particular concern that the proposed Cordova Hills project would affect 52 acres of vernal pools that are waters of the United States and states this is a large increase in impacts from the 18 acres reported in EPA’s comment letter of February 15, 2007.

USACE has determined that the proposed Cordova Hills project would affect 39.4 acres of waters, including approximately 15.4 acres of vernal pools, 14 acres of seasonal wetland swales that may contain habitat for vernal pool crustaceans, rather than 52 acres of vernal pools as stated by the commenter. Regardless, this EIR/EIS has already determined that the project would result in a cumulatively significant contribution to the cumulatively considerable impact relating to loss of vernal pools in the region. (See 2008 RDEIR/SDEIS pages 3.10-71 and 3.10-72.)

The comment recommends that the cumulative impacts analysis in the FEIR/FEIS include updated information regarding impacts on resources from the various proposed projects in the vicinity of the project site.

Because of current market conditions, the City and USACE believe that the cumulative impacts analysis contained in the 2008 RDEIR/SDEIS represents the most current information available regarding the various proposed projects in the vicinity of the project site.

The comment further recommends that the FEIR/FEIS document coordinate with project sponsors in the Sunrise Douglas Community Plan area and other projects in the vicinity to facilitate optimal wetland and other habitat preservation in the area.

See response to comment EPA-6.

EPA-R-16

The comment states that EPA remains concerned, as expressed in its comment letter dated February 15, 2007, that the Proposed Project Alternative does not appear to be the LEDPA. The comment points out in particular that the DEIS and SDEIS did not demonstrate that more wetland areas cannot be avoided, as proposed in the Impact Minimization Alternative, while still achieving the basic project purpose. The comment states that the Impact Minimization Alternative may be practicable based on cost, logistical, and technical feasibility and that EPA believes the FEIS should include a more detailed analysis of the alternatives to determine the LEDPA.

See responses to comments EPA-1 and EPA-2 and EPA-R-5, EPA-R-6, EPA-R-8, EPA-R-9, and EPA-R-10.

EPA-R-17

The comment states that although the draft SSCHCP has not yet been adopted, the project would contribute significantly to habitat impacts in the draft SSCHCP area, and the County is relying on conservation measures in the proposed HCP to support its planning and development decisions. The comment recommends that the FEIR/FEIS include a detailed analysis of the project's contribution to habitat impacts and describe whether it is consistent with the draft SSCHCP. The comment also states that preservation of approximately 70% of the on-site vernal pool habitat, as proposed in the 2008 DEIR/SDEIS, is inconsistent with the USFWS's vernal pool recover plan.

For most species, the draft SSCHCP proposes to establish preserves located entirely outside the Urban Development Area. Because the draft SSCHCP has not been completed and adopted and these preserves have not been established yet, it is not possible or appropriate to evaluate project consistency with the draft SSCHCP. Furthermore, the draft SSCHCP does not promote establishment of independent on-site project preserves for most species, and habitat used for conservation has to be evaluated for suitability and approved by the draft SSCHCP. CEQA does not require that a project consider consistency with a law, order, regulation, policy, or plan that is still in a draft state and has not been adopted, certified, or ratified.

A separate EIR/EIS will be prepared for the draft SSCHCP. The public will have an opportunity to comment on the conservation strategies included in the draft SSCHCP before the EIR is certified and the project is adopted. Should the Rio del Oro project applicant(s) and permitting agencies decide to pursue coverage under the draft SSCHCP rather than proceed with the mitigation as outlined in the 2008 RDEIR/SDEIS, the lead agencies would have to review the revised project to determine whether the project's scope would change enough or whether any previously undisclosed significant impacts

would result that would warrant a subsequent or supplemental environmental analysis. However, it is more likely the case that this project will receive its 404 permit approvals and associated biological opinion before the SSCHCP is adopted. Should additional analysis be deemed necessary, the public would have a chance to review any such analysis circulated for review pursuant to CEQA.

See response to comment USFWS-5 regarding consistency with USFWS's vernal pool recovery plan.

EPA-R-18

The comment encourages the Rio del Oro project to include additional "green infrastructure" approaches, including the use of permeable pavement and rain harvesting, to protect water quality on the project site and in the adjacent preserve and to assist in water use efficiencies.

See response to comment EPA-R-3. The Rio del Oro project would incorporate water supplies and infrastructure to promote water conservation through the project development, project infrastructure, and water supply and infrastructure. Resolution 11-2006, adopted by the City Council on February 6, 2006, includes the use of nonpotable water for "urban irrigation use only in new parks, golf courses, school fields, streetscapes, etc." The *Rio del Oro Non-Potable Water Master Plan* (prepared in February 2007, updated June 2007) includes the above use, including irrigation of commercial and industrial land uses. See Impact 3.5-8 (pages 3.5-82 through 3.5-86) of the 2008 RDEIR/SDEIS for additional information about the use of recycled water at the project site.

The project would comply with the City General Plan's Natural Resources Element, which requires incorporation of all feasible and cost-effective conservation and water reuse options into project designs and installation of state-of-the-art irrigation systems that reduce water consumption (e.g., gray-water systems) (Natural Resources Element, Goal NR.5, 1, Policy NR.5.1, and Actions NR.5.1.2 and NR.5.1.3). In addition, the Rio del Oro project would comply with Title 22, Chapter 32.180, "Water Use and Conservation," of the City's Municipal Code, which specifies criteria for irrigation system design and plant selection requirements. These requirements include but are not limited to installing irrigation systems that minimize overspray and runoff, using control valves to account for different site-specific characteristics and using rain shutoff systems, and installing plants that are suited to the local climate and require moderate amounts of water (Sections 22.180.070 and 22.180.080).

The commenter's request for on-site rainwater catchment is noted; however, CEQA does not require an agency to adopt every mitigation scheme or alternative brought to its attention or proposed in an EIR. (*San Franciscans for Reasonable Growth v. City and County of San Francisco* [1989] 209 Cal.App.3d 1502, 1519 [*San Franciscans for Reasonable Growth*].) A public agency's duty to condition a project's approval on incorporation of mitigation measures, however, arises only when such measures (1) are feasible and (2) would "substantially lessen" a significant environmental effect. (Public Resources Code, Section 21002.) Because the RDEIR/SDEIS concludes that impacts on water supply would be less than significant with incorporation of identified mitigation, the commenter's suggested mitigation is not necessary to "substantially lessen" a significant environmental effect.

Moreover, it is not evident that such systems would be feasible for the project. Although rainwater capture is used in many water-short places, there are a number of limitations to its functionality. It would not be practical for the average Rio del Oro property owner to

store enough rainwater for a practical use, such as to adequately treat landscaping. In Sacramento County, the rainwater catchment receptacle would be filled only during the rainy season (November through March). As a practical matter, an average belowground water cistern would be limited in size to about 8 feet in diameter and 14 feet in depth. This would hold about 5,000 gallons when full. This quantity would fall short of the necessary requirements of most residential landscaping in Sacramento County, about 1,500 gallons of water per week to irrigate a typical home lawn/landscape with one-half inch of water, especially during the summer months when no additional precipitation occurs to replenish the cistern. The cistern water would then need to be pumped out and delivered to its desired location, thus causing increased energy use. The cost of the systems would also be prohibitive, ranging from \$1,500 to \$3,000 for the tank and pump systems, and equating to a total of \$17.4 to \$34.8 million for the 11,601 planned homes in the project area. The lack of a significant environmental effect to substantially lessen and the high cost of such systems, therefore, makes rainwater catchment systems unnecessary and infeasible for the project.

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SECTION B

State Agencies



California Regional Water Quality Control Board

Central Valley Region



Karl Longley, ScD, P.E., Chair

Linda Adams
Secretary for
Environmental
Protection

Sacramento Main Office
Internet Address: <http://www.swrcb.ca.gov/~rwqcb5/home.html>
11020 Sun Center Drive, Suite 200, Rancho Cordova 95670-6114
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Arnold Schwarzenegger
Governor

13 June 2008

Patrick Angell
City of Rancho Cordova Planning Department
2729 Prospect Park Drive
Rancho Cordova, CA 95670

Anna Sutton
U.S. Army Corps of Engineers, Sacramento
District Regulatory Branch
1325 J Street, Room 1480
Sacramento, CA 95814-2922

RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT, RIO DEL ORO SPECIFIC PLAN PROJECT

Thank you for the opportunity to review the subject recirculated draft document. Regional Board staff reviewed the document and our comments on the pertinent sections (water supply and biological resources) of the original draft CEQA document and our comments are as follows:

A Water Supply Comments:

1. In some instances, the current conditions on water supply availability and water supply project plans is different than what is discussed in the revised document. Those differences include, but are not limited to:
 - i) The agreements between the Sacramento County Water Authority (SCWA) and Aerojet and the Boeing Company have been terminated by the SWCA or the agreement itself. Therefore, reliance on the use of the remediated groundwater as proposed is not an option at this time. The Sacramento County Board of Supervisors certified the CEQA document for the Eastern Sacramento County Replacement Water Supply Project and then decided not proceed with the project. This does not mean that the remediated groundwater produced by Aerojet and Boeing should not be considered for use at the project (see following comment). It is just that the SCWA Freeport project will not rely on the remediated groundwater as one of the sources for its supply.
 - ii) The project relies on Golden State Water Company (GSWC) to provide at least the initial startup water (Phase 1A) based on discussions with GSWC in 2005. GSWC's current situation is not the same as it was in 2005. In 2005 the Aerojet-SCWA agreement was in place that would provide replacement water to GSWC for supplies lost in the future and provide 5000 acre-feet of water to replace past losses. With the termination of the Aerojet-SCWA agreement and the cancellation of the replacement water supply project by SCWA, the ability for GSWC to supply water needs to be re-evaluated. In addition, pollutants have impact several of the GSWC

Our mission is to preserve and enhance the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations.

water supply wells since 2005 that could compromise its ability to supply water for the project in the near and/or long term

2. The remediated groundwater produced by Aerojet and Boeing should be considered as source for all non-potable water needs for the Rio Del Oro project, as well as future projects on in the surrounding area (Glenborough at Easton, Westborough at Eason, Easton Place, and Cordova Hills, and others). The remediated groundwater is a high quality reclaimed water that is far superior to traditional reclaimed water produced by wastewater treatment plants. The remediated groundwater meets drinking water standards for the pollutants of concern and can be available in time to serve the Rio del Oro project. It is our understanding that SCWA is in negotiations with Aerojet regarding water supply replacement and supply issues.
3. In order to be able to adequately utilize the remediated groundwater, and potentially future reclaimed water from the Sacramento County Sanitation District, reclaimed water piping should be required for all landscaping areas on the project, including front and rear landscaping of residences. There are several adverse impacts resulting from not providing such reclaimed water infrastructure and subsequent use of the remediated groundwater. Utilizing potable water for non-potable needs is much more environmentally adverse than utilizing the available remediated groundwater. If potable is used for non-potable uses, the water will have had to be pumped uphill all the way from the Sacramento River and treated to meet drinking water standards. Whereas the remediated groundwater would require only minimal (if any) additional treatment and is located just uphill from the project area. Using potable water for non-potable purposes is therefore an unnecessary cost in both money and energy use that can easily be avoided. An additional benefit of the remediated groundwater is that it is available at all times and not subject to cutbacks due to dry conditions. This request reiterates that we supplied on the original draft CEQA document for the project.

B Biological Resource Section Comments:

1. The following comments were originally supplied by our office on the initial draft CEQA document. There is nothing in the revised section that would cause us to change the comments:
 - i) Page 3.10-32, Impact 3.10-2, third paragraph. This paragraph states that the 57 acres of cottonwood-willow riparian forest on the site present the highest habitat value of all the riparian habitat types present. As this forest is adjacent to the proposed wetland preservation area, we recommend that the wetland preservation area be expanded to include this cottonwood-willow riparian forest. No justification is provided for not including this high-quality habitat in the area being preserved.
 - ii) The proposed development of the Alpha/IOC-1 Complex (Area 44) is designated as private recreation. What does private recreation entail? The area should not be used for activities that will present adverse impacts onto the adjacent wetlands preserve. Activities such as golf courses discharge pollutants that are incompatible with a wetland preserve.
-

If you have questions regarding these comments, please call me at (916) 364-4625 or by e-mail at amacdonald@waterboards.ca.gov.



ALEXANDER MACDONALD
Senior Engineer

cc: Ed Cargile, Department of Toxic Substances Control, Sacramento
Rodney Fricke, Aerojet-General Corporation, Sacramento

CVRWQCB-R-1

The comment states that current conditions on water supply availability and water supply project plans differ from what is discussed in the 2008 RDEIR/SDEIS. The comment further states that the agreements between SCWA and Aerojet and the Boeing Company have been terminated and that reliance on the use of remediated groundwater as proposed is no longer an option. The County Board of Supervisors certified the CEQA document for the Eastern Sacramento County Replacement Water Supply Project but decided not to proceed with the project, so the SCWA Freeport project will not rely on the remediated groundwater as one of the sources for its supply.

Although the 2003 agreements between SCWA and Aerojet and the Boeing Company have been terminated, SCWA and Aerojet have entered into a new (2010) agreement (“2010 Agreement”) under which Aerojet is transferring 8,900 afy of GET water to SCWA. Under the 2010 Agreement, SCWA acknowledges that the 8,900 afy will provide SCWA with sufficient available water to supply the Project, and shall further confirm this fact in writing to the City. The 8,900 afy along with other available Zone 40 water (including 1,500 afy under the SCWA conjunctive use program) is sufficient to meet the Project demand of 8,891 afy. The amount of water available under the 2010 agreement – 8,900 afy – is sufficient for build-out for the entire project, even if the 1,500 afy expected through the SCWA conjunctive-use supplies, for whatever reason, does not become available as expected. Thus, the water supply for the Project is reasonably likely to be available under the standards set forth in *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal.4th 412. (See Master Response 1, “Adequacy of Long-Term Water Supply,” in Chapter 3 of this FEIR/FEIS.)

Furthermore, although the County did not approve the RWSP, as discussed on page 3.5-7 of the 2008 RDEIR/SDEIS, the Rio del Oro project would not rely on the RWSP for water supply. The RWSP was a project under which SCWA would receive essentially all of Aerojet’s GET remediated water discharged to the American River, and in return SCWA would have certain obligations to provide water to the Folsom South Canal and have certain pipeline obligations to implement its project. The RWSP is not required to ensure that GET water is available for the Rio del Oro development, however. The 2010 Agreement assures that there will be adequate water to serve the Project even without the approval of the RWSP.

CVRWQCB-R-2

The comment states that the ability of GSWC to supply water to Phase 1A of the Rio del Oro project, as proposed, needs to be reevaluated because of the termination of the Aerojet-SCWA agreement and the cancellation of the replacement water supply project by SCWA.

The project would not rely on “replacement water” from GSWC to provide the initial water supply for Phase 1A. The supply from GSWC is a separately secured supply based on discussions with GSWC in 2005 and more recent discussions with GSWC in July 2008. (See 2008 RDEIR/SDEIS Table 3.5-6 and accompanying text and pages 3.5-34 and 3.5-35; page 5-2 [Gisler, Ernest. Engineering and planning manager. Golden State Water Company (formerly Southern California Water Company). Rancho Cordova, CA. July 29, 2005—letter to Russell Davis of Elliott Homes regarding water supply].) Therefore, termination of the 2003 SCWA and Aerojet agreement and cancellation of the RWSP do not bear on the separate agreement GSWC has made to supply water for Phase 1A. It

should be noted that requests for small-lot tentative subdivision maps would now be pursued as part of later entitlements (Tier 2), as described in Chapter 2 of this FEIR/FEIS, and not part of the Tier 1 entitlements.

CVRWQCB-R-3

The comment states that pollutants have affected several of the GSWC water supply wells since 2005, which could compromise GSWC's ability to supply water for the project in the near and/or long term.

The GSWC wells that have been affected by contamination have been taken offline, and supplies from these wells were not assumed as part of the water available to supply Phase 1A of the project. GSWC can provide the initial water supply for the units in Phase 1A even without the GSWC wells taken out of operation because of groundwater contamination.

CVRWQCB-R-4

The comment suggests that the remediated groundwater produced by Aerojet and Boeing be considered as source for all nonpotable water needs for the Rio del Oro project, as well as future projects in the surrounding area. The comment states that the remediated groundwater is far superior to traditional reclaimed groundwater produced by wastewater treatment plants, and indicates the commenter's understanding that SCWA is believed to be in negotiations with Aerojet regarding water supply replacement and supply issues.

The City agrees with the commenter's assessment that the remediated groundwater produced by Aerojet and the Boeing Company (known as GET remediated water) is an appropriate source water to serve the nonpotable needs of the Rio del Oro project and, potentially, other projects in the area. The potential for using GET remediated water as a source for nonpotable needs for the project has been discussed. If used, GET remediated water would be conveyed through the purple pipe distribution system that would be installed for the project. (See response to comment CVRWQCB-R-5.)

CVRWQCB-R-5

The comment states that reclaimed water piping should be required for all landscaping areas on the project, including front and rear landscaping of residences, to be able to adequately utilize remediated groundwater. The comment further states that using potable water for nonpotable purposes is more environmentally adverse than using the available remediated groundwater and would result in unnecessary, easily avoidable costs in both money and energy use.

The use of reclaimed water and GET remediated water for nonpotable uses is discussed in Impact 3.5-8 of the 2008 RDEIR/SDEIS. The City adopted a Citywide Recycled Water Distribution Ordinance (Resolution No. 11-2006) on February 6, 2006, stating that new development should install a "purple pipe" recycled-water distribution system. Because of the City's commitment to using recycled water, SCWA and SRCSD are investigating the feasibility of providing recycled-water service. In the long term, it is assumed that future supplies of nonpotable water would be provided by SRCSD or by GET-remediated water facilities when a sufficient supply of nonpotable water is available to meet project demands.

SRCSD has prepared a *Water Recycling Opportunities Study* (SRCSD 2007) to study the feasibility of meeting its goal to increase water recycling throughout the Sacramento region on the scale of 30–40 mgd over the next 20 years. A planned expansion of the SRCSD water recycling facility plant could serve new areas of planned and expected growth and areas of public open space, including Zone 40 and Rancho Cordova. The expanded water-recycling facility and new water-recycling service areas will be called

Phase II of the SRCSD Water Recycling Program. Phase II construction will be timed with the need for the higher capacity and is currently expected to be in service within 5–10 years. Off-site facilities (i.e., infrastructure, storage tanks, and booster pumps), including those that would serve the project, would be constructed by SRCSD through Phase II of the SRCSD Water Recycling Program. Implementation of a large-scale water recycling program would be required to undergo a comprehensive review of the program elements to satisfy CEQA requirements. The *Water Recycling Opportunities Study*, however, provides technical information to support a programmatic-level EIR for the Rio del Oro project.

Therefore, although it may not occur for many years, the project includes a component to implement a recycled-water-use program. All major landscaping and open space areas within the project site would be irrigated via a recycled-water system that could be easily converted from a potable-water supply to a nonpotable-water at some future date. The draft *Rio del Oro Specific Plan Non-Potable Water Study* (Wood Rodgers 2007b) addressed the viability of providing supplies of nonpotable water to the project site, identified on- and off-site infrastructure needs, and evaluated designs for consistency with the existing WSMP (Wood Rodgers 2007a). The areas identified to be served by the nonpotable waters system include those with land uses designated as park, streetscape, landscape corridor, greenbelt, school, commercial, public/quasi-public, private recreation, and business park.

The commenter suggests that the purple pipe system should also be required for front and rear landscaping of residences. CEQA does not require an agency to adopt every mitigation scheme or alternative brought to its attention or proposed in an EIR (*San Franciscans for Reasonable Growth v. City and County of San Francisco* [1989] 209 Cal.App.3d 1502, 1519) (*San Franciscans for Reasonable Growth*). Rather, a public agency's duty to condition a project's approval on incorporation of mitigation measures arises only when such measures are (1) feasible and (2) would "substantially lessen" a significant environmental effect (Public Resources Code, Section 21002). "Feasible" is defined as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors" (State CEQA Guidelines, Section 15364). Furthermore, "'feasibility' under CEQA encompasses 'desirability' to the extent that desirability is based on a reasonable balancing of the relevant economic, environmental, social, and technological factors" (*City of Del Mar v. City of San Diego* [1982] 133 Cal.App.3d 410, 417; *California Native Plant Society v. City of Santa Cruz* [2009] 177 Cal. App. 4th 957, 1001). The City has investigated with the applicant the feasibility of using the purple pipe system to irrigate residential front and rear landscaping. At this time, however, requiring the purple pipe system for residential irrigation has inherent problems because it would require construction of an extra waterline system and the addition of an extra water meter for each residential unit. The cost of the extra system must be added to the cost of the residential unit, and in a lean market, such expensive extras make the system cost prohibitive and infeasible for residential housing.

CVRWQCB-R-6

The comment recommends expanding the wetland preservation area to include the 57 acres of cottonwood-willow riparian forest on the site, which present the highest habitat value of all the riparian habitat types present.

The Impact Minimization Alternative includes the expansion of the project's wetland preserve to include the cottonwood-willow riparian forest into the area preserved by the project. Adoption of the preferred alternative is at the discretion of the City Council.

As specified in Mitigation Measure 3.10-2b of the 2008 RDEIR/SDEIS, a wetland MMP would be developed and implemented to replace the 57 acres of cottonwood willow riparian woodland and 4 acres of willow scrub at no-net-loss acreage to preserve the overall habitat functions . Elements of the wetland MMP may include habitat preservation on-site, enhancement of on-site riparian habitat types, or enhancement or protection of habitat off-site. The specific ratios of habitat lost to habitat created would be determined by the City, in consultation with DFG as a trustee agency (regarding wildlife resources of the state). The ratios would be consistent with the City's policy and would be adequate to protect and preserve the City's diverse resources. Therefore, no revisions to the 2008 RDEIR/SDEIS are warranted.

CVRWQCB-R-7

The comment notes that the proposed development of the Alpha/IOC-1 Complex (Area 44) is designated as private recreation and asks what this designation entails. The comment states that the area should not be used for activities such as golf courses that are incompatible with the adjacent wetland preserve.

See response to comment CVRWQCB-1-4.

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MARK B HORTON, MD, MSPH
Director

State of California—Health and Human Services Agency
California Department of Public Health



ARNOLD SCHWARZENEGGER
Governor

May 22, 2008

City of Rancho Cordova Planning Department
2729 Prospect Park Drive
Rancho Cordova, CA 95670

Attention: Mr. Patrick Angell

Subject: **COMMENTS ON THE RIO DEL ORO SPECIFIC PLAN, RECIRCULATED
DRAFT ENVIRONMENTAL IMPACT REPORT/SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT (SCH# 2003122057)**

The California Department of Public Health (CDPH) has reviewed the Re-circulated Draft Environmental Impact Report/Supplemental Environmental Impact Statement (EIR) for the Rio Del Oro Specific Plan, dated April 15, 2008 and has the following comments.

Clearly significant effort has been put into this document. Extensive discussion is given to the numerous intertwined and related water projects, plans and agreements including but not limited to:

- Freeport Region Water Project
- Vineyard Surface Water Treatment Plant
- Eastern County Replacement Water Supply Project
- North Service Area Pipeline Project
- The Central Sacramento County Groundwater Management Plan
- Zone 40 Groundwater Management Plan
- 2005 Zone 41 Urban Water Management Plan
- Zone 40 Water System Infrastructure Plan
- SCWA Zone 40 Water Supply Master Plan
- Central Valley Project Water Supply Entitlements (SMUD Assignment and "Fazio Water")
- GET Remediated Water Agreement(s)
- Golden State Water Company Agreement
- Cal-Am Agreement
- Lower Consumnes River Environmental and Water Management MOA

May 22, 2008
Page 2

These documents are in various stages of implementation, revision and/or negotiation which make analysis very difficult. One critical component of many of the above plans is the "Aerojet Agreement" that would provide 6,300 acre-feet per year of remediated GET water. It is CDPH's understanding that on or about April 20, 2008, negotiations concerning the "Aerojet Agreement" ceased.

Without the allocations of the "Aerojet Agreement", CDPH is concerned that adequate long-term water supplies for the project may not be available as discussed in the Re-circulated Draft EIR.

Therefore, in light of the cancellation or suspension of the "Aerojet Agreement", the water supply analysis in the Re-circulated EIR is not supported by substantial evidence that demonstrates the supply to serve this development is a "reasonable likelihood." Until this issue is resolved, CDPH is not in agreement with the conclusions of the Re-circulated Draft EIR.

If you have any questions, please contact Gus Peterson at (916) 449-5669 or gus.peterson@cdph.ca.gov.

Sincerely,



Kim F. Wilhelm, P.E.
Northern California Regional Engineer
Drinking Water Field Operations Branch

CC:
Kathleen Dadey
U.S. Army Corps of Engineers, Sacramento District
Regulatory Branch
1325 J Street, Room 1480
Sacramento, CA 95814-2922

State Clearinghouse by Fax

DHS-R-1

The comment states that in light of the cancellation or suspension of the “Aerojet Agreement” as of April 20, 2008, the California Department of Public Health is concerned that adequate long-term water supplies for the Rio del Oro project may not be available as discussed in the 2008 RDEIR/SDEIS. The commenter states that the water supply analysis in the 2008 RDEIR/SDEIS is not supported by substantial evidence that demonstrates the supply to serve the Rio del Oro development is a “reasonable likelihood.”

Although the 2003 agreements between SCWA and Aerojet and the Boeing Company have been terminated, SCWA and Aerojet have entered into a new 2010 Agreement under which Aerojet is transferring 8,900 afy of GET water to SCWA. Under the 2010 Agreement, SCWA acknowledges that the 8,900 afy will provide SCWA with sufficient available water to supply the Project, and shall further confirm this fact in writing to the City. The 8,900 afy along with other available Zone 40 water (including 1,500 afy under the SCWA conjunctive use program) is sufficient to meet the Project demand of 8,891 afy. The amount of water available under the 2010 agreement – 8,900 afy – is sufficient for build-out for the entire project, even if the 1,500 afy expected through the SCWA conjunctive-use supplies, for whatever reason, does not become available as expected. Thus, it is a reasonably likely water supply for the Project under the standards set forth in *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal.4th 412. (See Master Response 1, “Adequacy of Long-Term Water Supply,” in Chapter 3 of this FEIR/FEIS.)

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SECTION C

Regional and Local Agencies

Municipal Services Agency

**Planning and Community
Development**

Robert Sherry, Director



Terry Schutten, County Executive
Paul J. Hahn, Agency Administrator

County of Sacramento

July 7, 2008

Patrick Angell
City of Rancho Cordova
2729 Prospect Park Drive
Rancho Cordova, CA 95670

RE: City of Rancho Cordova Rio Del Oro Specific Plan – Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement

Dear Mr. Angell:

Thank you for the opportunity to review the Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement for the Rio Del Oro Specific Plan area. The staff of the County's Planning Department has reviewed the document and made special note of the changes and clarification made regarding how drainage interacts with the aquatic resources of vernal pools and Morrison Creek, as well as the additional measures taken for the preservation of the elderberry scrub habitat. However, there are some areas in the draft document that still deserve some additional attention.

Utilities and Service Systems – Water Supply:

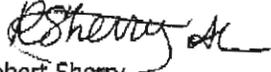
The Water Supply portion of the Draft EIR/EIS refers to the necessary realignment of Morrison Creek downstream of the vernal pool preserves. The County is supportive of the 250 foot buffer on either side of the bank of the creek, however the proposed buffer area is sufficient to allow for a natural meander to remain in the creek, which would help reduce channel flows and overall sediment load being carried offsite and potentially affecting downstream areas, such as the Mather Lake, which has seen a recent increase in sediment from Morrison Creek and the preserve easement buffering Morrison Creek southwest of the intersection of Douglas Road and Sunrise Boulevard.

Biological Resources:

The County strongly supports the decision to retain all displaced Elderberry bushes on the project site and the planting of a significant number of additional Elderberry resources along the drainage parkways and other open space areas. A design that would allow for a direct adjacent connection between the proposed 10 and 14 acre Elderberry reserves and the proposed areas for future planting should be considered to further ensure protection and continued presence of the VELB inhabiting the Elderberry bushes.

Again, we thank you very much for the opportunity to review and respond to the Draft Environmental Impact Report for the Rio Del Oro Specific Plan Project. If you have any questions or comments, please contact Tim Tadlock or Dave Defanti at 916-874-6141.

Sincerely,

A handwritten signature in black ink, appearing to read "R. Sherry". The signature is written in a cursive style with a long horizontal flourish extending to the right.

Robert Sherry
Planning Director

ComDev-R-1

The comment states that the County supports the 250-foot buffer on either side of the bank of Morrison Creek. The comment notes that the proposed buffer area is sufficient to allow for a natural meander of the creek, which would help reduce channel flows and overall sediment load being carried off-site and potentially affecting downstream areas.

The comment is noted.

ComDev-R-2

The comment states that the County strongly supports the decision to retain all displaced elderberry shrubs on the project site and planting a significant number of additional elderberry resources along the drainage parkways and other open space areas. The comment suggests that considering a design that would allow direct, adjacent connectivity between the two elderberry preserves and proposed planting areas to further ensure protection and continued presence of valley elderberry longhorn beetle (VELB) inhabiting elderberry bushes on the project site.

A revised VELB mitigation plan was developed on behalf of the project applicant(s) in 2009 (see Appendix R to this FEIR/FEIS). It has been determined by the biological resources consultants retained by the project applicant(s), based on USFWS guidelines, that 7,400 plantings would be required to compensate for the loss of VELB habitat that would result from implementing the project. One mitigation credit is equivalent to 10 plants (five elderberry seedlings and five associated native plants), so 740 mitigation credits are needed to compensate for the loss of elderberry shrubs on the project site. The 2009 VELB mitigation plan included as Appendix R this FEIR/FEIS proposes that a 12-acre on-site preserve be established, containing 19 previously existing elderberry shrubs along with additional new elderberry seedlings and associated native plants, for a total of 290.4 on-site mitigation credits. The remaining 449.6 credits needed would be purchased from a USFWS-approved off-site mitigation bank. The 310 elderberry shrubs that would be directly affected by project implementation would be transplanted either to the on-site preserve or to an appropriate off-site location approved by USFWS. The VELB mitigation plan is subject to change as USFWS completes its consultation and preparation of a Biological Opinion for the project.

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County Executive
Terry Schutten



Sacramento International Airport
Mather Airport
Executive Airport
Franklin Field

Sacramento County
Airport System
G. Hardy Acree, Director of Airports

County of Sacramento

June 20, 2008

Kathleen Dadey
Army Corps of Engineers – Sacramento District
Regulatory Branch
1325 J Street, Room 1480
Sacramento, CA 95814-2922

Patrick Angell
Planning Department
City of Rancho Cordova
2729 Prospect Park Drive
Rancho Cordova, CA 95670

By Email: Kathleen.a.Dadey@spk01.uaace.army.mil
pangell@pmcworld.com

Subject: Comments – Recirculated Draft Environmental Impact Report (EIR)/
Supplemental Draft Environmental Impact Statement (EIS)
Rio del Oro Specific Plan, State Clearinghouse #2003122057

Dear Ms. Dadey and Mr. Angell:

This letter conveys the comments and recommendations of the Sacramento County Airport System (County Airport System) on the Recirculated Draft EIR/EIS for the proposed Rio Del Oro Specific Plan ("Project"). In summary, the County Airport System is of the opinion that the Draft EIR/EIS is deficient and warrants further revision because none of the project alternatives presented in the document include an adequate consideration of potential impacts on commercial aviation activities at nearby Mather Airport (MHR).

In particular, the Draft EIR/EIS devotes little consideration to the following subjects:

- Projected increases in aviation activity contained in the draft Mather Airport Master Plan (Master Plan), which was accepted by the Sacramento County Board of Supervisors (Board) on February 17, 2004. Environmental analysis of the Master Plan pursuant to the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) is now underway, as directed by the Board. (The Mather Airport (MHR) Master Plan may be viewed on the County Airport System website, by accessing the Planning and Development tab: <http://www.sacairports.org/mather/planning/index.html>)
- Even more important, potential hazardous wildlife attractants associated with water features in the development itself, and in association with the contemplated wetland mitigation measures. Aquatic features near airports tend to attract wa-

terfowl and other avian species that have a propensity to collide with aircraft operating at low altitudes. Such features include retention/detention basins and other stormwater facilities, recreational lakes, settling ponds for drinking water treatment plants, and compensatory wetlands.

Overview of Mather Airport

Mather Airport (MHR) is one of four airports operated by the County Airport System. (The aviation operations at McClellan Airport are managed by the County Airport System on behalf of another County agency). MHR is the County Airport System's designated cargo airport, and it also supports a significant number of general aviation operations. During 2001 MHR supported 83,567 flight operations (including cargo, general aviation, air taxi, and military). The MHR Master Plan projects an annual average growth rate in operations ranging between 1.2 and 1.8 percent, resulting in annual operations ranging between 103,300 and 118,900 in the year 2021. As an indication of the regional economic importance of Mather, during April of this year more than 14,555,000 pounds of freight passed through the facility, or a 19.5% increase compared to April 2007.

Hazardous Wildlife Implications and Concerns

The Federal Aviation Administration (FAA) establishes and enforces policies and guidance relative to the placement of hazardous wildlife attractants on and near airports, in particular with regard to projects within a five-mile radius of airports subject to FAA grant assurances. The FAA Wildlife Hazards AC referenced herein specifies two geographic areas of concern relative to hazardous wildlife:

- The "Critical Zone," which is defined as a 10,000-foot radius from the runway centerline for airports serving turbine-powered (jet) aircraft; and
- A five mile radius from the airport.

The FAA strongly discourages hazardous wildlife attractants within the Critical Zone, and requires airport operators such as the County Airport System to evaluate all proposed development projects within a five mile radius for potential hazardous wildlife attractants. Exhibits depicting the Critical Zone and Five-Mile radius for MHR are enclosed. Our analysis of the draft EIR/EIS for the Rio del Oro Specific Plan indicates that the proposed project would be within the five mile radius, and therefore of concern to operations at MHR. Certain aquatic components of the Rio del Oro Specific Plan, when implemented, have the potential to attract avian species that can inflict significant damage to aircraft, in addition to endangering passengers and crew members. This threat is not addressed in the draft EIR/EIS.

Federal Aviation Administration Policies Addressing Hazardous Wildlife

The FAA is the federal agency responsible for the safe design, operation and maintenance of airports. As the human population and number of aircraft operations have increased in the United States, collisions involving avian species and aircraft have become more common, costly, and threatening to human safety. Aquatic features such as wetlands, water and sewage treatment plants, and compensatory wetland mitigation projects are among the landscape features most likely to attract waterfowl and other birds that have a high likelihood of inflicting damage to aircraft. The FAA is therefore understandably concerned with minimizing hazardous wildlife attractants near airports, and makes airport operators responsible for monitoring proposed developments that could lessen the viability of airport operations. A number of FAA hazardous wildlife policies and guidance documents are described below.

- Title 14, Code of Federal Regulations (CFR), Part 139, Certification of Airports, Subpart D.
- "Hazardous Wildlife Attractants On Or Near Airports," FAA Advisory Circular (AC) No. 150/5200-33B, August 28, 2007 (enclosed). Please note that the 2007 revision replaces all previous versions of this AC.
- *Memorandum of Agreement Between the Federal Aviation Administration, the U.S. Air Force, the U.S. Army, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service and the U.S. Department of Agriculture to Address Aircraft-Wildlife Strikes* (hereinafter "Interagency MOA"), executed by the six agencies between December 9, 2002 and May 2, 2003 (enclosed).
- *Wildlife Hazard Management At Airports – A Manual for Airport Personnel*, FAA and USDA, Second Edition - July 2005.

Project-Specific Hazardous Wildlife Concerns

The County Airport System's analysis of the draft EIR/EIS indicates four types of facilities for which there is little or no analysis of potential attraction of avian species hazardous to aircraft operations. Those project elements include but are not necessarily limited to the following:

- Permanent retention basins/ponds
- Domestic water supply treatment facility
- Stormwater infrastructure
- Wetland compensatory mitigation sites

As stated above, MHR is the County Airport System's designated cargo airport. However, a "Continuity of Operations Plan" (Continuity Plan) plan is now in the initial stages of preparation for Sacramento International Airport (SMF). The lessons learned during Hurricane Katrina warrant such a contingency plan. It is contemplated that the Continuity Plan will address means by which limited commercial passenger service operations

could be temporarily transferred to MHR in the unlikely event of a levee breach or other natural disaster that could cause commercial passenger operations to be temporarily interrupted at SMF. Although the number of flights diverted to MHR would be limited to those necessary to sustain the national air transportation system, the passengers and crews aboard such aircraft could be confronted with unnecessary risk of collision with birds if the aquatic features contemplated in the Rio del Oro Specific Plan were to be constructed. (No permanent facilities or related developments at MHR are contemplated to address the temporary relocation of operations to that facility.)

Recommendations

The County Airport System strongly recommends the following actions.

- That the draft EIR/EIS be amended to include a complete and thorough evaluation of the hazardous wildlife implications associated with all of the project alternatives.
- Based on the above referenced "Interagency MOA," we believe the Army Corps of Engineers has an affirmative obligation to consult with the FAA and the United States Fish and Wildlife Service (Service) regarding measures to minimize hazardous wildlife attractants associated with the proposed project.

CEQA Requirements

The County Airport System also requests that the EIR for the proposed Rio del Oro Specific Plan fully address the potential for the lake/detention basin element to create a safety hazard for aircraft operations. Please refer to CEQA Guideline 15154 – Projects Near Airports (below).¹

15154. Projects Near Airports

(a) When a lead agency prepares an EIR for a project within the boundaries of a comprehensive airport land use plan or, if a comprehensive airport land use plan has not been adopted for a project within two nautical miles of a public airport or public use airport, the agency shall utilize the Airport Land Use Planning Handbook published by Caltrans' Division of Aeronautics to assist in the preparation of the EIR relative to potential airport-related safety hazards and noise problems.

(b) A lead agency shall not adopt a negative declaration or mitigated negative declaration for a project described in subdivision (a) unless the lead agency considers whether the project will result in a safety hazard or noise problem for persons using the airport or for persons residing or working in the project area.

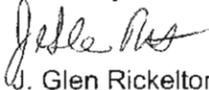
¹ Title 14 CCR, Chapter 3 - CEQA Guidelines, Article 10 - Considerations in Preparing EIRs and Negative Declarations.

Conclusion

In recent years the County Airport System has submitted comments and recommendations on a number of proposed residential development projects near Sacramento International Airport and Mather Airport. Attachment 1 (below) is an excerpt from our April 21, 2006 comment letter on the proposed Greenbriar project near SMF. Most of the comments in that letter are also relevant to the Rio del Oro Specific Plan.

Thank you for the opportunity comment on the proposed Rio del Oro Specific Plan Project. Questions may be directed to me at the telephone number below. Alternatively, information on the Mather Master Plan CEQA/NEPA process may be obtained by contacting Airport Planner George Munson at 874-0767, and information on hazardous wildlife may be obtained by contacting Senior Natural Resource Specialist Janae Scruggs at 874-0820.

Sincerely,



J. Glen Rickelton
Manager – Planning and Environment (P&E)
916-874-0482

C: George Munson, Airport Planner – P&E
Greg Rowe, Senior Environmental Analyst – P&E
Janae R. Scruggs, Senior Natural Resource Specialist – P&E
Richard Radmacher, Senior Planner – Planning and Community Development,
County of Sacramento Municipal Services Agency (MSA)
Douglas Pomeroy, Environmental Protection Specialist/Biologist – FAA San
Francisco Airports District Office (ADO)

Enclosures:

- FAA Wildlife Hazards Advisory Circular (AC)
 - Interagency MOA on Aircraft – Wildlife Strikes
 - Drawing No. 1, MHR Critical Zone
 - Sacramento Mather Airport 5 Mile Radius exhibit
-

**Attachment 1: Excerpt from April 21, 2006 Comment Letter on Proposed
Greenbriar Project – City of Sacramento**

Wildlife Hazard Concerns Related to the Proposed Project

The proposed development project includes a common lake/detention basin, which will contain water to its full capacity 365 days of the year. USDA Wildlife Services generally recommends that water retention basins not be constructed within a five-mile radius of an airport if the feature has the potential to attract wildlife that may pose a hazard to aircraft. The USDA has therefore advised that such attractants should not be permitted within a five mile radius of the Airport, consistent with FAA AC 150/5200-33B. USDA believes that positioning a new lake near the airfield could increase waterfowl traffic directly through the airspace around the airfield by means of a synergistic effect with other landscape features in the area. This situation is addressed in Section 2.8 of the FAA Advisory Circular.

Recommended Project Modifications

The project includes provisions for the temporary storage and off-site conveyance of periodic stormwater and ongoing urban runoff. Those facilities should be designed and operated in a manner that does not induce conditions hazardous to aircraft operations. The County Airport System and USDA Wildlife Services believe that the alternative project components should be examined by the City and the project applicant, although none of the alternatives is likely to completely eliminate use of the project site by wildlife hazardous to aircraft operations. The alternatives are listed in descending order of preference. Eliminating proposed lakes/detention basins would result in the greatest reduction in potential wildlife attraction. We understand, however, that various factors may preclude this alternative. The alternative(s) selected must be acceptable to the FAA, and must be incorporated in the final EIS and final EIR and Mitigation Monitoring and Reporting Program (MMRP)

- 1) Eliminate the Proposed Common Lake/Detention Basin Facility and Replace with a Dry Detention Facility: The most effective method to eliminate the potential attraction of wildlife hazardous to aircraft would be to construct detention facilities that are not a permanent surface water feature, i.e. that is not a "common lake" or a "detention basin" that permanently holds water. As currently proposed, this facility appears to be intended as a permanent water retention device, rather than a facility for the temporary storage of stormwater runoff. A dry detention basin would provide the following benefits in terms of hazardous wildlife attraction:
 - a) It would hold stormwater runoff from both landscape and hardscaped areas for temporary time periods (between 24 and 72 hours);
 - b) It would function as a flood control device;
 - c) When dry, it could be used for parks and playgrounds, which are less attractive to hazardous wildlife species;
 - d) It would have less water surface coverage during the period when the Pacific Flyway experiences the highest rate of movement for migratory bird species;

- e) It would have shorter durations of water, thereby reducing available habitat for feeding and roosting of both local and migratory waterfowl
- 2) Wet Detention Basin Incorporating Detailed Design Management Plan (DSM): A DSM, similar to the proposal adopted for the Greenbriar project, could provide an initial conceptual framework for a detailed design and management plan. Such a plan would, in many respects, be similar to an airport *Wildlife Hazard Management Plan* (WHMP). A qualified and experienced wildlife damage biologist/manager should be retained by the project proponent to develop such a comprehensive wildlife damage control and management plan.

In summary, the County Airport System suggests that the DSM be amended to include the following provisions:

- a) Prohibited Activities: Expressly prohibit all activities and uses of the lake/detention basin that may conflict with the wildlife control program.
- b) Covenants, Conditions and Restrictions (CC&Rs): the CC&Rs should expressly prohibit feeding waterfowl or engaging in other activities likely to attract wildlife hazardous to aircraft operations. In particular, the CC&Rs should prohibit these activities at the community parks connected to the lake/detention basin.
- c) Other provisions that should be included in the detailed DSM:
- Detailed drawing and description of the common lake/detention basin;
 - Description of bank edge below bulkhead to water surface;
 - More specific design for landscape areas surrounding lake/detention pond;
 - More specific management program, including adaptive control methods that will be implemented in the event hazardous wildlife problems arise;
 - Specification that the management program be staffed by a qualified wildlife hazard damage biologist or wildlife manager possessing requisite experience and academic background.
 - Any wildlife attracted to the lake/detention pond would be hazed aggressively to deter use of the facility.
 - Specification that any training and/or support provided by USDA Wildlife Services shall be at the sole cost and responsibility of the developer or Homeowners Association (HOA).
- d) Metro Air Park (MAP) Mitigation Measures: The potential hazardous wildlife attraction associated with the golf course component of the MAP project has long been of concern to the County Airport System and the FAA. The Final Supplemental EIR for the MAP project includes mitigation measures that should be required of the Greenbriar project², and included in the DSM. In summary, if the County Airport System determines that inadequate measures are being undertaken to control hazardous wildlife at the lake/detention facility, the County Airport System would have authority to engage in the following actions:

² Final Supplemental Environmental Impact Report, Metro Air Park. State Clearinghouse No. 92032074, August, 1997, Sacramento County Department of Environmental Review and Assessment (DERA); pages 32 – 35.

- i) Notify the property owner that the wildlife control measures are out of compliance;
 - ii) That the County Airport System may, at its option, initiate control measures at the site, with the costs of such measures billed to the owner; and
 - iii) In the event of an immediate threat to aircraft safety, County Airport System Personnel can take immediate action to remedy the air hazard emergency.
- 3) Cover Entire Lake/Detention Basin with Grid Wire: The entire lake would be covered with a wire grid system, with wires spaced no less more than 30 feet apart to discourage use by waterfowl requiring large "landing areas." Recreational activities likely to encourage lake usage by geese, gulls, and diving ducks would be prohibited. A full-time biologist/technician qualified in wildlife damage management would be employed to continually monitor the efficacy of the grid wire system and make adjustments as necessary. Qualified individuals should be consulted on the necessary spacing of the grid wires. Any wildlife attracted to the lake/detention pond would be aggressively hazed. Additional wildlife control methods, including but not limited to trapping and shooting, would be employed on a regular basis to permanently eliminate wildlife that may congregate on or near the lake. Finally, the CC&Rs would prohibit feeding waterfowl or engaging in other activities likely to encourage waterfowl congregation. All successive owners would be bound by the same requirements.

Project Review by FAA and California Department of Transportation (Caltrans)

The FAA wildlife Advisory Circular obligates commercial airports to a number of responsibilities related to nearby changes in land-use practices (Section 4-3-a of AC 150/5200-33B). Pursuant to the AC, the County Airport System will submit this project to the FAA San Francisco Airports District Office (ADO) for review and comment, utilizing FAA Form 7460-1, "Notice of Proposed Construction or Alteration." In addition, the Caltrans Division of Aeronautics typically comments on proposed projects located near airports.

**Memorandum of Agreement Between
the Federal Aviation Administration,
the U.S. Air Force,
the U.S. Army,
the U.S. Environmental Protection Agency,
the U.S. Fish and Wildlife Service, and
the U.S. Department of Agriculture
to Address Aircraft-Wildlife Strikes**

PURPOSE

The signatory agencies know the risks that aircraft-wildlife strikes pose to safe aviation.

This Memorandum of Agreement (MOA) acknowledges each signatory agency's respective missions. Through this MOA, the agencies establish procedures necessary to coordinate their missions to more effectively address existing and future environmental conditions contributing to aircraft-wildlife strikes throughout the United States. These efforts are intended to minimize wildlife risks to aviation and human safety, while protecting the Nation's valuable environmental resources.

BACKGROUND

Aircraft-wildlife strikes are the second leading causes of aviation-related fatalities. Globally, these strikes have killed over 400 people and destroyed more than 420 aircraft. While these extreme events are rare when compared to the millions of annual aircraft operations, the potential for catastrophic loss of human life resulting from one incident is substantial. The most recent accident demonstrating the grievous nature of these strikes occurred in September 1995, when a U.S. Air Force reconnaissance jet struck a flock of Canada geese during takeoff, killing all 24 people aboard.

The Federal Aviation Administration (FAA) and the United States Air Force (USAF) databases contain information on more than 54,000 United States civilian and military aircraft-wildlife strikes reported to them between 1990 and 1999¹. During that decade, the FAA received reports indicating that aircraft-wildlife strikes, damaged 4,500 civilian U.S. aircraft (1,500 substantially), destroyed 19 aircraft, injured 91 people, and killed 6 people. Additionally, there were 216 incidents where birds struck two or more engines on civilian aircraft, with damage occurring to 26 percent of the 449 engines involved in these incidents. The FAA estimates that during the same decade, civilian U.S. aircraft sustained \$4 billion worth of damages and associated losses and 4.7 million hours of aircraft downtime due to aircraft-wildlife strikes. For the same period,

¹ FAA estimates that the 28,150 aircraft-wildlife strike reports it received represent less than 20% of the actual number of strikes that occurred during the decade.

USAF planes colliding with wildlife resulted in 10 Class A Mishaps², 26 airmen deaths, and over \$217 million in damages.

Approximately 97 percent of the reported civilian aircraft-wildlife strikes involved common, large-bodied birds or large flocks of small birds. Almost 70 percent of these events involved gulls, waterfowl, and raptors (Table 1).

About 90 percent of aircraft-wildlife strikes occur on or near airports, when aircraft are below altitudes of 2,000 feet. Aircraft-wildlife strikes at these elevations are especially dangerous because aircraft are moving at high speeds and are close to or on the ground. Aircrews are intently focused on complex take-off or landing procedures and monitoring the movements of other aircraft in the airport vicinity. Aircrew attention to these activities while at low altitudes often compromises their ability to successfully recover from unexpected collisions with wildlife and to deal with rapidly changing flight procedures. As a result, crews have minimal time and space to recover from aircraft-wildlife strikes.

Increasing bird and wildlife populations in urban and suburban areas near airports contribute to escalating aircraft-wildlife strike rates. FAA, USAF, and Wildlife Services (WS) experts expect the risks, frequencies, and potential severities of aircraft-wildlife strikes to increase during the next decade as the numbers of civilian and military aircraft operations grow to meet expanding transportation and military demands.

SECTION I.

SCOPE OF COOPERATION AND COORDINATION

Based on the preceding information and to achieve this MOA's purpose, the signatory agencies:

- A.** Agree to strongly encourage their respective regional and local offices, as appropriate, to develop interagency coordination procedures necessary to effectively and efficiently implement this MOA. Local procedures should clarify time frames and other general coordination guidelines.
- B.** Agree that the term "airport" applies only to those facilities as defined in the attached glossary.
- C.** Agree that the three major activities of most concern include, but are not limited to:
 - 1. airport siting and expansion;

² See glossary for the definition of a Class A Mishap and similar terms.

2. development of conservation/mitigation habitats or other land uses that could attract hazardous wildlife to airports or nearby areas; and
 3. responses to known wildlife hazards or aircraft-wildlife strikes.
- D.** Agree that “hazardous wildlife” are those animals, identified to species and listed in FAA and USAF databases, that are most often involved in aircraft-wildlife strikes. Many of the species frequently inhabit areas on or near airports, cause structural damage to airport facilities, or attract other wildlife that pose an aircraft-wildlife strike hazard. Table 1 lists many of these species. It is included solely to provide information on identified wildlife species that have been involved in aircraft-wildlife strikes. It is not intended to represent the universe of species concerning the signatory agencies, since more than 50 percent of the aircraft-wildlife strikes reported to FAA or the USAF did not identify the species involved.
- E.** Agree to focus on habitats attractive to the species noted in Table 1, but the signatory agencies realize that it is imperative to recognize that wildlife hazard determinations discussed in Paragraph L of this section may involve other animals.
- F.** Agree that not all habitat types attract hazardous wildlife. The signatory agencies, during their consultative or decisionmaking activities, will inform regional and local land use authorities of this MOA’s purpose. The signatory agencies will consider regional, local, and site-specific factors (e.g., geographic setting and/or ecological concerns) when conducting these activities and will work cooperatively with the authorities as they develop and implement local land use programs under their respective jurisdictions. The signatory agencies will encourage these stakeholders to develop land uses within the siting criteria noted in Section 1-3 of FAA Advisory Circular (AC) 150.5200-33 (Attachment A) that do not attract hazardous wildlife. Conversely, the agencies will promote the establishment of land uses attractive to hazardous wildlife outside those siting criteria. Exceptions to the above siting criteria, as described in Section 2.4.b of the AC, will be considered because they typically involve habitats that provide unique ecological functions or values (e.g., critical habitat for federally-listed endangered or threatened species, ground water recharge).
- G.** Agree that wetlands provide many important ecological functions and values, including fish and wildlife habitats; flood protection; shoreline erosion control; water quality improvement; and recreational, educational, and research opportunities. To protect jurisdictional wetlands, Section 404 of the Clean Water Act (CWA) establishes a program to regulate dredge and/or fill activities in these wetlands and navigable waters. In recognizing Section 404 requirements and the Clean Water Action Plan’s goal to annually increase the Nation’s net wetland acreage by 100,000 acres through 2005, the signatory agencies agree to resolve aircraft-wildlife conflicts. They will do so by
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avoiding and minimizing wetland impacts to the maximum extent practicable, and will work to compensate for all associated unavoidable wetland impacts. The agencies agree to work with landowners and communities to encourage and support wetland restoration or enhancement efforts that do not increase aircraft-wildlife strike potentials.

- H. Agree that the: U.S. Army Corps of Engineers (ACOE) has expertise in protecting and managing jurisdictional wetlands and their associated wildlife; U.S. Environmental Protection Agency (EPA) has expertise in protecting environmental resources; and the U.S. Fish and Wildlife Service (USFWS) has expertise in protecting and managing wildlife and their habitats, including migratory birds and wetlands. Appropriate signatory agencies will cooperatively review proposals to develop or expand wetland mitigation sites, or wildlife refuges that may attract hazardous wildlife. When planning these sites or refuges, the signatory agencies will diligently consider the siting criteria and land use practice recommendations stated in FAA AC 150/5200-33. The agencies will make every effort to undertake actions that are consistent with those criteria and recommendations, but recognize that exceptions to the siting criteria may be appropriate (see Paragraph F of this section).
 - I. Agree to consult with airport proponents during initial airport planning efforts. As appropriate, the FAA or USAF will initiate signatory agency participation in these efforts. When evaluating proposals to build new civilian or military aviation facilities or to expand existing ones, the FAA or the USAF, will work with appropriate signatory agencies to diligently evaluate alternatives that may avoid adverse effects on wetlands, other aquatic resources, and Federal wildlife refuges. If these or other habitats support hazardous wildlife, and there is no practicable alternative location for the proposed aviation project, the appropriate signatory agencies, consistent with applicable laws, regulations, and policies, will develop mutually acceptable measures, to protect aviation safety and mitigate any unavoidable wildlife impacts.
 - J. Agree that a variety of other land uses (e.g., storm water management facilities, wastewater treatment systems, landfills, golf courses, parks, agricultural or aquacultural facilities, and landscapes) attract hazardous wildlife and are, therefore, normally incompatible with airports. Accordingly, new, federally-funded airport construction or airport expansion projects near habitats or other land uses that may attract hazardous wildlife must conform to the siting criteria established in the FAA Advisory Circular (AC) 150/5200-33, Section 1-3.
 - K. Agree to encourage and advise owners and/or operators of non-airport facilities that are known hazardous wildlife attractants (See Paragraph J) to follow the siting criteria in Section 1-3 of AC 150/5200-33. As appropriate, each signatory agency will inform proponents of these or other land uses about the land use's potential to attract hazardous species to airport areas.
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The signatory agencies will urge facility owners and/or operators about the critical need to consider the land uses' effects on aviation safety.

- L. Agree that FAA, USAF, and WS personnel have the expertise necessary to determine the aircraft-wildlife strike potentials of various land uses. When there is disagreement among signatory agencies about a particular land use and its potential to attract hazardous wildlife, the FAA, USAF, or WS will prepare a wildlife hazard assessment. Then, the appropriate signatory agencies will meet at the local level to review the assessment. At a minimum, that assessment will:
 - 1. identify each species causing the aviation hazard, its seasonal and daily populations, and the population's local movements;
 - 2. discuss locations and features on and near the airport or land use attractive to hazardous wildlife; and
 - 3. evaluate the extent of the wildlife hazard to aviation.
 - M. Agree to cooperate with the airport operator to develop a specific, wildlife hazard management plan for a given location, when a potential wildlife hazard is identified. The plan will meet applicable FAA, USAF, and other relevant requirements. In developing the plan, the appropriate agencies will use their expertise and attempt to integrate their respective programmatic responsibilities, while complying with existing laws, regulations, and policies. The plan should avoid adverse impacts to wildlife populations, wetlands, or other sensitive habitats to the maximum extent practical. Unavoidable impacts resulting from implementing the plan will be fully compensated pursuant to all applicable Federal laws, regulations, and policies.
 - N. Agree that whenever a significant aircraft-wildlife strike occurs or a potential for one is identified, any signatory agency may initiate actions with other appropriate signatory agencies to evaluate the situation and develop mutually acceptable solutions to reduce the identified strike probability. The agencies will work cooperatively, preferably at the local level, to determine the causes of the strike and what can and should be done at the airport or in its vicinity to reduce potential strikes involving that species.
 - O. Agree that information and analyses relating to mitigation that could cause or contribute to aircraft-wildlife strikes should, whenever possible, be included in documents prepared to satisfy the National Environmental Policy Act (NEPA). This should be done in coordination with appropriate signatory agencies to inform the public and Federal decision makers about important ecological factors that may affect aviation. This concurrent review of environmental issues will promote the streamlining of the NEPA review process.
 - P. Agree to cooperatively develop mutually acceptable and consistent guidance, manuals, or procedures addressing the management of habitats attractive to
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hazardous wildlife, when those habitats are or will be within the siting criteria noted in Section 1-3 of FAA AC 5200-33. As appropriate, the signatory agencies will also consult each other when they propose revisions to any regulations or guidance relevant to the purpose of this MOA, and agree to modify this MOA accordingly.

SECTION II. GENERAL RULES AND INFORMATION

- A. Development of this MOA fulfills the National Transportation Safety Board's recommendation of November 19, 1999, to form an inter-departmental task force to address aircraft-wildlife strike issues.
 - B. This MOA does not nullify any obligations of the signatory agencies to enter into separate MOAs with the USFWS addressing the conservation of migratory birds, as outlined in Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, dated January 10, 2001 (66 *Federal Register*, No. 11, pg. 3853).
 - C. This MOA in no way restricts a signatory agency's participation in similar activities or arrangements with other public or private agencies, organizations, or individuals.
 - D. This MOA does not alter or modify compliance with any Federal law, regulation or guidance (e.g., Clean Water Act; Endangered Species Act; Migratory Bird Treaty Act; National Environmental Policy Act; North American Wetlands Conservation Act; Safe Drinking Water Act; or the "no-net loss" policy for wetland protection). The signatory agencies will employ this MOA in concert with the Federal guidance addressing wetland mitigation banking dated March 6, 1995 (60 *Federal Register*, No. 43, pg. 12286).
 - E. The statutory provisions and regulations mentioned above contain legally binding requirements. However, this MOA does not substitute for those provisions or regulations, nor is it a regulation itself. This MOA does not impose legally binding requirements on the signatory agencies or any other party, and may not apply to a particular situation in certain circumstances. The signatory agencies retain the discretion to adopt approaches on a case-by-case basis that differ from this MOA when they determine it is appropriate to do so. Such decisions will be based on the facts of a particular case and applicable legal requirements. Therefore, interested parties are free to raise questions and objections about the substance of this MOA and the appropriateness of its application to a particular situation.
 - F. This MOA is based on evolving information and may be revised periodically without public notice. The signatory agencies welcome public comments on this MOA at any time and will consider those comments in any future revision of this MOA.
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- G. This MOA is intended to improve the internal management of the Executive Branch to address conflicts between aviation safety and wildlife. This MOA does not create any right, benefit, or trust responsibility, either substantively or procedurally. No party, by law or equity, may enforce this MOA against the United States, its agencies, its officers, or any person.
- H. This MOA does not obligate any signatory agency to allocate or spend appropriations or enter into any contract or other obligations.
- I. This MOA does not reduce or affect the authority of Federal, State, or local agencies regarding land uses under their respective purviews. When requested, the signatory agencies will provide technical expertise to agencies making decisions regarding land uses within the siting criteria in Section 1-3 of FAA AC 150/5200-33 to minimize or prevent attracting hazardous wildlife to airport areas.
- J. Any signatory agency may request changes to this MOA by submitting a written request to any other signatory agency and subsequently obtaining the written concurrence of all signatory agencies.
- K. Any signatory agency may terminate its participation in this MOA within 60 days of providing written notice to the other agencies. This MOA will remain in effect until all signatory agencies terminate their participation in it.

SECTION III. PRINCIPAL SIGNATORY AGENCY CONTACTS

The following list identifies contact offices for each signatory agency.

Federal Aviation Administration
Office Airport Safety and Standards
Airport Safety and
Compliance Branch (AAS-310)
800 Independence Ave., S.W.
Washington, D.C. 20591
V: 202-267-1799
F: 202-267-7546

U.S. Air Force
HQ AFSC/SEFW
9700 Ave., G. SE, Bldg. 24499
Kirtland AFB, NM 87117
V: 505-846-5679
F: 505-846-0684

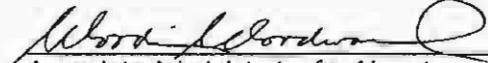
U.S. Army
Directorate of Civil Works
Regulatory Branch (CECW-OR)
441 G St., N.W.
Washington, D.C. 20314
V: 202-761-4750
F: 202-761-4150

U.S. Environmental Protection Agy.
Office of Water
Wetlands Division
Ariel Rios Building, MC 4502F
1200 Pennsylvania Ave., SW
Washington, D.C. 20460
V: 202-260-1799
F: 202-260-7546

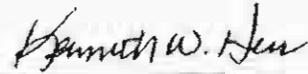
U.S. Fish and Wildlife Service
Division of Migratory Bird Management
4401 North Fairfax Drive, Room 634
Arlington, VA 22203
V: 703-358-1714
F: 703-358-2272

U.S. Department of Agriculture
Animal and Plant Inspection Service
Wildlife Services
Operational Support Staff
4700 River Road, Unit 87
Riverdale, MD 20737
V: 301-734-7921
F: 301-734-5157

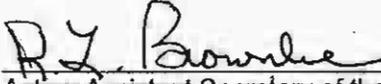
Signature Page


Associate Administrator for Airports,
Federal Aviation Administration

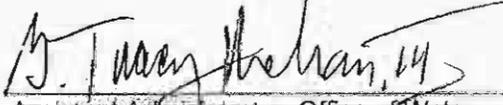
12/17/02
Date


Chief of Safety,
U. S. Air Force

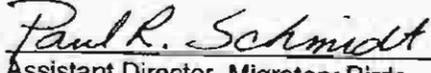
27 May 2003
Date


Acting Assistant Secretary of the Army
(Civil Works)
Department of the Army

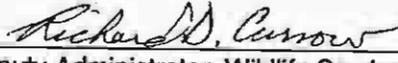
December 9, 2002
Date


Assistant Administrator, Office of Water,
U.S. Environmental Protection Agency

1/17/03


Assistant Director, Migratory Birds
and State Programs,
U.S. Fish and Wildlife Service

7/29/03
Date


Acting Deputy Administrator, Wildlife Services
U.S. Department of Agriculture

09 January 2003
Date

GLOSSARY

This glossary defines terms used in this MOA.

Airport. All USAF airfields or all public use airports in the FAA's National Plan of Integrated Airport Systems (NPIAS). Note: There are over 18,000 civil-use airports in the U.S., but only 3,344 of them are in the NPIAS and, therefore, under FAA's jurisdiction.

Aircraft-wildlife strike. An aircraft-wildlife strike is deemed to have occurred when:

1. a pilot reports that an aircraft struck 1 or more birds or other wildlife;
2. aircraft maintenance personnel identify aircraft damage as having been caused by an aircraft-wildlife strike;
3. personnel on the ground report seeing an aircraft strike 1 or more birds or other wildlife;
4. bird or other wildlife remains, whether in whole or in part, are found within 200 feet of a runway centerline, unless another reason for the animal's death is identified; or
5. the animal's presence on the airport had a significant, negative effect on a flight (i.e., aborted takeoff, aborted landing, high-speed emergency stop, aircraft left pavement area to avoid collision with animal)

(Source: *Wildlife Control Procedures Manual*, Technical Publication 11500E, 1994).

Aircraft-wildlife strike hazard. A potential for a damaging aircraft collision with wildlife on or near an airport (14 CFR 139.3).

Bird Sizes. Title 40, Code of Federal Regulations, Part 33.76 classifies birds according to weight:

- small birds weigh less than 3 ounces (oz).
- medium birds weigh more than 3 oz and less than 2.5 lbs.
- large birds weigh greater than 2.5 lbs.

Civil aircraft damage classifications. The following damage descriptions are based on the *Manual on the International Civil Aviation Organization Bird Strike Information System*:

Minor: The aircraft is deemed airworthy upon completing simple repairs or replacing minor parts and an extensive inspection is not necessary.

Substantial: Damage or structural failure adversely affects an aircraft's structural integrity, performance, or flight characteristics. The damage normally requires major repairs or the replacement of the entire affected component. Bent fairings or cowlings; small dents; skin punctures; damage to wing tips, antenna, tires or brakes, or engine blade damage not requiring blade replacement are specifically excluded.

Destroyed: The damage sustained makes it inadvisable to restore the aircraft to an airworthy condition.

Significant Aircraft-Wildlife Strikes. A significant aircraft-wildlife strike is deemed to have occurred when any of the following applies:

1. a civilian, U.S. air carrier aircraft experiences a multiple aircraft-bird strike or engine ingestion;
2. a civilian, U.S. air carrier aircraft experiences a damaging collision with wildlife other than birds; or
3. a USAF aircraft experiences a Class A, B, or C mishap as described below:

A. Class A Mishap: Occurs when at least one of the following applies:

1. total mishap cost is \$1,000,000 or more;
2. a fatality or permanent total disability occurs; and/or
3. an Air Force aircraft is destroyed.

B. Class B Mishap: Occurs when at least one of the following applies:

1. total mishap cost is \$200,000 or more and less than \$1,000,000; and/or
2. a permanent partial disability occurs and/or 3 or more people are hospitalized;

C. Class C Mishap: Occurs when at least one of the following applies:

1. cost of reported damage is between \$20,000 and \$200,000;
2. an injury causes a lost workday (i.e., duration of absence is at least 8 hours beyond the day or shift during which mishap occurred); and/or
3. an occupational illness causing absence from work at any time.

Wetlands. An ecosystem requiring constant or recurrent, shallow inundation or saturation at or near the surface of the substrate. The minimum essential characteristics of a wetland are recurrent, sustained inundation or saturation at or

near the surface and the presence of physical, chemical, and biological features indicating recurrent, sustained inundation, or saturation. Common diagnostic wetland features are hydric soils and hydrophytic vegetation. These features will be present, except where specific physiochemical, biotic, or anthropogenic factors have removed them or prevented their development.

(Source the 1987 Delineation Manual; 40 CFR 230.3(t)).

Wildlife. Any wild animal, including without limitation any wild mammal, bird, reptile, fish, amphibian, mollusk, crustacean, arthropod, coelenterate, or other invertebrate, including any part, product, egg, or offspring there of (50 CFR 10.12, *Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants*). As used in this MOA, "wildlife" includes feral animals and domestic animals while out of their owner's control (14 CFR 139.3, *Certification and Operations: Land Airports Serving CAB-Certificated Scheduled Air Carriers Operating Large Aircraft (Other Than Helicopters)*)

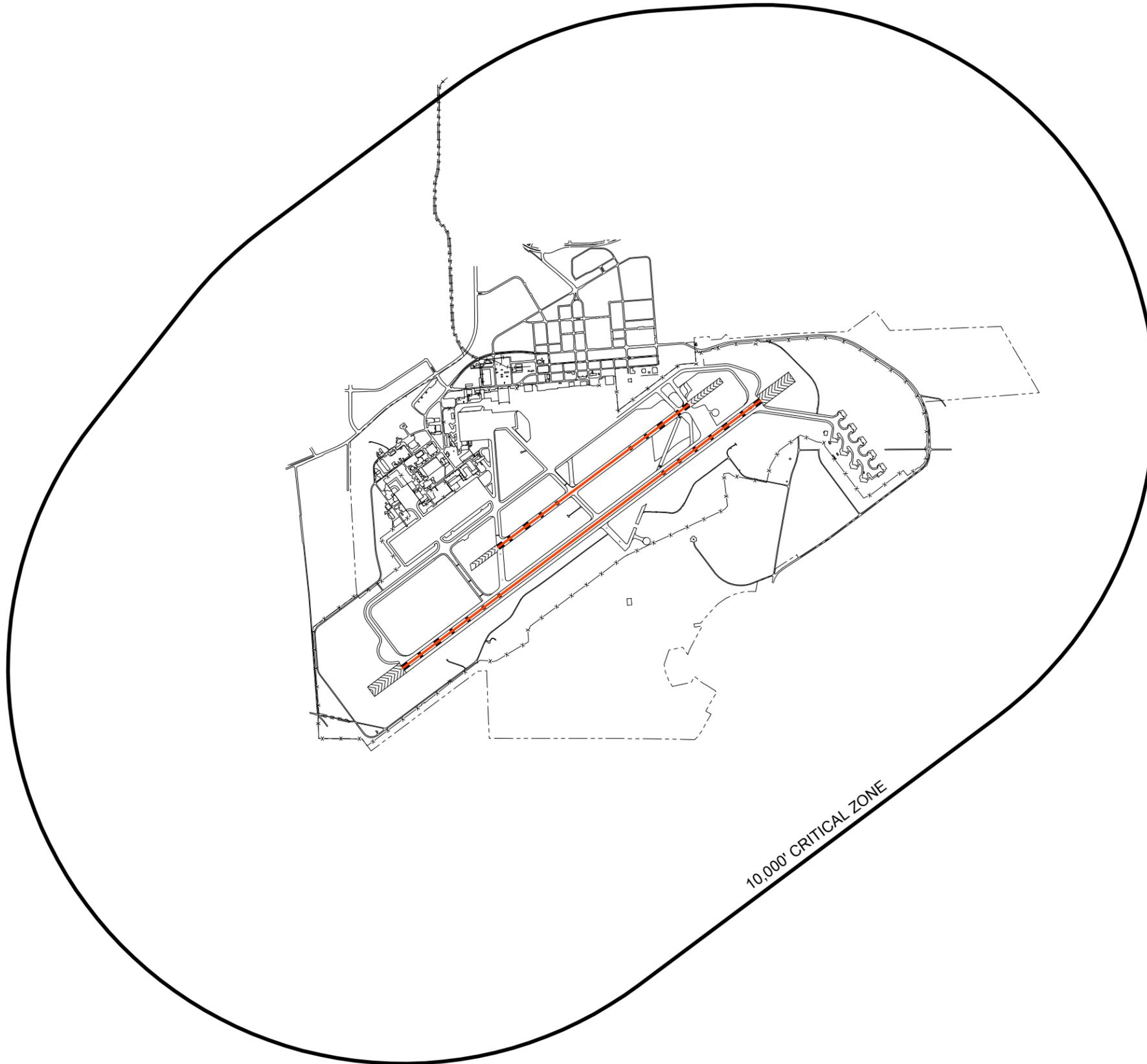
Table 1. Identified wildlife species, or groups, that were involved in two or more aircraft-wildlife strikes, that caused damage to one or more aircraft components, or that had an adverse effect on an aircraft's flight. Data are for 1990-1999 and involve only civilian, U.S. aircraft.

Birds	No. reported strikes
Gulls (all spp.)	874
Geese (primarily, Canada geese)	458
Hawks (primarily, Red-tailed hawks)	182
Ducks (primarily Mallards.)	166
Vultures (primarily, Turkey vulture)	142
Rock doves	122
Doves (primarily, mourning doves)	109
Blackbirds	81
European starlings	55
Sparrows	52
Egrets	41
Shore birds (primarily, Killdeer & Sandpipers)	40
Crows	31
Owls	24
Sandhill cranes	22
American kestrels	15
Great blue herons	15
Pelicans	14
Swallows	14
Eagles (Bald and Golden)	14
Ospreys	13
Ring-necked pheasants	11
Herons	11
Barn-owls	9
American robins	8
Meadowlarks	8
Buntings (snow)	7
Cormorants	6
Snow buntings	6
Brants	5
Terns (all spp.)	5
Great horned owls	5
Horned larks	4
Turkeys	4
Swans	3
Mockingbirds	3
Quails	3
Homing pigeons	3
Snowy owls	3
Anhingas	2

Ravens	2
Kites	2
Falcons	2
Peregrine falcons	2
Merlins	2
Grouse	2
Hungarian partridges	2
Spotted doves	2
Thrushes	2
Mynas	2
Finches	2
Total known birds	2,612

Mammals	No. reported strikes
Deer (primarily, White-tailed deer)	285
Coyotes	16
Dogs	10
Elk	6
Cattle	5
Bats	4
Horses	3
Pronghorn antelopes	3
Foxes	2
Raccoons	2
Rabbits	2
Moose	2
Total known mammals	340

Ring-billed gulls were the most commonly struck gulls. The U.S. ring-billed gull population increased steadily at about 6% annually from 1966-1988. Canada geese were involved in about 90% of the aircraft-geese strikes involving civilian, U.S. aircraft from 1990-1998. Resident (non-migratory) Canada goose populations increased annually at 13% from 1966-1998. Red-tailed hawks accounted for 90% of the identified aircraft-hawk strikes for the 10-year period. Red-tailed hawk populations increased annually at 3% from 1966 to 1998. Turkey vultures were involved in 93% of the identified aircraft-vulture strikes. The U.S. Turkey vulture populations increased annually at 1% between 1966 and 1998. Deer, primarily white-tailed deer, have also adapted to urban and airport areas and their populations have increased dramatically. In the early 1900's, there were about 100,000 white-tailed deer in the U.S. Current estimates are that the U.S. population is about 24 million.



10,000' CRITICAL ZONE

LEGEND	
	10,000' Critical Zone
	Runway Centerline



REVISIONS		
NO.	DATE	DESCRIPTION

FILE NAME: MHR 10000 Crit Zone
 DRAWN BY: WILSONDS
 DATE: 4/23/07
 DESIGNED BY:
 CHECKED BY:
 SCALE:
 AS SHOWN
 LINE IS 2 INCHES
 AT FULL SIZE
 (IF NOT 2" SCALE ACCORDINGLY)

**SACRAMENTO
 INTERNATIONAL
 AIRPORT**

SHEET TITLE
 10,000 Foot Critical Zone

DRAWING NO.
1
 SHEET NO. 1 OF 1

SCAS-R-1

The comment states that the 2008 RDEIR/SDEIS does not adequately address potential impacts on commercial aviation activities at Mather Airport.

A discussion of the Mather Airport Master Plan is provided in the “Regulatory Framework” subsection of Section 3.1, “Land Use,” on pages 3.1-13 and 3.1-14 in the 2006 DEIR/DEIS, and the compatibility of the proposed land uses with the Mather Airport Master Plan is addressed in Impact 3.1-2 on page 3.1-24 in the 2006 DEIR/DEIS. Further discussion of the Mather Airport Master Plan is provided in the “Environmental Setting” subsection on page 3.16-5 and in the “Regulatory Framework” subsection on pages 3.16-10 and 3.16-11 of Section 3.16, “Noise,” in the 2006 DEIR/DEIS. Impact 3.16-5 on pages 3.16-28 and 3.16-29 provides additional analysis of the compatibility of the proposed land uses with the Mather Airport Master Plan.

SCAS-R-2

The comment states that the 2008 RDEIR/SDEIS should consider increases in aviation activities identified in the Draft Mather Airport Master Plan. In addition, the comment notes that the environmental analysis of the master plan pursuant to CEQA and NEPA is underway and the master plan is available on the Sacramento County Airport System’s website.

See response to comment SCAS-R-1, above.

SCAS-R-3

The comment states that the 2008 RDEIR/SDEIS should consider potential hazardous wildlife attractants associated with water features in the Rio del Oro development itself and in conjunction with the contemplated wetland mitigation measures.

Use of the Rio del Oro project site by wildlife considered hazardous to airport operations is not expected to increase as a result of project implementation. It should first be noted that several ponds and numerous other water features comprising approximately 70 acres already exist on the project site. Project development would include creation of three on-site detention basins sized at 7 acres, 6 acres, and 26 acres of overall basin land area, respectively. This acreage represents the total basin land area and does not represent permanently wetted acreage. The smaller basins would be filled to capacity only during 10-year or greater storm events and the larger basin would fill to capacity only during 100-year or greater storm events. The amount of time these basins would hold water would vary depending on the magnitude of storm events. The first flush water quality storm events would be pumped out within 48 hours, mean annual storm events to 10-year storm events would be pumped out in 48-72 hours, and storm events above a 10-year to a 100-year event would be pumped out in 3-10 days. Therefore, these basins would not provide a perennial water source for waterfowl and would not contain emergent vegetation that would provide food or cover for hazardous wildlife. Additionally, the detention basins would be fenced from public access and the public would not have opportunities to feed waterfowl at these basins. There is no open space land designated adjacent to the detention basins to provide escape cover, nesting, or roosting opportunities for hazardous wildlife.

Project compensatory mitigation includes creation of 13.45 acres of vernal pools, 0.75 acre of seasonal wetland swale, 8.40 acres of low-flow channel, and 16.94 acres of seasonal wetland/riparian habitat on the project site. The proposed on-site wetland and riparian habitat creation, however, is intended to compensate for wetland and riparian

habitats that currently exist on-site that would be removed through project implementation, and compensatory wetlands proposed for creation would be designed to provide the same habitat functions as the wetlands they replace. Therefore, on-site wetland mitigation would not result in a change in the types of habitat present on the project site and would not make the site more attractive to hazardous wildlife. Wetland habitat acreage would be roughly the same after project implementation as currently exists, but wetland habitats would mostly be contained within the proposed 507-acre preserve area in the southern portion of the site rather than being spread throughout the site as they are currently. Wetlands on the project site after project implementation would reflect existing habitat conditions that primarily consist of vernal pools and other ephemeral wetlands.

Implementing the proposed project would reduce the amount of riparian habitat on site from approximately 807 acres to 16.94 acres, making the project site much less attractive to avian species that use these habitats. Implementing the project would eliminate all of the existing woodland and scrub habitat present on the project site, thereby reducing habitat available to tree and shrub nesting and roosting species commonly involved in airline strikes such as eagles, osprey, hawks, owls, crows, ravens, and herons. Although the project includes creation of a drainage corridor to convey stormwater in winter and urban runoff in summer, overall, the project would result in a net loss of on-site habitat attractive to hazardous wildlife.

SCAS-R-4

The comment states that Mather Airport supports a significant number of general aviation operations. The comment summarizes the number of flight operations, the annual average growth rate in these operations, and the quantity of freights passed through the airport.

The comment is noted.

SCAS-R-5

The comment states that the Rio del Oro project would be within a 5-mile radius of Mather Airport, which the Federal Aviation Administration's (FAA's) Hazards Advisory Circular specifies as an area of concern relative to hazardous wildlife. The comment states that the 2008 RDEIR/SDEIS does not address the threat that aquatic components of the specific plan could attract avian species that could inflict significant damage to aircraft using Mather Airport and endanger passengers and crew members.

Habitats types present on the project site after project implementation would not be substantially different than habitats that currently exist on the project site. Therefore, project implementation is not expected to attract hazardous wildlife. See response to comment SCAS-R-3.

SCAS-R-6

The comment describes FAA's role in airport safety and concern about minimizing hazardous wildlife attractants, then lists FAA policies and guidance documents related to hazardous wildlife.

See response to SCAS-R-3.

SCAS-R-7

The comment states that the 2008 RDEIR/SDEIS contains little or no analysis of potential attraction of avian species hazardous to aircraft operations at four types of facilities: permanent water retention basins/ponds, domestic water supply treatment facility, stormwater infrastructure, and wetland compensatory mitigation sites.

The project does not include permanent water retention basins/ponds or a domestic water supply treatment facility. See response to comment SCAS-R-3 regarding the types of detention basins and wetland mitigation that would be implemented on the project site.

SCAS-R-8

The comment states that under the Continuity of Operations Plan being developed for Sacramento International Airport, limited passenger service operations could be temporarily transferred to Mather Airport in the event of a levee breach or other natural disaster. The comment states that the passengers and crews aboard aircraft diverted to Mather Airport could be confronted with the unnecessary risk of collision with birds if the aquatic features contemplated in the Rio del Oro Specific Plan were constructed.

See response to comment SCAS-R-3. Overall, the project would result in a net loss of on-site habitat attractive to hazardous wildlife, and therefore aircraft diverted to Mather Airport would not be confronted with an unnecessary risk of collision with birds.

SCAS-R-9

The commenter recommends amending the 2008 RDEIR/SDEIS to include a complete and thorough evaluation of the hazardous wildlife implications associated with all of the project alternatives.

See responses to comment SACAS-R-3. None of the project alternatives under consideration would result in an overall increase in habitat attractive to hazardous wildlife, and no further analysis is necessary.

SCAS-R-10

The commenter believes that USACE is obligated to consult with FAA and USFWS regarding measures to minimize hazardous wildlife attractants associated with the Rio del Oro project.

As a cooperating agency, FAA has been given the opportunity to comment on the DEIR/DEIS and the RDEIR/SDEIS and is being given the opportunity to provide input on the content of the FEIR/FEIS. Because project implementation is not expected to increase hazardous wildlife attractants, USACE has not requested specific input from FAA regarding hazardous wildlife attractants and there is no need to consult with USFWS to reduce such attractants. Further, FAA received notice of the 2006 DEIR/DEIS and 2008 RDEIR/SDEIS and therefore has had the opportunity to comment on the potential for hazardous wildlife attractants. Changes to the original design of the 26-acre detention basin were made to minimize habitats attractive to hazardous wildlife. Specifically, compensatory wetlands are no longer proposed in the 26-acre detention basin as they were in the 2007 draft wetland MMP. Although other compensatory wetlands would be created on site, these wetlands would be similar to habitats that already exist on the site that would be removed as a result of implementing the project. As described in response to comment SCAS-R-3, the project would result in an overall reduction in habitat attractive to hazardous wildlife at the project site.

SCAS-R-11

The commenter requests that the EIR fully address the potential for the lake/detention basin element to create a safety hazard for aircraft operations, and refers to Section 15154 of the State CEQA Guidelines (Projects Near Airports).

See response to comment SCAS-R-3.

SCAS-R-12

The commenter refers to an attached excerpt from the Sacramento County Airport System's April 21, 2006, comment letter on the proposed Greenbriar project near Sacramento International Airport, and notes that most of the comments in that letter are also relevant to the Rio del Oro Specific Plan.

Unlike the Greenbriar project, the Rio del Oro project does not propose creation of a lake that would support year-round surface water. Proposed water detention basins on the Rio del Oro project site are designed and would be operated in a manner that would not induce conditions hazardous to aircraft operations. Please see response to comment SCAS-R-3 for a description of the project detention basins.



10545 Armstrong Avenue

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June 16, 2008

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Patrick Angell
City of Rancho Cordova Planning Department
2729 Prospect Park Drive
Rancho Cordova, CA 95670

Subject: Rio Del Oro Specific Plan Recirculated Draft Environmental Impact Report/Supplemental Environmental Impact Statement

Dear Mr. Angell:

The Sacramento Area Sewer District (SASD) and Sacramento Regional County Sanitation District (SRCSD) have reviewed the Recirculated Draft EIR for the Rio Del Oro Specific Plan and have the following comments:

SRCSD, in coordination with Sacramento County Water Agency (SCWA) and other stakeholders, is currently evaluating the feasibility of providing recycled water to the City of Rancho Cordova. It is uncertain as to when recycled water would be available to this area.

1. Page 3.5-19, Recycled Water Component

The first sentence should be revised as follows: "Approximately 800 afy of recycled water is currently provided to SCWA by the Sacramento County Regional County Sanitation District (SRCSD)."

The following sentences should be added to the end of the paragraph: "*The 2005 Zone 40 Water Supply Master Plan (WSMP) has a recycled water supply component of 4,400 afy. SRCSD and SCWA have identified projects that could potentially provide this supply of 4,400 afy noted in the WSMP.*"

2. Page 3.5-24, City of Rancho Cordova's Recycled Water Supplies

The first and second paragraphs should be replaced with the following:

"SRCSD provides wastewater conveyance, treatment and disposal services for most of the urbanized areas of the Sacramento metropolitan region, including the majority of the SCWA retail service areas. In 2002, SRCSD and SCWA entered into a Wholesale Agreement to wholesale and retail recycled water. Through this agreement, SRCSD is responsible for providing up to 3.5 million gallons per day (MGD) of recycled water to SCWA. SCWA is responsible for retailing this recycled water to select customers within its service area. Because of its high reliability and its

independence of hydrologic conditions in any given year, recycled water is a desirable source of water to meet non-potable demands such as landscape irrigation.

Since 2003, SRCSD has been producing high quality recycled water at its Water Reclamation Facility (WRF) located at the Sacramento Regional Wastewater Treatment Plant (SRWTP). The WRF was designed to produce 5 MGD of recycled water and was permitted to be expandable to produce up to 10 MGD. The recycled water is used in lieu of potable water to irrigate parts, school fields, greenbelts, landscaped medians and freeway interchanges. It is also used in the treatment processes at the SRWTP. SRCSD and SCWA are currently evaluating potential recycled projects to expand the recycled water capacity of the Water Recycling Program."

3. Page 3.5-25, Expanded Use of Recycled Water

The first and second paragraphs should be replaced with the following:

"In February 2007, SRCSD completed its Water Recycling Opportunities Study (WROS). The WROS is a planning document that would guide the SRCSD in reaching its goal producing 30-40 MGD of recycled water over the next 20 years. The WROS studied different target areas throughout the Sacramento Region at a master planning level to evaluate the possibility of providing recycled water to these areas. The WROS identified 18 potential recycled water projects and recommended conducting more detailed feasibility studies on the most promising projects or target areas. The increased use of recycled water within Zone 40 would increase the total volume of supplies available to SCWA to meet its projected demands within Zone 40. The WROS serves to: "

The fourth paragraph should be revised as follows:

"Potential projects to provide recycled water to Rancho Cordova may include diversion of wastewater from an interceptor located near the vicinity and may require construction of a new satellite wastewater treatment plant, above ground storage tanks, pumping stations and new infrastructure to convey and distribute this recycled water."

If you have any questions regarding these comments please contact me at (916) 876-9994.

Sincerely,



Sarena Deeble, PE
SASD/SRCSD
Policy and Planning

cc: Michael Meyer
Ruben Robles
Jose Ramirez
Stephen Moore
Kathleen Dadey
SRCSD Development Services
SASD Development Services

SRCSD-R-1

The comment states that SRCSD, in coordination with SCWA and other stakeholders, is currently evaluating the feasibility of providing recycled water to the City, and is uncertain as to when recycled water would become available to the proposed project area.

As explained on pages 3.5-24 and 3.5-25 in Section 3.5, “Utilities and Service Systems—Water Supply,” in the 2008 RDEIR/SDEIS, the City is committed to the use of recycled water, and SCWA and SRCSD are investigating the feasibility of providing recycled-water service. It is acknowledged that it is unknown whether recycled water would be available to the City in the future.

SRCSD-R-2 and
SRCSD-R-3

The commenter requests that the first paragraph on page 3.5-19 be revised to reflect a change in the amount of recycled water provided by SRCSD and the information contained in the 2005 Zone 40 Water Supply Master Plan (Zone 40 WSMP).

As requested by the commenter and as shown in Chapter 5 of this FEIR/FEIS, the first full paragraph on page 3.5-19 of the 2008 RDEIR/SDEIS is hereby revised as follows:

Approximately ~~4,400 afy~~ 800 afy of recycled water is currently provided to SCWA by SRCSD. This water is used within the Zone 40 service area to offset demand by parks and for other nonpotable uses. “Recycled water” refers to wastewater treated to a tertiary level—filtration and disinfection (Title 22, unrestricted use)—and is used for nonpotable uses such as landscape irrigation at parks, schools, and rights-of-way. The 2005 Zone 40 WSMP has a recycled-water supply component of 4,400 afy. SRCSD and SCWA have identified projects that could potentially provide this supply of 4,400 afy noted in the WSMP.

SRCSD-R-4

The commenter requests that the first and second paragraphs on page 3.5-24 under “City of Rancho Cordova’s Recycled-Water Supplies” be revised to rephrase the information about SRCSD services.

As requested by the commenter and as shown in Chapter 5 of this FEIR/FEIS, the first and second paragraphs under “City of Rancho Cordova’s Recycled-Water Supplies” on page 3.5-24 of the 2008 RDEIR/SDEIS are hereby revised as follows:

~~SRCSD is responsible for the collection, treatment, disposal, and reuse (of recycled water) of up to 5 mgd of wastewater throughout most of the urbanized areas of Sacramento County, including the majority of the SWCA retail service areas. SRCSD implemented a water recycling program on the Sacramento Regional Water Treatment Plant (SRWTP) site, which began service to communities in southern Sacramento County in 2003.~~

~~Through an agreement between SCWA and SRCSD, SCWA has successfully implemented a water recycling program. Approximately 4,400 afy of recycled water is currently provided to SCWA by SRCSD and used within the Zone 40 service area. This program provides recycled water for SRCSD’s on-site uses and for large commercial irrigation customers within Zone 40 (e.g., commercial uses,~~

industrial uses, right of way landscaping, schools, and parks). Because of its high reliability and its independence of hydrologic conditions in any given year, recycled water is a desirable source of water for a community's outdoor irrigation demands—parks, schools, street medians, landscaping of residential front and back yards, and public open space. It is also desirable for industrial uses such as cooling water. In addition, recycled water is commonly used for environmental purposes such as wetlands and habitat restoration. SRCSD is working in partnership with SCWA to serve areas in Zone 40, including Rancho Cordova. The expanded water recycling facility and new water recycling service areas will be called Phase II of the SRCSD Water Recycling Program. Phase II construction will be timed with the need for the higher capacity and is currently expected to be in service in five to ten years.

SRCSD provides wastewater conveyance, treatment, and disposal services for most of the urbanized areas of the Sacramento metropolitan region, including the majority of the SCWA retail service areas. In 2002, SRCSD and SCWA entered into a wholesale agreement to wholesale and retail recycled water. Through this agreement, SRCSD is responsible for providing up to 3.5 mgd of recycled water to SCWA. SCWA is responsible for retailing this recycled water to selected customers within its service area. Because of its high reliability and its independence of hydrologic conditions in any given year, recycled water is a desirable source of water to meet nonpotable demands such as landscape irrigation.

Since 2003, SRCSD has been producing high-quality recycled water at its water reclamation facility (WRF) located at the Sacramento Regional Wastewater Treatment Plant (SRWTP). The WRF was designed to produce 5 mgd of recycled water and was permitted to be expanded to produce up to 10 mgd. The recycled water is used in lieu of potable water to irrigate parts of school facilities, greenbelts, landscaped medians, and freeway interchanges. It is also used in the treatment processes at the SRWTP. SRCSD and SCWA are currently evaluating potential recycled-water projects to expand the recycled-water capacity of the Water Recycling Program.

SRCSD-R-5

The commenter requests that the first and second paragraphs on page 3.5-25 of the 2008 RDEIR/SDEIS under “Expanded Use of Recycled Water” be revised to reflect the results of SRCSD’s 2007 Water Recycling Opportunities Study.

As requested by the commenter and as shown in Chapter 5 of this FEIR/FEIS, the first and second paragraphs under “Expanded Use of Recycled Water” on page 3.5-25 of the 2008 RDEIR/SDEIS are hereby revised as follows:

~~The water recycling program on the SRWTP site was designed and constructed to be readily expandable from 5 mgd to 10 mgd in accordance with SRCSD’s Master Reclamation Permit (WDR #97-146). To plan for water recycling projects beyond 2010, a planned plant expansion of the water recycling facility from 5 mgd to 10 mgd could serve new areas of planned and expected growth and public open space areas. The increased use of recycled water within Zone 40 would increase the total volume of supplies available to SCWA to meet its projected demands within Zone 40. The WROS serves to:~~

~~SRCSD has prepared a *Water Recycling Opportunities Study* (SRCSD 2007) to study the feasibility of meeting its goal to increase water recycling throughout the~~

~~Sacramento region on the scale of 30–40 mgd over the next 20 years. The study serves to:~~

In February 2007, SRCSD completed its *Water Recycling Opportunities Study (WROS)*. The WROS is a planning document that would guide SRCSD in reaching its goal of producing 30–40 mgd of recycled water over the next 20 years. The WROS studied different target areas throughout the Sacramento Region as a master planning level to evaluate the possibility of providing recycled water to these areas. The WROS identified 18 potential recycling water projects and recommended conducting more detailed feasibility studies on the most promising projects or target areas. The increased use of recycled water within Zone 40 would increase the total volume of supplies available to SCWA to meet its projected demands within Zone 40. The WROS serves to:

SRCSD-R-6

The commenter requests that the fourth paragraph on page 3.5-25 of the 2008 RDEIR/SDEIS under “Expanded Use of Recycled Water” be revised as related to the Bradshaw/Folsom Interceptor System.

As requested by the commenter and as shown in Chapter 5 of this FEIR/FEIS, the fourth paragraph under “Expanded Use of Recycled Water” on page 3.5-25 of the 2008 RDEIR/SDEIS is hereby revised as follows:

Future Potential projects to provide recycled water to Rancho Cordova may include diversion of wastewater from ~~the Bradshaw/Folsom Interceptor System~~ an interceptor located near the vicinity and may require construction of a new wastewater satellite treatment plant, ~~an~~ aboveground storage tanks, a pump stations, and new infrastructure to convey and distribute this recycled water.

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Department of Water Resources
Keith DeVora, Director



Including service to the cities of
Elk Grove and Rancho Cordova

SACRAMENTO COUNTY
WATER AGENCY

July 03, 2008

Patrick Angell
City of Rancho Cordova Planning Department
2729 Prospect Park Drive
Rancho Cordova, CA 95670

Re: **Rio Del Oro Specific Plan Recirculated Draft Environmental Impact
Report/Supplemental Draft Environmental Impact Statement**

Dear Mr. Angell:

Thank you for the opportunity to comment on the subject document. The Sacramento County Water Agency ("SCWA") will supply public water to the project, which lies entirely in SCWA Zone 40.

In the discussion of water supply alternatives, the document frequently references the 2003 agreements between SCWA and the Aerojet General and McDonnell Douglas-Boeing Corporations, respectively, and a 2004 agreement between SCWA and the Golden State Water Company. These three agreements have been terminated and the references are no longer applicable.

The City of Rancho Cordova ("City") General Plan Policy ISF.2.4 states in part:

"Ensure that water supply and delivery systems are available in time to meet the demand created by new development"

and provides for implementation of this policy by Action ISF 2.4.1 and Action ISF 2.4.2:

"The following shall be required for project-specific discretionary land-use entitlements and approvals including, but not limited to, all tentative subdivision maps, parcel maps, or use permits. . . . an assured water supply and delivery system shall be available or reasonably foreseeable at the time of project approval Prior to recordation of any final subdivision map, or prior to City approval of any similar project-specific discretionary land use approval or entitlement required for nonresidential uses, the project applicant or water provider shall demonstrate the availability of a long-term, reliable water supply for the amount of development that would be authorized Such demonstration shall consist of a written certification from the water provider that either existing sources are available or that needed improvements will be in place prior to occupancy."

"Managing Tomorrow's Water Today"

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Facilities Operations & Admin.: 3847 Branch Center Rd. #1, Sacramento, CA 95827 • (916) 875-RAIN • fax (916) 875-6884
Elk Grove Office: 9280 W. Stockton Blvd., Suite 220, Elk Grove, CA 95758 • (916) 875-RAIN • fax (916) 875-4046

Accordingly, SCWA requires the following conditions on any and all development entitlements necessary for any portion of the Rio Del Oro Specific Plan Project in order to assure that a reliable supply of water can be provided in a timely fashion consistent with the City's General Plan policies:

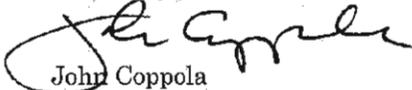
1. Subdivision maps, including large lot maps and parcel maps, shall not be recorded until SCWA has executed a remediated water supply agreement with the Aerojet General Corporation.
2. A non-potable water supply system shall be provided for all development in the Rio del Oro Specific Plan area to the satisfaction of SCWA.
3. Subdivision maps, including large lot maps and parcel maps, shall not be recorded until SCWA has approved a CEQA-compliant document for the North Service Area Pipeline Project or has made a written determination that a reliable water supply is available.
4. Tentative subdivision maps, including large lot maps and parcel maps, shall not be approved until SCWA has executed reservation agreements for the acquisition of sites suitable and necessary for the construction of storage tanks, pump stations, and all other facilities required to provide potable and non-potable water supply, as determined by SCWA.
5. Subdivision maps, including large lot maps and parcel maps, in the California-American Water Company franchise area shall not be recorded until SCWA has executed a wholesale water service agreement with California-American or until SCWA provides written verification of alternative reliable water service.

Please note that Conditions No. 1, 3, and 5 require that the condition be met in order for final maps to record; with respect to Condition No. 4, it is essential to identify specific sites before a tentative map is approved.

These conditions are necessary in order for SCWA to assure that a reliable water supply can be provided in a timely fashion to meet the projected water demands of the Rio Del Oro Specific Plan development. Compliance with these conditions will be required in order for SCWA to provide both Will-Serve Letters to the State Department of Real Estate and a Written Verification of the Availability of a Sufficient Water Supply pursuant to the California Water Code (SB 221). Furthermore, these conditions support the City's General Plan Natural Resource Policies NR.5.1, NR.5.2, and NR.5.4, which address water conservation, water recycling, and the remedy of existing groundwater contamination.

Thank you again for the opportunity to comment on this matter.

Very truly yours,



John Coppola
Principal Civil Engineer
Sacramento County Water Agency

cc: Kathleen Dadey, U.S. Army C.O.E.
David Hatch, Aerojet General Corp.
Russ Davis, Elliott Homes

SCWA-R-1

The comment states that SCWA will supply public water to the project, which lies entirely within SCWA Zone 40.

This comment confirms that SCWA would supply water to the project. (See also Master Response 1, “Adequacy of Long-Term Water Supply,” in Chapter 3 of this FEIR/FEIS.) The project would fall into the SCWA and Cal-Am service areas; as stated on page 3.5-19 of Section 3.5, “Utilities and Service Systems—Water Supply,” of the 2008 RDEIR/SDEIS, the initial water for the project would be supplied to SCWA by GSWC, pending completion of the water supply and conveyance facilities identified in the Zone 40 WSMP have been constructed and are online.

SCWA-R-2

The comment states that the 2003 agreements between SCWA and the Aerojet General and McDonnell Douglas–Boeing Corporations, respectively, and a 2004 agreement between SCWA and GSWC have all been terminated, and that references to these agreements in the discussion of water supply alternatives in the 2008 RDEIR/SDEIS are no longer applicable.

In response to this comment, which was written before Aerojet and SCWA entered into the 2010 Agreement discussed at length in Master Response 1 (“Long-Term Water Supply”), the City acknowledges that the 2003 agreements between SCWA and Aerojet and the Boeing Company and between SCWA and GSWC referenced in the 2008 RDEIR/SDEIS are no longer in effect. The 2010 Agreement, though, has replaced the 2003 Agreement between Aerojet and SCWA. Even so, references to these 2003 agreements in the RDEIR/SDEIS are still relevant because the RDEIR/SDEIS specifically recognized that termination of the agreements could occur. (2008 RDEIR/SDEIS, pages 3.5-6 and 3.5-7). The City therefore disagrees that the FEIR should eliminate all references. The City believes that the reader will better understand the situation if references to the agreements remain in the EIR.

Although the agreements between the SCWA and Aerojet and the Boeing Company have been terminated, SCWA and Aerojet have entered into the 2010 Agreement under which Aerojet is transferring 8,900 afy of GET water to SCWA. Under the 2010 Agreement, SCWA acknowledges that the 8,900 afy will provide SCWA with sufficient available water to supply the Project, and shall further confirm this fact in writing to the City. The 8,900 afy along with other available Zone 40 water (including 1,500 afy under the SCWA conjunctive use program) is sufficient to meet the Project demand of 8,891 afy. Thus, it is a reasonably likely water supply for the Project under the standards set forth in *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal.4th 412. (See Master Response 1, “Adequacy of Long-Term Water Supply,” in Chapter 3 of this FEIR/FEIS.)

The termination of the MDC-County Agreement does not affect the water available for the project because the water that was contemplated under this agreement (through the RWSP) is not necessary to supply the project. Approval and implementation of the RWSP by SCWA is not required for GET remediated water to be available to SCWA to meet Rio del Oro’s demand. As noted above, the GET remediated water transferred to SCWA by Aerojet under the 2010 Agreement shall be available to meet Project demand.

Similarly, the termination of the SCWA-GSWC Agreement does not affect the water supply available to the project. Aerojet and GSWC entered into a Master Settlement Agreement (MSA) under which both parties agreed to Aerojet's obligations to provide up to 5,000 afy of replacement water, as needed, for supply lost as a result of groundwater contamination from past activities by Aerojet. Concurrent with the MSA, GSWC entered into a water supply agreement with Sacramento County and SCWA under which SCWA would be responsible for providing replacement groundwater to GSWC. The agreement contemplated that SCWA would approve a replacement water supply project (for this reason, the SCWA circulated the RWSP DEIR). If the RWSP had been approved, the water supply agreement would have required SCWA to deliver 5,000 afy of replacement water to GSWC's intake facilities on the Folsom South Canal. As with the MDC-County Agreement, the SCWA-GSWC Agreement is not necessary to supply the project. Furthermore, although under the MSA, Aerojet has a continuing obligation to provide replacement water to GSWC, the amount of water Aerojet currently discharges to the American River (more than 15,000 afy) is more than enough to satisfy its obligation of up to 5,000 afy to GSWC while still supplying the project demand.

SCWA-R-3

The comment quotes Policy ISF.2.4, Action ISF.2.4.1, and Action ISF 2.4.2 of the City General Plan regarding water supply and delivery systems. The comment also lists the SCWA conditions on development entitlements necessary for the Rio del Oro project to assure that a reliable water supply can be provided in a timely fashion, consistent with the City General Plan.

The City will consult with SCWA regarding proposed conditions of approval for subsequent entitlements under Tier 2 consistent with the provisions of Policy ISF.2.4, Action ISF.2.4.1, and Action ISF 2.4.2 of the City General Plan. However, in the 2010 Agreement, SCWA acknowledges that the Agreement fully satisfies SCWA's proposed condition in its comment letter for a "remediated water supply agreement with Aerojet General Corporation" with respect to water supply for the Project.

SCWA-R-4

The comment states that the conditions specified in comment SCWA-R-3 will be required for SCWA to provide will-serve letters to the California Department of Real Estate and a written verification of the availability of a sufficient water supply pursuant to the California Water Code (Senate Bill [SB] 221).

See response to comment SCWA-R-3.



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PLANNING

May 8, 2008
E225.000

Patrick Angell
City of Rancho Cordova
Planning Department
2729 Prospect Park Drive
Rancho Cordova, CA 95670

**Application: Notice of Availability – Recirculated Draft
Environmental Impact Report/Supplemental
Environmental Impact Statement for Rio Del Oro
Specific Plan**

Board of Directors

Representing:

County of Sacramento
City of Citrus Heights
City of Elk Grove
City of Folsom
City of Rancho Cordova
City of Sacramento

Dear Mr. Angell:

Sacramento Area Sewer District (District, formerly CSD-1) has reviewed the Notice of Availability (NOA) for the Environmental Impact Report (EIR) for the subject project. The Sacramento Regional County Sanitation District (SRCSD) or Policy & Planning may send their comments in a separate letter.

It is noted that the above project would permit a mixed use development on approximately 3,828 acres in five phases over a 25- to 30-year period. The project provides for construction of approximately 11,601 residential dwelling units. Commercial land use would include Village Commercial, Local Town Center, and Regional Town Center; Business Park; and Industrial Park. The project is located south of White Rock Road north of Douglas Road, and east of Sunrise Boulevard within the City of Rancho Cordova.

The subject property is not within the boundaries of the District and SRCSD, but is within the Urban Service Boundaries (USB) as defined by the Sacramento County General Plan. Annex the subject property to both SRCSD and the Sacramento Area Sewer District of Sacramento County prior to recordation of the Final Map or to the approval of improvement plans, whichever occurs first. After annexation, the ultimate plan for conveyance and treatment of the subject property shall be by the Districts as specified in the District and SRCSD Master Plans.

Mary K. Snyder
District Engineer

Christoph Dobson
Collection System Manager

Wendell H. Kido
District Manager

Marcia Maurer
Chief Financial Officer

10545 Armstrong Avenue
Mather, California 95655
Tel 916.876.6000
Fax 916.876.6160
www.sacsewer.com

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PMC

Patrick Angell
May 8, 2008
Page 2

As this Recirculated Draft EIR/Supplemental EIS is only requesting comments on water conveyance system and biological resources, the District's sewer comments are not necessary for this report. Comments made on the 2006 Draft EIR/EIS should still be valid for any sewer related sections.

If you have any questions regarding these comments, please call Amandeep Singh at 876-6296 or myself at 876-6094.

Sincerely,



Salam A. Khan, P.E.
Sacramento Area Sewer District
Development Services

SK/CJ:clm

cc: File
Kathleen Dady
U.S. Army Corps of Engineers, Sacramento District
Regulatory Branch
1325 J Street, Room 1480
Sacramento, CA 95814-2922

SASD-R-1

The comment states that the project site is not within the boundaries of the Sacramento Area Sewer District (formerly CSD-1) but is within the Sacramento County Urban Services Boundary, and annexation of the project site to the Sacramento Area Sewer District and SRCSD is required before recordation of the final map or approval of improvement plans, whichever occurs first.

Please see Impact 3.1-1 in Section 3.1, "Land Use," of the 2006 DEIR/DEIS. This impact outlines the process and requirement for annexation of the project site to the Sacramento Area Sewer District and SRCSD.

SASD-R-2

The comment states that the ultimate design for the conveyance and treatment of wastewater generated by the Rio del Oro project must meet the specifications of the Sacramento Area Sewer District and SRCSD Master Plans.

The comment is noted.

SASD-R-3

The comment reiterates that comments provided by CSD-1 on the 2006 DEIR/DEIS are still valid.

Responses to comments by CSD-1 on the 2006 DEIR/DEIS are contained in this FEIR/FEIS.

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Municipal Services Agency

Department of Transportation

Michael J. Penrose, Interim Director



Terry Schutten, County Executive
Paul J. Hahn, Agency Administrator

County of Sacramento

April 30, 2008

Mr. Patrick Angell
City of Rancho Cordova Planning Department
2729 Prospect Drive
Rancho Cordova, CA 95670

Ms. Kathleen Dadey
U. S. Army Corps of Engineers, Sacramento District
Regulatory Branch
1325 J Street, Room 1480
Sacramento, CA 95814-2922

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PMC

SUBJECT: COMMENTS ON THE RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT (EIR)/SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS) FOR RIO DEL ORO SPECIFIC PLAN PROJECT.

Dear Mr. Angell and Ms. Dadey:

The Sacramento County Department of Transportation has reviewed the recirculated draft EIR/supplemental draft EIS for Rio del Oro Specific Plan Project. We appreciate the opportunity to review this document. It should be noted that we have previously sent a comment letter on December 15, 2006. A copy of this letter is enclosed for your reference. We ask that our previous comments be addressed in the final environmental impact report/statement for this project. We have performed a cursory relating to the traffic circulation and have no comments to offer at this time.

Should you have any questions, please feel free to contact me at (916) 875-2844 or atwalk@saccounty.net.

Sincerely,

Kamal Atwal, P.E., T.E.
Associate Transportation Engineer
Department of Transportation

KA:ka



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www.sacdot.com

Municipal Services Agency

Department of Transportation
Tom Zlotkowski, Director



Terry Schutten, County Executive
Cheryl Creson, Agency Administrator

County of Sacramento

December 15, 2006

Mr. Patrick Angell
City of Rancho Cordova
2729 Prospect Park Drive
Rancho Cordova, CA 95670

Anna Sutton
U. S. Army Corps of Engineers, Sacramento District
Regulatory Branch
1325 J Street, Room 1480
Sacramento, CA 95814-2922

COPY

**SUBJECT: DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE RIO DEL ORO
SPECIFIC PLAN PROJECT**

Dear Mr. Angell and Ms. Sutton:

The County of Sacramento, Department of Transportation has reviewed the Draft Environmental Impact Report (DEIR) for the Rio Del Oro Specific Plan. We appreciate the opportunity to review this document and have the following general comments:

- Tom Zlotkowski, Department of Transportation Director, County of Sacramento, is currently working with a multi-jurisdictional coalition that is analyzing regional transportation issues in the East Sacramento/West El Dorado County region. The City of Rancho Cordova is also involved with this effort. This analysis attempts to establish land use and infrastructure baseline and cumulative condition assumptions that should be used on future studies in the region. This project should be subject to the assumptions recently identified by this coalition.
- It should be pointed out that the County of Sacramento would expect that the traffic impacts caused by this particular Specific Plan be mitigated by the development to the extent that the development is responsible for the impacts. To that end, the financing for these improvements should be identified in a public facilities financing plan.

If you have any questions, please feel free to contact me at 874-7052.

Sincerely,

Matthew G. Darrow
Senior Civil Engineer

MGD:mgd

c: Steve Hong, IFS
Dean Blank, DOT
Dan Shoeman, DOT
Tom Zlotkowski, DOT



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www.sacdot.com

DOT-R-1

The commenter notes that the Sacramento County Department of Transportation previously sent a comment letter on the 2006 DEIR/DEIS but has no additional comments on the 2008 RDEIR/SDEIS, and asks that the prior comments be addressed in the FEIR/FEIS.

The comment is noted.

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From: Traci Canfield [tcanfield@sacrt.com]

Sent: Thursday, June 12, 2008 4:26 PM

To: riodeloro@cityofranchocordova.org

Subject: Rec DEIR/SDEIS

RT does not have any additional comments on the Rio Del Oro Recirculated DEIR/Supplemental DEIS. Our Feb 2007 comments on the DEIR/DEIS still apply. Please let me know if you have any questions.

Thanks,
Traci Canfield
Planner
RT
556-0513

RT-R-1

The comment states that Sacramento Regional Transit District does not have additional comments on the 2008 RDEIR/SDEIS and that the district's previous comments on the 2006 DEIR/DEIS still apply.

The comment is noted.

From: Paul Junker [pjunker@cityofranchocordova.org]
Sent: Monday, July 07, 2008 5:59 PM
To: Patrick Angell
Subject: FW: Comments Re: Rio Del Oro Specific Plan- Draft EIR
Rio comment received via e-mail.

Paul Junker, Planning Director
City of Rancho Cordova
2729 Prospect Park Drive
Rancho Cordova, CA 95670
(916) 851-8751

From: Sandra Hamameh [mailto:sandra@sachousingalliance.org]
Sent: Monday, July 07, 2008 4:45 PM
To: Paul Junker; Kathleen.a.Dadey@spk01.usace.army.mil
Subject: Comments Re: Rio Del Oro Specific Plan- Draft EIR

July 7, 2008

Rio Del Oro Specific Plan
Draft Environmental Impact Report/Supplemental Draft

The Sacramento Housing Alliance submits the following comments:

The Draft EIR for The Rio Del Oro Specific Plan is inadequate without a complete analysis under Chapter 3.2, regarding jobs and housing balance. The Final EIR should include a complete analysis of employment and wages to determine if this project will impact the jobs/housing balance as stated. With only 10% of the homes affordable to low income people, many Rancho Cordova workers will be unable to afford to live in this development, and therefore this project will not improve the jobs/housing balance and associated air quality issues involved with increased commute times to and from the City of Rancho Cordova. Without more analysis of Chapter 3.2 and the jobs/housing balance, the Draft EIR is insufficient.

Thank you,
Sandra Hamameh

Sacramento Housing Alliance
1800 21st Street, Suite 100
Sacramento, CA 95814
phone (916) 455-4900 * fax (916) 455-4917
<http://www.sachousingalliance.org/>

SHA-R-1

The comment expresses concern that the Rio del Oro project would not improve the jobs/housing balance and associated air quality issues involved with increased commute times to and from the City of Rancho Cordova, and with only 10% of the homes affordable to low-income people, many Rancho Cordova workers will be unable to afford to live in this development. The comment recommends that an additional analysis of employment and wages be conducted to determine whether the Rio del Oro project will affect the jobs/housing balance as stated in the DEIR in Section 3.2, "Population, Employment, and Housing."

This comment is based on information contained in the 2006 DEIR/DEIS, not the 2008 RDEIR/SDEIS. The notice of availability (NOA) for the 2008 RDEIR/SDEIS noted that pursuant to procedures set forth in Section 15088.5(f)(2) of the State CEQA Guidelines, reviewers should limit their comments to the materials contained in the 2008 RDEIR/SDEIS. The NOA further noted that the City would respond only to comments on the 2006 DEIR/DEIS that were received during the initial circulation period of the 2006 DEIR/DEIS and comments received during the recirculation period that relate to the 2008 RDEIR/SDEIS. Therefore, this comment is outside the scope of the documents identified in the NOA of the 2008 RDEIR/SDEIS for which comments were invited, and no response is required under CEQA (State CEQA Guidelines, CCR Section 15088.5[f][2]). Although not required under CEQA, the USACE is required under NEPA to assess and consider comments individually and collectively and has determined that substantive comments received prior to the release of the Final EIR/EIS will be considered under NEPA. In addition, in the interest of clarity, the City as CEQA lead agency, has chosen to respond to this comment. See also Master Response 3, "Comments Outside the CEQA Public Review Period," in Chapter 3 of this FEIR/FEIS.

The Rio del Oro project includes single-family low-density, medium-density, and high-density residential uses. This range of densities would provide both for-sale and rental opportunities in a wide range of housing types for Rancho Cordova's workers. According to Goal H.1, Policy H.1.1, Action H.1.1.3 in the Housing Element of the *Rancho Cordova General Plan*, the project would be required to make 10% of the housing in new neighborhoods affordable to moderate- and lower-income households. Existing, proposed, and approved projects within the Rancho Cordova city limits and the City's planning areas would also comply with this requirement. (See Table 3.2-6 in Section 3.2, "Population, Employment, and Housing," of the 2006 DEIR/DEIS for a summary of existing, proposed, and approved projects within the city limits and the City's planning areas.)

In February 2008, SACOG adopted a new regional housing needs plan for the 2006–2013 planning period. Table 3-3 below shows Rancho Cordova's allocation of regional housing needs for the 2006–2013 planning period. SACOG anticipates that a total of 10,395 new housing units would be required for Rancho Cordova during the current planning period (2006–2013) to meet regional housing needs (Table 3-3). Based on the 2007 projected housing units, the City would exceed its regional housing needs allocation for the 2006–2013 planning period.

Table 3-3 City of Rancho Cordova Regional Housing Needs Allocation for 2006–2013			
Income Group	Projected Housing Units (2007)	Required Housing Units (2013)	Housing Units Required (2007 Projected – 2013 Required)
Very-low	5,925	2,107	0 (+3,818)
Low	4,497	1,595	0 (+2,902)
Moderate	4,855	1,991	0 (+2,864)
Above-moderate	8,076	4,702	0 (+3,374)
Total	23,353	10,395	0 (+12,958)
Source: SACOG 2008			

As described in Section 3.2, “Population, Employment, and Housing,” of the 2006 DEIR/DEIS, Rancho Cordova’s strong employment base equates to a jobs/housing balance of 3:1, meaning that there are three job opportunities in the city for each household. This indicates an imbalance between housing and jobs in Rancho Cordova, with employment growth outpacing housing growth and, therefore, more jobs in Rancho Cordova than employed residents.

Existing, proposed, and approved projects within the Rancho Cordova city limits and the City’s planning area would generate approximately 109,844 dwelling units and 146,459 jobs by 2030, and approximately 126,241 dwelling units and 195,021 jobs by 2050. Development of the Rio del Oro project was included in these projections. Using the projected numbers of housing units (109,844 units) and jobs (146,459 jobs), the jobs/housing index in 2030 would be 1.33. At full buildout of the city in 2050, with 126,241 housing units and 195,021 jobs projected, the jobs/housing index would increase to 1.5. These indices indicate that employment growth will continue to outpace housing growth, resulting in more jobs than housing.

The Rio del Oro project would provide new employment opportunities from development of retail, commercial, office, and industrial jobs. The jobs/housing index would vary by project alternative: 1.57 for the Proposed Project Alternative, 1.18 for the High Density Alternative, 1.66 for the Impact Minimization Alternative, and 1.36 for the No Federal Action Alternative. However, regardless of the project alternative implemented, the number of jobs would exceed the projected number of dwelling units.

Therefore, the Rio del Oro project and existing, proposed, and approved projects would provide adequate housing to moderate- and lower-income households, ensuring that residents of all income levels may find housing in Rancho Cordova and serve the full range of available and projected jobs in the city.

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SECTION D

Others

California Native Plant Society

May 28, 2008

Patrick Angell
City of Rancho Cordova
2729 Prospect Park Drive
Rancho Cordova, CA 95670

FAX 916-361-1574

Kathleen Dadey
U.S. Army Corps of Engineers, Regulatory Branch
1325 J Street, Room 1480
Sacramento, CA 95814-2922

FAX 916-557-6877

RE: Rio del Oro Specific Plan RDEIR-SDEIS
State Clearinghouse #2003122057, Corps Public Notice 199900590

The California Native Plant Society (CNPS) originally provided comments regarding this project on February 1, 2007. The comments and concerns raised at that time are hereby incorporated by reference and we request that all of our comments be addressed in the FIER/FEIS. The following additional comments pertain only to new information contained in the Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement.

1. CNPS is still concerned about the proposal to create additional wetlands within the existing natural vernal pools intended to be preserved onsite.
 - While the use of LIDAR to model surface watershed boundaries is novel, it cannot be used to determine the shape and suitability of the subsurface impermeable layer. What remedial measures will be implemented if it is found that the necessary hardpan layer is lacking, sloped or otherwise unsuitable in the locations proposed for the created pools?
 - Because the perched water table in the uplands serves as a hydrologic buffer, long term monitoring of the natural pools is required in order to determine whether or not the additional created pools are dewatering or shortening the inundation period of the natural pools. What remedial measures will be implemented if it is found that the natural pools are becoming dryer as a result of the onsite creation?
 - Indirect impacts to existing onsite vernal pools has not been adequately addressed in the environmental review. Diagrams showing the proposed creation plan indicate that creation will occur within the typical 250' indirect impact zone. How is the project mitigating for that additional indirect impact?
2. Use of the California Rapid Assessment Monitoring (CRAM) methodology for documenting baseline and annual conditions is unacceptable to CNPS. While assessment of stressors and other metrics contained within CRAM are important, in the end a simple numerical score is



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of insufficient detail to document trends or to inform remediation/management strategies. In addition to CRAM, more thorough traditional methods (such as relevés or transects that are both quantitative and floristic in nature) that assess richness and diversity should be used for baseline documentation and subsequent monitoring.

3. The final success criteria in the draft Mitigation and Monitoring Plan are totally arbitrary and unacceptable to CNPS. To achieve no net loss of function and value, the pools must mimic the natural vernal pools being destroyed. The document fails to provide any data demonstrating that by meeting the success criteria, the created pools will achieve the intended mitigation. The success criteria should be based upon comparison with natural pools in the vicinity. Additionally, there are currently no monitoring methods and success criteria for the listed crustaceans. *It is my professional opinion that a created vernal pool with only ten plant species is at best a very crude caricature of a natural vernal pool.*
4. The proposed mitigation ratios are extremely low for both preservation and creation. For the creation component, 29.187 acres (48.6%) of replacement wetlands will be within "drainage corridors" and therefore not subject to monitoring or management specifically intended to conserve biological function and value. There is also no protection in perpetuity for these wetlands. To me this is akin to offering wetland creation credits for stormwater retention basins. Considering the above, the compensatory mitigation actually being provided by the project is only 0.72:1. Similarly, the preservation component does not appear to take into consideration any indirect impacts to the natural vernal pools within the wetland preserve, so the claimed preservation ratio of 1.19:1 is inflated.

Please note that these comments are being provided to meet the CEQA deadline of May 30, 2008. CNPS may choose to provide additional comments related to NEPA and 404 issues on or before July 6, 2008.

Again, CNPS thanks the City of Rancho Cordova and the U.S. Army Corps of Engineers for the opportunity to comment upon this SDEIS for the Rio del Oro Specific Plan. We request that we continue to receive all notices related to this project and others within the City of Rancho Cordova or under jurisdiction of the USACE Sacramento District Office.

Sincerely,



Carol W. Witham
1141 37th Street
Sacramento, CA 95816

CNPS-R-1

The comment states that the California Native Plant Society (CNPS) originally provided comments regarding this project on February 1, 2007 and requests that those comments and concerns be addressed in the FEIR/FEIS. Below are additional comments that pertain only to new information contained in the RDEIR/SDEIS.

Responses to comments CNPS-1 through CNPS-13 contained in this FEIR/FEIS address comments provided in the CNPS letter dated February 1, 2007.

CNPS-R-2

The comment states that, with regard to creating vernal pools in the preserve area, LIDAR cannot be used to determine the shape and suitability of the subsurface impermeable layer. The commenter questions what remedial measures would be implemented if it is found that the necessary hardpan layer is lacking, sloped, or otherwise unsuitable in the locations proposed for created pools.

LIDAR was used to study the watershed of the proposed vernal pools to enable the design of compensatory mitigation wetlands that would function, but not negatively affect existing wetlands to be preserved. An investigation of soils on the proposed preserve site was conducted by Davis² Consulting Earth Scientists in July 2007 (Davis² 2007) to evaluate the probability that subsoil characteristics in the areas proposed for vernal pool creation are suitable for sustained seasonal ponding during the wettest portion of an average year. The soils investigation concluded that the areas proposed for wetland creation are well-drained loam or clay loam textures over clay at depths ranging from 20 to 40 inches. The clay subsoil represents an older buried surface that is capable of ponding water during the wet part of an average hydrologic cycle, from late January through May. Therefore, it is reasonable to assume that vernal pool creation should not fail because of a lack of suitable subsoil. Further detailed feasibility studies will be conducted before construction of wetlands and in the field during construction. Although thorough feasibility studies have been conducted, minor changes to the design are often made in the field during construction in response to pool-specific conditions that may be encountered. Wetlands will not be constructed where conditions preclude naturally appearing (and functioning) habitat. As always, final as-built maps (clearly identifying any changes from the approved construction plans) will be prepared and submitted to the appropriate agencies following construction. However, as stated in Mitigation Measure 3.10-1a of the 2008 RDEIR/SDEIS, the final MMP will include corrective measures to be implemented if performance standards, including hydrologic criteria, are not met.

CNPS-R-3

The comment states that because the perched water table in the uplands serves as a hydrologic buffer, long-term monitoring of the natural pools is required to determine whether or not the additional created pools are dewatering or shortening the inundation period of the natural pools. The commenter asks what remedial measures will be implemented if it is found that the natural pools are becoming drier as a result of the onsite creation.

The hydrologic analysis indicates that the natural hydrology of existing pools would not be substantially altered by vernal pool creation because the watershed ratios would not decrease below levels necessary to sustain existing wetlands or the proposed 13.5 acres of compensatory vernal pools and 0.75 acre of compensatory swales. See response to comment USFWS-1.

Compensatory wetlands have been designed to avoid indirect impacts on existing vernal pools. Extensive studies have been conducted to ensure that the hydrology of existing pools is not compromised. If any existing pools “become dryer” in future years, and other on-site pools and/or off-site reference pools are not exhibiting similar changes, an investigation will be conducted to determine if one or more compensation pools is affecting the hydrology of the preserved pool. As stated in the MMP, existing vernal pools would be monitored concurrent with monitoring of created vernal pools. As required in Mitigation Measure 3.10-1a of the 2008 RDEIR/SDEIS, CRAM data would be used to evaluate current on-site wetland conditions. CRAM data were collected in the wetland preserve in the early summer of 2008 to provide a baseline to which later data may be compared. If any annual performance criterion is not met for all or any portion of the mitigation project in any year, or if the final success criteria are not met, the project applicant shall prepare an analysis of the cause or causes of failure, and if deemed necessary by USACE, propose remedial action for approval. The final, agency-approved MMP would include corrective measures to be implemented if performance standards, including hydrology criteria, and compensatory mitigation ratios were not met. Final compensatory mitigation ratios determined through the Section 404 permitting process would have to contain an adequate margin of safety to reflect anticipated success rates of created wetlands.

CNPS-R-4

The comment states that indirect impacts on existing vernal pools have not been adequately addressed in the environmental review. Diagrams showing the proposed creation plan indicate that creation will occur within the typical 250-foot indirect impact zone. The commenter asks how the project is mitigating that additional indirect impact.

The compensatory wetland mitigation plan provides a 250-foot buffer between existing and proposed vernal pools, wherever possible. In a few instances, the buffer to existing pools would be only 200 feet. However, even where the buffer between existing and proposed vernal pools would be less than 250 feet, the watersheds necessary to support preserved pools would be maintained as indicated by the watershed analysis. Therefore, no indirect impacts on preserved pools would be expected to result from construction of the compensatory pools.

CNPS-R-5

The comment states that using CRAM methodology to document baseline and annual conditions is unacceptable to CNPS because a simple numerical score is insufficient detail to document trends or to inform remediation/management strategies. In addition to CRAM, more thorough traditional methods that assess richness and diversity should be used for baseline documentation and subsequent monitoring.

CRAM has been recommended by EPA as a supplementary source of information to establish baseline conditions for future monitoring and for plotting the “restoration trajectory” over time. CRAM would also be useful to plot trends in functional conditions of existing wetlands over time. CRAM scores are derived based on 17 different metrics used to assess buffer and landscape context, hydrology, physical structure, and biotic structure. The data behind each metric score are provided in detailed CRAM field books that would be provided in the monitoring reports. Metrics for assessing the biotic structure attribute in CRAM include the number of codominant species, percent invasive species, and number of vernal pool endemics.

Additional monitoring methods would be applied to determine whether compensatory wetlands are functioning properly. A monitoring methodology that includes metrics for hydrology, floristics (e.g., cover of vernal pool endemics, number of vernal pool indicator and vernal pool associated species, and number and cover of nonnative species), and

wildlife is proposed in the 2009 update to the draft wetland MMP included Appendix Q to this FEIR/FEIS. See also response to comment CNPS-7.

CNPS-R-6

The comment states that the final success criteria in the MMP are totally arbitrary and unacceptable to CNPS. To achieve no net loss of function and value, the pools must mimic the natural vernal pools being destroyed. The commenter states that the document fails to provide any data demonstrating that by meeting the success criteria, the created pools would achieve the intended mitigation. The commenter further states that there are currently no monitoring methods and success criteria for the listed crustaceans. The comment further expresses the opinion that a created vernal pool with only 10 plant species is at best a very crude caricature of a natural vernal pool.

The 2009 draft wetland MMP (see Appendix Q to this FEIR/FEIS) proposes monitoring of vernal pool branchiopods in years 1, 2, 3, 5, 7, and 10 of the proposed 10-year monitoring period. Branchiopod sampling would follow USFWS guidelines, except it would not include a 2-week sampling period, and would be conducted in constructed, nearest neighbor, and reference pools (30 of each). In its 2009 version, the draft wetland MMP (previously presented as Appendix Q of the 2008 RDEIR/SDEIS) no longer includes 10 vernal pool plant species as a success criterion. See response to comment CNPS-7 for a list of vernal pool success criteria proposed in the 2009 draft MMP.

EPA is now recommending incorporation of performance standards proposed by Barbour et al. (2007) in *Classification, Ecological Characterization, and Presence of Listed Plant Taxa of Vernal Pool Associations in California* for use in monitoring success of compensatory vernal pools on the project site. As noted in the 2009 draft wetland MMP, the reference wetlands will be analyzed according to methodology similar to that described by Barbour et al. (2007), but modified by discussions between EPA and ECORP staff. These data will establish baseline conditions for the preserved wetlands and provide a basis for comparisons with constructed and/or restored wetlands. Performance standards similar to these standards proposed by Barbour et al. have also been incorporated into the 2009 MMP as success criteria for vernal pools as follows:

Hydrology:

- ▶ Depth and/or duration of ponded water in constructed pools and the nearest neighbor pools should not differ statistically from that of the reference pools.

Vegetation:

- ▶ Absolute and relative cover of each vernal pool endemic in constructed pools and the nearest neighbor pools should not be statistically different from the average values of each species in reference pools.
- ▶ The number of vernal pool endemics in constructed pools and the nearest neighbor pools should not be statistically lower than the average number of those taxa among reference pools.
- ▶ The number and cover of nonnative species in any constructed pool and any nearest neighbor pools should not be significantly higher than the average among reference pools.

At the end of the 10-year monitoring period, the constructed pools and nearest-neighbor pools must meet the success criteria with 3 years of no human intervention for

compensatory mitigation to be considered successful. Final performance standards and success criteria would be specified in the final wetland MMP, as approved by the regulatory agencies (see Mitigation Measure 3.10-1a, pages 3.10-41 and 3.10-43 of the 2008 RDEIR/SDEIS). Monitoring methods and success criteria for listed crustaceans would be determined through the ongoing Section 7 consultation process.

CNPS-R-7

The comment states that proposed mitigation ratios are extremely low for both preservation and creation. For the creation component, 29.187 acres (48.6%) of replacement wetlands would be within “drainage corridors” and therefore not subject to monitoring or management specifically intended to conserve biological function and value. There is also no protection in perpetuity for these wetlands. Therefore, compensatory mitigation actually being provided by the project would be only 0.72:1. Similarly, the preservation component does not appear to take into consideration any indirect impacts on the natural vernal pools within the wetland preserve, so the claimed preservation ratio of 1.91:1 is inflated.

See response to comment EPA-R-13. The proposed “drainage corridors” would not be used for detention or water quality basins, and other detention/water quality swales/basins are proposed outside of the drainage corridor features that that would be used for compensatory mitigation. Also, these features will be subject to a MMP, an O&M Plan would be developed, and they would be preserved in perpetuity.

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RE: Rio Del Oro Specific Plan Project
Draft Environmental Impact Report (SCH #2003122057)

Dear Mr. Angell, Ms. Dadey, Rancho Cordova Planning Staff, and U.S. Army Corps of Engineers, Sacramento Regulatory Branch:

These comments on the Rio Del Oro Specific Plan Project DEIR ("DEIR") are submitted on behalf of Rancho Cordova Citizens for Quality Planning, Dave Murdock, Thomas L. Davis, and John Szoboscan. These are their comments. The comments also include the attached comments of Daniel Smith, Traffic Engineer; Mark Grismer, Hydrologist; Shawn Smallwood, Wildlife Biologist; and Steve Pettyjohn, Acoustical Engineer. We also incorporate into our comments all of the comments of other individuals and organizations, and intend to rely on those comments as well as our own. Furthermore, we oppose the City of Rancho Cordova approving the Rio Del Oro Specific Plan Project and the accompanying requested entitlements. In these comments we intend to highlight some of the deficiencies in the DEIR, and we also request additional information.

My clients believe that the Rio Del Oro Specific Plan Project is premature, the Rio Del Oro Specific Plan Project is being processed by the City of Rancho Cordova before the City has been able to assure that there will be an adequate water supply for the Project. As global warming produces an increasing frequency of dry years, the City of Rancho Cordova will be unable to assure adequate supply of water for the Rio Del Oro Specific Plan Project. The Project also threatens to cause traffic gridlock in Eastern Sacramento County, with accompanying increased air pollution in the area. Smog pollution poses a serious health risk. Recent clinical studies show that chronic exposure to smog irreversibly reduces lung capacity, lowers stamina, and leaves people vulnerable to long-term respiratory problems. Smog is especially harmful to children, senior citizens, and those who suffer from heart or lung disease. The Project will increase the suffering from respiratory diseases in the Eastern Sacramento County area. More citizens will suffer from asthma, emphysema, and other lung and heart diseases.

Mr. Patrick Angell
City of Rancho Cordova Planning Department
Ms. Kathleen Dadey
U.S. Army Corps of Engineers,
Sacramento Regulatory Branch
June 18, 2008
page 2

1. The Project EIR Fails to Include a Stable Project Description.

To fulfill its role of insuring the lead agency and the public have enough information to ascertain the Project's environmentally significant effects, assess ways of mitigating them, and consider Project alternatives, an EIR must provide "an accurate, stable and finite project description". (*Save Round Valley Alliance v. County of Inyo* (2007) 157 Cal.App.4th 1437, 1448; *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 193.) As the court stated in *County of Inyo*

"Only through an accurate view of the project may affected outsiders and public-decisionmakers balance the proposals benefits against its environmental costs, consider mitigation measures, assess the advantage of terminating the proposal (i.e., the "no project" alternative) and weigh other alternatives in the balance. An accurate, stable and finite project description is the *sine qua non* of an informative and legally sufficient EIR." (*Id.* at page 192.)

The adequacy of an EIR's Project Description is closely linked to the adequacy of the EIR's analysis of the Project's environmental effects. If the description is inadequate because it fails to discuss the complete Project, the environmental analysis will probably reflect the same mistake. A complete Project Description is necessary to ensure that all the Project's environmental impacts are considered.

In the case of Rio Del Oro Specific Plan Project, the Project Description is unclear and uncertain. The DEIR (Section 2) claims that the DEIR is a Project Level EIR for the Phase I development in the Rio Del Oro Specific Plan area. The Project EIR provides certain information about the build-out time for Phase I and also the construction schedule for certain activities such as the school. Table 2-5 includes all of the Project site improvements that will be completed for Phase I. The Revised and Circulated Environmental Impact Report uncouples the Project development from the phasing set forth in the DEIR because of the potential lack of water to develop the Phase I at one time. This change and the plan phasing makes the other conclusions in the EIR unstable, including the construction air pollution calculations and traffic calculations. Without a stable Project Description it is not possible to accurately calculate the construction air emissions. Without information about when infrastructure is going to be installed it is difficult to determine the air pollution impacts from the installation of that infrastructure. The Revised Draft Environmental Impact Report does not include enough information about how the change in Project phasing will affect other aspects of the environmental determination included in the DEIR.

The DEIR purports to be a Project Level EIR for the Phase I of the Rio Del Oro Specific Plan Project. The Project Description for Phase I is sufficiently uncertain for the DEIR to serve as a Project Level EIR. There is no information as to the times when the 4 phases of Phase I will be implemented. Without information concerning the construction schedule and implementation of the various components of Phase I, there is insufficient detail to complete an analysis of construction emissions and also toxic air contaminants. Further, it is difficult to address the traffic impacts when the timing of the 4 phases of Phase I are completely uncertain due to the unavailability of a water

Mr. Patrick Angell
City of Rancho Cordova Planning Department
Ms. Kathleen Dadey
U.S. Army Corps of Engineers,
Sacramento Regulatory Branch
June 18, 2008
page 3

supply. Therefore, the City should not certify the EIR as a Project Level EIR for Phase I of the Rio Del Oro Specific Plan.

2. Segmentation of the Project in Violation of CEQA.

In the case of *San Joaquin Raptors/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal.App.4th 713, the court required that, as part of the "whole of the action" under review, the project EIR consider the environmental impacts of expanding the sewer treatment plant to serve the project, even though the sewer treatment facility was under the control of another agency. In this case, it is clear that the North Service Area Pipeline Project is required for the Rio Del Oro Specific Plan Project. The Rio Del Oro Specific Plan EIR should address the environmental impacts of the North Service Area Pipeline Project. These impacts need to be addressed in relatively specific terms, rather than generalities. The North Service Area Pipeline Project is a certainty if the Rio Del Oro Specific Plan Project goes forward. The Project EIR does not include sufficient information to evaluate the environmental impacts of this necessary part of the Project.

The Project EIR is silent as to whether the Sacramento Regional Wastewater Treatment Plant has sufficient capacity to accommodate the wastewater flows from the Rio Del Oro Specific Plan. This information needs to be included in the Project EIR to determine if other arrangements must be made for wastewater flows. Additionally, the Project EIR states that interim wastewater conveyance facilities must be developed to convey wastewater before major trunklines are constructed. The Environmental Impact Report does not include information on the environmental impacts of constructing the interim wastewater flow facilities.

3. The Water Supply Analysis Is Not Adequate.

With respect to Impact 3.5-1 (Need for initial water supplies for development Phase IA), the RDEIR states that "GSWC has indicated that it would have an adequate water supply to serve the initial phases of development up to 600 dwelling units.) The EIR then concludes that there would be sufficient water available for the entire Phase IA, which includes 861 dwelling units. The Environmental Impact Report fails to explain how the availability of water from GSWC for 600 dwelling units translates into water available for 861 units. This information needs to be provided. Unless, the Environmental Impact Report can adequately explain how the availability of water for 600 dwelling units services 861 units, then the EIR incorrectly concludes that "there is a reasonable likelihood that initial water supplies needed to serve Phase IA would be available." Additionally, the documentation for the water supply for Phase IA is not adequate. The authors of the DEIR must rely on more than a personal communication in 2005 from a Mr. Gisler. CEQA, and the cases construing CEQA, require that the availability of a water supply be documented by a contract, a memorandum of agreement, or an adjudication of water rights. The simple oral representation of the availability of water is not sufficient evidence for the EIR to rely on to assert that the water is in fact available. Therefore, the EIR should conclude that there is not reasonable certainty of the available water for Phase IA, and should analyze alternative sources of water for Phase IA. If a Contract or Agreement is available for the GSWC water, the EIR needs to provide the Contract or Agreement.

Mr. Patrick Angell
City of Rancho Cordova Planning Department
Ms. Kathleen Dadey
U.S. Army Corps of Engineers,
Sacramento Regulatory Branch
June 18, 2008
page 4

Impact 3.5-2 addresses the need for initial water supplies for the remaining Phase I development. Option A considers the use of existing GSWC wells that have been decommissioned as a result of groundwater contamination and treatment of the water to Department of Health standards. Option B would pipe groundwater treated at Aerojet GET facility (e.g., GETJ facility) to the nearby Coloma/Pyrites Water Treatment Plant. This option would also require Department of Health approval. The final 2 options include obtaining water from the North Vineyard Well Field and water from the GSWC deep-well replacement water. The RDEIR finds that all of these options may not be considered a reliable source of potable water, and therefore the impact is direct and significant. As a mitigation measure the City would have to comply with Government Code §66473.7 and insure an adequate water supply before development could be authorized for the Project.

The approach adopted by the RDEIR violates the requirements of *Vineyard Area Citizens Responsible Growth, Inc. v. Rancho Cordova* (2007) 40 Cal.4th 412. The Supreme Court required environmental analysis for alternative water sources. The information for Option A and Option B is inadequate to meet the requirements of the *Vineyard Area Citizens* decision. Option A includes no baseline information regarding the quality of the groundwater, and information concerning the water quality of the GET treated groundwater. The same is true as to Option B. Without this information it is impossible to assess the environmental impacts of use of the water. Further, Option A and Option B require the construction of water conveyance infrastructure. The environmental impacts of the water conveyance infrastructure is only described in the most rudimentary manner.

The EIR also suggests use of the excess capacity of the North Vineyard Well Field that has been planned to convey water to the Anatolia Water Treatment Plant. In the Judgment after Appeal dated May 29, 2008, in the case of *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova*, the trial court held that the record does not include substantial evidence that the North Vineyard Well Field has sufficient long-term water supplies to serve the Sunrise Douglas Community Plan and the plan's long-term water needs. There is no evidence that the North Vineyard's Field could serve any of the needs of the Rio Del Oro Specific Plan area. The court also stated: "With respect to groundwater supply from the North Vineyard Well Field to meet project water needs in the near term, the FEIR newly discloses a potentially significant impact on flow levels and fish migration in the Consumnes River which should have been analyzed in a Revised Draft EIR and circulated for public comment under CEQA procedures." The environmental impact of use of the North Vineyard's Well Field is not evaluated in the Rio Del Oro Specific Plan Project EIR. The information concerning use of the North Vineyard's Well Field on fish resources in the Consumnes River must be included in the FEIR for the Rio Del Oro Specific Plan Project. This is a potential environmental impact of an alternative source of water.

With respect to Table 3.5-10, the authors of the EIR need to correct the table because it subtracts the system loss from demand instead of adding it. The table needs to be corrected, reprinted, and re-circulated in a Revised Draft Environmental Impact Report.

Impact 3.5-5 "increased demand for permanent water supplies" states the GET remediated water supplies, pursuant to the Aerojet-County Agreement, would be available and would be sufficient to provide the water required by the Project. Table 3.5-13 states the water demand will

Mr. Patrick Angell
City of Rancho Cordova Planning Department
Ms. Kathleen Dadey
U.S. Army Corps of Engineers,
Sacramento Regulatory Branch
June 18, 2008
page 5

be 8,891 acre feet per year for the Proposed Project alternative. Table 30.5-18 sets forth the supplies and demand for a normal year. However, the EIR does not adequately explain the availability of the water for the Project. The Rio Del Oro Specific Plan EIR assumes a constant supply of GET remediated water of 15,000 acre feet per year. However, there is no explanation as to why the 15,000 acre feet per year is not considered part of the groundwater supply. The water is being pumped out of the ground. Part of the area where the GET remediated water is located is in Zone 40 and part is in Zone 41. The EIR does not explain why the GET remediated water is not considered part of the groundwater supply, but a separate source of water as if it was surface water. This seeming discrepancy between the assumptions in the EIR and fact needs to be explained.

The Project EIR states that currently there is 15,000 acre feet per year of GET remediated water available and that the facilities are being expanded under government oversight during the next several years to extract, treat, and discharge more than 26,000 acre feet per year. In order for the EIR to consider the water supply above 15,000 acre feet per year reasonably certain, the EIR needs to provide greater detail as to the current expansion plans. Has the Environmental Impact Report and other environmental studies being completed for the expansion. Are the plans prepared for the increased extraction and treatment? Is the funding in place for the increased extraction and treatment? When will the construction begin on the facilities for increased extraction and treatment? All of these questions need to be answered.

The EIR also states as follows: "Upon completion of all planned GET facilities, and if the water currently discharging to Morrison Creek is redirected to the American River through pipelines, more than 35,000 acre feet per year of treated groundwater would be discharged to the American River. This appears to be merely speculation and there is no reasonable certainty that 35,000 acre feet per year of treated groundwater will be available. If the EIR is going to claim that there will be in reality 35,000 acre feet per year of GET remediated water, the EIR needs to do more than cite the Replacement Water Supply Project DEIR, and provide actual information about the facilities, the funding, and the time when the water will be available. Without this information the 35,000 AFY of GET water is not reasonably certain.

The Project EIR fails to provide the agreements as an appendices or even assert that the agreement is in place so that the GET remediated water will be available for the Rio Del Oro Specific Plan. The agreement needs to be attached to the water supply assessment along with all other contracts for water. The failure to provide this information would appear to violate state law.

It would appear that almost all of the GET water has already been committed without any being available for the Rio Del Oro Project.

If the replacement water supply plan is approved, SCWA would deliver 5,000 acre feet per year of GET water to GSWC's intake facility on the Folsom South Canal. Additionally, SCWA would also deliver up to 10,200 additional acre feet per year through the FRWP to GSWC. Up to 15,200 acre feet per year of GET remediated water is committed to GSWC as replacement water for Aerojet's contamination of the GSWC wells.

Mr. Patrick Angell
City of Rancho Cordova Planning Department
Ms. Kathleen Dadey
U.S. Army Corps of Engineers,
Sacramento Regulatory Branch
June 18, 2008
page 6

In addition to the commitment of the 15,200 acre feet to GSCW, the FEIR makes other commitments of GET remediated water. The lower Consumnes River Environmental Water Management MOA is reported to state as follows: "The proposed project would make available 5,000 AFY to SCWA, which would make the water available to the Nature Conservancy." The only source of the extra 5,000 acre feet per year that the Rio Del Oro Project must make available to the Nature Conservancy is GET remediated water. The FEIR also reports that SCWA has a duty to provide replacement water to CalAM, but the agreement is not yet worked out. The EIR estimates 5,000 AFY to go to CalAM. It would also appear the only source of the replacement water for CalAM would be a GET remediated water. Therefore, the Project EIR fails to explain how a permanent water supply will be provided for the Project with reasonable certainty. Even if the GET remediated water is increased in a few years to 26,000 acre feet per year, it would appear that all of that water is committed to the GSWC, the Nature Conservancy, and CalAM. The EIR fails to explain how there will be GET remediated water remaining for the Rio Del Oro Project.

The EIR assumes that the Zone 40 groundwater will be available without environmental impacts. However, the environmental impacts of pumping the Zone ground 40 groundwater were not evaluated in the Environmental Impact Report for the Zone 40 Water Supply Master Plan. The Environmental Impact Report for the Zone 40 Water Supply Master Plan does not address the impact in fish resources in the Consumnes River of pumping the groundwater within the Zone 40 area. This information needs to be included in the Specific Plan EIR, since the EIR is relying on Zone 40 groundwater.

The Project EIR also indicates that alternative water supplies are available, such as GSWC Phase 1A water supplies, GSWC Options A and B, GSWC Deep Well Replacement Water, and Natomas Central Mutual Water Company. The Project EIR fails to address the environmental impacts of the use of these alternative water resources as required by *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova*. Further, the Specific Plan EIR admits the sources are speculative.

The EIR assumes that there will be adequate groundwater available in the dry years. Table 3.5-17 shows in normal years 39,097 AFY groundwater will be used in Zone 40 in a year. This is close to the sustainable yield for Zone 40 groundwater of 40,900 AFY as reported in the SCWA 2005 Zone 41 Urban Water Management Plan. In dry years, according to the RDEIR, the use of water is on the average about 68,500 AFY increasing to 70,795 AFY in year 4. The RDEIR fails to provide any environmental analysis that would support the claim that such supplies of water would be available in Zone 40 in the multiple dry years.

The attached studies show that the Sacramento area is likely to experience increasing numbers of dry years as global warming becomes more pronounced. In dry years, the demand on the groundwater table will greatly increase and it will become more difficult to withdraw large quantities of water from the groundwater table. The EIR fails to address the increased energy costs associated with pumping in multiple dry years. This is an environmental impact that must be addressed. Additionally, the EIR fails to address the impact on spreading the Aerojet toxic plume related to intense groundwater pumping. It would also appear that it will be more difficult to obtain the GET remediated water in very dry years because the water table is being pumped down.

Mr. Patrick Angell
City of Rancho Cordova Planning Department
Ms. Kathleen Dadey
U.S. Army Corps of Engineers,
Sacramento Regulatory Branch
June 18, 2008
page 7

Nevertheless, the EIR treats GET remediated water as surface water, as if it had no connection to the groundwater table. The Environmental Impact Report needs to address the impact on the availability of GET water of multiple dry year conditions.

The EIR includes no energy analysis related to the Project's reliance on groundwater. Appendix F of the CEQA Guidelines require that the energy use of the project related to water be addressed in the Environmental Impact Report.

The Project EIR relies on the Zone 40 WSMP for the analysis of cumulative demand. This reliance on the Zone 40 WSMP would appear inadequate since with respect to the 2030 scenario, most of the specific plan area is not included within Zone 40. The EIR needs a much more thorough cumulative analysis of water demand and water supply in order to meet the requirements of CEQA. The EIR needs to identify those project which will contribute to the long-term cumulative demand for water and compare that demand with the likely supply. This critical analysis is not included in the Environmental Impact Report.

4. The Project EIR Does Not Adequately Address Greenhouse Gases.

The Legislature has declared a policy that CEQA requires feasible mitigation measures to be adopted whenever they would substantially lessen the significant environmental effects of the project. (Public Resources Code §21002.) The Legislature requires that when a project will have a significant environmental effect which cannot be mitigated below a level of significance, then the responsible agency must find that specific overriding economic, legal, social, technological or other benefits of the project outweigh the significant environmental effects which cannot be mitigated below a level of significance, before approving a project. (Public Resources Code §21801(b).) Nothing in CEQA would support the view that a statement of overriding considerations would relieve a public agency of the duty to adopt feasible mitigation measures which would substantially lessen the significant environmental effects of a project simply because those measures would not reduce the impact below a level of significance.

It is clearly the law in California that an agency must adopt all feasible mitigation measures even if they will not mitigate the environmental impact below a level of significance. With respect to mitigating the impact of the Project on global climate change, the EIR does not set forth adequate mitigation.

As set forth in the attached article incorporated herein by reference, Dr. Greg McPherson of the USDA Forest Service Center for Urban Forest Research states, asphalt concrete and roof surfaces account for 50-70% of the total land space of urban areas. Dr. McPherson concludes that "reduction in atmospheric carbon dioxide are achieved directly through sequestration and indirectly through emission reductions." Trees reduce carbon dioxide in the air, thereby reducing the warming and "greenhouse" effect of the gas. Further, by providing shade and transpiring water, trees lower air temperature, and, therefore, cut energy use, which reduces the production of carbon dioxide. The City should require that all streets be planted with public or special district maintained street trees that will provide a canopy fully covering the streets within 15-20 years. For wide streets, the City should require a center planting area to accommodate street trees. Feasible mitigation would include

Mr. Patrick Angell
City of Rancho Cordova Planning Department
Ms. Kathleen Dadey
U.S. Army Corps of Engineers,
Sacramento Regulatory Branch
June 18, 2008
page 8

planting a sufficient number of trees in parking lots so that there would be full coverage of trees in 15 years. The EIR does not discuss as a mitigation measure for greenhouse gases the planting of groups of trees that have a significant impact on reducing CHGs by sequestering CO₂. Redwood trees are especially effective at reducing CHGs and air pollutants. The EIR should consider as a mitigation measure the planting of urban forests in areas within and around the proposed Project.

As part of the mitigation measures, the City should require installation of solar water heaters for domestic hot water with respect to each house. This is a feasible mitigation measure, and the City has the authority to require as a mitigation measure for greenhouse gases. Solar hot water is both cheap and effective.

The attached article from the Seattle Times dated March 31, 2007, discusses a development that will include zero energy homes. While a development of zero energy homes may not be economically feasible for the Rio Del Oro, the installation of solar electric panels on each house is feasible. The cost for a 5,000 watt system which should meet the energy needs of an efficient home is approximately \$23,000.00. In the article from the Seattle Times Mr. John Ralston, Vice President of Sales and Marketing for Premier Homes in Roseville, California, is quoted. He states that his firm is developing an all solar development in Yuba City. Requiring solar electric panels of 3-5 kilowatts in each home is a feasible and effective measure to reduce greenhouse gases. The homes will be cheaper to operate and therefore the owners will have lower carrying costs. If the square footage of the homes have to be reduced slightly to accommodate the cost of the solar panels, the homes will generate even less greenhouse gases due to the lower square footage. As set forth in the attached Fact Sheet from the Solar Energy International Association, a 1 kilowatt photovoltaic system each month prevents 150 pounds of coal from being mined, prevents 300 pounds of carbon dioxide from entering the atmosphere, keeps 105 gallons of water from being consumed, and reduces nitrous oxide and sulfur dioxide from being released into the environment.

There are other feasible mitigation measures to reduce greenhouse gases. The Project developers can be required to purchase offsets by financing windmill production of electricity offsite. 100 kilowatt hours of wind power each month is equivalent to planting one-half acres of trees or not driving 2400 miles. The EIR should consider feasible mitigation to reduce the non-transportation CO₂ emissions to zero. If each house is not fitted with photovoltaics and solar hot water heaters, the EIR may require the planting of trees or furnishing windmills offsite as a carbon dioxide offset.

Feasible mitigation would include requiring all lightbulbs in all houses to be energy saving compact fluorescents.

As further mitigation, the City of Rancho Cordova should be required to purchase only hybrid service vehicles for the Project area. This would reduce both CO₂ emissions and other air pollutant emissions.

As further mitigation, the City should adopt a ban on the use of gas powered lawn mowers and gardening equipment as a CC&R in the Project area.

Mr. Patrick Angell
City of Rancho Cordova Planning Department
Ms. Kathleen Dadey
U.S. Army Corps of Engineers,
Sacramento Regulatory Branch
June 18, 2008
page 9

5. Energy Conservation Issues.

The EIR is deficient because it did not comply with the requirements of Appendix F of the Guidelines. Appendix F states as follows: "In order to assure the energy implications are considered in project decisions, the California Environmental Quality Act requires that EIRs include the discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy."

The EIR is to include some if not all of the following items:

- 1) Energy consuming equipment and processes which will be used during construction, operation, and/or removal of the project. If appropriate, this discussion should consider the energy intensiveness of materials and equipment required for the project;
- 2) Total energy requirements of the project by fuel type and end use;
- 3) Energy conservation equipment and design features;
- 4) Initial and lifecycle energy costs or supplies;
- 5) Total estimated daily trips to be generated by the project and the additional energy consumed per trip by mode.

In this case, there is no discussion of the energy issues. In view of the fact that the Project will add thousands of daily vehicle trips to the area, the EIR should include some discussion of the additional energy requirements related to all of the vehicle trips. The EIR does include information about the supply of energy to the Project site, and it does include some possible energy conservation provisions. The EIR suggests the Project will be energy efficient because the buildings will comply with Title 24. However, all buildings must comply with Title 24. An appropriate mitigation measure would be to require residential consumption of energy to be reduced 10-20% below the requirements of Title 24. The EIR does not comply with the requirements of CEQA. Except for compliance with Title 24, there is no discussion about energy conservation for the many commercial, industrial, and public buildings that will be constructed in the Specific Plan area. The EIR does not include a discussion of "the Project's energy requirements and energy use efficiencies by amount and type of fuel used for each stage of the Project's lifecycle, including construction, operation, maintenance and/or removal." The information that is required by Appendix F is missing. There is no discussion on the effect of the Project on "energy resources." Additionally, the EIR does not discuss "the project's projected transportation energy use requirements and its overall use of efficient transportation alternatives." There is no discussion of cumulative energy demand in conjunction with other East Sacramento County projects.

Mr. Patrick Angell
City of Rancho Cordova Planning Department
Ms. Kathleen Dadey
U.S. Army Corps of Engineers,
Sacramento Regulatory Branch
June 18, 2008
page 10

The EIR does not include any of the following items:

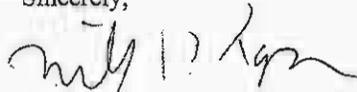
- 1) Potential measures to reduce wasteful and inefficient and unnecessary consumption of energy during construction, operation, maintenance and/or removal. The discussion should explain why certain measures were incorporated in the Project and why other measures were dismissed;
- 2) The potential site, orientation and design to minimize energy consumption, including transportation energy.
- 3) The potential for reducing peak energy demand;
- 4) Alternative fuels (particularly renewable ones or energy systems).
- 5) Energy conservation which could result from recycling efforts

The alternate discussion did not consider overall energy consumption in terms of reducing wasteful, inefficient and unnecessary consumption of energy. There were no energy consumption calculations in consideration of alternatives. There was no discussion in the EIR about avoiding the wasteful, inefficient and unnecessary consumption of energy during the project construction, operation and maintenance of the Project. Finally, there was no discussion of the short term gains versus long term impacts that could be compared by calculating the energy costs over the lifetime of the Project.

6. Misleading Notice.

The City provided misleading public notice. On or about May 6, 2008, the City circulated a notice stating: "Please submit and address your written comments to the individuals noted above by July 7, 2008." This was a notice for comments on the Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement. Later, the City circulated a notice indicating that there would be a shorter time for review and that in fact comments would be due June 20, 2008. Under CEQA, the City is precluded from circulating notice that misleads the public.

Sincerely,



WILLIAM D. KOPPER

WDK:kgr



June 19, 2008

Mr. William D. Kopper
Attorney at Law
417 E Street
Davis, CA 95616

Subject: RDEIR/SDEIS For The Rio Del Oro Project

P08004

Dear Mr. Kopper:

Per your request, I have reviewed the Recirculated Draft Environmental Impact Report / Supplemental Draft Environmental Impact Statement (hereinafter the "RDEIR/SDEIS") as well as the original Draft Environmental Impact Report / Draft Environmental Impact Statement (hereinafter the "DEIR/DEIS") for the Rio Del Oro Project (hereinafter the "Project") in the City of Rancho Cordova (hereinafter the "City"). The focus of my review has been on traffic and transportation matters. My qualifications to perform this review include registration as both a Civil and Traffic Engineer in California and forty years professional consulting engineering experience in these fields, specializing in traffic and transportation matters. I have both prepared and performed reviews of the traffic and transportation components of numerous environmental documents. My professional resume is attached. My comments on the subject project follow.

The Traffic and Transportation Analysis Is Based On Outdated Existing Conditions Data. The RDEIR/SDEIS Should Have Included an Update of the Traffic and Transportation Analysis Based On Current Existing Conditions Data

As the period for public comment on the RDEIR/SDEIS comes to a close, it is almost exactly mid-2008. By the time the final environmental documentation on the proposed Project comes to the point of certification, it will be late 2008 or perhaps even 2009. The traffic counts on which the traffic analysis is based were conducted in the second quarter of 2003, the first quarter of 2004 and the last quarter of 2005. Hence, as the final version of this environmental document comes up for certification, a majority of the existing traffic conditions data on which the analysis is based will be at least 4.5 years old and some of it 5.5 years old. Although the narrative discussion of the existing traffic conditions in the DEIR/DEIS claims that no changes in existing conditions had occurred over the

period of time in which traffic data was collected, that statement is unsubstantiated in any way in the documentation. Moreover, the statement was written sometime before the document was circulated in December, 2006; by the time of circulation, the oldest of the traffic data was already 3.5 years old, making the claim seem improbable. With most of the data being at least 4.5 to 5.5 years old at the time this document comes up for certification, it seems a virtual certainty that the aged traffic count data will not reflect anything like "existing" traffic conditions. Once the decision was made to prepare an RDEIR/SDEIS, the time line to a certification point would have been reasonably clear and it should have been evident that the existing conditions traffic data would be obsolete and that the traffic analysis needed to be recompiled within the RDEIR/SDEIS. The RDEIR/SDEIS is deficient in the absence of this recompilation.

The Study Area for the Traffic and Transportation Analysis Is Cut Off Too Close To the Project Site To Fully Disclose All the Project's Traffic Impacts

The study area for the traffic analysis, which appears to have been defined without logical substantiation, is terminated too close to the project site, resulting in failure to disclose potential significant impacts that would likely occur just outside the area that was analyzed. By its own analysis the DEIR/DEIS estimates that the project would generate 229,200 motor vehicle trips per day. It seems probable that a project of this scale could easily significantly impact street segments or intersections north of the American River, especially due to interchange of project trips with the burgeoning development taking place and planned in south Placer County, and particularly in the Sunrise Boulevard and Hazel Avenue corridors and the intersections of these with major east-west streets. However, the traffic analysis does not evaluate impacts at any street segment or intersection north of the American River. It also seems probable that a project of this scale could easily significantly impact street segments or intersections west of the alignment of Excelsior Road – Mather Field Road. However, the traffic analysis does not evaluate impacts at any street segment or intersection west of this general limit line. It also seems highly probable that a project of this scale could easily significantly impact freeway ramp merge, diverge weave or mainline conditions on U.S. 50 east of the Aerojet Road interchange or west of the Mather Field Road interchange yet the traffic analysis does not evaluate traffic impacts east or west of these respective limits. The traffic analysis of street segments, intersections and freeway merge, diverge and weave sections should be expanded outward in each direction until, through encountering a sequence of locations where the Project has no direct or cumulative impact, it clearly demonstrates that the Project's full traffic impacts have been disclosed.

The DEIR/DEIS Does Not Provide the Computations Data and Assumptions Supporting Its Traffic and Transportation Analyses and Conclusions. In Addition, Portions of the Project Are Insufficiently Defined For the Public to Verify the Completeness and Reasonableness of the Traffic and Transportation Analysis and Conclusions

Virtually none of the computations and data supporting the traffic original is presented; everything is in the form of figures and tables containing data summaries and analysis results. Normally, all traffic data collection sheets and computation sheets are provided in an appendix. This gives members of the public the opportunity to that data was collected on dates reasonably representative of typical traffic and that the computations for all the scenarios were carried out under reasonably consistent procedures and assumptions. In this case, the traffic appendices that were provided (I and J) contain additional traffic analysis not covered in the main body of the document instead of back-up computations and data that would normally be contained in an environmental document's traffic appendix. So there is no way for the public to make the verifications described above.

Another instance where there is an absence of reasonable computational and data detail is the traffic generation estimate for the Project. Normally, the traffic analysis in an environmental document identifies the component land uses in a project, each in units that correspond to trip generation rates ordinarily used in traffic engineering practice (for example, numbers of square feet of office or retail space, numbers of dwelling units by dwelling unit type, student enrollment for schools, etc.), the trip generation rates employed, the trip generation totals for each component of the Project, and the trip generation total for the entire Project as a whole. In the subject environmental document, only the aggregate trip generation for the entire project is presented. This prevents members of the public from reassuring themselves that all components in the Project have been taken into account in the analysis and that reasonable trip generation rates have been employed.

Moreover, some components of the project have been defined in terms that simply do not relate to the units of measure in normal trip generation rates. This means that the traffic analysts had to make assumptions translating the component defined in the project description to units that conform to normal trip generation rates. Those translation assumptions are undocumented in the traffic analysis section of the document or its appendices. Again, the public has no way of reassuring itself that the analysis has been carried out reasonably. Following are examples of this problem issue.

Three of the Project components included in the Project Description are 20 acres of "village commercial", 22 acres of "local town center" and 111 acres of "regional

town center". Authoritative trip generation data source references such as the Institute of Transportation Engineers publication *Trip Generation, 7th Edition*, include no specific trip generation rates for these vague land use descriptions. A reasonable person can conjecture that "village commercial", "local town center" and "regional town center" developments might be comprised of a mix of retail, service commercial, restaurant, office and perhaps entertainment uses like a cinema. *Trip Generation, 7th Edition* provides authoritative trip generation rates for these types of uses. The rates are typically based on gross square footage of building area devoted to each of these more specific usage types. But who is to say how many square feet of office or retail or restaurant use would be in 20 acres of. The traffic analysts obviously had to make assumptions to translate these vague conceptual terms to tangible land use quantities for purposes of trip generation estimates or have the project sponsor make them, but those critical assumptions are undocumented. Hence, the DEIR/DEIS traffic analysis that remains unchanged in the RDEIR/SDEIS is inadequate as an information document. Moreover, the Project Description section of the document that describes these components only in the vague terms of "village commercial" or "local town center" or "regional town center" is also deficient as an information document.

The same type of concern applies to 78 acres of high schools, 20 acres of middle schools and 54 acres of elementary schools. Generally, school traffic is estimated on the basis of anticipated numbers of students, employees or gross building area, not acreage. Again, translation assumptions must have been made by or for the traffic analysts, but they are undocumented. As a result, the traffic analysis section is deficient as an information document. The problem is not limited to documentation of the details of the traffic analysis – the real problem is that the Project Description is inadequate.

Another of the inadequacies of the trip generation analysis and documentation is that it describes only the aggregate numbers of Project trips that travel outside the Project area and the aggregate number traveling both within and outside the Project area. However, it fails to identify the number of trips that are assumed to remain internal to the individual traffic analysis zones within the project area (which hence are never assigned to travel on the street and highway network at all). Again, the traffic analysis section is inadequate as an information document.

The Traffic Analysis of the Project Relies on the Obsolete Circular 212 Method for Computing Level of Service at Intersections. Circular 212 Methodology Is Not Only Obsolete, It Is Incapable Of Disclosing Actual Traffic Impacts Perceived By Public.

The City of Rancho Cordova and the County of Sacramento rely on intersection Level Of Service (LOS) analysis by adaptations of Circular 212 procedure.

Circular 212 is now a twenty-eight year old, simplified methodology that was created in 1980 as an interim analysis procedure pending updating of the Highway Capacity Manual (hereinafter the HCM). It has now been rendered obsolete by the 1985 HCM and three subsequent editions of the HCM. While analysis under Circular 212 procedures does provide a relative measure of the differences in transportation effects of various development scenarios, it is an abstract measure, incapable of disclosing the traffic impact that the public perceives - congestion and delays in traffic. The criterion in Circular 212 analysis is a *linear measure*: at a given intersection a fixed increment of traffic produces the same percentage change in the traffic volume-to-capacity (hereinafter "v/c") ratio regardless of whether traffic at the intersection is well below capacity or closely approaching capacity. The relationship of v/c to actual congestion and delay loosely *postulated* in the Circular 212 methodology is also a linear one. However, traffic engineers know that, at a given intersection, a fixed increment of traffic produces vastly more congestion and delay if traffic already using the intersection is close to capacity than if the same increment were added to the same intersection when the traffic using it were well short of capacity. So the quality the public perceives as traffic impact, delay, is a *non-linear function, an exponential function* of the relationship of volume to capacity. This non-linear escalation of delay as traffic approaches (or exceeds) capacity is forecast by the post-1985 HCM procedures that rendered the interim Circular 212 methods obsolete, but the Circular 212 methods assume delay is linear. At this point in time, reliance on Circular 212 methods is unsound and unreasonable for traffic impact analysis, because Circular 212 simply does not predict traffic impacts that the public perceives.

We understand that the City inherited the Circular 212 procedures from the County and has based CIP improvements and development fair share fee calculations on computations based on changes to v/c as computed using the Circular 212 procedure. Hence, it would be inconvenient for the City to change the methodology while the CIP program is in midstream. However, inconvenience to the City is not a reasonable justification for continuing to measure project traffic impacts using a long-obsolete tool that isn't simply inaccurate: it doesn't even measure the actual impact perceived by the public as the real traffic impact - that of delay. The entire intersection analysis should be redone using current HCM methods and criteria.

Another significant reason why the obsolete Circular 212 analysis methodology fails to disclose traffic impacts and should not be relied on is because it does not provide information regarding traffic queues (stacking) at the intersections analyzed whereas the current HCM method does so. Queue length information is critical to the analysis of impacts of busy intersections because, if queues of vehicles waiting in turn storage lanes exceed the length of the lanes (thereby blocking flows in the through lanes) or queues of vehicles waiting in the through

lanes extend beyond the length of the turning lanes (thereby blocking access to the turn lanes), a kind of condition the public refers to as "gridlock" will occur where the actual traffic impacts, the LOS experienced and the delay suffered, will be worse than indicated in the theoretical LOS computations. With the queue length information provided by the current HCM method, the analyst is able to disclose the significant impact problem and propose appropriate mitigation such as adding lanes or extending turning lanes. Because the Circular 212 method provides no queue information, significant traffic impacts caused by excessive queue lengths remain undisclosed.

In addition to all of the foregoing, the City of Rancho Cordova and the County of Sacramento employ a criterion where, if an intersection is already operating at an unsatisfactory level of service, a project is not found to have a significant impact unless it causes a change in v/c ratio of .05. The DEIR/S text says that this is 'consistent' with normal practice. It is true that this is the criterion employed in the few other jurisdictions in the greater Sacramento area that still employ the obsolete Circular 212 procedure. However, considering jurisdictions throughout California that still rely on Circular 212 method, the most common criterion for significant project traffic impact when LOS is already at an unacceptable level is a v/c change of .01 or .02. The reason why the .05 change criterion is unreasonable is because in the LOS ranges that jurisdictions now consider unacceptable (E or worse for Rancho Cordova, F for Sacramento County), the relationship between v/c and what the public considers as traffic impact – the actual delay they experience- is nonlinear; it is exponential. A .05 change in v/c in these LOS levels implies a very large change in actual delay – well beyond the change in delay that most people perceive as significant. What has happened is that nearly three decades ago when jurisdictions started relying on Circular 212, most moderately developed suburban and semi-rural jurisdictions regarded LOS C as the upper limit of acceptable LOS. In LOS C and into LOS D, the relationship between v/c and actual delay is fairly linear, so a change in v/c of .05 would not cause a disproportionate or very large increase in delay. As many of areas became increasingly urbanized, the jurisdictions changed policies and adopted inferior levels of service as being acceptable. Many addressed the issue of the relationship between v/c and delay being exponential in the worst LOS ranges by reducing the limits of v/c change required to find significant impact when LOS was already unacceptable, changing the threshold to .01 or .02. Some forgot to make this appropriate adjustment. Unfortunately, the significance thresholds applied in the subject analysis reflect such an omission.

Background Roadway Infrastructure Improvements and Cumulative Traffic Mitigations May Not Be Developed As Quickly As Presumed in the Analysis

The traffic analysis finds that there are significant project and cumulative traffic impacts. The purported mitigation of these, and indeed, the existence of certain

facilities improvements in the future base scenarios, is propped up like a house of cards, depending on full and timely build-outs of other developments, the City's CIP, development of Tier 1 projects from the SACOG and actions by Caltrans and Sacramento County. There is no analysis of how the assumed baseline networks and mitigation needs and/or the financial feasibility of mitigation would change if either some of the projects in the area were built-out while others were not or if all of the prospective projects considered in the analysis were only partially built out. The DEIR/DEIS traffic section admits this in text at the bottom of page 3.14-1 and top of 3.14-2. There is a substantial possibility that all the planned development in the area may exceed the market for it, leading to a situation where the baseline roadway network that is developed and the fair share funding contributions from all planned development sources to implement various capital improvements and mitigation measures may be substantially more limited than the assumptions in the study. The traffic analysis should include a long term scenario where implications of a slowed pace of development demand in the general area is considered

The Project Should Be Conditioned Contingently To Pay Fair Share Contributions Toward Mitigation Measures that Conflict With Current City Policy or Have Not Yet Been Proven Environmentally Feasible

Several project traffic impacts are categorized as significant and unavoidable. In many cases, this is simply because intergovernmental agreements with the jurisdiction having control over implementing the mitigation has yet to be completed. In those cases, the project should be conditioned to deposit fair share funds in escrow in a timely manner, pending completion of the interagency agreements. However, in other cases, the project avoids obligation to participate in funding mitigation of certain high-cost measures as the result of City policies that preclude improvements to certain roadways (no more than 6-lanes city-wide and no more than 4 lanes on Folsom Boulevard) and as the result of conventional wisdom that says another crossing of the American River is environmentally infeasible. At a minimum, the Project should be conditioned to make fair share contributions to roadway mitigations that would be feasible if the City were to change its policies regarding the maximum number of lanes in general and those specific to Folsom Boulevard and in addition if a feasible American River crossing improvement is defined within a reasonable time frame.

It is also appropriate to observe here that, since the City relatively recently adopted the policy that Folsom Boulevard would not have more than 4 lanes and that no street under City jurisdiction would have more than 6 lanes, it would be illogical and irresponsible for the City to approve, under conditions of overriding considerations, a project that would ordinarily require making Folsom Boulevard 6-lanes and Sunrise Boulevard 8-lanes as mitigation.

Mr. William D. Kopper
June 19, 2008
Page 8

Conclusion

This completes my current comments on the Rio Del Oro RDEIR/SDEIS. For the above-stated reasons, I do not believe the traffic and transportation analysis in the subject document is adequate; it should be revised and recirculated in draft status.

Sincerely,

Smith Engineering & Management
A California Corporation



Daniel T. Smith Jr., P.E.
President



SMITH ENGINEERING & MANAGEMENT

DANIEL T. SMITH, Jr. President

EDUCATION

Bachelor of Science, Engineering and Applied Science, Yale University, 1967
Master of Science, Transportation Planning, University of California, Berkeley, 1968

PROFESSIONAL REGISTRATION

California No. 21913 (Civil) Nevada No. 7969 (Civil) Washington No. 29337 (Civil)
California No. 938 (Traffic) Arizona No. 22131 (Civil)

PROFESSIONAL EXPERIENCE

Smith Engineering & Management, 1993 to present. President.
DKS Associates, 1979 to 1993. Founder, Vice President, Principal Transportation Engineer.
De Leuw, Cather & Company, 1968 to 1979. Senior Transportation Planner.
Personal specialties and project experience include:

Litigation Consulting. Provides consultation, investigations and expert witness testimony in highway design, transit design and traffic engineering matters including condemnations involving transportation access issues; traffic accidents involving highway design or traffic engineering factors; land use and development matters involving access and transportation impacts; parking and other traffic and transportation matters.

Urban Corridor Studies/Alternatives Analysis. Principal-in-charge for State Route (SR) 102 Feasibility Study, a 35-mile freeway alignment study north of Sacramento. Consultant on I-280 Interstate Transfer Concept Program, San Francisco, an AA/EIS for completion of I-280, demolition of Embarcadero freeway, substitute light rail and commuter rail projects. Principal-in-charge, SR 238 corridor freeway/expressway design/environmental study, Hayward (Calif.) Project manager, Sacramento Northeast Area multi-modal transportation corridor study. Transportation planner for I-80N West Terminal Study, and Harbor Drive Traffic Study, Portland, Oregon. Project manager for design of surface segment of Woodward Corridor LRT, Detroit, Michigan. Directed staff on I-80 National Strategic Corridor Study (Sacramento-San Francisco), US 101-Sonoma freeway operations-study, SR 92 freeway operations study, I-880 freeway operations study, SR 152 alignment studies, Sacramento RTD light rail systems study, Tasman Corridor LRT AA/EIS, Fremont-Warm Springs BART extension plan/EIR, SRs 70/99 freeway alternatives study, and Richmond Parkway (SR 93) design study.

Area Transportation Plans. Principal-in charge for transportation element of City of Los Angeles General Plan Framework, shaping nations largest city two decades into 21st century. Project manager for the transportation element of 300-acre Mission Bay development in downtown San Francisco. Mission Bay involves 7 million gsf office/commercial space, 8,500 dwelling units, and community facilities. Transportation features include relocation of commuter rail station; extension of MUNI-Metro LRT; a multi-modal terminal for LRT, commuter-rail and local bus; removal of a quarter mile elevated freeway; replacement by new ramps and a boulevard; an internal roadway network overcoming constraints imposed by an internal tidal basin; freeway structures and rail facilities; and concept plans for 20,000 structured parking spaces. Principal-in-charge for circulation plan to accommodate 9 million gsf of office/commercial growth in downtown Bellevue (Wash.). Principal-in-charge for 64 acre, 2 million gsf multi-use complex for FMC adjacent to San Jose International Airport. Project manager for transportation element of Sacramento Capitol Area Plan for the state governmental complex, and for Downtown Sacramento Redevelopment Plan. Project manager for Napa (Calif.) General Plan Circulation Element and Downtown Riverfront Redevelopment Plan, on parking program for downtown Walnut Creek, on downtown transportation plan for San Mateo and redevelopment plan for downtown Mountain View (Calif.), for traffic circulation and safety plans for California cities of Davis, Pleasant Hill and Hayward, and for Salem, Oregon.

Transportation Centers. Project manager for Daly City Intermodal Study which developed a \$7 million surface bus terminal, traffic access, parking and pedestrian circulation improvements at the Daly City BART station plus development of functional plans for a new BART station at Colma. Project manager for design of multi-modal terminal (commuter rail, light rail, bus) at Mission Bay, San Francisco. In Santa Clarita Long Range Transit Development Program, responsible for plan to relocate system's existing timed-transfer hub and development of three satellite transfer hubs. Performed airport ground transportation system evaluations for San Francisco International, Oakland International, Sea-Tac International, Oakland International, Los Angeles International, and San Diego Lindberg.

Campus Transportation. Campus transportation planning assignments for UC Davis, UC Berkeley, UC Santa Cruz and UC San Francisco Medical Center campuses; San Francisco State University; University of San Francisco; and the University of Alaska and others. Also developed master plans for institutional campuses including medical centers, headquarters complexes and research & development facilities.

Special Event Facilities. Evaluations and design studies for football/baseball stadiums, indoor sports arenas, horse and motor racing facilities, theme parks, fairgrounds and convention centers, ski complexes and destination resorts throughout western United States.

Parking. Parking programs and facilities for large area plans and individual sites including downtowns, special event facilities, university and institutional campuses and other large site developments; numerous parking feasibility and operations studies for parking structures and surface facilities; also, resident preferential parking.

Transportation System Management & Traffic Restraint. Project manager on FHWA program to develop techniques and guidelines for neighborhood street traffic limitation. Project manager for Berkeley, (Calif.), Neighborhood Traffic Study, pioneered application of traffic restraint techniques in the U.S. Developed residential traffic plans for Menlo Park, Santa Monica, Santa Cruz, Mill Valley, Oakland, Palo Alto, Piedmont, San Mateo County, Pasadena, Santa Ana and others. Participated in development of photo/radar speed enforcement device and experimented with speed humps. Co-author of Institute of Transportation Engineers reference publication on neighborhood traffic control.

Bicycle Facilities. Project manager to develop an FHWA manual for bicycle facility design and planning, on bikeway plans for Del Mar, (Calif.), the UC Davis and the City of Davis. Consultant to bikeway plans for Eugene, Oregon, Washington, D.C., Buffalo, New York, and Skokie, Illinois. Consultant to U.S. Bureau of Reclamation for development of hydraulically efficient, bicycle safe drainage inlets. Consultant on FHWA research on effective retrofits of undercrossing and overcrossing structures for bicyclists, pedestrians, and handicapped.

MEMBERSHIPS

Institute of Transportation Engineers Transportation Research Board

PUBLICATIONS AND AWARDS

Residential Street Design and Traffic Control, with W. Homburger *et al.* Prentice Hall, 1989.

Co-recipient, Progressive Architecture Citation, *Mission Bay Master Plan*, with I.M. Pei WRT Associated, 1984.

Residential Traffic Management, State of the Art Report, U.S. Department of Transportation, 1979.

Improving The Residential Street Environment, with Donald Appleyard *et al.*, U.S. Department of Transportation, 1979.

Strategic Concepts in Residential Neighborhood Traffic Control, International Symposium on Traffic Control Systems, Berkeley, California, 1979.

Planning and Design of Bicycle Facilities: Pitfalls and New Directions, Transportation Research Board, Research Record 570, 1976.

Co-recipient, Progressive Architecture Award, *Livable Urban Streets, San Francisco Bay Area and London*, with Donald Appleyard, 1979.

Mark E. Grismer PE PhD
Vadose Zone Hydrologist
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(707) 823-0703

1 June 2008

TO: Bill Kopper Esq.

RE: Review of Rancho del Oro Recirc DEIR

As requested, I have reviewed the recirculated DEIR, specifically regarding project related impacts on site hydrology, storm water drainage and water supply, as contained in the Executive Summary & Project Description, Chapter 3.4 – Drainage, Hydrology and Water Quality, Chapter 3.5 – Public Utilities and Services – Water Supply, and the associated Water Supply Assessment (WSA) and Summary of Environmental Effects sections of the Recirculated DEIR for the Rio Del Oro proposed development in Sacramento.

Over all, the DEIR is thorough, if not cumbersome, and addresses most of the site concerns. Further, the project seems to intelligently make use of disturbed land for beneficial use, including preserving wetland and other open space areas. However, the major limiting factor for this project, and others in the region, is **simply** water supply. Further, alternative means of meeting water needs, such as rainwater catchment and greywater reuse are not addressed. The question of energy required to operate the water treatment and conveyance facilities is not addressed. A secondary concern is site drainage and resulting flooding issues. Finally, the carbon footprint for this development has not been determined nor is mitigation considered.

Permanent Water Supply

The project water demand is anticipated to be met through agreements with several entities that as of yet are not in place. Ultimately, the Sacramento County Water Agency (SCWA) is the identified water supplier, and the primary water sources for the project are to be surface water diversion from the Sacramento River and treatment of remediated groundwater from the site itself. Yet these supplies are contingent on a series of complex and interrelated agreements pertaining to water replacement obligations, the Zone 40 Water Supply Master Plan, the Zone 41 Urban Water Supply Plan and other stakeholders.

Ultimately, the water supply plan appears to be something of a shell game: Water pumped and remediated from the project site (GET water) is directed to the American River at the rate of up to 29,000 AF/yr. This water is in part dedicated to the Golden State Water District as replacement for water “taken” from the project site groundwater. The remaining volume is considered available water supply that can be directed to

meeting other water supply needs of the Zone 40 plan. This is considered a surface water take, and groundwater is reserved for dry weather years only.

The water demand for the project has been determined to be 8888 AF/yr. We assume that appropriate water-use factors have been employed. However, the exact source of that water is not completely clear. It appears that to meet the demand, 1500 AF/yr will be supplied through surface water diversion of the Sacramento River, through the not yet constructed Freeport Regional Water Project intake and Vineyard Water Treatment Plants. These imperative pieces of infrastructure will not be completed until 2011. Further, once treated, the potable water will be conveyed to the site via the North Service Area Pipeline Project (NSAPP), which has not yet been approved and its earliest completion date is estimated at 2014.

The remaining water demand is proposed to be met through the remediated (GET) water via the Eastern County Replacement Water Supply Project (RSWP). This supply is dependent on an agreement between Sacramento County, The SCWA and Aerojet, which in turn depends on the certification by the SCWA of the FEIR for that project by a "specific date". The agreement allows for the termination of the agreement by that date, which is now passed without certification. This water supply is therefore not guaranteed.

The DEIR provides a thorough and lengthy explanation of Zone 40 water management plan, explains all of the stakeholders and agreement necessary to provide water to the area, and summarizes the 2030 study that evaluates water demand and supply for a portion of the project area. The DEIR well tabulates the water supply sources for the Zone 40 water management plan, which includes the Rio del Oro Project, and includes water allocations currently and in the future. Future increased demands from global warming already underway require further evaluation. For example, reference evapotranspiration less rainfall rates have been increasing at an average rate of 6.1 % per decade since 1985 in the Central Valley based on DWR CIMIS data.

I would like to see, in simple direct language, a clear statement explaining that the water supply is not yet secure for THIS project, followed by the complex explanation and the variety of agreements and construction requirements needed to provide water to the project. A simple set of tables for THIS project should be created that will make the water supply issue more easily understood. See example Tables 1-3 below.

Table 1: Water supply sources

Water Supply Component and source	Total Capacity (AF/yr)	Amount Available for Project	Secured?	Availability Date	% Demand Met	Contingencies?
Vineyard WTP – Sacramento River Diversion	11,000	1500	Y	X% 2010 Y% 2029	17%	Dependent on FRWP, NSAPP not constructed til 2014, etc.
RWSP – GET remediated groundwater	29,000	7300	N	?	83%	FEIR not certified. Multi-agency agreement
Etc.....						

Table 2: Infrastructure Requirements

Infrastructure Component	Status	% Supply	Completion date	Contingencies?	Reference Page #(s)
NSAPP	Not approved	17%	Earliest 2014	CEQA review	
FRWP, etc					

Table 3: Impacts

Water Supply Component	Source	Impact on Regional Water	Reference Page Number

Groundwater/Surface water balance

The DEIR states that the wet year reliance on surface water from the Sacramento and American Rivers will allow groundwater supplies to be replenished to be available to meet dry-weather demands without impacting surface water during dry years (p. 3.5-11). Missing from this argument is that even wet weather – surface water supplies for the project are met with groundwater pumping via the GET replacement RWSP project that removes up to 29,000 AF/yr of groundwater from the project area. The one paragraph presented does not provide a convincing water balance to support this claim; a more detailed assessment is required.

GAP water supply

The document also states that the interim (GAP) water supply will be provided through and agreement with the Golden State Water Agency (Section 3.5 p 19), and follows with a detailed explanation of all of the sources of water allocated to the GSWC and the demands. In Table 3.5-6, the various sources and allocations of water are summarized, including excess supply. The excess water from the GSWC demand is to supply the interim water needs for the Rio del Oro project. However, one of the sources is the Aerojet Replacement Water, which will not be available until 2010, according to the Table. However, earlier discussion (p 3.5-6) indicates that this water supply will not be fully available until 2011 or 2014, depending on whether the NSAPP is required. Therefore, the 5000 AF/yr from this project should not be considered available until a later date, and not included in the calculation of water available for the project. Furthermore, the DEIR states that no water conveyance systems are located within the project area. These therefore require approval and construction before the GSWC water can be considered a secure interim water supply.

Alternative means

Greywater reuse is a sound and easy means of reducing potable water requirement for residential and commercial applications. Water demand can be reduced 30% in household and varying amounts for commercial sites, and should be considered in all development projects in this area.

Onsite wastewater treatment should be considered to reduce energy and infrastructure requirements for collection and conveyance of water.

Onsite rainwater catchment should be considered as a reliable water source. In average rainfall years, the average sized house can collect about 30,000 gallons of water per year from rooftops in this area. Houses should be constructed with this in mind, and this water should be used to meet irrigation demands.

Energy

DWR estimates that water supply, treatment and conveyance accounts for 19% of electricity demand and 30% of natural gas demand nationwide. The Sacramento area experiences recurring brownouts during summer peak demands. This development will put increased demands on energy supplies that are already taxed, a significant portion of which will be required to operate and maintain the water supply. There is no discussion of how increased energy demands will be met for the project in general, nor specifically for water supply.

Drainage

Site hydrology and drainage is discussed in Chapter 3.4. Flooding conditions already occur onsite due to undersized culverts at the South and Central Overshute and North siphon. The DEIR states that site development will increase potential flooding conditions and potential impact water quality. Thorough and concise analyses of impacts are provided, but mitigation measures must be utilized.

According to the DEIR, the proposed project could result in significant and direct impacts related to stormwater runoff and subsequent risk of flooding, water quality impacts due to runoff, both during construction, and with the ensuing land uses. The mitigation for this impact is to submit appropriate drainage plans and implement the requirements and to implement "measures" or BMPs to mitigate for construction related impacts. These plans are not specified in the DEIR, are not yet developed and may require environmental review. The plan should not be approved without understanding the means to remediate site drainage, erosion and construction related activities.

Carbon Footprint

While there is a detailed discussion of the potential impacts of climate change on water supply, there is no discussion in this DEIR of carbon footprint for the project nor how that will be offset. The influence of human generated greenhouse gases on climate change is no longer disputed. Responsible development projects will address carbon footprint and offset options for both construction activity and subsequent land uses. This project does not.

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EDUCATION

- Ph.D. – Agricultural Engineering, Colorado State University (1984)
Study Emphasis: Groundwater Hydrology
- M.S. – Environmental Engineering, Oregon State University (1981)
Study Emphasis: Hydrology and Water Quality
- B.S. – Agricultural Engineering, Oregon State University (1980)
Study Emphasis: Soil and Water Science
- EIT – Engineer-in-Training Registration, Oregon (1980)

HONORS

- Outstanding Teamwork Award & Prize – Water Conservation in Agriculture, UC Division of Agriculture & Natural Resources (2003)
- Outstanding Teacher Award, Environmental Resource Sciences Major, UC Davis (1992)
- Mined Land Reclamation Group Graduate Fellowship, CSU Environmental Resources Center (1983)
- ASAE Student Honor Award, Oregon State University (1980)
Honors Program, Oregon State University (1980)
- High Scholarship Graduate, Oregon State University (1980)
- Presidential Scholarship, Hamline University, MN (1976)

UNIVERSITY EXPERIENCE

Chair, Hydrologic Sciences Graduate Group, UC-Davis; 7/90-7/93 and 7/2002-present.

Professor, Departments of LAWR and Biological and Agricultural Engineering, UC-Davis; 7/95-present.

Associate Editor, California Agriculture, Land & Water Resources; 10/99-present.

Associate Editor, ASCE Journal of Irrigation & Drainage Engineering; 7/94-12/96.

Master Advisor, Hydrology; 7/94-7/98

Master Advisor, Environmental & Resource Sciences; 7/2003-present

Graduate Advisor, Hydrologic Sciences; 7/92-present.

Associate Professor, Departments of LAWR and Agricultural Engineering, UC-Davis; 7/89–6/95.

As an associate professor, I have continued work as outlined below as well as serve on additional college and campus committees. These include chairing an undergraduate major review committee and chairing the Academic Senate and College Rules & Jurisdiction committees during a period of numerous rule changes resulting from integration of Cooperative Extension into the College. Also, as chair of the Earth Sciences & Resources Graduate Group, I was responsible for transformation of this Group into the new Hydrologic Sciences Graduate Group and the creation of Hydrology undergraduate teaching programs (new major and minor). My efforts in curriculum development also resulted in my chairing a graduate education oversight committee for the College.

Assistant Professor, Departments of Land, Air & Water Resources (LAWR) and Agricultural Engineering, UC-Davis; 10/84–6/89.

As an assistant professor, my research program considered near surface processes such as infiltration, surface evaporation and irrigation management, as well as various aspects of shallow groundwater including; vapor movement in unsaturated soils, lateral subsurface flows, seepage from wastewater impoundments, groundwater modeling, soil salinity and drainage of cracking clay soils, and regional modeling of shallow groundwater as affected by irrigation and drainage (see publications). In addition to regular teaching, research and committee responsibilities, I served as Chair of the Committee of

Consultants on San Joaquin River Water Quality, Chair of a faculty position (geohydrology) search committee, and Chair of the interdisciplinary Graduate Program of Earth Sciences and Resources.

Research Associate, Department of Agricultural and Chemical Engineering, Colorado State University; 1/84–9/84.

As a research associate, I was responsible for completion of contracts with oil shale processing companies and consulting firms relative to the leaching of spent oil shales. This work involved laboratory leaching column and hydraulic property studies, as well as, a conceptual mass balance estimate of seepage/drainage from spent oil shale piles in the field.

Research Assistant, Department of Agricultural and Chemical Engineering, Colorado State University; 7/81–12/83.

During this period, I completed classroom and laboratory studies toward the Ph.D. In the laboratory, gamma ray attenuation methods were devised for simultaneously monitoring water and salt movement in relatively dry soils.

Research Assistant, Department of Agricultural Engineering, Oregon State University; 6/80–6/81.

In this year, I completed coursework in hydrology, water chemistry, and adult education, as well as, M.S. thesis work related to fecal coliform contamination of Tillamook Bay from land application of dairy wastes.

Engineer-in-Training, Oregon Soil and Water Conservation Commission, The Dalles, OR; 6/79–9/79.

As an intern, I worked with USDA-SCS personnel on the design, layout and surveying inspection of earthen terraces constructed to limit hillside erosion from dryland wheat fields.

TEACHING RESPONSIBILITIES

Principles of Hydrology (HYD/ERS 100 & 100L, 6 units) – Large enrollment course including multiple laboratory and discussion sections for environmental science students covering all aspects of general hydrology as well as basic hydrogeochemistry and hydraulics.

Seepage and Drainage, Irrigation and Drainage (HYD 140, HYD 115/EBS 145, 4 units) – An engineering principles and design course considering subsurface drainage issues associated with excess rootzone drainage, seepage from canals or impoundments and artesian groundwater conditions.

Multi-phase Transport in Soils, Infiltration and Drainage (HYD 244/EBS 240, 3 units) – A graduate course considering two and three-phase flow through porous media and its application to infiltration and vadose zone processes. Students design and complete research projects of interest as part of the course.

Wood Properties & Fabrication (ABT 15, 2 units) – A basic materials course with multiple laboratory sections considering wood as a biological material, its physical properties (e.g. strength, density, thermal conductivity), mechanics of materials and construction of wood hand planes.

OSHA HAZWOPER Training (HYD 410, HYD 440, 1&3 units) – OSHA 10-hr and 40-hr certification courses required before entering hazardous material sites.

Hydrologic Science Seminar (HYD 200, 1 unit) – Graduate seminar course considering basic literature review, proposal writing and lecture principles combined with attendance and review of seminars related to hydrology.

RESEARCH AREAS

Field Research – General hydrology and irrigation and drainage engineering. Extensive field research conducted related to irrigation, soil salinity and cracking, and drainage as well as general water quality issues associated with agricultural runoff. Current field research is considering erosion and riparian systems, restoration of tidal marshes via drainage channel design and construction, role of wetlands in watershed systems and use of constructed wetlands for treatment of agricultural process (e.g. winery, fruit) wastewaters.

Laboratory Research – Soil physics. Ongoing research related to measurement of soil hydraulic parameters, multi-phase transport through soils, adsorption/desorption of VOC's on clay minerals, strength of clays and general aspects of flow in porous media.

Modeling Research – Surface runoff and shallow groundwater systems. Have completed extensive modeling of the impacts of regional irrigation/drainage on soil salinity and shallow groundwater, river water quality, pesticide runoff from orchards and seepage from impoundments.

CONSULTING PROJECTS (selected few)

My consulting projects and work is generally directed at evaluation of environmental impacts of development, irrigation projects and related activities on the watershed. This includes evaluation of soil-salinity, water use, evapotranspiration, flooding and related processes and their effects. Some specific projects include:

Levee seepage – Modeled timing and extent of levee seepage near Sacramento for CA State Attorney General.

Santa Rosa Regional Wastewater Treatment System – Expert reviewer of draft EIR document development.

Subsurface Drainage System Design – Developed new design that incorporated an old system for the CA Department of Corrections doubling expansion of an existing prison in the San Joaquin Valley.

Lincoln City, CA Aggregate Mining - Expert reviewer of Draft EIR document on behalf of concerned citizen group (WPCARE) of Placer county.

Fresno, CA Aggregate Mining - Expert reviewer of Kings River Sand & Gravel Project Draft EIR document on behalf of concerned citizen group.

Orchard Surface Drainage – Surveyed and developed remedial surface drainage design for orchard near Gridley, CA.

Livingston Waste Water Treatment Plant – Evaluated declining percolation pond seepage rates and problems associated with river discharge of partially-treated effluent and recommended plant modifications to maintain compliance with waste discharge requirements.

La Conchita Ranch Orchard Seepage Evaluation – Conducted extensive field monitoring program and sampling to estimate avocado/citrus orchard water use and rootzone drainage relative to rainfall induced seepage through the vadose zone.

Evaluation of Dry/Linda Creek Flood Control Project - Expert reviewer of draft EIR document on behalf of concerned citizen group and Sierra Club to determine potential for downstream flooding resulting from the project. Developed model and possible alternative flood-control designs to reduce loss of “heritage” oak trees along riverbanks and protection of chinook salmon run for presentation to Roseville City officials and FEMA.

Evaluation of District Canal Seepage Problems – Assisted in conducting a field survey and analysis of shallow groundwater levels as they were affected by operation of a water district canal for orchard near Gridley, CA.

Independent Review Panel Expert on Agricultural Water Conservation for CALFED. Advised CALFED officials about proposed evaluation of agricultural water use efficiency around the state related to the Delta water issues.

Evaluation of Draft EIR Specific Plans for urban development in the Sacramento area. These typically involve assessment of water use, water quality, land use and flooding impacts associated with the proposed developments.

Evaluation of Imperial Valley Water Use (USBR & MWD). Completed a detailed assessment of the applicability of the “reduced-runoff” irrigation method to forage crop production in the Imperial Valley and how it would lead to significant water savings. This research and work resulted in USBR and DANR awards.

Mercury Fate & Transport in the Yuba Goldfields. This ongoing work involves assessment of mercury transport, transformation and fate as well as possible abatement and cleanup costs associated with mining and dredging operations in this unique area.

Assessment of Contaminant Transport & Remediation - DBCP, MTBE, Hg, Coliforms. Prepared reviews of the state of the science on these contaminants in groundwater systems for DBCP and MTBE, and surface waters for Hg and in the seawater environment for fecal coliforms.

Evaluation of Water Use and Stream-Water Table Interactions on Middle Rio Grande River, NM. Completed a detailed current and historical assessment (1896-2000) of Pueblo Indian water use, crop production, evapotranspiration, effects of shallow water table depth on losses in crop production and dependence of this relationship on changing stream – WT aquifer conditions.

CONFERENCE PUBLICATIONS

Moore, J. A., M. E. Grismer, S. R. Crane, and J. R. Miner. 1982. Evaluating dairy waste management systems' influence on fecal coliform concentration in runoff. ASAE Paper No. 82-4024.

McCullough-Sanden, B. L., T. K. Gates, and M. E. Grismer. 1986. Analysis of seepage in an on-farm evaporation pond. ASAE Paper No. 86-2064.

Grismer, M. E. 1987. Water vapor adsorption kinetics during constant-rate infiltration. ICIDA Conference, Hawaii. January.

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- Grismer, M. E. 1987. Automated monitoring of remote soil sensors. ASAE Paper No. 87-2095.
- Gates, T. K. and M. E. Grismer. 1987. Stochastic optimal management of saline perched aquifers in irrigated regions. Proceedings of International Conference on Groundwater Contamination: Use of models in Decision-Making. Amsterdam, The Netherlands. October.
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- Grismer, M. E. 1989. Drainage efficiency and drain water quality. *In*: Proceedings of the Eleventh International Congress on Agricultural Engineering, Dublin, Ireland. September. pp. 285-290.
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- Grismer, M.E., F. Karajeh and H. Bouwer. 1993. Evaporation pond hydrology. *In*: Proceedings of the ASCE National Conf. on Irrigation and Drainage Engineering, Durango, CO. July.
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REVIEWS

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- Grismer, M.E. 2002. Fecal Coliforms in Seawater: A Review.
- Grismer, M.E. 2002. Rainfall Simulation (RS) Methods: Reviews of RS applied to rainfall effects on aggregate stability, RS design, environmental transport, erosion, fire effects, insecticide/spore dispersal, runoff modeling, slope/cover and tillage/traffic processes.
- Grismer, M.E. 2003. Mercury Contamination, Transport and Bio-availability Associated with Dredging Operation in the Yuba Goldfields: A Review.

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- Moore, J. A., M. E. Grismer, S. R. Crane and J. R. Miner. 1983. Modeling dairy waste management systems influence on coliform concentration in runoff. Trans. of ASAE 26(4): 1194-1200.
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K. Shawn Smallwood, Ph.D.
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17 June 2008

Bill Kopper, Attorney at Law
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RE: Rio del Oro Specific Plan Project Recirculated Draft Environmental Impact Report

Dear Mr. Kopper,

I reviewed the Recirculated Draft Environmental Impact Reports (EIR) and related documents. My qualifications for preparing expert comments on the EIR are summarized in my curriculum vitae, which is attached. I earned a Ph.D. degree in ecology from the University of California at Davis in 1990. Then I worked as a post-graduate researcher for four years in the Department of Agronomy and Range Science at UCD. Since then I have worked as a consulting ecologist. My clientele has included citizen groups, businesses, attorneys, and government agencies. Much of my work has been directed toward special-status species and CEQA issues. I have worked directly with endangered species and other special-status species, and am currently helping to recover the endangered Fresno kangaroo rat in California. For two years I worked under contract for the U.S. Fish and Wildlife Service on the threatened California red-legged frog in the south Bay Area. I have worked on California tiger salamander, Swainson's hawk, white-tailed kite, burrowing owl, multiple other species of raptor, as well as on mammals of various species. I have authored numerous papers on special-status species issues, including "Using the best scientific data for endangered species conservation," published in *Environmental Management*, and "Suggested standards for science applied to conservation issues" published by *The Wildlife Society – Western Section*. I served as Chair of the Conservation Affairs Committee for *The Wildlife Society – Western Section*, I am a member of *The Wildlife Society* and the *Raptor Research Foundation*, and I've been a part-time lecturer at California State University, Sacramento. I was also Associate Editor of wildlife biology's premier scientific journal, *The Journal of Wildlife Management*, as well as of *Biological Conservation*.

SITE VISITS

I visited the project site on 25 May 2008 between the hours of 19:30 and 20:30, on 27 May between the hours of 19:45 and 20:45, and on 11 June between the hours of 18:00 and 21:00. The weather was cool and sky mostly overcast during both the first two days. It was warm and smoky (due to wildfires) on the 11th of June. I walked the perimeter, observing the habitat, the plant species along the edge, and wildlife I could see or hear. Table 1 includes the species of wildlife I observed. During the first two hours I observed 26 species of wildlife, and on the 11th I saw 27 species over the first 1.5 hours, and 31 species over the full 3 hours. I saw 39 species of wildlife during all three trips. I would have visited the interior of the project site, but the property owners denied my request for site access. Photos 1 and 2 show the types of views I had from the perimeter.

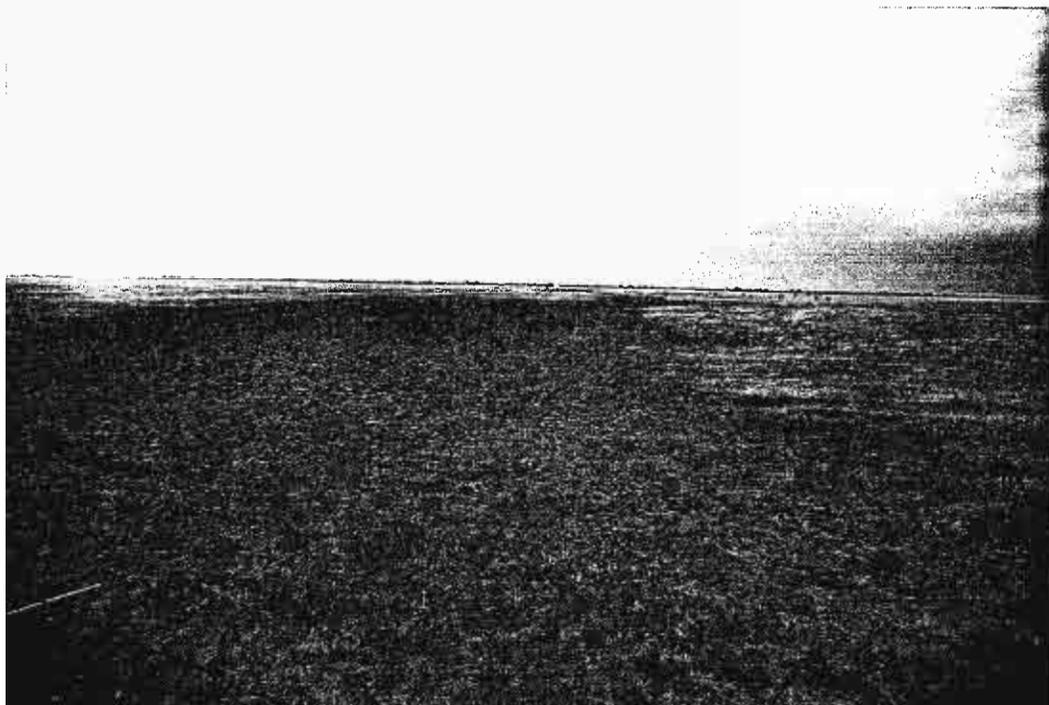


Photo 1. View north of vernal pool on 25 May 2008.



Photo 2. View south of dredge tailings on 25 May 2008.

Table 1. Species of wildlife observed by Smallwood on at the site proposed for the Rio del Oro Specific Plan Project during one hour visits around the perimeter on 25 and 27 May 2008, and three hours around the perimeter on 11 June 2008.

Common name	Species name	Status ^a	Evidence
Great blue heron	<i>Ardea herodias</i>		Flyover, low
Great egret	<i>Ardea alba</i>		Flying (2)
Mallard	<i>Anas platyrhynchos</i>		Nesting (chicks on water)
Killdeer	<i>Charadrius vociferous</i>		Flying & perched (multiple)
Turkey vulture	<i>Cathartes aura</i>		On the ground
American kestrel	<i>Falco sparverius</i>		Foraging
Red-tailed hawk	<i>Buteo jamaicensis</i>		Flying & perched (5)
Northern harrier	<i>Circus cyaneus</i>	CSC	Foraging
White-tailed kite	<i>Elanus leucurus</i>	CFP	Foraging
Cooper's hawk	<i>Accipiter cooperi</i>	CSC	Flying
Great horned owl	<i>Bubo virginianus pacificus</i>		Vocal
Wild turkey	<i>Melleagris gallopavo</i>		Dead on side of the road
Ring-necked pheasant	<i>Phasianus colchicus</i>		Vocal
Northern flicker	<i>Colaptes auratus cafer</i>		Vocal
Mourning dove	<i>Zenaida macroura</i>		Flying & perched (many)
Northern mockingbird	<i>Mimus polyglottos</i>		Flying
American crow	<i>Corvus brachyrhynchos</i>		Flying
Scrub jay	<i>Aphelocoma coerulescens</i>		Perched
Common raven	<i>Corvus corax</i>		Flying (2)
Cliff swallow	<i>Hirundo pyrrhonota</i>		Flying (many)
Tree swallow	<i>Hirundo pyrrhonota</i>		Flying (many)
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>		Perched
Bushtit	<i>Psaltriparus minimus</i>		Flying and perched (many)
Western kingbird	<i>Tyrannus verticalis</i>		Flying & perched (many)
Western bluebird	<i>Sialia mexicana</i>		Many flying and perching
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>		Perched & flying
European starling	<i>Sturnus vulgaris</i>		Flying & perched (many)
Brown-headed cowbird	<i>Molothrus ater</i>		Perching & flying
Brewer's blackbird	<i>Euphagus cyanocephalus</i>		Perching & flying
Red-winged blackbird	<i>Agelaius phoeniceus</i>		Flying & perched (many)
Western meadowlark	<i>Sturnella neglecta</i>		Flying & perched (many)
Spotted towhee	<i>Pipilo erythrophthamnus</i>		Vocal & flying
California towhee	<i>Pipilo fuscus</i>		Perching & flying
American goldfinch	<i>Carduelis tristis</i>		Vocal & flying
House finch	<i>Carpodacus mexicanus</i>		Perching & flying
Bat sp.			Flying
Coyote	<i>Canis latrans</i>		Vocalization (multiple)
Desert cottontail	<i>Sylvilagus bachmani</i>		
California ground squirrel	<i>Spermophilus beecheyi</i>		Many in southeast area

^a See Table 2 legend for a key to the acronyms indicating special status.

SUFFICIENCY OF DEIR AS AN INFORMATIVE DOCUMENT

Under CEQA,¹ “[A] paramount consideration is the right of the public to be informed in such a way that it can intelligently weigh the environmental consequences of any contemplated action and have an appropriate voice in the formulation of any decision.” The public needs information that is thorough, relevant, unbiased, and honest; the public needs full disclosure of the environmental setting and possible cumulative impacts. Documents presenting information from a biased perspective will tend to include omissions, logical fallacies, internal contradictions, and unfounded responses to substantial issues. Therefore, my assessment of the DEIR and associated documents also considers omissions, errors, logical fallacies, and bias, which bears on the sufficiency of the Rio del Oro Specific Plan DEIR.

From what I could gather in the DEIR, biologists visited the project site for wildlife surveys once on 13 December 2004 and on 12 and 13 January 2005. The DEIR does not inform the reader what time of day or how long the biologist(s) were on-site. The level of detail provided in the DEIR’s description of surveys for biological resources fell short of minimum professional standards of environmental document preparation.² I suggest the DEIR be revised to include much more detail about wildlife surveys. Better yet, I suggest that many more wildlife surveys be performed, including during all seasons of the year.

Visiting the site only three times in December/January almost guaranteed the consultant would not detect the multiple special-status species that would: (1) occur in the area during other portions of the year; (2) emerge from burrows during other portions of the year; or, (3) occur in situations in which special survey techniques have been established to detect the species. For example, a January visit was unlikely to detect western spadefoot because this species emerges from underground burrows during early spring. It was unlikely the consultant would have seen Swainson’s hawks, because they are in Mexico during the winter. It might have been possible to see California tiger salamanders traveling to breeding pools, but the consultants would have had to be out there during rainy nights. Flowering plants and annuals would have been missed by the consultants during their winter visits, as well. The survey period selected corresponded with a time of the year when at least some special-status species would not be detected. Had the consultants surveyed several times per season, they would have detected many more species of animals and plants than they did.

If the consultants visited the site during daylight hours only, and not during the evening or nighttime hours, then they likely would have missed western spadefoot, California tiger salamander, short-eared owl, or any of the species of bat. The DEIR does not indicate what time of day the consultant visited the site, but the methods in the ECORPS attachment indicate they visited the site only during the day because they looked for animals and plants within 100 feet of

¹ Environmental Planning and Information Council vs. County of El Dorado (1982) 131 Cal. App. 3d 350, 354.

² Smallwood, K.S., A. Gonzales, T. Smith, E. West, C. Hawkins, E. Stitt, C. Keckler, C. Bailey, and K. Brown. 2001. Suggested standards for science applied to conservation issues. Transactions of the Western Section of the Wildlife Society 36:40-49.

each of 35 sampling sites. Looking for animals from these sites during the night would have required lights, night-vision equipment or auditory detection. Nighttime surveys using appropriate methods would have enabled the consultants to detect many more species of wildlife than they did.

The DEIR reported that the biologists searched for biological resources within 100 feet of 35 sites within the 3,828 acres of the project area, or 0.019% of the site, and it does not explain how or why these sites were selected. The DEIR did not specify how long the surveys were performed at each site. I do not recall ever seeing such a cursory survey for biological resources. Why so few sites and such a small area around each site? Searching only 0.019% of the project site was grossly insufficient, as was doing so during only one season of the year. Given the biological resources I observed in two hours along the perimeter of the project site, the level of biological survey founding the DEIR was grossly deficient. The level of effort devoted to biological resource surveys suggest that the consultants either operated with a very small budget or just wanted to detect as few animal and plant species as possible. I suggest the DEIR be revised so that it includes the results of many more surveys over a much larger percentage of the project area.

The DEIR provided no indication any other methods of wildlife survey were used other than visual scans. Visually searching a 100-foot radius around observation points has precedence in songbird surveys, otherwise known as point counts. However, this search radius was inappropriate for raptors and large bird species. It was also unsuitable for many other species of wildlife, including herpetofauna. To find lizards, snakes, and salamanders, biologists need to turn over woody debris and look under objects lying on the ground and into burrows. To find small mammals, live-trapping is typically used by biologists, and to find ground squirrels and pocket gophers, biologists need to survey large areas on foot. Transects should be walked for long distances to detect sign of other mammals, such as carnivores, deer, and hares and cottontails. Standing at one location is unlikely to detect any of the taxa just mentioned. Based on considerable personal experience, I can attest to 35 sites also being grossly deficient for the purpose of detecting plant species within an area the size of the Rio del Oro project. In summary, had the consultants used appropriate survey methods on the project site, they would have detected many more species of wildlife and plants than they did.

Even when more rigorous surveys are performed, it is common to not detect special-status species, and sometimes these missing detections were due to the species not occurring on the site. However, even if the species was not present at a particular time, it is typical of animal species to exhibit a dynamic spatial distribution, meaning their centers of activity shift locations.³ An unoccupied habitat patch at time t can be occupied at time $t+1$ or at time $t+2$, and so on.⁴ This DEIR is better than most in concluding species presence/absence among those species that

³ Taylor, R.A.J., and L.R. Taylor. 1979. A Behavioral Model for the Evolution of Spatial Dynamics. Pages 1-28 in R.M. Anderson, B.D. Turner, and L.R. Taylor (editors). *Population Dynamics*. Blackwell Scientific Publications, Oxford.

⁴ Smallwood, K.S. 2002. Habitat models based on numerical comparisons. Pages 83-95 in Predicting species occurrences: Issues of scale and accuracy, J. M. Scott, P. J. Heglund, M. Morrison, M. Raphael, J. Haufler, and B. Wall, editors. Island Press, Covello, California.

were discussed, but even so, too many potentially occurring special-status species were not addressed and a few were dismissed based on flawed arguments (see below).

List of Special-Status Species

The DEIR presented a very cursory list of known and potentially occurring special-status species for a project site of this size and diversity of vegetation cover types. The species list in the DEIR is simply not believable. To get a better understanding of which species might use the project site, I visited it, and I also consulted with the California Wildlife Habitat Relationships (CWHR) system maintained by the California Department of Fish and Game. I queried CWHR for species that might occur in Sacramento County within vegetation cover types consistent with those listed in the DEIR. I had to use judgment in some cases because the cover types described in the DEIR did not always match those in CWHR. For example, Coyote brush scrub is not included in CWHR, and the riparian forests in the project site are closest to CWHR's Valley Foothill Riparian cover type, but without surface water flows. Also, even though perennial ponds were described in the DEIR, I did not query CWHR for species that associate with lacustrine environments. I took a conservative approach. Nevertheless, my query of CWHR revealed potential use of the site by 270 species of vertebrates, including 194 species of birds, 47 species of mammals, 19 species of reptiles, and 10 species of amphibians (Table 2). In total, the DEIR addressed the likelihood of occurrence of 26 vertebrate species, which is the same number as I observed during my first 2 hours at the project site and one shy of the number I saw within the first 90 minutes of my third visit, and <10% of the number identified by my query of CWHR. In other words, the environmental setting of the project site was inadequately described, and the shortfall was astonishingly large.

Table 3-10.2 of the DEIR listed 17 vertebrate species with special-status, but concluded 3 of these were unlikely to occur at the project site. These 17 species included 12 bird species, 1 mammal, 2 reptiles, and 2 amphibians. My query of CWHR turned up 46 vertebrate species with special status, or 2.7 times more than reported in the DEIR. I found 30 species of special-status birds, 9 species of mammals, 3 of reptiles, and 4 of amphibians. Why did my review of CWHR reveal so many more special-status species of vertebrates than did the DEIR? Whatever the reason, the DEIR is deficient at describing the environmental setting of the project, and therefore is deficient in its estimates of project impacts.

Table 2. Species of terrestrial vertebrates and select invertebrates potentially occurring and known to occur on and near the Rio del Oro Specific Plan Project site. Under **Status**, species are listed as FE = federal endangered, FT = threatened, FSC = federal species of conservation concern, CE = California endangered, CT = California threatened, CSC = California species of special concern (not threatened with extinction, but rare, very restricted in range, declining throughout range, peripheral portion of species' range, associated with habitat that is declining in extent), CFP = California Fully Protected, CSA = California Special Animal, CDFS = California Department of Forestry sensitive, and CNPS = California Native Plant Society listing. Under **CWHR ratings**, L, M, and H represent California Wildlife Habitat Relationships ratings of Low, Medium, and High for the habitats' fulfillment of the species need to reproduce, find cover and forage. The input parameters used in the CWHR analysis included the following: Sacramento County, annual grassland, fresh emergent wetland, Valley oak woodland, Valley foothill riparian, and riverine. The ratings used in the table were the highest ratings associated with habitat cover types used in the analysis. I excluded a few of the species that were listed in the CWHR output file based on my knowledge of the species regarding the likelihood of their occurrence at the project site. Under **Smallwood assessment**, "Observed by ECORP" refers to observations reported in ECORP Consulting, Inc. (2006).

Common name	Species name	Status	EIR rating of occurrence potential	CWHR ratings	Smallwood assessment
Arthropods					
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	FT, CE	Likely	---	Exit holes observed by Gibson & Skordal (2000a)
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	FT	Present	---	Observed by Gibson & Skordal
Vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	FE	Present	---	Observed by Gibson & Skordal
Conservancy fairy shrimp	<i>Branchinecta conservatio</i>	FE	Likely	---	Probable
Longhorn fairy shrimp	<i>Branchinecta longiantenna</i>	FE	Unlikely	---	No opinion
California linderiella	<i>Linderiella occidentalis</i>	FC	Present	---	Observed by Gibson & Skordal
Birds					
Pied-billed grebe	<i>Podilymbus podiceps</i>			HH	Probable
Western grebe	<i>Aechmophorus occidentalis</i>			LM	Possible
American white pelican	<i>Pelecanus erythrorhynchos</i>	CSC		M	Possible
American bittern	<i>Botaurus lentiginosus</i>			L	Possible
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	CSA		MMH	Probable
Green heron	<i>Butorides striatus</i>			HH	Possible
Cattle egret	<i>Bubulcus ibis</i>			LHH	Probable
Snowy egret	<i>Egretta thula</i>	CSA, CDFS		LLH	Probable
Great egret	<i>Ardea alba</i>	CSA, CDFS		HHH	Observed by SS; Likely (ECORPS)

Great blue heron	<i>Ardea herodias</i>	CSA, CDFS	HHH	Observed by SS; Likely (BCORPS)
White-faced ibis	<i>Plegadis chihi</i>	CSC	HHH	Probable
Sandhill crane	<i>Grus canadensis tabida</i>	CT	MM	Possible
Tundra swan	<i>Cygnus columbianus</i>		HH	Possible
Greater white-fronted goose	<i>Anser albifrons</i>		HH	Possible
Snow goose	<i>Chen caerulescens</i>		HH	Possible
Ross's goose	<i>Chen rossii</i>		HH	Possible
Canada goose	<i>Bramia Canadensis</i>		LHH	Probable
Mallard	<i>Anas platyrhynchos</i>		HHH	Observed by SS
Northern pintail	<i>Anas acuta</i>		LM	Possible
Coldwall	<i>Anas strepera</i>		HHL	Possible
Green-winged teal	<i>Anas crecca</i>		HHH	Probable
Eurasian wigeon	<i>Anas Penelope</i>		MH	Possible
Cinnamon teal	<i>Anas cyanoptera</i>		LMH	Possible
Ruddy duck	<i>Oxyura jamaicensis</i>		LH	Probable
Wood duck	<i>Aix sponsa</i>		HHH	Probable
Canvasback	<i>Aythya valisineria</i>		HH	Possible
Redhead	<i>Aythya Americana</i>		ML	Possible
Lesser scaup	<i>Aythya affinis</i>		HH	Possible
Common goldeneye	<i>Bucephala clangula</i>		HH	Possible
Hooded merganser	<i>Lophodytes cucullatus</i>		HH	Probable
Common merganser	<i>Mergus merganser</i>		HH	Probable
California black rail	<i>Laterallus jamaicensis coturniculus</i>	CT, CFP	L	Possible
Common moorhen	<i>Gallinula chloropus</i>		L	Possible
American coot	<i>Fulica Americana</i>		LH	Possible
Spotted sandpiper	<i>Actitis macularia</i>		LH	Probable
Western sandpiper	<i>Calidris mauri</i>		HH	Probable
Least sandpiper	<i>Calidris minutilla</i>		HH	Probable
Wilson's phalarope	<i>Phalaropus tricolor</i>		HM	Possible
Lesser yellowlegs	<i>Tringa flaviceps</i>		HH	Probable
Greater yellowlegs	<i>Tringa melanoleuca</i>		HH	Probable
Whimbrel	<i>Numenius phaeopus</i>		HH	Probable
Long-billed curlew	<i>Numenius americanus</i>	FSC, CSC	HH	Probable

Dunlin	<i>Calidris alpina</i>				HH	Probable
Long-billed dowitcher	<i>Limnodromus scolopaceus</i>				HH	Probable
Black-bellied plover	<i>Pluvialis squatarola</i>				MM	Possible
Semi-palmated plover	<i>Charadrius semipalmatus</i>				LL	Possible
Killdeer	<i>Charadrius vociferus</i>					Observed by SS
Bonaparte's gull	<i>Larus philadelphia</i>				LL	Possible
Mew gull	<i>Larus canus</i>				LL	Possible
Ring-billed gull	<i>Larus delawarensis</i>				HH	Probable
California gull	<i>Larus californicus</i>	CSC			MH	Probable
Herring gull	<i>Larus argentatus</i>				MM	Possible
Spian tern	<i>Sterna caspia</i>				MM	Possible
Turkey vulture	<i>Cathartes aura teter</i>				HHH	Observed by SS and ECORPS
Golden eagle	<i>Aquila chysaetos</i>	CFP		Likely, but not nesting	HHH	Probable
Cooper's hawk	<i>Accipiter cooperii</i>	CSC		Likely, but not nesting	HHH	Observed by SS (during nesting season)
Sharp-shinned hawk	<i>Accipiter striatus velox</i>	CSC			MH	Probable
Northern harrier	<i>Circus cyaneus</i>	CSC		Likely	HHH	Observed by SS
White-tailed kite	<i>Elanus leucurus</i>	CFP		Present	HHH	Observed by SS and ECORPS
Red-tailed hawk	<i>Buteo jamaicensis</i>			Expected	HHH	Observed by SS and ECORPS
Ferruginous hawk	<i>Buteo regalis</i>	CSC		Present	MH	Observed by ECORPS
Swainson's hawk	<i>Buteo swainsoni</i>	FSC, CT		Likely	HHH	Probable
Red-shouldered hawk	<i>Buteo lineatus</i>				HHH	Probable
Pough-legged hawk	<i>Buteo lagopus</i>				HH	Probable
Merline falcon	<i>Falco peregrinus anatum</i>	FSC, CE			HHH	Probable
Prairie falcon	<i>Falco mexicanus</i>	FSC, CSC		Present	HHH	Probable
American kestrel	<i>Falco sparverius</i>				HHH	Observed by SS
Merlin	<i>Falco columbarius</i>	CSC		Likely	HH	Probable
Wild turkey	<i>Meleagris gallopavo</i>				HHH	Observed by SS
California quail	<i>Callipepla californica</i>				HHH	Observed by ECORPS
Ring-necked pheasant	<i>Phasianus colchicus</i>				HHH	Observed by SS
Band-tailed pigeon	<i>Columba fasciata</i>				HHH	Probable
Mourning dove	<i>Zenaida macroura</i>				HHH	Observed by SS
Rock dove	<i>Columba livia</i>				H	Observed by SS

Barn owl	<i>Tyto alba</i>				HHH	Probable
Western screech owl	<i>Otus kennicottii</i>				HHH	Probable
Great horned owl	<i>Bubo virginianus pacificus</i>				HHH	Observed by SS and ECORPS
Long-eared owl	<i>Asio otus wilsonianus</i>	CSC			HHH	Probable
Western burrowing owl	<i>Athene curuculana hypugea</i>	FSC, CSC	Likely		HHH	Probable
Northern pygmy owl	<i>Glaucidium gnoma</i>				HHH	Probable
Short-eared owl	<i>Asio flammeus</i>	CSC	Likely		HHH	Probable
Northern saw-whet owl	<i>Aegolius acadicus</i>				HHH	Probable
Lesser nighthawk	<i>Chordeiles acutipennis</i>				MMH	Probable
Common poorwill	<i>Phalaenoptilus nuttallii</i>				HHH	Probable
Yaux's swift	<i>Chaetura vauxi vauxi</i>	CSC			LL	Possible
White-throated swift	<i>Aeronautes saxatalis</i>				HHH	Probable
Black-chinned hummingbird	<i>Archilochus alexandri</i>				HHH	Probable
Anna's hummingbird	<i>Calypte anna</i>				HHH	Probable
Calliope hummingbird	<i>Stellula calliope</i>				MM	Probable
Rufous hummingbird	<i>Selasphorus rufus</i>				HH	Probable
Allen's hummingbird	<i>Selasphorus sasin</i>				HHH	Probable
Belted kingfisher	<i>Ceryle alcyon</i>				HHH	Probable; Likely (ECORPS)
Lewis's woodpecker	<i>Melanerpes lewis</i>	FSC			HHH	Probable
Acorn woodpecker	<i>Melanerpes formicivorus bairdi</i>				HHH	Probable
Red-breasted sapsucker	<i>Sphyrapicus ruber</i>				HH	Probable
Downy woodpecker	<i>Picoides pubescens</i>				HHH	Probable
Nuttall's woodpecker	<i>Picoides nuttalli</i>				HHH	Observed by ECORPS
Northern flicker	<i>Colaptes auratus cafer</i>				HHH	Observed by SS
Western wood peewee	<i>Contopus sordidulus</i>				HHH	Probable
Willow flycatcher	<i>Empidonax traillii</i>	FE, CE			HHH	Probable
Hammond's flycatcher	<i>Empidonax hammondi</i>				LL	Possible
Dusky flycatcher	<i>Empidonax oberholseri</i>				LL	Possible
Pacific-slope flycatcher	<i>Empidonax difficilis</i>				HHH	Probable
Black phoebe	<i>Sayornis nigricans semiatra</i>				HHH	Probable
Say's phoebe	<i>Sayornis saya</i>		Expected		HH	Observed by ECORPS
Western kingbird	<i>Tyrannus verticalis</i>		Expected		HHH	Observed by SS
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>				HHH	Observed by SS

California horned lark	<i>Eremophila alpestris actia</i>	CSC		HHH	Probable
Purple martin	<i>Progne subis</i>	CSC		HHH	Probable
Tree swallow	<i>Tachycineta bicolor</i>			HHH	Observed by SS
Violet-green swallow	<i>Tachycineta thalassina</i>			HHH	Probable
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>			HHH	Probable
Cliff swallow	<i>Hirundo pyrrhonota</i>			HHH	Observed by SS
Bank swallow	<i>Riparia riparia</i>	CT		HHH	Probable
Barn swallow	<i>Hirundo rustica</i>			HHH	Probable
Western scrub jay	<i>Aphelocoma coerulescens</i>			HHH	Observed by SS
Yellow-billed magpie	<i>Pica nuttalli</i>			HHH	Probable
Common raven	<i>Corvus corax</i>				Observed by SS
American crow	<i>Corvus brachyrhynchos</i>			HHH	Observed by SS
Oak titmouse	<i>Parus inornatus</i>			HHH	Observed by ECORPS
Bush tit	<i>Psaltriparus minimus</i>			HHH	Observed by SS
Red-breasted nuthatch	<i>Sitta canadensis</i>			HHH	Probable
White-breasted nuthatch	<i>Sitta carolinensis aculeata</i>			HHH	Probable
Brown creeper	<i>Certhia americana</i>			LL	Possible
Rock wren	<i>Salpinctes obsoletus</i>			HHL	Probable
Marsh wren	<i>Cistothorus palustris</i>			LMH	Possible
Bewick's wren	<i>Thryomanes bewickii</i>			HHH	Observed by ECORPS
House wren	<i>Troglodytes aedon</i>			HHH	Probable
Winter wren	<i>Troglodytes troglodytes</i>			HHH	Probable
Golden-crowned kinglet	<i>Regulus satrapa</i>			LLL	Possible
Ruby-crowned kinglet	<i>Regulus calendula</i>			HH	Observed by ECORPS
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>			HHH	Observed by SS
Western bluebird	<i>Sialia mexicana</i>			HHH	Observed by SS and ECORPS
Mountain bluebird	<i>Sialia currucoides</i>			LH	Probable
Swainson's thrush	<i>Catharus ustulatus</i>			HHH	Probable
Hermit thrush	<i>Catharus guttatus</i>			HH	Probable
American robin	<i>Turdus migratorius</i>			HHH	Probable
Varied thrush	<i>Ixoreus naevius</i>			HH	Probable
Wren tit	<i>Chamaea fasciata</i>			LLL	Possible
Northern mockingbird	<i>Mimus polyglottos</i>			HHH	Observed by SS

California thrasher	<i>Toxostoma redivivum</i>				LMM	Probable
American pipit	<i>Anthus rubescens</i>				HH	Probable
Cedar waxwing	<i>Bombycilla cedrorum</i>				MHH	Probable
Phainopepla	<i>Phainopepla nitens</i>				MMH	Probable
Loggerhead shrike	<i>Lanius ludovicianus</i>	FSC, CSC	Likely		HHH	Probable
European starling	<i>Sturnus vulgaris</i>				HHH	Observed by SS and ECORPS
Hutton's vireo	<i>Vireo huttoni</i>				HHH	Probable
Warbling vireo	<i>Vireo gilvus</i>				HHH	Probable
Orange-crowned warbler	<i>Vermivora celata</i>				HHH	Probable
Nashville warbler	<i>Vermivora ruficapilla</i>				MM	Probable
Blow-rumped warbler	<i>Dendroica coronata</i>				HH	Observed by ECORPS
Yellow warbler	<i>Dendroica petachia brewsteri</i>	CSC			HHH	Probable
Black-throated gray warbler	<i>Dendroica nigrescens</i>				MH	Probable
Hermit warbler	<i>Dendroica occidentalis</i>				HH	Probable
Townsend's warbler	<i>Dendroica townsendi</i>				HH	Probable
MacGillivray's warbler	<i>Oporornis tolmiei</i>				MMM	Probable
Common yellowthroat	<i>Geothlypis trichas</i>				HHH	Probable
Wilson's warbler	<i>Wilsonia pusilla</i>				MHH	Probable
Yellow-breasted chat	<i>Icteria virens</i>	CSC			LMH	Probable
Western tanager	<i>Piranga ludoviciana</i>				HH	Probable
Black-headed grosbeak	<i>Pheucticus melanocephalus</i>				HHH	Probable
Blue grosbeak	<i>Guiraca caerulea</i>				HHH	Probable
Lazuli bunting	<i>Passerina amoena</i>				HHH	Probable
California towhee	<i>Pipilo fuscus</i>				HHH	Observed by SS
Spotted towhee	<i>Pipilo erythrophthalmus</i>				MHH	Observed by SS
Chipping sparrow	<i>Spizella passerina</i>				HHH	Probable
Grasshopper sparrow	<i>Ammodramus savannarum</i>				HHH	Probable
Vesper sparrow	<i>Poocetes gramineus</i>				HH	Probable
Song sparrow	<i>Melospiza melodia</i>				HHH	Probable
Lincoln's sparrow	<i>Melospiza lincolni</i>				MM	Possible
Savannah sparrow	<i>Passerculus sandwichensis</i>		Expected		HHH	Observed by ECORPS
Rufous-crowned sparrow	<i>Aimophila ruficeps</i>				HHH	Probable
Lark sparrow	<i>Chondestes grammacus</i>				HHH	Probable
Fox sparrow	<i>Passerella iliaca</i>				MM	Possible

White-crowned sparrow	<i>Zonotrichia leucophrys</i>				HH	Observed by ECORPS
Golden-crowned sparrow	<i>Zonotrichia atricapilla</i>				HH	Probable
Dark-eyed junco	<i>Junco hyemalis</i>				HHH	Observed by ECORPS
Western meadowlark	<i>Sturnella neglecta</i>		Expected		HHH	Observed by SS and ECORPS
Tricolored blackbird	<i>Agelaius tricolor</i>	FSC, CSC	Likely		MMH	Possible
Red-winged blackbird	<i>Agelaius phoeniceus</i>				HHH	Observed by SS
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>				_LL	Possible
Brewer's blackbird	<i>Euphagus cyanocephalus</i>				HHM	Observed by SS
Brown-headed cowbird	<i>Molothrus ater</i>				HHH	Observed by SS
Wooded oriole	<i>Icterus cucullatus</i>				LLL	Possible
Bullock's oriole	<i>Icterus galbula</i>				HHH	Probable
Pine siskin	<i>Carduelis pinus</i>				HH	Probable
American goldfinch	<i>Carduelis tristis</i>				HHH	Observed by SS
Lesser goldfinch	<i>Carduelis psaltria</i>				HHH	Probable
Lawrence's goldfinch	<i>Carduelis lawrencei</i>	FSC			HHH	Probable
Purple finch	<i>Carpodacus purpureus</i>				MMM	Probable
House finch	<i>Carpodacus mexicanus</i>				HHH	Observed by SS
House sparrow	<i>Passer domesticus</i>				MMM	Probable
Mammals						
Virginia opossum	<i>Didelphis virginianus</i>				HHH	Probable
Ornate shrew	<i>Sorex ornatus</i>	CSC			MMM	Possible
Broad-footed mole	<i>Scapanus latimanus</i>				HHH	Probable
Pallid bat	<i>Antrozous pallidus pacificus</i>	CSC			MMH	Probable
Townsend's big-eared bat	<i>Plecotis townsendii</i>	CSC			MMM	Probable
Western mastiff bat	<i>Eumops perotis</i>	CSC			MMH	Probable
Yuma myotis	<i>Myotis yumanensis saturatus</i>	CSC			HHH	Probable
California myotis	<i>Myotis californicus</i>				MMM	Probable
Western pipistrelle	<i>Pipistrellus Hesperus merriami</i>				MMM	Probable
Big brown bat	<i>Eptesicus fuscus bernardinus</i>				HHH	Probable
Western red bat	<i>Lasiurus borealis teleotis</i>				MMM	Probable
Hoary bat	<i>Lasiurus cinereus cinereus</i>				HHH	Probable
Brazilian free-tailed bat	<i>Tadarida brasiliensis muscula</i>				MMM	Probable

Brush rabbit	<i>Sylvilagus bachmani</i>				LLH	Possible
Desert cottontail	<i>Sylvilagus audubonii</i>				MMM	Observed by SS
Black-tailed jackrabbit	<i>Lepus californicus</i>		Expected		MMH	Probable
Beaver	<i>Castor Canadensis</i>				HHH	Probable
Muskkrat	<i>Ondatra zibethica</i>				HHH	Probable
California ground squirrel	<i>Spermophilus beecheyi sierrae</i>				HHH	Observed by SS
Western gray squirrel	<i>Sciurus griseus</i>				HHH	Probable
Botta's pocket gopher	<i>Thomomys bottae leucodon</i>				HHH	Probable
California kangaroo rat	<i>Dipodomys californicus</i>	CSC			HHH	Probable
San Joaquin pocket mouse	<i>Perognathus inornatus</i>				HHH	Probable
Western harvest mouse	<i>Reithrodontomys megalotis</i>				HHH	Probable
Deer mouse	<i>Peromyscus maniculatus</i>				HHH	Probable
Brush mouse	<i>Peromyscus boyleyi</i>				HHH	Probable
Pinon mouse	<i>Peromyscus truei</i>				MMH	Possible
Dusky-footed woodrat	<i>Neotoma fuscipes</i>				MMM	Possible
California vole	<i>Microtus californicus</i>				HHH	Probable
House mouse	<i>Mus musculus</i>				HHH	Probable
Norway rat	<i>Rattus norvegicus</i>				MMM	Possible
Black rat	<i>Rattus rattus</i>				HHH	Probable
Common porcupine	<i>Erethizon dorsatum</i>				MMM	Possible
American badger	<i>Taxidea taxus</i>	CSC	Likely		HHH	Probable
Long-tailed weasel	<i>Mustela frenata</i>				HHH	Probable
American mink	<i>Mustela vison</i>				HHH	Possible
Western spotted skunk	<i>Spilogale gracilis</i>				MMM	Probable
Striped skunk	<i>Mephitis mephitis</i>				HHH	Probable
River otter	<i>Lutra Canadensis</i>				MH	Probable
Ringtail	<i>Bassariscus astutus</i>	CFP			HHH	Possible
Raccoon	<i>Procyon lotor</i>				HHH	Probable
Mountain lion	<i>Puma concolor</i>	CFP			MMM	Possible
Bobcat	<i>Felis rufus</i>				MMM	Probable
Coyote	<i>Canis latrans lestes</i>		Expected		HHH	Observed by SS and ECORPS
Gray fox	<i>Urocyon cinereoargenteus</i>				MMH	Probable
Red fox	<i>Vulpes vulpes</i>				L	Possible
Black-tailed deer	<i>Odocoileus hemionus</i>				HHH	Probable

Reptiles							
Western skink	<i>Eumeces skiltonianus</i>					HHH	Probable
Gilbert's skink	<i>Eumeces gilberti</i>					HHH	Probable
Western fence lizard	<i>Sceloporus occidentalis</i>			Expected		HHH	Probable
Western whiptail	<i>Aspidoscelis tigris</i>					LLL	Possible
Southern alligator lizard	<i>Gerrhonotus multicarinatus</i>					HHH	Probable
Coast horned lizard	<i>Phrynosoma coronatum frontale</i>	CSC				MMM	Probable
Western pond turtle	<i>Clemmys m. marmorata</i>	CSC		Unlikely		HHH	Probable
Ring-necked snake	<i>Diadophis punctatus</i>					HHH	Possible
Sharp-tailed snake	<i>Conita tenuis</i>					HHH	Possible
Racer	<i>Coluber constrictor</i>					HHH	Probable
California whipsnake	<i>Masticophis lateralis</i>					HHH	Possible
Common garter snake	<i>Thamnophis sirtalis</i>					HHH	Probable
Western terrestrial garter snake	<i>Thamnophis elegans</i>					HHH	Possible
Giant garter snake	<i>Thamnophis gigas</i>	FT, CT		Unlikely		HHH	Possible
Night snake	<i>Hypsiglena torquata</i>					MMM	Possible
Common kingsnake	<i>Lampropeltis getulus</i>					HHH	Probable
California mountain kingsnake	<i>Lampropeltis zonata</i>					MMM	Possible
Gopher snake	<i>Pituophis melanoleucus</i>			Expected		HHH	Probable
Western rattlesnake	<i>Crotalus viridis</i>					HHH	Possible
Amphibians							
California slender salamander	<i>Batrachoseps attenuatus</i>					HHH	Probable
California tiger salamander	<i>Ambystoma californiense</i>	FT, CSC		Unlikely		HHH	Possible
Desatina	<i>Desmognathus eschscholtzii</i>					HHH	Possible
Arboreal salamander	<i>Aneides lugubris</i>					HHH	Possible
Pacific tree frog	<i>Hyla regilla</i>					HHH	Likely (ECORPS)
Foothill yellow-legged frog	<i>Rana boylei</i>	CSC				LHH	Unlikely
California red-legged frog	<i>Rana aurora draytonii</i>	FT, CSC				HHH	Unlikely
Bullfrog	<i>Rana catesbeiana</i>					MHH	Likely (ECORPS)
Western spadefoot	<i>Scaphiopus hammondi</i>	CSC		Likely		HHH	Probable
Western toad	<i>Bufo boreas</i>					MMM	Probable
Plants							
Dwarf downingia	<i>Downingia pusilla</i>	CNPS 2		Unlikely		---	

Tuolumne button-celery	<i>Eryngium pinnatisectum</i>	CNPS 1B	Unlikely	---	
Bogg's Lake hedge-hyssop	<i>Gratiola heterosepala</i>	CNPS 1B	Unlikely	---	
Legenere	<i>Legenere lemosa</i>	CNPS 1B	Present	---	Observed by ECORPS
Ahart's dwarf rush	<i>Juncus leiospermus</i> var. <i>ahartii</i>	CNPS 1B	Unlikely	---	
Pincushion navarretia	<i>Navarretia myersii</i> spp. <i>myersii</i>	CNPS 1B	Unlikely	---	
Slender orcutt grass	<i>Orcuttia tenuis</i>	FT, CE, CNPS 1B	Unlikely	---	
Sacramento orcutt grass	<i>Orcuttia viscida</i>	FE, CE, CNPS 1B	Unlikely	---	
Sanford's arrowhead	<i>Sagittaria sanfordii</i>	CNPS 1B	Unlikely	---	
Northern California black walnut	<i>Juglans hinsii</i>	CNPS 1B	Present; suspected hybrids	---	Certainly present, but what evidence is there that these are hybrids? Does it matter if they are hybrids?

Invertebrates

According to the EIR (page 3.10-14), "*The seasonal wetland depressions, riparian wetlands, vernal pools, and seasonal ponds on the project site could support vernal pool crustaceans that were not identified during the branchiopod surveys. It is important to note that these surveys did not cover the entire project site.*" How much of the project site has not been properly surveyed for special-status species of crustaceans? Even 10% of the area would be 380 acres, which would be an unusually large area left without any protocol-level survey effort for these species.

Coast horned lizard

The DEIR makes no mention of Coast horned lizard as a possible resident of the project area. Without looking for Coast horned lizard, the consultants will not detect it. As a child I used to find Coast horned lizards only a few miles away, on the west side of Mather Air Force Base. I would expect that if they occurred only a few miles away, then they ought to occur on the project site, which was covered by much the same type of grassland where I used to find them. Without looking for coast horned lizards, they were certain not to be found. The reconnaissance surveys performed by EDAW were at the wrong time of year to detect coast horned lizards.

Giant garter snake

The DEIR is probably correct that giant garter snakes are unlikely to be found on the project site. However, without looking for giant garter snakes, they were certain not to be detected. Also, the reconnaissance surveys performed by EDAW were at the wrong time of year to detect giant garter snakes.

Western pond turtle

According to the DEIR (page 3.10-14), "*there is no suitable aquatic habitat within the project boundary and pond turtles are unlikely to nest there.*" However, pond turtles do not nest in aquatic environments; they nest in upland areas, including in annual grasslands. They often travel far from water to nest, and need the juxtaposition of upland and wetland environments for populations to persist. According to the DEIR, western pond turtles are known to occur nearby the project site, so it would be reasonable to assume that these pond turtles travel into the project area to nest. However, to be detected, they require adequate searches at the appropriate time of year, but EDAW did not make these searches.

California tiger salamander

According to the DEIR (page 3.10-14), "*few burrows or crevices have been identified on the project site that would provide suitable habitat for tiger salamander.*" In the paragraph just preceding the one in which the above statement was made, the DEIR stated, "*American badger, a California species of concern, prefers open grassland habitats with friable soils, and an occurrence slightly south of the project site is identified in the CNDDDB (Exhibit 3.10-2). Because there is suitable habitat for American badger on the project site, this species has the potential to occur on the site.*" These conclusions are contradictory because American badgers forage on

fossorial mammals, which are mammals that construct burrows. Badgers prey on ground squirrels and pocket gophers, the burrows of which are typically used by California tiger salamander for summer and fall refugia. Badgers would not occur without the presence of ground squirrels or pocket gophers, unless the badgers were just passing through. Furthermore, California tiger salamanders readily use cracks in the soil, which often open up in the winter, and close up by late spring. California tiger salamanders are not obligated to use ground squirrel burrows, as implied by the DEIR. All this said, however, from the site perimeter, I observed ground squirrels and their burrows on the project site.

Without surveying for the species, it is guaranteed that no records will be added to the County from this project site. There are multiple large and small vernal pools and other seasonal ponds on the project site, so potential habitat is available. Protocol-level surveys involve dip-netting the pools for larvae during the spring, which is an easy task to perform. Without making the effort to survey for the species, it is deficient of the DEIR to simply conclude the species is “*not expected to occur.*”

Western spadefoot

I agree with the conclusion in the DEIR that the project site likely supports western spadefoot. Given the known occurrences of western spadefoot next to the project site, and given the environmental conditions on the site, I would be surprised if I was to learn that western spadefoot does not occur there. It would be helpful, however, if appropriate searches for western spadefoot were made prior to any changes to the environment on the project site.

California red-legged frog

The DEIR does not address the possibility of California red-legged frog occurring on the site. However, despite the fact that CWHR rated the site highly for it's used by California red-legged frog, I believe it is unlikely the species can be found there. Nevertheless, one cannot be certain unless protocol-level surveys are performed, but they have not been performed.

Foothill yellow-legged frog

The DEIR does not address the possibility of Foothill yellow-legged frog occurring on the site. However, despite CWHR rating the site relatively high for the likelihood of occurrence of foothill yellow-legged frog, I doubt the species occurs there. From what I can see of the shoreline of Morrison Creek, it does not appear to be as rocky as where I have typically detected yellow-legged frogs. Still, without looking for this species, it certainly will not be detected.

White-faced ibis

The DEIR does not consider the likelihood of occurrence of white-faced ibis. Yet, the project site appears to provide suitable habitat during winter. Why was white-faced ibis omitted?

Golden eagle

The DEIR does not discuss the likelihood of occurrence of golden eagle. Based on what I have reviewed and what I have seen in the field, the project site appears suitable to golden eagle. The site provides the sort of open country that golden eagles like to forage over.

Cooper's hawk

The DEIR concludes that Cooper's hawks likely use the project site, but not for nesting. However, no explanation was given for concluding Cooper's hawks do not nest on the site. In fact, I saw a Cooper's hawk during one of my visits, which was during the nesting season. I see no reason why Cooper's hawk would not nest on the project site.

Even if Cooper's hawks never nested on the project site, would this matter?

Sharp-shinned hawk

The DEIR concludes that sharp-shinned hawks likely use the project site, but not for nesting. However, no explanation was given for concluding sharp-shinned hawks do not nest on the site. I see no reason why sharp-shinned hawks would not nest on the project site.

Even if sharp-shinned hawks never nested on the project site, would it matter?

Ferruginous hawk

The DEIR reports that the consultants observed ferruginous hawk on the project site. This siting makes perfect sense because the habitat appears ideal for use by wintering ferruginous hawks. The consultants were visiting the project site at the time of year when one would expect to see this species.

Swainson's hawk

I agree with the conclusion in the DEIR that the project site likely supports Swainson's hawks, but I would characterize the likelihood as probable. The project site includes all the habitat elements needed by Swainson's hawks.

White-tailed kite

The DEIR reported that a white-tailed kite was seen on the site during the consultants' winter visit. I also observed two white-tailed kites foraging over two sides of the project site. My observations were made during nesting season, so the site appears to be used for winter-time foraging as well as nesting.

Northern harrier

The DEIR concludes that northern harriers likely occur on the project site. My visits confirmed that this species indeed uses the site. I watched a northern harrier foraging along the southern edge of the dredge piles.

Merlin

I agree with the conclusion in the DEIR that the project site likely supports merlins, but I would characterize the likelihood as probable. The project site includes all the habitat elements needed by wintering merlins.

Peregrine falcon

The DEIR does not address the potential for peregrine falcon to use the project site. The project site is within the species geographic range, it supports habitat suitable to the species, and otherwise I see no reason why the species would not at least sometimes use the site.

Prairie falcon

The DEIR reports that a prairie falcon was observed on the project site. This sighting was not surprising to me, because the site provides habitat typically used by prairie falcons.

Short-eared owl

I agree with the conclusion in the DEIR that the project site likely supports short-eared owls, but I would characterize the likelihood as probable. The project site includes all the habitat elements needed by short-eared owls, which I believe warrant listing as threatened or endangered. There are very few locations remaining that can support short-eared owls.

Burrowing owl

The DEIR concludes the project site likely supports burrowing owls. In my experience, I would say the site almost certainly supports burrowing owls at least periodically, if not during most years. The habitat appears ideal, and ground squirrels are present, supplying burrows that burrowing owls often use for nesting.

Greater sandhill crane

The DEIR does not discuss the likelihood of occurrence of sandhill crane. Based on what I have reviewed and what I have seen in the field, the project site appears suitable to sandhill crane during the winter months.

California horned lark

The DEIR does not address California horned lark, which is a Species of Special Concern. According to CWHR, the vegetation cover types are suitable for this species, and in my experience I have to conclude the occurrence of this species on the site is probable.

Long-billed curlew

The DEIR does not discuss the likelihood of occurrence of long-billed curlew. Based on what I have reviewed and what I have seen in the field, the project site appears suitable to long-billed curlew during the winter months.

Purple martin

The DEIR does not address purple martin, which is a Species of Special Concern. According to CWHR, the vegetation cover types are suitable for this species.

Yellow warbler

The DEIR does not address the potential occurrence of yellow-warbler. It does not even consider the role the site might play in serving as stop-over habitat during seasonal migrations between the Central Valley and the Sierra Nevada. Why does the DEIR neglect the yellow warbler?

Yellow-breasted chat

I do not understand why the DEIR does not consider the likelihood of occurrence of yellow-breasted chat. It looked to me like the habitat is available.

Mountain lion

The DEIR does not consider mountain lion to be a potentially occurring species on the project site, even though the habitat elements used by mountain lion are present and contiguous with habitat to the east and north of the site. Mountain lions have been found on the outskirts of the City of Folsom and at other sites in the vicinity of the project site. It would not be very surprising for mountain lions to be detected on the project site, if one were to look for their sign.

Ringtail

The DEIR does not consider ringtail to be a potentially occurring species on the project site, even though the habitat elements used by ringtail are present and contiguous with habitat to the east and north of the site.

Bats

The DEIR does not address the potential for bats to occur on the project site, even though there are multiple special-status species of bat that can occur there, and there is considerable bat habitat available. No surveys were performed for bats. I saw one during one of my site visits, but I was never there longer than a few minutes into the night. I am certain there are numerous bats using the project site. Not addressing bats is a significant shortfall in the DEIR, leaving the DEIR deficient as an informative document. The DEIR should be revised to include a discussion of bats.

Wildlife Movement and Wildlife Movement Corridors

The DEIR does not address the project's effects on the ability of wildlife to move across the project site before and following the project (except in App. P, but the arguments in App. P conflict with the rest of the DEIR – see below). Wildlife movement corridors can be routes used for migration, dispersal, home range patrol, or other types of movements, and they can include various vegetation cover types and terrain, depending on local conditions. A significant effect under CEQA, as I understand it, is whether the project will “interfere substantially with the movement of any resident or migratory fish or wildlife species.” Converting several thousand acres of wildlife habitat to houses at the proposed location will indeed interfere with the movement of wildlife between the undeveloped areas to the east and to the north. The project would result in a 507-acre wetland preserve surrounded by residential and commercial development on 3 sides, giving wildlife no opportunity to pass through the preserve to anyplace. Also, the project would cover a portion of Morrison Creek, thereby cutting off the movements of animal species that routinely move along the Creek. Such species could include western pond turtles, river otters, various species of amphibian, garter snakes, and even pocket gophers.⁵

Habitat fragmentation is not considered adequately in the DEIR, even though it is likely the greatest threat to biological species⁶. It is species-specific, meaning that each species responds to habitat availability and configuration uniquely⁷. However, the process of habitat fragmentation is not seriously discussed in the DEIR, though it is mentioned. I suggest the DEIR be revised to include a more detailed discussion of habitat fragmentation caused by the project and surrounding ongoing and foreseeable projects, and that this discussion be directed to each special-status species potentially occurring in the area.

⁵ Williams, L. R., Cameron, G. N., 1984. Demography of dispersal in Attwater's pocket gopher, (*Geomys attwateri*). *J. Mamm.* 65, 67-75.

⁶ Saunders, D.A., R.J. Hobbs, and C. Margules. 1991. Biological Consequences of Ecosystem Fragmentation: a Review. *Conservation Biology* 5:18-32;

Wilcox, B.A., and D.D. Murphy. 1985. Conservation Strategy: the Effects of Fragmentation on Extinction. *American Naturalist* 125:879-887.

⁷ Villard, M-A., M. K. Trzcinski, and G. Merriam. 1999. Fragmentation Effects on Forest Birds: Relative Influence of Woodland Cover and Configuration on Landscape Occupancy. *Conservation Biology* 13:774-783.

Stop-over Habitat for Migrating Birds

The DEIR does not discuss or even mention the use of the proposed project site by migrating birds. Habitat patches are often critical for the persistence of special-status species, including for willow flycatcher, yellow warbler, white-faced ibis, and sandhill crane, among others. The DEIR should be revised to include impact estimates to migrant birds that rely on the project site as stop-over habitat.

Project Site Characterization

On page 3.10-2, it is claimed that the riparian habitat that is pervasive between rock piles is actually senescing due to changed hydrology and lack of regeneration. "*Riparian vegetation throughout much of the project site is characterized by trees and shrubs that are old and senescent (i.e., in the growth phase in which the plant proceeds from full maturity to death), with little regeneration occurring. It appears that hydrologic conditions that allowed riparian vegetation to originally establish within the basins have changed and no longer support regeneration. A review of U.S. Geological Survey (μ) topographic maps of the area revealed that some water features that were present approximately 20 years ago no longer exist.*" However, no description of the changed hydrology is provided, and no reason given for this change. There is a hydrologic model in the DEIR, but it does not address the purported change that supposedly dooms trees. No count of young versus mature trees is provided, so there is no quantitative support for the DEIR conclusion that all the trees are old and dying. The DEIR should be revised to include counts within size classes of the trees and shrubs that were inventoried.

The DEIR (page 3.10-2) describes the approximately 1,975 acres of annual grassland as being composed of the following species: "ripgut brome (*Bromus diandrus*), soft chess (*B. hordeaceus*), Italian thistle (*Carduus pycnocephalus*), yellow starthistle (*Centaurea solstitialis*), dovefoot geranium (*Geranium molle*), medusa head (*Taeniatherum caputmedusae*), rose clover (*Trifolium hirtum*), and vetch (*Vicia* spp.)." These species are exotics, and most are considered serious pests, i.e., "weeds." Seeing this description, any biologist would conclude that the site is degraded, so of lower value to wildlife and native flora. However, after walking much of the perimeter of the annual grassland described in the DEIR, outside the areas affected directly by mining and road construction, I did not see a single plant resembling ripgut brome, Italian thistle, yellow star-thistle, or rose clover. Not one. There were some clusters of yellow star-thistle and Italian thistle visible on the dredge tailings and along some access roads by the dredge tailings. The DEIR should be revised to more accurately portray the annual grassland across much of the project area.

According to the DEIR (page 6.10-6), "Structural diversity in the oak woodland community is good because of the variety of species and tree and shrub sizes; however, because of the relative lack of larger diameter trees, the oak woodland on-site would not provide suitable nesting habitat for raptors." It is untrue that the oak woodland on site is unsuitable as nesting habitat for raptors. The oaks on site are fairly large, and in my experience large enough to support nesting by red-tailed hawk, Swainson's hawk, white-tailed kite, and other species. I am curious to know what EDAW, Inc. considers to be the size threshold under which raptors supposedly cannot nest in oak trees.

IMPACT ASSESSMENT

DIRECT IMPACTS

According to the DEIR (page 3.10-21), "*The purpose of these [reconnaissance] surveys [at 35 sites with 100-foot survey radius over 3 days in December and January spread between 2004 and 2005] was to characterize and map biological resources present on the project site in sufficient detail to support a determination of overall habitat quality. Data collected during the field surveys was compiled in a technical report (EDAW 2005) and used in the development of the Impact Minimization Alternative for this project.*" Thus, the foundation for deciding on the proposed locations and spatial extents of various portions of the Project were based on data collected from 35 sites composing <0.019% of the project area. Such an exceedingly small area surveyed suggests the effort was designed to turn up few observations of biological resources.

Note that on page 3.10-1, the DEIR states, "*To provide a **thorough characterization** of the habitat types present, data were collected at 35 representative sampling points at the project site*" [bold font added for emphasis]. Just after stating the intent was to provide a thorough characterization of habitat types, the DEIR goes on to state, "*Each habitat type present at the project site, as determined using aerial photographs, included at least one sampling point. At each sampling point the biologists surveyed an area within an approximately 100-foot radius of the point.*" Searching 0.72 acres once in the middle of winter would not qualify in any scientific journal as a thorough characterization of any habitat type. There is no precedent in science or professional biology for such cursory surveys being used to thoroughly characterize a habitat.

In fact, the nature of the surveys used by EDAW does not even begin to characterize habitats, because habitats are defined by species' use of the environment.⁸ EDAW appears to have confused a term from wildlife biology with vegetative cover classifications commonly used by botanists. EDAW said the purpose of the surveys was to map biological resources in support of determinations of overall habitat quality, but then they surveyed vegetation cover types which they defined arbitrarily based on vegetation structure rather than on how biological resources actually use the environment. For example, if one was really interested in habitat quality of pocket gophers, then one would classify and measure the soils and types of vegetation within multiple pocket gopher home ranges. However, the assessment of habitat quality would not stop there, because there needs to be a metric for habitat quality. Sometimes biologists use productivity as the metric, so the number of young per some number of generations would be compared among pocket gophers over the range of habitat conditions measured, or it would be the number of young surviving to breeding age. Others might indicate habitat quality by body mass of pocket gophers, or by disease incidence. The point is habitat quality requires a metric of how the species fares in various environments. EDAW's metric, as far as I could tell, was the number of species observed within 100 feet of a sampling point, so it was the number of species observed per vegetation cover type (measured only once in the middle of winter). This metric does not inform of habitat quality.

⁸ Hall, L.S., P.R. Krausman, and M.L. Morrison. 1997. The habitat concept and a plea for standard terminology. *Wildlife Society Bulletin* 25:173-182.

The EDAW metric was even murkier than just described, however. On page 3 of Appendix E to the 2006 DEIR/EIS, EDAW (2005) explained that their factors used to determine overall biological value included the following factors (the numbering was added by me):

1. Presence/absence of sensitive habitats;
2. Presence/absence of special-status species;
3. Relative level of disturbance;
4. Health and regeneration of trees and shrubs;
5. Wildlife abundance and diversity;
6. Presence/absence of non-native species; and,
7. Presence/absence of permanent or temporary surface water.

Nowhere does EDAW explain how these factors were weighted, or even how they were used to determine biological value. Without such explanation, the Rio del Oro Specific Plan Project DEIR is insufficient as an informative document for public review. The reader cannot possibly understand EDAW's basis for formulating the Impact Minimization project alternative.

Next I address each of the factors used by EDAW, in the order they were numbered in the preceding paragraph.

1. Presence/absence of sensitive habitats. An examination of Exhibit 1 of Appendix E to the 2006 DEIR/EIS (EDAW 2005) revealed that 31 of the 35 sites were within the rows of dredge tailings, and the remaining 4 sites were immediately adjacent to the dredge tailings. None were within the interior portions of the grasslands or grassland and vernal pool complexes, and none were within Valley oak savanna outside the dredge tailings. Estimating that the dredge tailings compose about 55% of the project site (the DEIR does not provide this figure), 89% of the sampling sites were on them, which means the survey sites occurred on the dredge tailings 1.6 times more often other than expected ($89\% \div 55\%$). This loading of survey sites onto the dredge tailings indicates the selection of sites was neither random nor systematic, but was instead arbitrary. A loading of 1 would have indicated random or systematic site selection. An arbitrary sampling design is rarely acceptable in the biology profession, and it was inappropriate for this situation. Sensitive habitats were inadequately sampled.

2. Presence/absence of special-status species. Of the 62 special-status species (i.e., state and federal threatened and endangered species, California Fully Protected Species, California species of Special Concern, CNPS 1B and 2) potentially occurring on the project site (Table 2), the reconnaissance surveys at the 35 sites had no chance of detecting 22 (35%) of them, nearly zero chance of detecting 13 (21%), a very low likelihood of detecting 22 (35%), and only a low chance of detecting 5 of them (8%) (see Appendix A). The methods used by EDAW had no better than a low chance of detecting any of the potentially occurring special-status species. The survey methods that were used were inappropriate for detecting the special-status species (Appendix A).

That four special-status species were detected by EDAW's reconnaissance surveys suggests the methods described in Appendix E to the DEIR were not followed. It was highly unlikely EDAW biologists saw ferruginous hawk, prairie falcon or white-tailed kite within 100 feet of selected

sites because these species normally do not fly that close to people (see analysis below under factor 5). It was also unlikely EDAW observed green leggenere within 100 feet of these sites, because all but 4 of the sites were on the dredge tailings. Most likely, EDAW biologists recorded green leggenere while en route to selected survey sites, and most likely they recorded ferruginous hawk, prairie falcon and white-tailed kite at distances well beyond 100 feet.

3. Relative level of disturbance. What did EDAW consider a disturbance? If there was a relative level of disturbance, then EDAW must have conceived of a gradient of disturbance, but no such gradient is described in the DEIR or supporting documents, and I don't recall seeing any such gradient in the scientific literature. Furthermore, disturbances can be natural or anthropogenic in origin, as well as occurring continually (e.g., disrupting ecological process, such as suppressing a natural fire cycle), episodically (e.g., seasonal ORV use of a site), or as a singularity (e.g., abandoned dredge tailings). Disturbances can be to the quantity and timing of ecological flows and storages, to ecological health (e.g., contamination by toxicants or exotic species), or to ecological integrity (e.g., the degree to which the native flora and fauna are intact). The DEIR in no way explains what EDAW meant by "relative level of disturbance." Therefore, the DEIR is insufficient as an informative document because it provides no basis for estimating impacts for formulating mitigation measures and no basis for formulating the Impact Minimization Project Alternative.

Another problem with this factor is that it assumes "disturbances" are adverse to biological resources. In fact, many if not all biological resources rely on disturbances of some type. For example, kangaroo rats are often referred to as "disturbance adapted," meaning they thrive where ecological space is opened for them by events that destroy vegetation.⁹ All of the special-status species of brachiopods and plants associated with vernal pools rely on periodic flooding, which is a type of disturbance. Pocket gophers and ground squirrels thrive in disturbed soils.¹⁰ Burrowing owls often take up refuge and nest under impervious surfaces deposited on the ground by humans, and many species of wildlife take residence in rock piles such as in dredge tailings. The DEIR is misleading in implying that disturbance is adverse, and hopelessly vague in how disturbance is used to determine biological values of portions of the project site.

4. Health and regeneration of trees and shrubs. The DEIR provides no metric or measurements of the health of trees and shrubs. It refers to lack of regeneration, but no numbers of seedling

⁹ Smallwood, K. S. and M. L. Morrison. 2008. San Joaquin kangaroo rat (*Dipodomys n. nivatoides*) Conservation Research in Resource Management Area 5, Lemoore Naval Air Station: 2007 Progress Report (Inclusive of work during 2001-2007). U.S. Navy Integrated Product Team (IPT), West, Naval Facilities Engineering Command, Southwest, Daly City, California.

¹⁰ Smallwood, K.S. and M.L. Morrison. 1999. Estimating burrow volume and excavation rate of pocket gophers (*Geomyidae*). *Southwestern Naturalist* 44:173-183.

Smallwood, K.S. and M.L. Morrison. 1999. Spatial scaling of pocket gopher (*Geomyidae*) density. *Southwestern Naturalist* 44:73-82.

Smallwood, K.S., M.L. Morrison, and J. Beyea. 1998. Animal burrowing attributes affecting hazardous waste management. *Environmental Management* 22: 831-847.

and sapling trees and shrubs are provided. There is no quantitative or scientific support for the DEIR's conclusion that regeneration on the project site suddenly and recently stopped, nor is there any of this support for how regeneration was purportedly used to determine biological values of vegetation cover types visited on the project site. Furthermore, as pointed out previously, the cumulative area within 100 feet of 35 selected sites totaled <0.019% of the project area, which was an incredibly small percentage within which to compare regeneration of trees and shrubs.

5. Wildlife abundance and diversity. No effort to estimate wildlife abundance is summarized in the DEIR or supporting documents. Estimating abundance requires census, sight-resight, mark-resight, capture-recapture, or scientific sampling for animals or their sign. None of these methods were used. It was scientifically unacceptable to imply that wildlife abundance was estimated or even indicated by reconnaissance-level surveys covering <0.019% of the project area for a few days over the winter.

Without being able to indicate or measure abundance, it was also impossible to have characterized diversity. Species diversity has a technical definition, rooted in information theory, and which is measured or indexed.¹¹ No diversity index or measure is described in the DEIR.

Table 3 below demonstrates that the level of survey effort implemented by EDAW was much too low to detect wildlife species at meaningful levels. The numbers in Table 3 were derived from an 18-month research effort I led in the Altamont Pass, California,¹² where raptor abundance has long been known to be relatively high. Crews of biologists surveyed for raptors out to 400 m from observation points. They recorded bird locations on maps and attributed their observations in digital voice recorders every minute during 774 1-hour sessions. In Table 3, I show the tallies of on-the-minute raptor and common raven observations out to 400 m from the observers, as well

¹¹ Smallwood, K.S. 2002. Habitat models based on numerical comparisons. Pages 83-95 in *Predicting species occurrences: Issues of scale and accuracy*, J. M. Scott, P. J. Heglund, M. Morrison, M. Raphael, J. Haufler, and B. Wall, editors. Island Press, Covello, California.

¹² Smallwood, K. S., L. Neher, D. Bell, J. DiDonato, B. Karas, S. Snyder, and S. Lopez. In press. *Range Management Practices to Reduce Wind Turbine Impacts on Burrowing Owls and Other Raptors in the Altamont Pass Wind Resource Area, California. Final Report to the California Energy Commission, Public Interest Energy Research – Environmental Area.* Sacramento, California. 232 pp.

The basic methods of the above study are also described in the following reports:

Smallwood, K. S. and C. Thelander. 2005. *Bird mortality in the Altamont Pass Wind Resource Area, March 1998 – September 2001 Final Report.* National Renewable Energy Laboratory, NREL/SR-500-36973. Golden, Colorado. 410 pp.

Smallwood, K. S. and C. Thelander. 2004. *Developing methods to reduce bird mortality in the Altamont Pass Wind Resource Area. Final Report to the California Energy Commission, Public Interest Energy Research – Environmental Area, Contract No. 500-01-019.* Sacramento, California. 531 pp.

as the tallies within 100 feet of the observers, which is the distance used by EDAW around 35 selected sites.

Table 3. Rates of observations of raptors at observation sites in the Altamont Pass, California during scientific surveys.

Species	No. of on-the-minute observations		Hours spent per observation	
	All distances	Within 100 feet	All distances	Within 100 feet
American kestrel	667	16	1.2	48.4
Burrowing owl	1463	0	0.5	Not seen
Cooper's hawk	11	2	70.4	387.0
Common raven	5914	86	0.1	9.0
Ferruginous hawk	19	0	40.7	Not seen
Golden eagle	450	6	1.7	129.0
Merlin	2	1	387.0	774.0
Northern harrier	349	5	2.2	154.8
Prairie falcon	182	6	4.3	129.0
Rough-legged hawk	2	0	387.0	Not seen
Red-shouldered hawk	1	0	774.0	Not seen
Red-tailed hawk	6007	49	0.1	15.8
Sharp-shinned hawk	2	0	387.0	Not seen
Swainson's hawk	14	0	55.3	Not seen
Turkey vulture	1477	30	0.5	25.8
White-tailed kite	86	0	9.0	Not seen

As can be seen in the tallies in Table 3, on average it took 48 hours of observation to detect an American kestrel within 100 feet of the observers. It took 387 hours for each Cooper's hawk observation, 774 hours for each Merlin observation, 155 hours for each northern harrier observation, 129 hours for each prairie falcon, and even 16 hours for each red-tailed hawk and 26 hours for each turkey vulture within 100 feet of the observer. Within 100 feet of the observer, our crews never saw ferruginous hawk, burrowing owl, rough-legged hawk, red-shouldered hawk, sharp-shinned hawk, Swainson's hawk, or white-tailed kite, even though these species are known to occur in the Altamont Pass. As can be seen from these results, relying on a 100-foot survey radius doomed the EDAW habitat assessment to detect almost no raptors, and this conclusion is based solely on the survey radius. Considering the single visit per site and the single season of the year surveyed, there was no hope the reconnaissance surveys by EDAW would tally sufficient numbers of raptors for use in any kind of habitat evaluation or comparison among vegetation cover types. The same problems undoubtedly limited detection of all other bird species to levels that could not possibly be useful for habitat assessment or formulation of project alternatives, impact estimates, or mitigation measures.

6. Presence/absence of non-native species. As with other factors mentioned, the DEIR and supporting documents provides no explanation of how non-native species were factored into the determination of biological values among the vegetation cover types. Did the presence of exotic species mean a cover type had lesser biological value? If so, then why? What is the scientific basis for this determination, and what are the thresholds, if any? I performed considerable

research into exotic species invasions,¹³ and I have reviewed many papers and books on the topic since my PhD Thesis work, but I do not recall any scientific basis for assigning lower biological value to environments occupied by non-native species. Indeed, there is probably not a grassland, wetland, or woodland left in California that does not support some non-native species.

7. Presence/absence of permanent or temporary surface water. The DEIR and supporting documents provides no explanation of how this factor was used to assess biological value, nor does it present a scientific basis for doing so. Frankly, it makes no sense. For example, why would one assign lower biological value to oak woodland that lacked surface water? Oak woodlands are not supposed to include surface water, and if the land did include surface water, then it probably would not support oak woodland. Oak woodlands are of no inherently lesser value than wetlands, and EDAW is being arbitrary and unscientific in assigning values to vegetation cover types in this manner.

In summary, the habitat assessment performed by EDAW was unscientific and flawed in multiple, substantial ways. It was invalid as a scientific tool for determining biological values or for characterizing “habitat types.” It was inappropriate as a tool for estimating project impacts or for formulating mitigation measures or the Impact Minimization Project Alternative.

Specific Impacts

3.10-1 Loss and degradation of wetlands. According to the DEIR, the proposed project would destroy nearly 41 acres of wetlands, or 59% of the existing wetlands (Table 4). These losses cannot be replaced, unless these types of wetlands were to be restored at locations where they used to exist but were destroyed due to other human activities. Attempting to restore these wetlands at other locations would be inappropriate due to unsuitable soil and hydrologic conditions, or because other existing vegetation cover types would be destroyed in the process.

The DEIR presents a long discussion about how 507 acres of grassland and wetlands will be left in place as a preserve. This preserve would be considered mitigation for the project’s impacts. However, these 507 acres of grassland and wetlands already exists, and would not in any way be improved or enhanced by the project. In fact, the opposite would occur; the project would cause many indirect impacts which would degrade the environmental conditions within the preserve. Not only would these 507 acres be reduced to a smaller and less connected, remnant habitat patch with diminished value to animal and plant populations,¹⁴ but they would be degraded by the many indirect impacts that come from residential development, such as prevention of natural

¹³ Smallwood, K.S. 1990. Turbulence and the ecology of invading species. Ph.D. Thesis, University of California, Davis.

Smallwood, K.S. 1994. Site invasibility by exotic birds and mammals. *Biological Conservation* 69:251-259.

¹⁴ Wilcox, B.A., and D.D. Murphy. 1985. Conservation Strategy: the Effects of Fragmentation on Extinction. *American Naturalist* 125:879-887;

disturbance cycles,¹⁵ intrusive effects from urban areas, such as people, pets, and intolerance of adjacency to coyotes, mountain lions, raccoons and other native wildlife often considered by home owners to be nuisances,¹⁶ intrusion by exotic animals¹⁷ and plants,¹⁸ light pollution,¹⁹ noise pollution, chemical pollution, and vehicle collisions of animals attempting to cross new roads to

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- ¹⁵ Ricklefs, R.E., Z. Naveh, and R.E. Turner. 1984. Conservation of Ecological Processes. *The Environmentalist* 4, Supplement 8:1-16.
- ¹⁶ Schonewald-Cox, C. and J.W. Bayless. 1986. The Boundary Model: a Geographic Analysis of Design and Conservation of Nature Reserves. *Biological Conservation* 38:305-322;
- Schonewald-Cox, C.M. 1988. Boundaries in the Protection of Nature Reserves: Translating Multidisciplinary Knowledge into Practical Conservation. *BioScience* 38: 480-486;
- Kelly, P.A., and J.T. Rotenberry. 1993. Buffer Zones for Ecological Reserves in California: Replacing Guesswork with Science. Pages 85-92 *in* D.M. Bird, D.E. Varland, and J.J. Negro, eds. *Raptors in Human Landscapes*. Academic Press, London.
- ¹⁷ Brooks, R.P., M.J. Croonquist, E.T. D'Silva, J.E. Gallagher, and D.E. Arnold. 1991. Selection of Biological Indicators for Integrating Assessments of Wetland, Stream, and Riparian Habitats. Pages 81-89 *in* *Biological Criteria: Research and Regulation*. (EPA-440/5-91-005.) U.S. Environmental Protection Agency, Washington, D.C.;
- Lidicker, W.Z., Jr. 1991. Introduced Mammals in California. Pages 263-271 *in* R.H. Groves and F. Di Castri, Editors. *Biogeography of Mediterranean Invasions*. Cambridge University Press, London;
- Vuilleumier, F. 1991. Invasions in the Mediterranean Avifaunas of California and Chile. Pages 327-358 *in* R.H. Groves and F. Di Castri, Editors. *Biogeography of Mediterranean Invasions*. Cambridge University Press, London;
- Smallwood, K.S. 1994. Site Invasibility by Exotic Birds and Mammals. *Biological Conservation* 69:251-259.
- ¹⁸ Mulligan, G.A. 1965. Recent Colonization by Herbaceous Plants in Canada. Pages 127-46 *in* H.G. Baker, and G.L. Stebbins, eds. *The Genetics of Colonizing Species*. Academic Press, New York;
- Macdonald, I.A.W., D.M. Graber, S. DeBenedetti, R.H. Groves, E.R. Fuentes. 1988. Introduced Species in Nature Reserves in Mediterranean-type Climatic Regions of the World. *Biol. Conserv.* 44:37-66;
- Alberts, A.C., A.D. Richman, D. Tran, R. Sauvajot, C. McCalvin, and D.T. Bolger. 1993. Effects of Habitat Fragmentation on Native and Exotic Plants in Southern California Coastal Scrub. Pages 103-110 *in* J.E. Keeley, ed. *Interface Between Ecology and Land Development in California*, Southern California Academy of Sciences, Los Angeles.
- ¹⁹ Rich, C. and T. Longcore, eds. 2006. *Ecological consequences of artificial night lighting*. Island Press, Covello, California.

visit disconnected patches of habitat.²⁰ Being nearly completely surrounded by residential development, nothing about these 507 acres of natural resources will be “preserved.”

The DEIR implies that the project and its proposed wetlands preserve would benefit wetlands conservation in the region because it is the only remaining hope to achieve connectivity with the agencies’ proposed conservation area identified in a document prepared by Foothill Associates and ECORP Consulting (June 2004), entitled “*A Conceptual-Level Strategy for Avoiding, Minimizing, & Preserving Aquatic Resource Habitat in the Sunrise-Douglas Community Plan Area.*” I have not seen this document, as it was not included as an appendix to the DEIR. I do not know what agencies proposed this plan, or what chance the plan has of coming to fruition. What I can tell about it, however, is that it is not certified nor is its implementation a certainty – it is merely a conceptual plan. Therefore, it is inappropriate of the DEIR to imply that the project’s impacts will be offset somehow by achieving connectivity between its proposed wetland preserve and land protected by unstated means and to unstated levels in a conceptual plan consisting of nothing more than a map (according to the reference in the DEIR).

The DEIR’s discussion on the likely performance of the wetland preserve, post-construction, is upbeat, but relies on hydrologic modeling and whatever set of assumptions and data the modeling was based. It would be folly as well as unscientific to assume the model predictions are correct before they are tested by reality. Similarly, the claims that construction design, including certain bridge designs and stormwater retention basins, will minimize interference with wetland processes and wildlife movement should be regarded as speculative until proven otherwise. It may be that the hydrologic modeling will prove correct, and the construction design will perform as claimed in the DEIR, and I would certainly hope that the DEIR’s predictions will prove correct, but it is important to consider that these predictions could be wrong, and to plan accordingly. There should be a monitoring plan measuring the mitigation measures’ performance, and the monitoring results should be linked to thresholds tied to a performance bond (see below, under **Mitigation**).

3.10-2 Loss and Degradation of Sensitive Natural Communities. The DEIR reports that almost all the riparian habitat and sensitive natural communities on the site will be destroyed (see Table 4 below). I agree this will be a significant impact. I disagree, however, that the evidence is conclusive the cottonwoods and willows and other riparian shrubs and trees are senescing and will not persist for much longer. Insufficient effort was made to make this case, and I find this scenario highly unusual and perhaps too convenient. I find it suspect that after many decades – perhaps longer than a century – thousands of trees and shrubs suddenly begin dying off right when a corporation wants to construct residential units on the site.

3.10-3. Loss of Oaks and Oak Woodland. The DEIR reports that all the oaks on the site will be wiped out. No comment, other than to agree this will be a significant impact.

3.10-4 Loss and Degradation of Special-Status Wildlife Species Habitat. The DEIR does not consider all the special-status species that actually or could use the project site, so its impact assessment is deficient. The DEIR does not address the likelihood of the following species, all of which I conclude have a reasonable likelihood of using the project site: White-faced ibis,

²⁰ Forman, T. T., et al. (13 other authors). 2003. *Road Ecology*. Island Press, Covello, California.

sandhill crane, long-billed curlew, California gull, golden eagle, peregrine falcon, long-eared owl, Lewis's woodpecker, willow flycatcher, California horned lark, purple martin, bank swallow, yellow warbler, yellow-breasted chat, Lawrence's goldfinch, pallid bat, Townsend's big-eared bat, western mastiff bat, Yuma myotis, California kangaroo rat, ringtail, mountain lion, coast horned lizard (Table 2). Missing 23 species is troubling. Additionally, most other species that *are* discussed in the DEIR are minimized in estimated impacts. The DEIR should be revised to address the species I just listed, and it should re-evaluate the impact estimates for some of the other species.

The DEIR is incorrect in some of its conclusions about raptors. It concludes Swainson's hawk is the only listed species expected to use the site, but I also expect peregrine falcon to use it. It also says the site is unsuitable as nesting habitat for a list of raptor species, but I already proved it wrong about Cooper's hawk. I observed Cooper's hawk on the site during the breeding season.

It is a little misleading of the DEIR to state that western spadefoot has not been documented on the site. In no way have there been any suitable surveys for this species, so there was no possibility the species could have been documented on the site. It would be more informative of the DEIR to state that no surveys have been performed for western spadefoot on the project site.

It is also misleading of the DEIR to refer to the habitat on the site as "potential habitat" of western spadefoot. After acknowledging that western spadefoots have been documented all around the project site, it is almost a certainty that the species also occurs on the project site. The vernal pools and grasslands on the project site are not *potential* habitat, but should be regarded as habitat.

I agree with the DEIR's conclusions that the project impacts would be significant with respect to Valley elderberry longhorn beetle, nesting and foraging raptors, and western spadefoot.

3.10-5 Loss and Degradation of Special-Status Plants. I concur with the The DEIR (page 3.10-66) that the project would significantly and adversely affect populations of Greene's legnere.

In summary, specific impacts to vegetation cover types will be substantial, with direct losses of 59% of all wetlands, 76% of annual grasslands, and 100% of other vegetation cover types (Table 4). The DEIR does not even discuss the environmental impacts of losing so much of the annual grassland, but this impact will be serious. Annual grasslands support some of the most diverse assemblies of plant and wildlife species in California,²¹ many of which are threatened and endangered. Grasslands are widely known among biologists to be very important as foraging, nesting, and breeding habitat for a wide variety of wildlife species, not to mention the numerous species of wildlife that reside in grasslands, and has been shown to support high bird species richness compared to other vegetation types.²² However, grasslands have been reduced in

²¹ Jones & Stokes Associates, Inc. 1989. Sliding Towards Extinction: Reassembling the Pieces. Sacramento, California. Commissioned by The Nature Conservancy, San Francisco, California.

²² Jones & Stokes Associates, Inc. 1989.

California from their original extent by about 90 percent, representing a tremendous and significant loss of plant and wildlife habitat. The California Native Plant Society believes that grasslands are rare locally, regionally, and statewide, especially considering the cumulative losses that have occurred in the past 150 years. The decline of grasslands across the US has resulted in an emerging conservation crisis of declining distribution and abundance of grassland birds.²³ Losing the grassland in the project site should be considered a significant impact.

Table 4. Rio del Oro Project impacts on an acreage basis.

Vegetation cover type	Acres on project site	Acres filled/destroyed by project	Percent lost to the project
Waters of the US	56.632	27.9	49.3
Vernal pools	35.485	17.3 ^a	48.8
Seasonal swales	6.044	3.6	59.6
Seasonal wetland	6.418	3.1	48.3
Ponds	3.540	2.9	81.9
Ephemeral drainage	5.145	3.3	64.1
Non-navigable waters	12.946	12.9	100.0
Vernal pools	2.414	2.414	100.0
Seasonal swales	0.653	0.653	100.0
Seasonal wetlands	9.158	9.158	100.0
Ponds	0.721	0.721	100.0
Total wetlands	69.578	40.8	58.7
Cottonwood – Willow riparian forest	57	57	100.0
Oak woodland	3	3	100.0
Cottonwood woodland	597	597	100.0
Willow woodland	4	4	100.0
Elderberry savanna	16	16.5	100.0
Mixed riparian scrub	190	190	100.0
Willow scrub	16	16	100.0
Coyote bush scrub	23	23 ^b	100.0
Annual grassland	1975	1500	75.9

^a Including 2.2 acres of upland within 250 feet of vernal pools, referred to as “indirect impacts” in the DEIR.

^b Acreage of take not given in the DEIR, but I assume it will be all of it because coyote brush scrub is associated with oak woodland and mixed riparian scrub, all of which will be destroyed by the project.

²³ Brennan, L. A. and W. P. Kuvlesky, Jr. 2005. North American grassland birds: an unfolding conservation crisis? *Journal of Wildlife Management* 69:1-13.

CUMULATIVE IMPACTS

On page 3.10-68, the DEIR begins its cumulative impacts discussion with an inappropriate premise. It established its scope as the City's Planning Area, which is an arbitrary area that has no basis in biology. The scope of the cumulative effects analysis should be biologically based, not politically based. For example, when one considers a project's impacts on a federally endangered species, one does not limit the analysis to those individuals of the species occurring in the City's planning area, but rather to all the individuals occurring within the species' geographic range. Indeed, this is the impression given by the City's policy on determining significance of impacts to species after considering the species' status in the region (General Plan policy N.R.1.7.1). The determination of project impacts requires a biological scope that is larger than the project's footprint or the Planning Area, especially when it comes to cumulative impacts.

In addition to an inappropriate, arbitrary spatial scope, the DEIR's discussion of cumulative impacts appeared grossly simplistic and narrow, focusing on wetland acreages and Swainson's hawk foraging habitat, as if these are the only cumulative effects that matter. In fact, there are potentially many complex cumulative effects that can and should be assessed. As a starting point, I will overview cumulative effects analysis as recognized by scientists.

According to the National Research Council (1986)²⁴, cumulative environmental effects can be defined as:

- Time-crowded perturbations, in which perturbations are so frequent that the effects of one have not dissipated prior to the next perturbation;
- Space-crowded perturbations, in which the effects overlap spatially;
- Synergisms, in which reactions between different types of perturbations cause qualitatively and quantitatively different ecological responses; and,
- Incremental and decremental effects, in which the functional integrity of the species or resource at issue is eroded.

Note that the Rio del Oro project DEIR only addressed the type of impact covered in the second bullet above, and only for wetlands and Swainson's hawk, and only within an arbitrarily defined political boundary.

To perform a quantitative, cumulative impact assessment for each species, the thresholds of significance need to be established, along with margins of safety around these significance thresholds²⁵. In the scoping phase of cumulative effects analysis, the DEIR needs to identify the temporal and spatial scales of the assessment. The temporal scale should be set by the recovery time of the species or other environmental resources at issue (e.g., resources upon which the

²⁴ National Research Council. 1986. Ecological knowledge and environmental problem-solving: concepts and case studies. National Academy Press, Washington, D.C.

²⁵ MacDonald, L. H. 2000. Evaluating and managing cumulative effects: Process and constraints. Environmental Management 26:299-316.

special-status species depend). According to Smallwood et al. (1999)²⁶, the cumulative effects analysis should extend over the amortized life of the project or the permit duration, and should consider how long the types of project impacts generally last. They argued that the effects of housing developments are permanent, so the cumulative effects analysis should extend to the time when all land in the region has been converted to houses. The spatial scale should be set by the ecological process that is most critical to the species or resource at issue. For setting the spatial scale, the countable ecosystem approach²⁷ might be most appropriate, thus requiring estimates of the adult male home range size of the largest carnivore in the project area. However, the size of the area normally occupied by a species' population might be more appropriate as the basis for setting the spatial scale of the analysis (Smallwood 2001)²⁸. The most common method for establishing the minimum spatial scale for cumulative effects assessment is to identify and delineate the watershed as the area within which to consider cumulative impacts²⁹. Note that the Rio del Oro project DEIR used none of these approaches, but rather used a political boundary, i.e., the City's Planning Area.

Bedford and Preston (1988)³⁰ maintained that the ecological system, rather than the project footprint, should set the bounds of the cumulative impacts analysis. They argued that all the projects and activities affecting the resource at issue should be considered within the watershed, landscape or region in which the resource's formation, distribution and biogeochemistry are meaningful. According to MacDonald (2000), a cumulative effects analysis should also identify options for modification, mitigation, planning, and restoration within the plan area. It should also identify key data gaps and monitoring needs. Note that the Rio del Oro Project DEIR performed some of these steps, but to the levels described by Bedford and Preston (1980) or MacDonald (2000).

²⁶ Smallwood, K.S., J. Beyea and M. Morrison. 1999. Using the best scientific data for endangered species conservation. *Environmental Management* 24:421-435.

²⁷ Cousins, S.H. 1990. Countable Ecosystems Deriving from a New Food Web Entity. *Oikos* 57:270-275.

²⁸ Smallwood, K. S. 2001. Linking habitat restoration to meaningful units of animal demography. *Restoration Ecology* 9:253-261.

²⁹ Bedford, B. L. and E. M. Preston. 1988. Developing the scientific basis for assessing cumulative effects of wetland loss and degradation on landscape functions: status, perspectives, and prospects. *Environmental Management* 12:751-771;

Reid, L. M. 1998a. Chapter 19. Cumulative watershed effects and watershed analysis. Pages 476-501, in: Naiman, Robert J., and Robert E. Bilby, eds. *River Ecology and Management: Lessons from the Pacific Coastal Ecoregion*. Springer-Verlag, N.Y.;

Reid, L. M. 1998b. Cumulative watershed effects: Caspar Creek and beyond. In: Ziemer, Robert R., technical coordinator. *Proceedings of the conference on coastal watersheds: the Caspar Creek story, 1998 May 6; Ukiah, California*. General Tech. Rep. PSW GTR-168. Albany, California: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; 117-127.

³⁰ Bedford and Preston (1988)

As I mentioned earlier, there are potentially many cumulative effects that will be contributed by the Rio del Oro project. I will point out a few herein as a starting point, but I would suggest the DEIR address many more of them. For example, the project and surrounding projects will have substantial and significant adverse impacts on the ability of animals to move across the landscape. Yet, the Rio del Oro Project DEIR did not use available methods to evaluate the impacts of the project on animal movements.³¹ There was no attempt to evaluate the ability of wildlife and plants to move or disperse between wetlands remaining after build-out of all projects in the region, or between the isolated elderberry shrub preserves, or along the disrupted streams such as Morrison Creek.

There was no consideration of the possible effects of changes in water and other resources moving downstream along Morrison Creek into areas known to be occupied by giant garter snake.³² The Project would fill a portion of Morrison Creek, so what will this significant change do to water levels and water quality flowing into known giant garter snake habitat? There needs to be some assessment of changes in water flow, as well as in nutrient loads and animal movements that the snake relies on. Also, there needs to be an assessment of the potential impacts caused by contaminants introduced by the Project.

According to ECORPS Consulting, housing developments in the dredge tailings tend to transform ephemeral water channels into perennial water channels, which are favorable to the spread of the Southern watersnake (*Nerodia fasciata*).³³ The southern watersnake is a large, aggressive, aquatic snake that will compete with and consume many local species of amphibian and reptile, including the giant garter snake. As of three years ago, the southern watersnake had spread into Lake Natoma, only 2.5 miles from the Rio del Oro Specific Plan Project site.³⁴ Morrison Creek leads to the northern edge of an area known to be occupied by one of about 3

³¹ Beier, P., and S. Loe. 1992. A Checklist for Evaluating Impacts to Wildlife Movement Corridors. *Wildlife Society Bulletin* 20:434-440;

Spackman SC, Hughes JW. 1995. Assessment of Minimum Stream Corridor Width for Biological Conservation - Species Richness and Distribution Along Mid-Order Streams in Vermont, USA. *Biological Conservation* 71:325-332.

³² Hansen, G. E. 1986. Status of the giant garter snake *Thamnophis couchi gigas* (Fitch) in the southern Sacramento Valley during 1986. Final Report to the California Department of Fish and Game, Sacramento, California.

³³ Stitt, E. W., P. S. Balfour, T. Luckau, and T. E. Edwards (ECORPS Consulting, Inc.). 2005. The southern watersnake (*Nerodia fasciata*) in Folsom, California: history, population attributes, and relation to Other introduced watersnakes in North America. Cooperative Agreement #11420-1933-CM02. Final Report to U.S. Fish and Wildlife Service, Sacramento, California.

³⁴ Stitt et al. (2005).

populations that remain of the giant garter snake.³⁵ The Rio del Oro Specific Plan Project DEIR should address the potential impacts of facilitating the downstream spread of southern watersnake into areas occupied by the endangered giant garter snake and other species.

There are undoubtedly many additional examples of cumulative effects that can and should be assessed in the DEIR. However, the discussion of cumulative impacts was seven paragraphs in length, and therefore fell far short of adequate. The DEIR's consideration of cumulative impacts caused by infrastructure development in the region was cursory, referring to other EIRs that addressed roadways. However, the Rio del Oro project contributes to cumulative impacts that come from other sources than just roadways, and these can be considerable. For example, the project will need water and electric power. Where will the water come from and what impacts will this water use have on wildlife and plants elsewhere? Where will the electric power come from, and what affects will the power generation and transmission have on wildlife?

Demand at build-out of Rio del Oro would be 8,891 acre-feet per year, according to the DEIR. It was extremely difficult for me to follow the DEIR's analysis on sources of water for the project and where it will come from. Therefore, for the purpose of illustration I will assume all this water will come from surface sources, or ultimately could be used for crop irrigation (or use in wildlife habitats). Assuming the average crop in the Sacramento Valley requires 4 acre-feet per acre per year, then Rio del Oro will use enough water to remove about 2,223 acres of farmland from production. To take this example further, alfalfa production, which is an important and pervasive crop in the Sacramento Valley and which is relied upon a great deal by Swainson's hawks,³⁶ requires about 4 acre-feet per acre per year. The Rio del Oro demand would be large enough to curtail production of 2,223 acres of alfalfa, or 2,223 acres of prime Swainson's hawk foraging habitat. Further yet, there is a cumulative water demand from ongoing and foreseeable development in the region that ought to be addressed in a revised DEIR. The cumulative impact of water demand on Swainson's hawks and other species can and should be considered in the DEIR.

As for electric power, the DEIR mentioned future construction of the Cosumnes Power Plan, which would generate electric power from natural gas. Much of the electricity generation in California is from natural gas-fired power plants, and much of the local utility's power is from this source. Numerous additional gas-fired plants were recently permitted by the California Energy Commission (CEC). The environmental reviews for these plants are available on the CEC's web site, so I reviewed some of the documents for inland power plants relying on fresh water (as opposed to sea water) for cooling. Assuming each dwelling unit will require about

³⁵ Hansen, G. E. 1986. Status of the giant garter snake, *Thamnophis couchi gigas* (Fitch) in the southern Sacramento Valley during 1986. Final Report to the California Department of Fish and Game, Contract C-1433. Unpublished, 28 pp.

³⁶ Smallwood, K.S. 1995. Scaling Swainson's hawk population density for assessing habitat-use across an agricultural landscape. *J. Raptor Research* 29:172-178.

Smallwood, K.S., B.J. Nakamoto, and S. Geng. 1996. Association analysis of raptors on an agricultural landscape. Pages 177-190 in D.M. Bird, D.E. Varland, and J.J. Negro, eds., *Raptors in human landscapes*. Academic Press, London.

0.0055 megawatts (MW) per year, Rio del Oro at build-out would demand about 63.8 MW/year for dwelling units alone. Given the rate of water use for cooling among gas-fired power plants, one can use the model in Figure 1 to project the annual water requirement for 63.8 MW of demand, which would be 1,785 acre-feet. Assuming the average crop in the Sacramento Valley requires 4 acre-feet per acre per year, then Rio del Oro's energy demand would require enough water to irrigate 446 acres of arable farmland. One might also be able to estimate the acreage of wetland habitat that will be lost, by estimating annual flow-through needed to support various types of wetland in several local settings. In lieu of these figures, it would be reasonable to assume that, due to this project, another 446 acres of Swainson's hawk foraging habitat (e.g., alfalfa³⁷) will lose its irrigation, and will be degraded as habitat. Impact estimates could also be made due to the emissions of criteria pollutants from these power plants, as well as the habitat covered over by the plant foundation and infrastructure. However, these impacts ought to be considered in a revised DEIR.

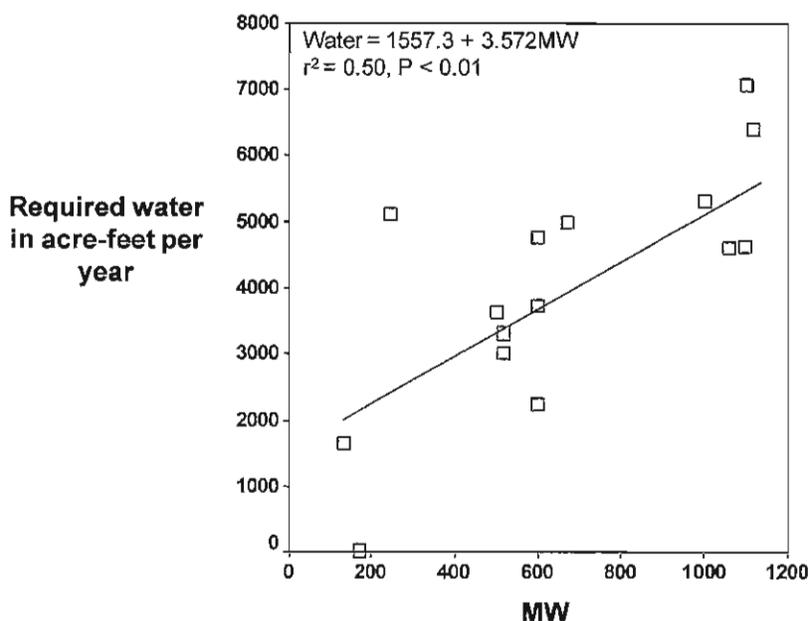


Figure 1. Relationship between the required water use for cooling inland, natural gas-fired power plants in California and the rated capacity of the power plants. Data were from the California Energy Commission.

In another example, if one assumed the electric power would be from wind turbines, which are growing in use in California, then one can use available data to estimate the impact the project's demand would have on birds (Table 5). According to the data from the Altamont Pass Wind Resource Area, 63.8 MW of demand would likely result in the annual deaths of at least 7 golden eagles, 21 red-tailed hawks, 124 raptors altogether, and 298 birds of all types. However, the

³⁷ Smallwood, K.S. 1995. Scaling Swainson's hawk population density for assessing habitat-use across an agricultural landscape. *J. Raptor Research* 29:172-178.

wind turbines in the Altamont Pass are much less efficient than their rated capacity, so if the energy for the project was to come solely from wind, then one could multiply the estimates in Table 5 by a factor of 2.5 to 5. Thus, if one was to assume that California's Renewable Portfolio Standard goal of 20% of its electric power generated from renewable sources, and that a factor of 5 is needed to adjust the installed wind power capacity to meet actual power output (i.e., adjust for inefficiency in the wind turbines), then the numbers in the right column of Table 5 would be about right for the annual death toll attributable to Rio del Oro's energy demand. The DEIR should be revised to address these potential impacts and how to mitigate them.

Table 5. Annual mortality estimates from the Altamont Pass Wind Resource Area, California.³⁸

Species	Mean deaths/MW/yr in the Altamont Pass	Annual deaths for 63.8 MW of wind power generation in the Altamont Pass
Golden eagle	0.115	7.3
Red-tailed hawk	0.324	20.6
Raptors	1.943	124.0
All birds	4.672	298.1

3.10.4 Residual Significant Impacts. The DEIR is unclear on what are residual significant impacts (page 3.10-72). The impacts assessment was deeply flawed, relying largely on unscientific methods to determine habitat values and wildlife species occurrences and abundance. In the end, the only reliable impacts assessment is in comparisons of acreages of vegetation cover types pre- and post-project construction, and even these are dealt with overly simplistically. These large shortfalls in the impacts assessment are likely the reason the small paragraph on residual significant impacts leaves the reviewer wondering what additional value this paragraph adds. The fact is that the reviewer of the DEIR is left with very little idea how extensive the environmental impacts will be, but I will agree with the conclusion in the paragraph that impacts will be significant and unavoidable.

RANCHO CORDOVA BIOLOGICAL RESOURCES POLICIES

Policy N.R.1.1: *Protect rare, threatened, and endangered species and their habitats in accordance with State and federal law. (Further implemented through Actions NR.1.1.1 through NR.1.1.4).*

The project would not protect rare, threatened and endangered species and their habitats in accordance with state and federal law. For one thing, the take permits have yet to be issued by state and federal regulatory agencies, and mitigation plans have yet to be finalized and circulated as part of this environmental review, so it is premature of the DEIR to claim that the project complies with this policy. Further, the DEIR acknowledges, and I concur, that project impacts will be significant and unavoidable in multiple cases involving special-status species. Further

³⁸ Smallwood, K. S., C. G. Thelander. 2008. Bird Mortality in the Altamont Pass Wind Resource Area, California. *Journal of Wildlife Management* 72:215-223.

yet, the DEIR did not even address the Migratory Bird Treaty Act, which prohibits the taking of most bird species that will be affected adversely by the project. Almost all of the bird species in Table 2 are protected by the MBTA, and many are protected by additional State and Federal laws, yet most will be adversely affected. Losing 76% of the grassland area, grassland-adapted birds will be substantially affected. Losing 59% of wetlands, most wetland-adapted species will be adversely affected by the project. Losing 100% of riparian and woodland and shrubland cover types, many bird, mammal, reptile and amphibian species will be adversely affected by the project, including multiple rare, threatened, and endangered species. Swainson's hawk will be adversely affected, and so will be peregrine falcon, endangered crustaceans, valley elderberry longhorn beetle, western spadefoot, white-tailed kite, northern harrier, and many other species. The DEIR does not dispute these findings in the Biological Resources section, but it does dispute them in App. P.

Action N.R.1.1.1: *Incorporate large habitat preserves and interconnected wildlife corridors in new development areas to provide ample space for animal movement.*

The project would leave one large wetland preserve, but its connectivity to similar habitat – or to any habitat – would be restricted to the eastern boundary. Currently, wildlife can traverse the entire project area, including from or to the east and north of the site. After development, there will be a much reduced habitat area for wildlife to use, and it will be connected to other habitat only to the east. Why would wildlife benefit from the ability to travel one way into a dead-end strip of wetland/grassland? What will be left will not be a movement corridor, but rather a dead-end trap that will bring wildlife into conflict with people on three sides.

Furthermore, the elderberry shrub preserves will be tiny and completely disconnected from each other and from any other habitat areas.

Action NR.1.1.2: *Review projects through the entitlement process and CEQA analysis to ensure that they comply with this policy if the site contains unique habitat, creeks, and/or wooded corridors.*

The habitat analysis was based on a flawed methodology that sampled only 0.019% of the project area. The wildlife survey methods would not be accepted by professional peers in a peer review process and had no precedent in science. I detected more wildlife species in 90 minutes than the consultants did over 3 days. The surveys were designed to minimize detections of wildlife, in my assessment.

Action NR.1.1.3: *As part of the consideration of development applications for individual Planning Areas containing habitats that support special-status plant and animal species that are planned to be preserved, the City shall require that these preserved habitats have interconnections with other habitat areas in order to maintain the viability of the preserved habitat to support the special-status species identified. The determination of the design and size of the interconnections" shall be made by the City, as recommended by a qualified professional, and will include consultation with the California Department of Fish and Game and U.S. Fish and Wildlife Service.*

No matter who decides on the design and size of the interconnections, what I see described in the DEIR will be inadequate to support multiple special-status species. The elderberry shrub preserves will lack any sort of connection except for sky. The wetland preserve will be connected to other habitat only on one side.

Action NR.1.1.4: *Prior to the approval of any public or private development project in areas containing trees, the City shall require that a determinate survey be conducted during the nesting season (March 1 and August 31) to identify if active nesting by birds protected under the Migratory Bird Treaty Act (MBTA) is taking place. If all site disturbance is to occur outside this time, the actions described in this mitigation measure are not required. If nesting activity is observed, consultation with the City of Rancho Cordova Planning Department shall be conducted in order to determine the appropriate mitigation, if any, required to minimize impacts to nesting birds. No activity may occur within 100 feet of any nesting activity or as otherwise required following consultation with the California Department of Fish and Game.*

In my reading of the DEIR, I did not see that the preconstruction surveys would be performed during the raptor nesting season.

Policy NR.1.2: *Conserve Swainson's hawk habitat consistent with State policies and Department of Fish and Game Guidelines. (Further implemented through Action NR.1.2.1).*

Based on my reading of DEIR, the mitigation plan for Swainson's hawk has not been finalized, so it is premature of the DEIR to claim that the project will comply with this policy.

Action NR.1.2.1 – Establish a Swainson's Hawk Ordinance in coordination with the California Department of Fish and Game to establish the process of mitigating for the loss of Swainson's hawk foraging habitat based on habitat value lost to development. The ordinance will set forth a process where habitat lost to development will be mitigated through the permanent protection of equivalent or better existing habitat conditions (referred to hereafter as "mitigation lands"). The specific required mitigation ratios (habitat acreage lost versus mitigation lands) and any other provisions to mitigation process shall be established through technical studies as part of the development of the ordinance and will take into account value of habitat to be converted in relation to habitat value of the mitigation lands (e.g., relation to nesting sites), proximity of the mitigation lands to adjacent conditions affecting habitat (e.g., nearby land uses and already permanently protected lands), and other relevant factors. The ordinance will also establish standards ensuring that mitigation land will be adequately protected and managed in perpetuity (e.g., via conservation easement, deed restriction or other appropriate method), and setting forth the timing of the required provision of mitigation lands in relation with the timing of the loss of habitat in the City (as its boundaries may be changed through subsequent annexations), such that mitigation lands shall be provided no later than prior to ground disturbance.

I do not understand why App. P of the DEIR concludes the DEIR complies with this measure, because I did not see any ordinance nor did I see any process or methodology to mitigate for loss of Swainson's hawk foraging habitat based on habitat values. In fact, the Biological Resources section of the DEIR concludes that Swainson's hawk foraging habitat will not be protected at the same acreage as will be destroyed by the project. There were no "technical studies" to estimate

or compare habitat values. The draft mitigation plan was incomplete at the time the DEIR was circulated for public review, so it is also premature to conclude that the mitigation will meet the timing specified in the Action, or that the protection of the mitigation land will be consistent with the Action.

Policy NR.1.4: *Discourage the planting of invasive species.*

App. P claims the mitigation plan will “ensure that invasive species do not adversely impact the preserve,” whereas the Biological Resources section of the DEIR concludes invasive plant species will inevitably degrade the grassland and wetland vegetation in the wetland preserve. One thing is for certain, however, and that is that establishing a sizable, private recreation area adjacent to the wetland preserve (see response in App. P to **Action OSPT.2.3.1**) will expose the preserve to invasive species.

Action NR.1.7.1: *For those areas in which special status species are found or likely to occur or where the presence of species can be reasonably inferred, the City shall require mitigation of impacts to those species that ensure that the project does not contribute to the decline of the affected species populations in the region to the extent that their decline would impact the viability of the regional population. Mitigation shall be designed by the City in coordination with the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG), and shall emphasize a multi-species approach to the maximum extent feasible. This may include development or participation in a habitat conservation plan.*

The DEIR provided no basis from which to determine whether project impacts will affect species regionally. Its mitigation and monitoring plans, most if not all of which were incomplete at the time the DEIR was circulated, included no means to assess the mitigation effectiveness on special-status species. Monitoring of on-site wetlands focused on water levels and percent plant cover, but not on the distribution and abundance of special-status species.

Furthermore, there is no real multi-species approach, and no participation with an HCP. The formulation of mitigation plans are usually deferred to unspecified, later dates, and some mention the possibility of being modified to use the South Sacramento County HCP, but these plans are incomplete and their deferred formulations denies me and others from meaningfully participating with the environmental review.

Policy NR.1.8: *The City shall encourage creation of habitat preserves that are immediately adjacent to each other in order to provide interconnected open space areas for animal movement.*

I do not understand the applicant’s response to this Policy. It claims the DEIR complies with this Policy because doing so is not required. Whatever it is the applicant is trying to say, the mitigation plan does not comply with the Policy. There is no habitat preserve to the east of the project area; rather, there is a conceptual plan for such a preserve.

Policy NR.1.9: *The City shall require that impacts to riparian habitats be mitigated at a no net loss of existing function and value based on field survey and analysis of the riparian habitat to*

be impacted. No net loss may be accomplished by avoidance of the habitat, restoration of existing habitat, or creation of new habitat, or through some combination of the above.

Again, the response to this policy in App. P is at odds with the conclusion in the Biological Resources section of the DEIR, which states the following, “*Preservation of a total of 5.08 acres of riparian habitat and creation of 12.3 acres of riparian habitat would partially compensate for the loss of biologically valuable riparian habitat under this alternative. Removal of the riparian habitat present on the project site constitutes a substantial adverse effect on sensitive natural communities for purposes of CEQA. Thus, loss or disturbance of riparian habitat would be considered a **direct and indirect significant impact**.*” The DEIR goes on to state, “*Although it is anticipated that a plan [which is not complete] to compensate for the loss of some of the riparian habitat would be developed, the project would still result in a substantial net loss of cottonwood- and willow-dominated communities that currently provide habitat for nesting and foraging raptors, neotropical migrant land birds, and other birds, as well as other common wildlife species. Therefore, with implementation of Mitigation Measures 3.10-2a and 3.10-2b, the direct and indirect impacts under the Proposed Project and High Density Alternatives would remain **significant and unavoidable**.*” These statements contradict the response to the policy in App. P.

Policy NR.2.1: *Require mitigation that provides for “no net loss” of wetlands consistent with current State and federal policies. (Further implemented by Action NR.2.1.1).*

Again, the applicant’s response to this policy in App. P is contradicted by conclusions in the Biological Resources section of the DEIR. The App. P response is that, yes, the project complies with this policy by achieving a no-net-loss of wetlands, whereas the Biological Resources section states, “*The loss and degradation of USACE jurisdictional vernal pools and other wetland habitats under either the Proposed Project Alternative or the High Density Alternative constitutes a substantial adverse effect on federally protected waters of the United States, including wetlands, as defined by Section 404 of the CWA. Removal of nonjurisdictional wetlands on the project site under the Proposed Project Alternative or the High Density Alternative constitutes a substantial adverse effect on sensitive natural communities as identified by DFG and on waters of the state subject to Central Valley RWQCB jurisdiction. Even with creation of the wetland preserve and implementation of a USACE-approved wetland MMP, this is considered a **direct and indirect significant impact**.*” In fact, the project would destroy 59% of the existing wetlands, and the remaining wetlands will be degraded, which is acknowledged in the Biological Resources section. App. P presents an entirely different picture.

Furthermore, the mitigation and monitoring plan remains a draft, so it is premature to conclude that the mitigation will achieve a no-net-loss of wetlands.

Policy NR.3.1: *Coordinate with property owners and local interest groups, such as the Sacramento Urban Creeks Council, to restore, enhance, and preserve creeks in Rancho Cordova.*

The response to this policy in App. P appeared to be misleading. It did not indicate that any local interest groups had actually been consulted, and that no coordination had been done to enhance or preserve Morrison Creek. The mitigation measures involving Morrison Creek appear

to have been formulated unilaterally to date. However, the formulation of these measures has yet to be completed.

Policy NR.4.1: *Conserve native oak and landmark tree resources for their historic, economic, aesthetic, and environmental value.*

The response in App. P claims the project will be consistent with this policy, but the Biological Resources section of the DEIR presents a different story. All of the acreage supporting oaks and other trees are projected to be lost to the project. Oak trees will be measured for possible on-site protection, but not until after the CEQA review has ended, thereby excluding me and others from participating in a meaningful way. Without having the mitigation plan presented in the DEIR, it is premature of App. P to claim the project meets the policy.

Action NR.4.1.1: *Implement the City's Tree Preservation and Protection Ordinance (and update as necessary) to establish minimum requirements for preserving native trees and landmark trees in the City, including a definition of the size, species, and age requirements of landmark, oak, and other trees to be protected and/or replaced.*

According to App. P, the project is consistent with this policy, but I cannot understand why. Because there is no Ordinance yet? Anyhow, the DEIR did not present sizes and ages of tree species inventoried on the project site.

Action NR.4.1.2: *Where feasible, require underground utility lines that are in close proximity to oaks and other landmark trees to be designed and installed to minimize impacts to trees. Work with the utility provider(s) to coordinate transmission line location and other potential impacts associated with the undergrounding of the utilities.*

The response to this policy in App. P is the following, "The project would likely remove 47 native oak trees greater than 6 inches dbh. No existing trees are expected to conflict with the installation of underground utility lines." In fact, according to the Biological Resources section, there will be no more oak trees, so the response in App. P is a little misleading, perhaps.

Action NR.4.1.3: *Establish development guidelines that require all oak habitat to be avoided to the maximum extent feasible. When avoidance is not possible, require mitigation efforts that result in preservation of in-kind habitat in the Planning Area.*

The App. P response is, "The project would result in the loss of 3 acres of oak woodland habitat. See discussion NR 4.1 for a description of tree mitigation." According to the Biological Resources section of the DEIR, all 3 acres of these oaks are projected to be removed. There is no plan to replace these 3 acres in the project area. Therefore, the App. P response is misleading.

Policy NR.4.4: *Prior to the approval of any public or private development project in areas identified or assumed to contain trees, the City shall require that a determinate survey of tree species and size be performed. If any native oaks or other native trees six inches or more in diameter at breast height (dbh), multitrunk native oaks or native trees of 10 inches or greater dbh, or nonnative trees of 18 inches or greater dbh that have been determined by a certified*

arborist to be in good health are found to occur, such trees shall be avoided if feasible. If such trees cannot be avoided, the project applicant shall do one of the following:

- All such trees shall be replaced at an inch for-inch ratio. A replacement tree planting plan shall be prepared by a certified arborist or licensed landscape architect and shall be submitted to the City of Rancho Cordova for approval prior to removal of trees; or,
- The project applicant shall submit a mitigation plan that provides for complete mitigation of the removal of such trees in coordination with the City of Rancho Cordova. The mitigation plan shall be subject to the approval of the City.
- If the City of Rancho Cordova adopts a tree preservation ordinance at any time in the future, any future development activities shall be subject to that ordinance instead.

According to App. P, “Mitigation measure 3.10-3 presented in the EIR/EIS is consistent with the provisions set forth in Policy NR 4.4.” However, the mitigation measures have not been formulated yet, and the DEIR says this formulation will happen after the CEQA review, thereby excluding me and others from participating in a meaningful way.

Proposed Revised Action NR.1.1.1: *Incorporate habitat preserves and interconnected wildlife corridors in new development areas to allow for animal movement where feasible and as necessary for viability of protected species.*

According to App. P, the project is consistent with this proposed revised action. However, the project is even more inconsistent with this revised action than it is with the original. The project would leave no wildlife corridors. Instead, it will leave two small, isolated elderberry shrub preserves, and one 507-acre wetland preserve closed in on 3 sides by residential and commercial developments. The corridor would lead from where to where?

Summary of Consistency with City of Rio Vista Policies

There are additional proposed revised actions and policies, as well as applicant responses in App. P, but I did not see any changes in the App. P responses or in my comments from the originals.

Generally, conclusions in App. P differed a great deal from those in the Biological Resources section of the DEIR, sometimes to the degree that they were completely contradictory. It looks to me like someone else prepared App. P compared to those who prepared the Biological Resources section, and there was poor correspondence between the two efforts. Some of the App. P conclusions appeared misleading, having omitted important, relevant information in order to conclude compliance with the corresponding action or policy. The DEIR should be revised with a completely rewritten summary of project consistency with City of Rio Vista General Plan Policies. The DEIR should not conclude the project is consistent with any Rancho Cordova actions and policies unless the corresponding mitigation measures are fully formulated and circulated for public review, and unless the conclusion is supportable in every other way.

MITIGATION

On page 3-10.22, the DEIR states, “*Compensatory mitigation would likely be tied to the various phases of development and would be phased in with project implementation.*” In this statement the DEIR defers formulation of the mitigation to unspecified later dates, when neither I nor any other member of the public can participate in any meaningful way with the environmental review. This shortfall is to be found in many of the specific mitigation measures, below.

3.10-1 Loss and degradation of wetlands. The DEIR proposes a mitigation and monitoring plan (MMP) which is undergoing review by state and federal agencies, and is not final. Therefore, the DEIR presents a mitigation plan consisting of measures that may yet be formulated after the public has had an opportunity to review and participate with the process. In short, the DEIR defers the formulation of mitigation measures to unspecified, later dates when neither I nor other members of the public can meaningfully participate.

The DEIR (App. Q) defers formulation of the MMP funding mechanism to an unspecified, later date. It says monitoring and maintenance will be funded through an endowment, a Community Facilities District, or Mello-Roos District as approved by the Corps and USFWS. In other words, the project applicant does not know how the MMP will be funded. The funding mechanism should have been decided upon and described in detail as part of the public review of this project. If it had been, then I could have commented on the sufficiency of the funds and the strengths and weaknesses of the funding mechanism in supplying sufficient funds.

The current draft of the MMP proposes restoration and creation of 17.9 acres of vernal pools within the 507 acre Wetlands Preserve. Which vernal pools require restoration, and why? The vernal pools I was able to view from the perimeter of the project site appeared in fine condition, and I could not determine what about them needs restoring. App. Q of the DEIR (The Wetland Mitigation Plan) also concluded that the preserve area was “relatively undisturbed” and well connected. So what is there to restore? It does not appear to me that there is any need for restoration. Without need for restoration, the project applicant should not be allowed to attempt restoration, because these activities could cause more harm than help.

As for wetlands creation, the DEIR makes no mention of the adverse impacts that would be caused to grassland and grassland-adapted species as a result of converting grassland to vernal pools. The Wildlife Society³⁹ accepted wetland creation as a form of mitigation only if the following conditions apply: (1) Creation of similar types of wetland in the region has been successful and documented; (2) The project proponent funds research on other similar wetlands in the region in order to learn how to most effectively create wetlands; (3) Only competent biologists are used; (4) The project proponent funds long-term monitoring to ensure that the created wetland is functioning properly and is self-perpetuating; and (5) The project proponent provides an irrevocable trust for long-term funding of management of the wetland. The DEIR offered little if any real evidence that creation of similar types of wetlands have been successful

³⁹ Hammer, D. A., R. D. Crawford, A. H. Huffinan, D. B. Inkley, M. C. Landin, J. S. Larson, J. A. McGlinchy, R. E. Stewart, Jr., R. Stromstad, M. W. Weller, and D. E. Wesley. 1994. Mitigation banking and wetlands characterization: the need for a national policy on wetlands. Wildlife Society Technical Review 94-1, 25 pp.

in the region. The DEIR referred to vernal pools created at Clay Station, pointing out that resource agencies often visit the site as a model of vernal pool creation, but the DEIR did not reference any peer-reviewed publications stemming from monitoring or research at this or any other vernal pool created in the region. The project proponent funded consultants to digitize the boundaries of vernal pools and other wetlands at the Cook Property, but this effort was not research. The DEIR also did not commit an irrevocable trust fund for monitoring and management of the created wetlands. Therefore, three of The Wildlife Society's criteria were unmet by the DEIR. According to the DEIR, the other two criteria *were* met, though I am not entirely convinced that they were.

Wetland creation as a mitigation measure is the type of measure that requires rigorous standards, given its poor track record. CNPS⁴⁰ and CDFG⁴¹ insist that the mitigation design, implementation measures, and reporting methods be clearly documented, along with who or which agencies will be responsible for achieving clearly defined success criteria. Assurances must be provided in writing that certain performance criteria of the mitigation plan will be realized, and guaranteed by a negotiable performance security large enough to complete the mitigation and to pursue alternative mitigation measures should the implementation be incomplete or the objectives fail to be achieved. Fifteen years of monitoring the success of the mitigation should be the minimum time period before returning the performance security. The DEIR provides only one or two of the details identified in this paragraph, and it did not commit to 15 years of monitoring.

Not only is discussion missing on the adverse impacts caused by wetlands creation, but the locations and configurations of the created pools have not been decided, pending additional analysis (page 15 of the DEIR's App. Q). In other words, the formulation of this measure has been deferred to an unspecified, later date, when I cannot meaningfully participate as a CEQA reviewer. I suggest the DEIR be revised so that it identifies exactly where and in what configuration wetlands would be created. More importantly, however, I recommend that wetland creation on the 507 acre preserve not be attempted because doing so will adversely affect grassland-adapted species as well as vernal pool species that require upland conditions for part of their lifecycles.

The success criteria listed in Table 4 of App. Q of the DEIR appear arbitrary and only vaguely related to the special-status species that are central to vernal pool creation. One is hydrologic in nature, and the other 3 relate to vegetation cover. But how does the occurrence of at least 10 plant species relate to the occurrence and abundance of threatened and endangered species in these types of vernal pools? No success criteria actually include presence or abundance of the species that are the reason for the mitigation in the first place. Habitat restoration is an empty

⁴⁰ California Native Plant Society. 1998. Mitigation guidelines regarding impacts to rare, threatened, and endangered plants. California Native Plant Society. <http://www.cnps.org/archives/mitigation2.htm>.

⁴¹ California Department of Fish and Game. 1997. Guidelines for assessing the effects of proposed developments on rare, threatened, and endangered plants and plant communities. California Department of Fish and Game, Sacramento.

accomplishment if it contains none of the species for which the habitat was restored.⁴² I suggest that the DEIR be revised to include definitive success criteria for wetlands creation, focused on the species for which the mitigation is targeted.

I could not understand Table 5 in App. Q of the DEIR. Table 5 in App. Q presents the monitoring schedule, but I cannot understand it. Under **Hydrology** and **Invertebrates**, what does “yes” mean? I suggest the DEIR be revised so that the public and decision-makers can understand what it is being presented in Table 5 of App. Q.

On pages 34 and 37 of App. Q of the DEIR, what is the point of the wildlife surveys? This same question goes to the other resources that would be monitored as described in this plan. There are no thresholds of significance, or thresholds upon which additional actions would be taken. No species are named as targets of the monitoring. No power analysis is presented in support of sample size requirements, and no sample size is mentioned at all. There is no explanation of what would be done with the wildlife survey data, or how the data collected would be analyzed or used to take additional actions. Furthermore, using a meandering path through the vernal pool complex will not yield comparable wildlife data, and therefore is scientifically unsound. I suggest that the DEIR be revised to include a scientifically sound monitoring program, because this one is not even close to acceptable.

The MMP is also deficient by not establishing baselines against which to compare monitoring data, except for the digitized perimeters of wetlands. Baseline data are needed on distribution and abundance of multiple target species, including threatened and endangered and other special-status species. Based on my review of the DEIR and its supporting documents, it appears to me that no effort has yet been made to survey the pools in the proposed Wetlands Preserve for special-status species, and no effort has been made to sample any other plants or wildlife species in the surrounding grasslands. It will not be possible to assess the performance of created or restored wetlands, let alone the performance of the Wetlands Preserve in the absence of any wetland creation or restoration. I suggest the DEIR be revised so that it includes a plan to establish baseline distribution and abundance characterizations for all special-status species occurring in the project area.

Under **Contingency Measures**, App. Q of the DEIR is deficient because the performance criteria do not include the status of any special-status species. The performance criteria are of peripheral variables with unknown, unquantified relationships to the special-status species. Even if the performance criteria are considered achieved, there will be no verification that the special-status species actually occur in the ponds. Also, possible remediation measures are not identified, thereby deferring the formulation of these measures until well after the CEQA review.

Also under **Contingency Measures**, App. Q (page 40) of the DEIR defers the formulation of the contingency mitigation to an unspecified, later date. It says that if additional analysis indicates the proposed wetlands construction site will not be suitable, then another site will be selected. It also says the funding mechanism is “to be determined.” By certifying this EIR without further developing this mitigation plan, there is no way I can provide meaningful comments on the

⁴² Morrison, M. L. 2002. *Wildlife Restoration: Techniques for habitat analysis and animal monitoring*. Society for Ecological Restoration, Island Press, Covelo, California.

mitigation plan. I cannot possibly determine whether the alternative construction site(s) would be suitable or whether the funding amount or the funding mechanism would be sufficient. The DEIR needs to specify where alternative sites are located, and it needs to detail the funding amounts and funding mechanisms.

According to App. Q of the DEIR, 13 acres of seasonal wetlands were constructed in 1994 as mitigation for this project in the Clay Station Mitigation Bank and is fully functioning. However, I don't know what the consultants mean when they say these wetlands are "fully functioning." Does this mean the same special-status species that occur on the project site are now residing in the seasonal wetlands at Clay Station Mitigation Bank? Is there some other definition of functionality? Why is wetland construction in 1994 tied to this project in 2008? I suggest the DEIR be revised to explain what is meant by "fully functioning," and to explain why wetland constructed in 1994 should now be regarded as mitigation for this project's impacts.

A scientific basis could be established for using the Cook Property to mitigate impacts on the project site, but that basis has yet to be made. It is not enough to conclude that special-status species likely occur on the Cook Property. The applicant needs to establish that they do, if there is going to be a technical or quantitative basis for the mitigation ratio, as called for in City of Rancho Cordova, such as Action N.R.1.2.1. Protocol-level surveys are needed on the Cook Property for comparison to results of protocol-level surveys throughout the pools on the project site, in order to establish a reasonable basis for deciding on the level of compensatory mitigation achieved by protecting the Cook Property.

On page 3.10-37, the DEIR states that the City may consider modifying the MMP to be consistent with the South Sacramento County Habitat Conservation Plan, if this HCP has been certified prior to the implementation of mitigation measures for this project. This statement again defers the formulation of the mitigation plan to an unspecified, later date, thus excluding me and others from providing meaningful review comments. I suggest the DEIR be revised by deleting this statement, so that the DEIR is certain in its presentation of the mitigation plan.

3.10-1a Securing Section 404 and other Permits. First, obtaining a required permit from a Federal regulatory agency does not qualify as a mitigation measure. Second, the steps outlined in the DEIR for securing wetlands take permits are the steps that should have been completed in advance of public circulation of the EIR. The public would also benefit from the types of surveys described.

3.10-2 Loss and Degradation of Sensitive Natural Communities. Translocation of elderberry shrubs would not result in a less-than-significant impact unless the shrubs survive and unless any valley elderberry longhorn beetles they support also survive the translocation and continue to use the shrubs.

The conclusion that impacts to riparian habitat would be less than significant is based on the premise that riparian trees are currently senescing and will not regenerate. If the premise is wrong, then the DEIR impact conclusion is wrong. As I pointed out earlier, the DEIR did not present a strong case for the premise that the trees are senescing and will not regenerate. Counts of trees in different size and age categories were not provided. Also, it would be very unusual

and very convenient for the project applicant to find that trees having grown over many decades – perhaps longer than a century – were suddenly dying and faced no regeneration. In my experience, I have never encountered a situation where thousands of trees suddenly and naturally ran short of water. I suggest that if the DEIR is going to stay with this premise, that it be revised with a more convincing line of evidence that the premise is true.

3.10-2a Section 1602 Streambed Alteration Agreement. The DEIR says that if the applicant is able to secure a Section 1602 Streambed Alteration Agreement with CDFG, then it will prepare a mitigation and monitoring plan (MMP) before altering Morrison Creek. First, obtaining a required permit from a state regulatory agency does not qualify as a mitigation measure. Second, this MMP should be prepared and included in the DEIR so that the public can have a chance to review it. The DEIR again defers the formulation of an important mitigation measure to an unspecified, later date, thereby excluding the public from the CEQA review.

3.10-2b Preserve, Restore, or Create Riparian Habitat. According to the DEIR, a habitat MMP will be developed to replace 57 acres of cottonwood willow riparian woodland. The DEIR says the MMP “may” address whether the replacement will be onsite or offsite, “enhancement” of habitat types (whatever that means), and specific mitigation ratios. These are substantial mitigation elements. Again, the DEIR defers the formulation of an important mitigation measure to an unspecified, later date, effectively excluding me and other members of the public from providing meaningful environmental review comments.

3.10-3 Loss of Oaks and Oak Woodland. I generally agree with the mitigation proposed. However, I suggest the DEIR could be improved by providing results of the tree survey so that reviewers can tell whether substantial changes to the project design will be needed. If it is determined that mature oaks need to be avoided, then I assume the project design will be altered, thereby shifting the project’s impacts.

3.10-4 Loss and Degradation of Special-Status Wildlife Species Habitat. The DEIR refers to a Draft Valley Elderberry Longhorn Beetle Mitigation Plan, which is App. R to the DEIR. The DEIR says this plan will be modified following consultation with the USFWS. In so doing, the DEIR again defers the formulation of an important mitigation measure to an unspecified, later date when neither I nor other members of the public can provide meaningful environmental review.

Two elderberry reserves of 10 and 12 acres would be created and managed in perpetuity as wildlife habitat (DEIR page 3.10-56). These reserves would be very small and fragmented, exposed to considerable edge effects from surrounding residential uses. Exotic species intrusions would be substantial. Unfortunately, these reserves would be too small, too fragmented and too degraded to serve as habitat for any of the special-status species at issue, except perhaps as stop-over habitat for migrating passerines such as yellow warbler and willow flycatcher.

3.10-4a Secure Take Authorization for Federally Listed Vernal Pool Invertebrates. Obtaining a required take permit from the USFWS does not qualify as a mitigation measure. It should not be presented in the DEIR as a mitigation measure.

Furthermore, the DEIR inappropriately defers the formulation of the mitigation plan to an unspecified, later date. It says the draft MMP, which is App. Q of the DEIR, is still under review at the USFWS, and is subject to change, including mitigation ratios, the locations of onsite and offsite protections and wetland creations, and other important elements of the plan. Waiting to finalize this important mitigation plan until after this DEIR is certified effectively excludes me and other members of the public from the environmental review. The DEIR claims that the mitigation in the MMP will result in no net loss in vernal pool or seasonal wetland habitat, but I do not agree the DEIR can make this claim in lieu of a final draft MMP.

Those who prepared the DEIR misapplied the term “ecosystem health” on page 3.1-59. The extent to which the upland area is large enough to accommodate wetlands creation and restoration has no real bearing on ecological health, which refers to ecosystem function and is usually associated with the roles of contaminants or other intrusive forces in degrading ecosystem function.⁴³ The preparers may have intended to use the term “ecosystem integrity,” but if they had, then they would have misapplied this one, too. Ecosystem integrity refers to the degree to which the elements of the ecosystem are intact, but the project would fragment vegetation cover types, including vernal pools, and its proposed wetlands creation could further destroy existing elements of the ecosystem, thereby decreasing the degree to which the ecosystem is intact. Thus, the mitigation measure discussed on page 3.1-59 would not maintain or improve ecosystem health, and it would reduce ecological integrity. To be informative as an environmental review document, the DEIR should accurately present ecological terminology.

3.10-4b Obtain Incidental Take Permit for Valley Elderberry Longhorn Beetle. Obtaining a required take permit from the USFWS does not qualify as a mitigation measure. It should not be presented in the DEIR as a mitigation measure.

According to the DEIR, “Detailed information on monitoring success of relocated and planted shrubs and measures to compensate (should success criteria not be met) would also likely be required in the BO.” However, this detailed information should appear in the DEIR, so that I and other members of the public can participate meaningfully with the environmental review. I know from personal experience that translocating elderberry shrubs is relatively easy, whereas translocating valley elderberry longhorn beetles (VELB) is prone to failure.⁴⁴ The DEIR should be revised to include much more detail about the proposed VELB translocation, especially about success criteria, the likelihood of success, and the consequences of failure.

According to the DEIR (page 3.10-62), a compensatory mitigation plan for take of VELB will be submitted to CDFG and the City prior to any grading. This step again defers the formulation of an important mitigation measure to an unspecified, later date, ensuring that I cannot

⁴³ Zhang, M., K. S. Smallwood, and E. Anderson. 2002. Relating indicators of ecological health and integrity to assess risks to sustainable agriculture and native biota. Pages 757-768 in D.J. Rapport, W.L. Lasley, D.E. Rolston, N.O. Nielsen, C.O. Qualset, and A.B. Damania (eds.), *Managing for Healthy Ecosystems*, Lewis Publishers, Boca Raton, Florida USA.

⁴⁴ Morrison, M. L., K. S. Smallwood, and L. S. Hall. 2002. Creating habitat through plant relocation: Lessons from Valley elderberry longhorn beetle mitigation. *Ecological Restoration* 21: 95-100.

meaningfully participate with the environmental review. The DEIR should be revised to include a detailed compensatory mitigation plan so that I can review it and comment on it.

3.10-4c Preconstruction Surveys for Raptor Nests. The DEIR (page 3.10-63) says a qualified raptor biologist will be hired to survey for raptor nests. It would be helpful to revise the DEIR so that it explains what is meant by “qualified.” From what I have seen of the scientific foundation in this DEIR, it appears to me that those who prepared this DEIR struggled with terminology used by ecologists and wildlife biologists, e.g. with *ecosystem health* and *habitat type*. The surveys used to “quantify” habitat values among the various vegetation cover types were unacceptable, having little if any basis in science and covering grossly inadequate portions of the landscape seasons of the year. The survey appeared as if it was designed to not find special-status species, and in fact I found more wildlife species in 90 minutes one day than the consultants documented throughout their survey effort. Given this poor understanding of methodology in wildlife biology, I suggest the DEIR be revised to explain what is meant by “qualified” biologist.

According to the DEIR, the CDFG’s guidelines on Swainson’s hawk nest surveys will be followed to the extent feasible. I suggest the DEIR be revised to read that these guidelines will be followed – not to the *extent feasible*, but that they will be followed in full. The reason I emphasize this point is because the DEIR does not state that raptor nest surveys will be performed during the appropriate time of year, and because the preparers of the DEIR already performed surveys at the wrong time of year to detect multiple special-status species. Surveys for nesting raptors need to be performed during the nesting season.

The burrowing owl mitigation guidelines were described by the DEIR in a very cursory manner, making no mention, for example, of the compensation ratio for unavoidable impacts to burrows and timing of actions. The DEIR should be revised to explain in detail which measures in the burrowing owl guidelines will be implemented, and which will not be implemented.

3.10-4d Prepare and Implement a Swainson’s Hawk Mitigation Plan. The DEIR again defers the formulation of an important mitigation plan to an unspecified, later date, thereby excluding me and other members of the public from participating in a meaningful way with the environmental review. The Swainson’s hawk mitigation plan should have been prepared already, and described in the DEIR. I suggest the DEIR be revised accordingly.

On page 3.10-65, the DEIR states, “*The project by itself, however, would not be expected to cause a decline in numbers of any of these species [vernal branchiopods, VELB, Swainson’s hawk, and western spadefoot] to the point where their regional populations were no longer viable, which is the threshold stated in the City’s General Plan Policy*” (referring to General Plan policy N.R.1.7.1). However, the City’s significance threshold is not the one the DEIR should consider in this case. Cumulative effects can be considered significant under CEQA, regardless of the City’s nonsensical policy. I describe this policy as nonsensical because it eliminates the possibility of significance findings from almost every conceivable project in the City’s Sphere of Influence, yet the incremental destruction and fragmentation of wildlife and plant habitats caused by multiple single projects has been definitively linked to regional populations becoming nonviable in multiple cases. Furthermore, those who prepared the DEIR themselves conclude

that due to cumulative development in the region there is no longer sufficient space available to offset the impacts from this project. As they put it, “*fully compensating for the impact by preserving existing habitat in the project vicinity is infeasible*”...and, “*there is not sufficient undeveloped land in the project vicinity to offset the effects of habitat fragmentation on special-status species, and thus, fully mitigate the impact*” (page 3.10-66). The City’s policy makes no sense from a scientific or biological point of view, and appears inconsistent with the CEQA standards, as I understand them. There is no getting around the conclusion that the cumulative effects of this and surrounding projects would be significant.

According to the DEIR, “*The mitigation does include elements of habitat creation and enhancement that would increase the habitat value of preserved lands so that mitigation habitat could be of greater value than habitat lost and degraded*” (page 3.10-66). I have already addressed this aspect of the mitigation plan, but because it appears in a concluding statement intended to soften the conclusion that the project’s impacts are significant and unavoidable due to lack of existing habitat that can be protected in the region, I will comment on it. The proposal to create and enhance habitat occurring on the proposed 507 acre wetland preserve implies that there is a need for habitat to be created or enhanced on this land. However, the DEIR concludes earlier that the habitats in this proposed preserve are undisturbed and in good condition. Attempting to “create” habitat there would require existing habitat to be destroyed. To “enhance” habitat would require a baseline of condition against which improvements will be made, but no such conditions have been detailed in this DEIR. There are no counts per pool of special-status crustaceans, western spadefoot larvae surviving to adulthood, or special-status plants. No measurements of any kind, other than digital delineation of vernal pools and seasonal wetlands have been made, and even the delineations are of suspect value. Vernal pools and seasonal wetlands do not have hard and fast boundaries, which is what the consultants would have obtained with a GPS or GIS digitizing mouse. A hard boundary derived from a one-time effort to delineate the wetlands is not a suitable basis from which to attempt “enhancements.” In short, there is no credible scientific basis in the DEIR for either habitat creation or enhancement on the project site.

3.10-5 Loss and Degradation of Special-Status Plants. According to the DEIR (page 3.10-67), “Direct impacts on the population of Greene’s legenera located within the wetland preserve shall be avoided to the maximum extent feasible.” This promise seems empty after reading in the immediately preceding paragraphs that at least two of the three populations will be completely destroyed by the project. The project, as proposed, will not avoid Greene’s legenera, so the DEIR ought to be revised by removing any promise that efforts will be made to avoid the impacts. This impact cannot be avoided, nor can it be offset.

The DEIR proposes to collect seed from the Greene’s legenera populations that will be destroyed, and translocate them to vernal pools in the proposed wetlands preserve. Translocating these seeds could result in genetic contamination of existing plants in the receiving pools, as well as new competition with existing plant species. It could also fail to propagate new populations due to differences in environmental conditions. If this approach is going to be taken, then I recommend paying careful attention to the CNPS guidelines, which I outlined below, under **Recommended Mitigation Planning Approach.**

Furthermore, the DEIR says an MMP will be prepared for mitigating impacts to Greene's legenera. Again, the DEIR defers the formulation of an important mitigation measure to an unspecified, later date, thereby excluding me and others from meaningfully participating with the environmental review.

I disagree that the measures outlined in the DEIR would reduce the significance of project impacts to Greene's legenera to less than significant levels. Fencing off a population will not protect it from invasive plants and chemical and soil pollutants that the DEIR acknowledges will come from the residential development. Tossing seed from the other two populations into other vernal pools will not necessarily result in new populations, nor would it necessarily be all positive if the new populations take, because their translocation could adversely affect other plants already established in the receiving pools. At the present, there is no mitigation and monitoring plan available to guide the mitigation and to respond to failures or surprises. I recommend that the DEIR be revised with a new impacts conclusion, based on a much more detailed mitigation plan for Greene's legenera.

3.10-6 Cumulative Impacts. I concur with the DEIR that the cumulative effects will be significant and unavoidable. However, I disagree with the DEIR's implication that the mitigation measures it cited will address cumulative impacts. The cited measures are directed to individual project impacts, but not to cumulative impacts. The DEIR should be revised so that it presents mitigation measures directed to cumulative impacts.

RECOMMENDED MITIGATION PLANNING APPROACH

The California Native Plant Society (CNPS) is a prominent group of natural resource scientists who have given much consideration to and have had much experience with mitigation. This group has contributed mitigation guidelines⁴⁵ that are useful for projects like the one proposed here. Here I summarize the CNPS guidelines as well as the CDFG expectations⁴⁶ for mitigation. These expectations will support my preceding comments and should be considered by the project applicant in rethinking its mitigation measures.

The CNPS advocates only for mitigation involving avoidance of impacts. To avoid impacts, the CNPS recommends pre-project planning and design, reconfiguring an existing project, or adopting the no-project alternative, in addition to site protection such as fencing and transfer of development rights in easements or fee title.

When lead agencies decide to minimize, rectify, reduce or compensate impacts, the CNPS recommends certain standards. For example, mitigation measures should be developed on a site-specific basis, and should involve consultation with the appropriate regulatory agencies. Additional research should be conducted to determine which mitigation measures are appropriate

⁴⁵ California Native Plant Society. 1998. Mitigation guidelines regarding impacts to rare, threatened, and endangered plants. <http://www.cnps.org/archives/mitigation2.htm>.

⁴⁶ California Department of Fish and Game. 1997. Guidelines for assessing the effects of proposed developments on rare, threatened, and endangered plants and plant communities. California Department of Fish and Game, Sacramento.

for the specific life history and ecological relationships of rare plant species occurring at a particular site. The CNPS regards habitat restoration and off-site introduction or translocation as unproven and usually unsuccessful. Genetic contamination of an otherwise unaffected population is intolerable.

When lead agencies allow reduction of impacts, the CNPS guidelines maintain that the project size should be reduced, the project sited in the least environmentally sensitive area and surrounded by buffer zones permanently protected in conservation easements. CNPS also insists that efforts be made to salvage portions of the population that will be lost.

When restoration is pursued, the CNPS recommends that it be directed to mitigate impacts of projects approved prior to environmental regulations. It must be tailored to the project site based on the assembly of local species and habitats. The goals of the restoration project and the courses of action intended to achieve those goals need to precede implementation. Pre-impact site conditions should be determined, and the restoration plan should consider land contours, soil types, erosion patterns, and pre-impact hydrologic conditions. Study of the targeted species should be thorough so as to identify their total distribution, habitat descriptions of occupied site and symbiotic relationships with other species. The plan should consider propagation techniques, re-introduction strategy, invasive species controls, site protection, public access and other factors. Finally, a monitoring program should be sufficiently rigorous to assess restoration success, and to augment the knowledge base relevant to related restoration efforts.

When lead agencies authorize reductions of impacts over time, the CNPS recommends limiting public access to protected habitat areas through fencing or other means, and that the species and habitat conditions are monitored to detect intrusion and subsequent impacts caused by construction and operation activities. Public education should be implemented regarding the values of these areas.

When off-site compensation is pursued, off-site populations should be protected permanently through conservation easement or mitigation banking. The area of a conservation easement must be sufficiently large to support a biologically secure, reproducing population within a buffer zone in perpetuity. The surrounding land uses must be considered, as well as expected future land uses. The design of the site boundary and management plan must be scientifically based, utilizing information from baseline studies and natural history data for each species. The contract should specify the rights of the grantee, the grantors rights and uses, and restrictions of undesirable activities, and it should include language that binds the terms and conditions of the contract in perpetuity, regardless of fee title transfers. The contract should protect the site from land use change, introduction of exotic species and public access, and it should protect the right of the grantee to enforce compliance with the terms of the easement.

Also, the mitigation exchange ratio should exceed 1:1 for most species, thereby accounting for an inevitable net loss of individuals and habitat area. Where needed, off-site compensation areas should be enhanced by reducing impacts caused by on-going activities such as over-grazing by livestock or dumping of hazardous materials or trash. Translocations should be preceded by detailed inventories of species occurring at the receiving site, accompanied by a feasibility assessment regarding persistence and avoidance of genetic contamination. These should also

occur at the appropriate time of year, following proper handling and propagation methods in consultation with the regulatory agencies. Furthermore, all translocations should be completed and shown to be successful prior to the initiation of project activities.

The CNPS and CDFG insist that the mitigation design, implementation measures, and reporting methods be clearly documented, along with whom or which agencies are responsible for achieving clearly defined success criteria. Assurances must be provided in writing that certain performance criteria of the mitigation plan will be realized, and guaranteed by a negotiable performance security large enough to complete the mitigation and to pursue alternative mitigation measures should the implementation be incomplete or the objectives fail to be achieved. Five years of monitoring the success of the mitigation should be the minimum time period before returning the performance security.

MITIGATION MONITORING

It has long been known that mitigation pursuant to CEQA has often either failed or has not been implemented, but with no consequences to the take-permit holder.⁴⁷ There should be consequences for not achieving mitigation objectives or performance standards. The project proponents should be required to pay fines in amounts that are sufficient for an independent party to achieve the mitigation objectives originally promised, and in this case, the promises should be much more substantial. An efficient means to ensuring enforcement of the mitigation measures is for the project applicant to pay an up-front security bond that is carefully tied to mitigation performance standards, as described earlier.

The DEIR should be revised to include a specific discussion on mitigation monitoring. A fund is needed to support named individuals or an organization to track the implementation of mitigation measures. Report deadlines should be listed, and who will be the recipients of the reports. In my experience, if these mitigation monitoring details are not specified in advance and not specifically funded, then nobody will keep track of them. For a project of the size and scope of Rio del Oro, there is a dire need for a well-designed mitigation monitoring plan.



Shawn Smallwood, Ph.D.

⁴⁷ Silva, E. 1990. Mitigation reporting and monitoring: a new challenge for California agencies. Appendix VI in M. H. Remy, T. A. Thomas, S. E. Duggan, and J. G. Moose. 1990. Guide to the California Environmental Quality Act (CEQA). Solano Press Books, Point Arena, California.

APPENDIX A: Likelihoods of detecting wildlife and plant species on the Rio del Oro Specific Plan Project site, using the methods described in the DEIR.

Common name	Status ^a	Likely deflection rate of diurnal, recon-level visual surveys during Dec & Jan & within 100 feet of 35 observation points?	Generally appropriate detection methods
Arthropods			
Valley elderberry longhorn beetle	FT, CE	None	Sample from water column following protocol
Vernal pool fairy shrimp	FT	None	Sample from water column following protocol
Vernal pool tadpole shrimp	FE	None	Sample from water column following protocol
Conservancy fairy shrimp	FE	None	Sample from water column following protocol
Longhorn fairy shrimp	FE	None	Sample from water column following protocol
California linderella	FC	None	Sample from water column following protocol
Birds			
Pied-billed grebe		Very low	Large area scans in during winter
Western grebe		Very low	Large area scans in during winter
American white pelican	CSC	Near zero	Large area scans in during winter
American bittern		Near zero	Large area scans in during winter
Black-crowned Night Heron	CSA	None	Large area scans; nocturnal surveys
Green heron		Near zero	Large area scans
Cattle egret		Near zero	Large area scans
Snowy egret	CSA, CDFS	Near zero	Large area scans
Great egret	CSA, CDFS	Near zero	Large area scans
Great blue heron	CSA, CDFS	Near zero	Large area scans
White-faced ibis	CSC	Near zero	Large area scans in winter
Sandhill crane	CT	Near zero	Large area scans in winter
Tundra swan		Near zero	Large area scans in winter
Greater white-fronted goose		Near zero	Large area scans in winter

Snow goose		Near zero	Large area scans in winter
Ross's goose		Near zero	Large area scans in winter
Canada goose		Near zero	Large area scans in winter
Mallard		Near zero	Large area scans in winter
Northern pintail		Near zero	Large area scans in winter
Gadwall		Near zero	Large area scans in winter
Green-winged teal		Near zero	Large area scans in winter
Eurasian wigeon		Near zero	Large area scans in winter
Cinnamon teal		Near zero	Large area scans in winter
Ruddy duck		Near zero	Large area scans in winter
Wood duck		Near zero	Large area scans in winter
Canvasback		Near zero	Large area scans in winter
Redhead		Near zero	Large area scans in winter
Lesser scaup		Near zero	Large area scans in winter
Common goldeneye		Near zero	Large area scans in winter
Hooded merganser		Near zero	Large area scans
Common merganser		Near zero	Large area scans
California black rail	CT, CFP	Near zero	Large area scans
Common moorhen		Near zero	Large area scans
American coot		Near zero	Large area scans
Spotted sandpiper		Near zero	Large area scans in winter
Western sandpiper		Near zero	Large area scans in winter
Least sandpiper		Near zero	Large area scans in winter
Wilson's phalarope		Near zero	Large area scans in winter
Lesser yellowlegs		Near zero	Large area scans in winter
Greater yellowlegs		Near zero	Large area scans in winter
Whimbrel		Near zero	Large area scans in winter
Long-billed curlew	FSC, CSC	Near zero	Large area scans in winter
Dunlin		Near zero	Large area scans in winter
Long-billed dowitcher		Near zero	Large area scans in winter
Black-bellied plover		Near zero	Large area scans in winter
Semi-palmated plover		Near zero	Large area scans in winter

Killdeer			Near zero	Large area scans
Bonaparte's gull			Near zero	Large area scans in winter
Mew gull			Near zero	Large area scans in winter
Ring-billed gull			Near zero	Large area scans in winter
California gull	CSC		Near zero	Large area scans
Herring gull			Near zero	Large area scans in winter
Caspian tern			Near zero	Large area scans in winter
Turkey vulture			Near zero	Large area scans
Golden eagle	CFP		Near zero	Large area scans
Cooper's hawk	CSC		Near zero	Large area scans
Sharp-shinned hawk	CSC		Near zero	Large area scans
Northern harrier	CSC		Near zero	Large area scans
White-tailed kite	CFP		Near zero	Large area scans
Red-tailed hawk			Very low	Large area scans
Ferruginous hawk	CSC		Very low	Large area scans in winter
Swainson's hawk	FSC, CT		None	Large area scans during spring and summer
Red-shouldered hawk			Very low	Large area scans
Rough-legged hawk			Very low	Large area scans in winter
Peregrine falcon	FSC, CE		Very low	Large area scans
Prairie falcon	FSC, CSC		Very low	Large area scans
American kestrel			Very low	Large area scans
Merlin	CSC		Very low	Large area scans in winter
Wild turkey			Very low	Large area scans; calling
California quail			Very low	Large area scans
Ring-necked pheasant			Very low	Large area scans
Band-tailed pigeon			Very low	Large area scans
Mourning dove			Very low	Large area scans
Rock dove			Very low	Large area scans
Barn owl			Very low	Nocturnal surveys
Western screech owl			None	Nocturnal surveys
Great horned owl			Very low	Nocturnal surveys
Long-eared owl	CSC		Very low	Nocturnal surveys

Western burrowing owl	FSC, CSC	Very low	Large area scans & foot searches during morning and evening
Northern pygmy owl		None	Nocturnal surveys
Short-eared owl	CSC	Near zero	Nocturnal surveys
Northern saw-whet owl		None	Nocturnal surveys
Lesser nighthawk		None	Nocturnal surveys
Common poorwill		None	Nocturnal surveys
Vaux's swift	CSC	Very low	Large area scans
White-throated swift		Very low	Large area scans
Black-chinned hummingbird		Very low	Point counts over many more locations
Anna's hummingbird		Very low	Point counts over many more locations
Calliope hummingbird		Very low	Point counts over many more locations
Rufous hummingbird		Very low	Point counts over many more locations
Allen's hummingbird		Very low	Point counts over many more locations
Belted kingfisher		Very low	Large area scans
Lewis's woodpecker	FSC	Very low	Point counts over many more locations or large area scans
Acorn woodpecker		Very low	Point counts over many more locations or large area scans
Red-breasted sapsucker		Very low	Point counts over many more locations or large area scans
Downy woodpecker		Very low	Point counts over many more locations or large area scans
Nuttall's woodpecker		Very low	Point counts over many more locations or large area scans
Northern flicker		Very low	Point counts over many more locations or large area scans
Western wood peewee		Very low	Point counts over many more locations or large area scans
Willow flycatcher	FE, CE	Very low	Point counts over many more locations or large area scans
Hammond's flycatcher		Very low	Point counts over many more locations or large area scans
Dusky flycatcher		Very low	Point counts over many more locations or large area scans
Pacific-slope flycatcher		Very low	Point counts over many more locations or large area scans
Black phoebe		Very low	Point counts over many more locations or large area scans
Say's phoebe		Very low	Point counts at many more sites, large area scans or flush surveys
Western kingbird		Very low	Point counts over many more locations or large area scans
Ash-throated flycatcher		Very low	Point counts over many more locations or large area scans
California horned lark	CSC	Very low	Point counts at many more sites, large area scans or flush surveys
Purple martin	CSC	Very low	Point counts over many more locations or large area scans
Tree swallow		Very low	Point counts over many more locations or large area scans

Violet-green swallow		Very low	Point counts over many more locations or large area scans
Northern rough-winged swallow		Very low	Point counts over many more locations or large area scans
Cliff swallow		Very low	Point counts over many more locations or large area scans
Bank swallow	CT	Very low	Point counts over many more locations or large area scans
Barn swallow		Very low	Point counts over many more locations or large area scans
Western scrub jay		Very low	Point counts over many more locations or large area scans
Yellow-billed magpie		Very low	Point counts over many more locations or large area scans
Common raven		Low	Large area scans
American crow		Low	Point counts at many more sites
Oak titmouse		Low	Point counts at many more sites
Bushfit		Low	Point counts at many more sites
Red-breasted nuthatch		Low	Point counts at many more sites
White-breasted nuthatch		Low	Point counts at many more sites
Brown creeper		Low	Point counts at many more sites
Rock wren		Low	Point counts at many more sites
Marsh wren		Low	Point counts at many more sites
Bewick's wren		Low	Point counts at many more sites
House wren		Low	Point counts at many more sites
Winter wren		Low	Point counts at many more sites
Golden-crowned kinglet		Low	Point counts at many more sites
Ruby-crowned kinglet		Low	Point counts at many more sites
Blue-gray gnatcatcher		Low	Point counts at many more sites
Western bluebird		Low	Point counts at many more sites
Mountain bluebird		Low	Point counts at many more sites
Swainson's thrush		Low	Point counts at many more sites
Hermit thrush		Low	Point counts at many more sites
American robin		Low	Point counts at many more sites
Variied thrush		Low	Point counts at many more sites
Wrenitit		Low	Point counts at many more sites
Northern mockingbird		Low	Point counts at many more sites; large area scans
California thrasher		Low	Point counts at many more sites; flushing surveys
American pipit		Low	Point counts at many more sites

Cedar waxwing		Low	Point counts at many more sites
Phainopepla		Low	Point counts at many more sites
Loggerhead shrike	FSC, CSC	Low	Point counts at many more sites; large area scans
European starling		Low	Point counts at many more sites; large area scans
Hutton's vireo		Low	Point counts at many more sites
Warbling vireo		Low	Point counts at many more sites
Orange-crowned warbler		Low	Point counts at many more sites
Nashville warbler		Low	Point counts at many more sites
Yellow-rumped warbler		Low	Point counts at many more sites
Yellow warbler	CSC	Low	Point counts at many more sites
Black-throated gray warbler		Low	Point counts at many more sites
Hermit warbler		Low	Point counts at many more sites
Townsend's warbler		Low	Point counts at many more sites
MacGillivray's warbler		Low	Point counts at many more sites
Common yellowthroat		Low	Point counts at many more sites
Wilson's warbler		Low	Point counts at many more sites
Yellow-breasted chat	CSC	Low	Point counts at many more sites
Western tanager		Low	Point counts at many more sites
Black-headed grosbeak		Low	Point counts at many more sites
Blue grosbeak		Low	Point counts at many more sites
Lazuli bunting		Low	Point counts at many more sites
California towhee		Low	Point counts at many more sites
Spotted towhee		Low	Point counts at many more sites
Chipping sparrow		Low	Point counts at many more sites, large area scans or flush surveys
Grasshopper sparrow		Low	Point counts at many more sites, large area scans or flush surveys
Vesper sparrow		Low	Point counts at many more sites, large area scans or flush surveys
Song sparrow		Low	Point counts at many more sites, large area scans or flush surveys
Lincoln's sparrow		Low	Point counts at many more sites, large area scans or flush surveys
Savannah sparrow		Low	Point counts at many more sites, large area scans or flush surveys
Rufous-crowned sparrow		Low	Point counts at many more sites, large area scans or flush surveys
Lark sparrow		Low	Point counts at many more sites, large area scans or flush surveys
Fox sparrow		Low	Point counts at many more sites, large area scans or flush surveys

White-crowned sparrow		Low	Point counts at many more sites, large area scans or flush surveys
Golden-crowned sparrow		Low	Point counts at many more sites, large area scans or flush surveys
Dark-eyed junco		Low	Point counts at many more sites, large area scans or flush surveys
Western meadowlark		Low	Point counts at many more sites, large area scans or flush surveys
Tricolored blackbird	FSC, CSC	Low	Point counts at many more sites; large area scans
Red-winged blackbird		Low	Point counts at many more sites; large area scans
Yellow-headed blackbird		Low	Point counts at many more sites
Brewer's blackbird		Low	Point counts at many more sites
Brown-headed cowbird		Low	Point counts at many more sites
Hooded oriole		Low	Point counts at many more sites
Bullock's oriole		Low	Point counts at many more sites
Pine siskin		Low	Point counts at many more sites
American goldfinch		Low	Point counts at many more sites
Lesser goldfinch		Low	Point counts at many more sites
Lawrence's goldfinch	FSC	Low	Point counts at many more sites
Purple finch		Low	Point counts at many more sites
House finch		Low	Point counts at many more sites
House sparrow		Low	Point counts at many more sites
Mammals			
Virginia opossum		None	Nocturnal surveys; trapping
Ornate shrew	CSC	None	Trapping
Broad-footed mole		None	Trapping
Pallid bat	CSC	None	Nocturnal surveys & use of auditory detectors
Townsend's big-eared bat	CSC	None	Nocturnal surveys & use of auditory detectors
Western mastiff bat	CSC	None	Nocturnal surveys & use of auditory detectors
Yuma myotis	CSC	None	Nocturnal surveys & use of auditory detectors
California myotis		None	Nocturnal surveys & use of auditory detectors
Western pipistrelle		None	Nocturnal surveys & use of auditory detectors
Big brown bat		None	Nocturnal surveys & use of auditory detectors
Western red bat		None	Nocturnal surveys & use of auditory detectors
Hoary bat		None	Nocturnal surveys & use of auditory detectors
Brazilian free-tailed bat		None	Nocturnal surveys & use of auditory detectors

Brush rabbit		None	Large area search; nocturnal spotlight surveys
Desert cottontail		Very low	Large area search; nocturnal spotlight surveys
Black-tailed jackrabbit		Low	Large area search; nocturnal spotlight surveys
Beaver		Near zero	Large area search for sign; trapping
Muskrat		Near zero	Large area search for burrows along shores; trapping
California ground squirrel		Low	Large area search for burrows
Western gray squirrel		Very low	Large area searches
Boita's pocket gopher		Low	Large area search for burrows
California kangaroo rat	CSC	Near zero	Large area search for burrows; trapping; spotlighting
San Joaquin pocket mouse		None	Trapping
Western harvest mouse		None	Trapping
Deer mouse		None	Trapping
Brush mouse		None	Trapping
Pinon mouse		None	Trapping
Dusky-footed woodrat		None	Large area search for houses; trapping
California vole		None	Trapping
House mouse		None	Trapping
Norway rat		None	Trapping
Black rat		None	Trapping
Common porcupine		None	Large area searches for sign
American badger	CSC	None	Camera traps, bait stations
Long-tailed weasel		None	Camera traps, bait stations
American mink		None	Camera traps, bait stations
Western spotted skunk		None	Camera traps, bait stations
Striped skunk		None	Camera traps, bait stations
River otter		None	Camera traps, bait stations
Ringtail	CFP	None	Camera traps, bait stations
Raccoon		None	Camera traps, bait stations
Mountain lion	CFP	None	Large area searches for sign
Bobcat		None	Large area searches for sign; camera traps
Coyote		Very low	Nocturnal searches; camera traps
Gray fox		None	Camera traps, bait stations, spotlighting

Red fox		None	Camera traps, bait stations, spotlighting
Black-tailed deer		Low	Large area search for animals or sign
Reptiles			
Western skink		None	Searches under woody debris
Gilbert's skink		None	Searches under woody debris
Western fence lizard		Very low	Large area searches in spring, summer and fall
Western whiptail		None	Large area searches in spring, summer and fall
Southern alligator lizard		None	Searches under woody debris Searches under woody debris
Coast horned lizard	CSC	None	Large area searches in spring, summer and fall
Western pond turtle	CSC	None	Spring and summer searches along streams and pond shores
Ring-necked snake		None	Search under woody debris in spring and summer
Sharp-tailed snake		None	Search under woody debris in spring and summer
Racer		None	Search under woody debris in spring and summer
California whipsnake		None	Large area searches in spring and summer
Common garter snake		None	Springtime searches along water's edge
Western terrestrial garter snake		None	Searches during spring along streams and pools
Giant garter snake	FT, CT	None	Protocol searches during spring along streams and pools
Night snake		None	Search under woody debris
Common kingsnake		None	Large area searches in spring and summer
California mountain kingsnake		None	Large area searches in spring and summer
Gopher snake		None	Large area searches in spring and summer
Western rattlesnake		None	Directed searches in summer around squirrel burrows and rocks
Amphibians			
California slender salamander		None	Search under woody debris; pitfall traps
California tiger salamander	FT, CSC	None	Springtime dip-netting for larvae; pitfall traps by protocol
Ensatina		None	Search under woody debris
Arboreal salamander		None	Search under woody debris
Pacific tree frog		None	Nocturnal surveys in spring
Foothill yellow-legged frog	CSC	None	Searches along streams in summer
California red-legged frog	FT, CSC	None	Protocol searches along streams and pond shores in summer
Bullfrog		None	Searches along streams and pond shores
Western spadefoot	CSC	None	Nocturnal surveys in spring

Western toad	None	Nocturnal surveys in spring
Plants		
Dwarf downingia	Very low	Surveys during flowering season: March to May
Tuolumne button-celery	Very low	Surveys during flowering season: May to August
Bogg's Lake hedge-hyssop	Very low	Surveys during flowering season: March to May
Legnere	Very low	Surveys during flowering season: April to June
Ahart's dwarf rush	Very low	Surveys during flowering season: March to April
Pincushion navarretia	Very low	Surveys during flowering season: May
Slender orcutt grass	Very low	Surveys during flowering season: May to September
Sacramento orcutt grass	Very low	Surveys during flowering season: April to July
Sanford's arrowhead	Very low	Surveys during flowering season: May to October
Northern California black walnut	Very low	Large area survey

Kenneth Shawn Smallwood
Curriculum Vitae

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Born May 3, 1963 in
Sacramento, California.
Married, father of two.

Expertise

Ecology / Wildlife interactions with human infrastructure and activities / Conservation biology

Education

Ph.D. Ecology, University of California, Davis. September 1990.
M.S. Ecology, University of California, Davis. June 1987.
B.S. Anthropology, University of California, Davis. June 1985.
Corcoran High School, Corcoran, California. June 1981.

Experience

- 238 professional publications, including:
 - 56 peer reviewed publications
 - 22 in non-reviewed proceedings
 - 152 reports, declarations, and book reviews (2)
 - 8 in mass media outlets
- 66 public presentations of research results at professional meetings
- Reviewed many professional papers and reports

Associate Editor, *Journal of Wildlife Management*, March 2004 to 30 June 2007.

Editorial Board Member, *Environmental Management*, 10/1999 to 8/2004.

Editorial Board Member, *Ecosystem Health*, 9/2002 to 9/2003.

Associate Editor, *Biological Conservation*, 9/1994 to 9/1995. Administered independent scientific reviews of submitted, professional papers in ecology and conservation biology, and made recommendations to the Editors.

Member, Alameda County Scientific Review Committee, 8/06 to present. As part of a five member committee, I investigate the causes of bird and bat collisions in the Altamont Pass Wind Resource Area, and I make recommendations to the monitoring team and to the County of Alameda. The Committee ensures the science applied to the problem is of the highest standards.

Research Ecologist, 2/06 to 12/07, under contract to East Bay Regional Parks District. Performed research of how fossorial mammals and raptors responded to grazing treatments and wind turbines at Vasco Caves Regional Preserve and a newly acquired property north of the Preserve. I designed the study, trained the fatality monitors and behavior observers, mapped the burrows of fossorial mammals, analyzed the data, and took the lead on writing the report.

Consulting Ecologist, 7/04 to 12/07, California Energy Commission (CEC). In collaboration with Lawrence-Livermore National Lab, I performed independent research funded by the CEC on bird behavior in the Altamont Pass Wind Resources Area. I also provided consulting services as needed to the CEC. I produced several reports to the CEC and the CEC's Public Interest Energy Research program.

Consulting Ecologist, 11/99 to present, U.S. Navy. I provide endangered species surveys at multiple Navy facilities, hazardous waste site monitoring, and habitat restoration for the endangered Fresno kangaroo rat. I have worked at Naval Air Station, Lemoore; Naval Weapons Station, Seal Beach, Detachment Concord; Naval Security Group Activity, Skaggs Island; and National Radio Transmitter Facility, Dixon.

Part-time Lecturer, 1/98 to 2005, California State University, Sacramento. I taught Contemporary Environmental Issues, Natural Resources Conservation (twice), Mammalogy, Behavioral Ecology, and Ornithology Lab.

Senior Ecologist, 1999 to 2005, BioResource Consultants. I planned and carried out research and monitoring projects, and analyzed complex data related to avian fatalities at wind turbines, avian electrocutions on electric distribution poles across California, and avian fatalities at transmission lines.

Systems Ecologist, 7/96 to present, Consulting in the Public Interest, www.cipi.com. I am part of a multi-disciplinary consortium of scientists facilitating large-scale, environmental planning projects and litigation. We provide risk assessments, assessments of management practices, and expert witness testimony.

Chairman, Conservation Affairs Committee, The Wildlife Society--Western Section, 1999-2001. I prepared position statements and led efforts directed toward conservation issues, including travel to Washington, D.C. to lobby Congress for more wildlife conservation funding.

Systems Ecologist, 1/95 until about 2000, Institute for Sustainable Development. I headed ISD's program on integrated resources management. I developed indicators of ecological integrity for large areas, using remotely sensed data, local community involvement and GIS.

Associate, 1997-1998, Department of Agronomy and Range Science, University of California, Davis. I worked with Shu Geng and Mingua Zhang on several projects.

Lead Scientist, 6/96 to 6/99, National Endangered Species Network. I headed NESN's efforts to inform academic scientists and environmental activists about emerging issues regarding the Endangered Species Act and other environmental laws pertaining to legally rare species. I also testified at public hearings on behalf of environmental groups and endangered species.

Ecologist, 1/97 to 6/98, Western Foundation of Vertebrate Zoology. I conducted field research to determine the impact of past mercury mining on the status of red-legged frogs in Santa Clara County, California.

Senior Systems Ecologist, 7/94 to 12/95, EIP Associates, Sacramento, California. Provided consulting services in environmental planning. I also developed a quantitative assessment of land units for their conservation and restoration opportunities, using the ecological resource requirements of 29 legally rare species. I mapped vegetation and land use, and derived new spatial data from a GIS overlay of these variables with soil types, flood zones, roads, and other spatially referenced data. Using these derived data, I developed a set of indicators for prioritizing areas within Yolo County that will receive mitigation funds for habitat easements and restoration.

Post-Graduate Researcher, 10/90 to 6/94, with Dr. Shu Geng, Department of Agronomy and Range Science, *U.C. Davis*. Studied landscape and management effects on temporal and spatial patterns of abundance among pocket gophers and species of Falconiformes and Carnivora in the Sacramento Valley. I also developed and analyzed a data base of energy use in California agriculture, and I assisted with a landscape (GIS) study of groundwater contamination across Tulare County, California.

Co-teacher, 1/91 to 6/91 and 1/93 to 6/93, Graduate Group in Ecology, *U.C. Davis*. Co-taught conservation biology with Dr. Christine Schonewald.

Reader, 3/90 to 6/90, Department of Psychology, *U.C. Davis*. Assisted students of Psychobiology (taught by Dr. Richard Coss) with research and writing term papers.

Research Assistant, 11/88 to 9/90, with Dr. Walter E. Howard, Department of Wildlife and Fisheries Biology, *U.C. Davis*. Tested durable baits for pocket gopher control in forest plantations, and developed gopher sampling methods.

Fulbright Research Fellow, Indonesia, 7/88 to 11/88. Tested use of new sampling methods for monitoring the number of Sumatran tigers and six other species of endemic felids, and evaluated methods used by other researchers.

Research Assistant, 7/87 to 6/88, with Dr. Terrell P. Salmon, Wildlife Extension, Department of Wildlife and Fisheries Biology, *U.C. Davis*. Developed empirical models of mammal and bird invasions in North America, and a rating system for priority research and control of exotic species based on economic, environmental, and human health hazards in California.

Student Assistant, 3/85 to 6/87, with Dr. E. Lee Fitzhugh, Wildlife Extension, Department of Wildlife and Fisheries Biology, *U.C. Davis*. Developed and implemented a statewide mountain lion track count for long-term monitoring of numbers and distribution. Also developed quantitative techniques to identify individual mountain lions by their tracks, and to differentiate mountain lion and dog tracks.

Projects

Research to reduce avian mortality due to wind turbines at Altamont Pass. I used GPS and GIS to map and study environmental impacts of 5,400 wind turbines. I related the number of raptor fatalities at wind turbines to the degree of aggregation of prey species around the turbines, as well as many other factors related to where the turbines are located, how they are designed and operated, and how raptors behave in the Altamont Pass Wind Resource Area. I also serve on the

Alameda County Scientific Review Committee, charged with recommending scientific monitoring methods and mitigation measures for reducing avian mortality.

Research to reduce avian mortality on electric distribution poles. Since about 2000 I have performed research directed toward reducing bird electrocutions on electric distribution poles. I led fatality monitoring efforts at 10,000 poles multiple times in California, spanning Orange County to Glenn County, and I have produced two large reports.

Cook *et al.* v. Rockwell International *et al.*, No. 90-K-181 (D. Colorado). I provided expert testimony on the role of burrowing animals in affecting the fate of buried and surface-deposited radioactive and hazardous chemical wastes at the Rocky Flats Plant, Colorado. I provided expert reports based on four site visits and the most extensive document review of burrowing animals ever conducted. I conducted transect surveys for evidence of burrowing animals and other wildlife on and around waste facilities. I also discovered substantial intrusion of waste structures by burrowing animals. I testified in federal court in November 2005, and my clients were subsequently awarded a \$553,000,000 judgment by a jury.

Hanford Nuclear Reservation Litigation. I am providing expert testimony on the role of burrowing animals in affecting the fate of buried radioactive wastes at the Hanford Nuclear Reservation, Washington. I provided three expert reports based on three site visits and extensive document review. I predicted and verified a certain population density of pocket gophers on buried waste structures, as well as incidence of radionuclide contamination in body tissue. I conducted transect surveys for evidence of burrowing animals and other wildlife on and around waste facilities. I also discovered substantial intrusion of waste structures by burrowing animals.

Expert Testimony and Declarations on Residential and Commercial Development Proposals. I have testified before the California Coastal Commission, California Energy Commission, County Boards of Supervisors, and City Councils, and I have participated with press conferences and have been deposed by attorneys. I prepared expert witness reports and court declarations, which are summarized under Reports (below).

Expert Testimony on Proposed Gas-fired Power Plants. I provided comments letters, declarations, expert reports, and oral testimony on the impacts and appropriate mitigation of natural gas-fired power plants in California.

Protocol-level endangered species searches and recovery efforts. I search for special-status species using Department of Fish and Game and US Fish and Wildlife Service protocols. I have searched for, or otherwise worked with, California red-legged frog, arroyo southwestern toad, California tiger salamander, blunt-nosed leopard lizard, western pond turtle, giant kangaroo rat, Fresno kangaroo rat, San Joaquin kit fox, Sumatran tiger, willow flycatcher, least Bell's vireo, western burrowing owl, Swainson's hawk, Valley elderberry longhorn beetle and many other special-status species. I also help with recovery of the Fresno kangaroo rat at Lemoore Naval Air Station.

Conservation of the endangered Fresno kangaroo rat. I am performing applied research to identify the factors responsible for the decline of this endangered species at Lemoore Naval Air Station, and am implementing habitat enhancements designed to reverse the trend and to expand the area occupied by this species.

Impact of West Nile Virus on yellow-billed magpies. Since 2005 I have worked under contract to the Sacramento-Yolo Mosquito and Vector Control District to gather post-West Nile Virus epidemic data to pre-epidemic data I had gathered on multiple bird species in the Sacramento Valley in the 1990s, but particularly on yellow-billed magpie and American crow, which are particularly susceptible to WNV.

Workshops on HCPs. Assisted Dr. Michael Morrison with organizing and conducting a 2-day workshop on Habitat Conservation Plans, sponsored by Southern California Edison, and another 1-day workshop sponsored by PG&E. These Workshops were attended by academics, attorneys, and consultants with HCP experience. We guest-edited a Proceedings published in Environmental Management.

Mapping of biological resources along Highways 101, 46 and 41. I used GPS and GIS to delineate vegetation complexes and locations of special-status species along 26 miles of highway in San Luis Obispo County, 14 miles of highway and roadway in Monterey County, and in a large area north of Fresno, including within reclaimed gravel mining pits.

GPS mapping and monitoring at restoration sites and at Caltrans mitigation sites. I am monitoring the success of elderberry shrubs at one location, the success of willows at another location, and the response of wildlife to the succession of vegetation at both these sites. I am also using GPS to monitor the response of fossorial animals to yellow star-thistle eradication and natural grassland restoration efforts at Bear Valley, Colusa County, and at the decommissioned Mather Air Force Base in Sacramento County.

Mercury effects on Red-legged Frog. I assisted Dr. Michael Morrison and US Fish and Wildlife Service in assessing the possible impacts of historical mercury mining on the federally listed California red-legged frog in Santa Clara County. I also measured habitat variables in numerous streams.

Opposition to proposed No Surprises rule. I wrote a white paper and summary letter explaining scientific grounds for opposing the incidental take permit (ITP) rules providing ITP applicants and holders with general assurances they will be free of compliance with the Endangered Species Act once they adhere to the terms of a "properly functioning HCP." I obtained 188 signatures of scientists and environmental professionals on the letter submitted to the US Fish and Wildlife Service and the National Marine Fisheries Service. The letter was also provided to all US Senators. It helped change the prevailing view of HCPs as beneficial to listed species.

Natomas Basin Habitat Conservation Plan alternative. I designed narrow channel marsh to increase the likelihood of survival and recovery in the wild of giant garter snake, Swainson's hawk and Valley Elderberry Longhorn Beetle. The design included replication and interspersions of treatments for experimental testing of critical habitat elements. I provided a report to Northern Territories, Inc.

Assessment of Environmental Technology Transfer to China, and Assessment of Agricultural Production System. I twice traveled to China and interviewed scientists, industrialists, agriculturalists, and the Directors of the Chinese Environmental Protection Agency and the Department of Agriculture to assess the need and possible pathways for environmental clean-up

technologies and trade opportunities between the US and China. I spent a total of five weeks in China, including in Shandong and Linxion Provinces and in Beijing.

Yolo County Habitat Conservation Plan. I conducted the landscape ecology study of Yolo County to identify the priority land units to receive mitigation so as to most improve the ecosystem functionality within the County from the perspective of 29 special-status species of wildlife and plants. I used a hierarchically structured indicators approach to apply principles of landscape and ecosystem ecology, conservation biology, and local values in rating land units. I derived GIS maps to help guide the conservation area design, and then I developed implementation strategies.

Mountain Lion Track Count. I developed and conducted the carnivore monitoring program throughout California since 1985. Species counted include mountain lion, bobcat, black bear, coyote, red and gray fox, raccoon, striped skunk, badger, and black-tailed deer. Vegetation and land use are also monitored. The transect was established on dusty, dirt roads within randomly selected quadrats. These roads are searched for tracks of the carnivores, which routinely use the roads for travel paths.

Sumatran Tiger and other Felids. I designed and conducted track counts for seven species of wild cats in Sumatra, including the Sumatran tiger, fishing cat, and golden cat. I spent four months on Sumatra and Java, and learned Bahasa Indonesia (the official Indonesian language). I was awarded a Fulbright Research Fellowship to complete the project.

Wildlife in Agriculture. Beginning as my post-graduate research, I have studied pocket gophers and other wildlife in 40 alfalfa fields throughout the Sacramento Valley, and I surveyed for wildlife along a 200 mile road transect for six years. The data were analyzed using GIS and methods from landscape ecology, and the results were published and presented orally to farming groups in California and elsewhere. I also conducted the first study of wildlife in cover crops used on vineyards and orchards.

Agricultural Energy Use and Tulare County Groundwater Study. I developed and analyzed a data base of energy use in California agriculture, and collaborated on a landscape (GIS) study of groundwater contamination across Tulare County, California.

Pocket Gopher Damage in Forest Clearcuts. I tested various poison baits and baiting regimes for pocket gopher control in forest plantations, and I developed gopher sampling methods. I conducted the most extensive field study of pocket gophers ever, involving thousands of gophers in 68 research plots on 55 clearcuts among 6 National Forests in northern California.

Risk Assessment of Exotic Species in North America. I developed empirical models of mammal and bird species invasions in North America, as well as a rating system for assigning priority research and control to exotic species in California, based on economic, environmental, and human health hazards.

Representative Clients

Law offices and environmental groups

Law Offices of Berger & Montague
 Law Offices of Roy Haber
 Law Offices of Edward MacDonald
 Law Office of John Gabrielli
 Law Office of Bill Kopper
 Law Office of Donald B. Mooney
 Law Office of Veneruso & Moncharsh
 Law Office of Steven Thompson
 California Wildlife Federation
 Defenders of Wildlife
 Sierra Club
 National Endangered Species Network
 Spirit of the Sage Council
 The Humane Society
 Hagens Berman LLP
 Environmental Protection Information Center (EPIC)
 Goldberg, Kamin & Garvin, Attorneys at Law
 Californians for Renewable Energy (CARE)
 Seatuck Environmental Association

Government agencies

US Department of Agriculture
 US Forest Service
 US Fish & Wildlife Service
 US Navy
 California Energy Commission
 California Office of the Attorney General
 California Department of Fish & Game
 California Department of Transportation
 California Department of Forestry
 California Department of Food & Agriculture
 Ventura County Counsel
 County of Yolo
 Tahoe Regional Planning Agency
 Sustainable Agriculture Research & Education Program
 Sacramento-Yolo Mosquito and Vector Control District
 East Bay Regional Parks District
 County of Alameda

Businesses

Pacific Gas & Electric Co.
 Southern California Edison Co.
 Georgia-Pacific Timber Co.
 Northern Territories Inc.
 National Renewable Energy Lab
 David Magney Environmental Consulting
 Wildlife History Foundation
 Emerald Farms
 Terry Preston, Wildlife Ecology Research Center
 G3 Energy and enXco
 Comstocks Business (magazine)
 Californians for Renewable Energy

Other organizations and Individuals

Don & LaNelle Silverstien
 Seventh Day Adventist Church
 Escuela de la Raza Unida
 Susan Pelican and Howard Beeman
 Residents Against Inconsistent Development, Inc.
 Bob Sarvey
 Mike Boyd
 Hillcroft Neighborhood Fund
 Joint Labor Management Committee of the Retail Food Industry
 Lisa Rocca
 Kevin Jackson
 Dawn Stover and Jay Letto
 Nancy Havassy

Representative special-status species experience

Common name	Species name	Status ¹	Description
Field experience			
California red-legged frog	<i>Rana aurora draytonii</i>	FT, CSC	Protocol searches & detected at multiple sites
Foothill yellow-legged frog	<i>Rana boylei</i>	FSC, CSC	Research and search detections at multiple sites
Western spadefoot	<i>Spea hammondi</i>	FSC, CSC	Searches and search detections
California tiger salamander	<i>Ambystoma californiense</i>	FC, CSC	Protocol searches & detections at multiple sites
Coast range newt	<i>Taricha torosa torosa</i>	CSC	Searches and multiple detections
Blunt-nosed leopard lizard	<i>Gambelia sila</i>	FE, CE	Detected in San Luis Obispo County
California Horned Lizard	<i>Phrynosoma coronatum frontale</i>	FSC, CSC	Search and detected in San Luis Obispo Co.
Western pond turtle	<i>Clemmys marmorata</i>	FSC, CSC	Searches and detected at multiple sites
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	FE, CT	Protocol searches and detections
Sumatran tiger	<i>Panthera tigris</i>		Research in Sumatra
Mountain lion	<i>Puma concolor californicus</i>	CFP	Research and publications
Point Arena mountain beaver	<i>Aplodontia rufa nigra</i>	FE, CSC	Remote camera operation
Giant kangaroo rat	<i>Dipodomys ingens</i>	FE, CE	Detected in Cholame Valley
Fresno kangaroo rat	<i>Dipodomys nitratoideus</i>	FE, CE	Research and conservation at Lemoore Naval Air Station – reports
Monterey dusky-footed woodrat	<i>Neotoma fuscipes luciana</i>	FSC, CSC	Non-target captures and mapping of dens
Salt marsh harvest mouse	<i>Reithrodontomys raviventris</i>	FE, CE	Habitat assessment, monitoring
Salinas harvest mouse	<i>Reithrodontomys megalotus distichlus</i>	G5T1S1	Captures in the Salinas area; habitat assessment
California clapper rail	<i>Rallus longirostris</i>	FE, CE	Surveys at Concord Naval Weapons Station
Golden eagle	<i>Aquila chrysaetos</i>	CSC	Research in Sacramento Valley
Swainson's hawk	<i>Buteo swainsoni</i>	CT	Research in Sacramento Valley
Northern harrier	<i>Circus cyaneus</i>	CSC	Research and publication
White-tailed kite	<i>Elanus leucurus</i>	CFP	Research and publication
Loggerhead shrike	<i>Lanius ludovicianus</i>	FSC, CSC	Research in Sacramento Valley
Least Bell's vireo	<i>Vireo bellii pusillus</i>	FE, CE	Detected in Monterey County
Willow flycatcher	<i>Empidonax traillii extimus</i>	FE, CE	Research at Sierra Nevada breeding sites
Burrowing owl	<i>Athene cunicularia hypugia</i>	FSC, CSC	Research at multiple locations
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	FT	Research on mitigation site and publication
Analytical			
Arroyo southwestern toad	<i>Bufo microscaphus californicus</i>	FE, CSC	Research and report.
Giant garter snake	<i>Thamnophis gigas</i>	FT, CE	Research and publication.
Northern goshawk	<i>Accipiter gentilis</i>	FSC, CSC	Research and publication.
Northern spotted owl	<i>Strix occidentalis</i>	FT	Research and reports. Publication in progress.

¹ FE = Federal Endangered, FT = Federal threatened, FC = Federal candidate for listing, FSC = Federal species of concern, CE = California Endangered, CT = California threatened, CFP = California Fully Protected, CSC = California Species of Concern, G5T1S1 = CNDDDB rating of imperiled throughout California range.

Peer Reviewed Publications

- Smallwood, K. S. 2008. Wind power company compliance with mitigation plans in the Altamont Pass Wind Resource Area. *Environmental & Energy Law Policy Journal* 2(2):229-285..
- Smallwood, K. S., C. G. Thelander. 2008. Bird Mortality in the Altamont Pass Wind Resource Area, California. *Journal of Wildlife Management* 72:215-223.
- Smallwood, K. S. 2007. Estimating wind turbine-caused bird mortality. *Journal of Wildlife Management* 71:2781-2791.
- Smallwood, K. S., C. G. Thelander, M. L. Morrison, and L. M. Ruge. 2007. Burrowing owl mortality in the Altamont Pass Wind Resource Area. *Journal of Wildlife Management* 71:1513-1524.
- Cain, J. W. III, K. S. Smallwood, M. L. Morrison, and H. L. Loffland. 2005. Influence of mammal activity on nesting success of Passerines. *J. Wildlife Management* 70:522-531.
- Smallwood, K.S. 2002. Habitat models based on numerical comparisons. Pages 83-95 *in* Predicting species occurrences: Issues of scale and accuracy, J. M. Scott, P. J. Heglund, M. Morrison, M. Raphael, J. Haufler, and B. Wall, editors. Island Press, Covello, California.
- Morrison, M. L., K. S. Smallwood, and L. S. Hall. 2002. Creating habitat through plant relocation: Lessons from Valley elderberry longhorn beetle mitigation. *Ecological Restoration* 21: 95-100.
- Zhang, M., K. S. Smallwood, and E. Anderson. 2002. Relating indicators of ecological health and integrity to assess risks to sustainable agriculture and native biota. Pages 757-768 *in* D.J. Rapport, W.L. Lasley, D.E. Rolston, N.O. Nielsen, C.O. Qualset, and A.B. Damania (eds.), *Managing for Healthy Ecosystems*, Lewis Publishers, Boca Raton, Florida USA.
- Wilcox, B. A., K. S. Smallwood, and J. A. Kahn. 2002. Toward a forest Capital Index. Pages 285-298 *in* D.J. Rapport, W.L. Lasley, D.E. Rolston, N.O. Nielsen, C.O. Qualset, and A.B. Damania (eds.), *Managing for Healthy Ecosystems*, Lewis Publishers, Boca Raton, Florida USA.
- Smallwood, K.S. 2001. The allometry of density within the space used by populations of Mammalian Carnivores. *Canadian Journal of Zoology* 79:1634-1640.
- Smallwood, K.S., and T.R. Smith. 2001. Study design and interpretation of Sorex density estimates. *Annales Zoologici Fennici* 38:141-161.
- Smallwood, K.S., A. Gonzales, T. Smith, E. West, C. Hawkins, E. Stitt, C. Keckler, C. Bailey, and K. Brown. 2001. Suggested standards for science applied to conservation issues. *Transactions of the Western Section of the Wildlife Society* 36:40-49.
- Geng, S., Yixing Zhou, Minghua Zhang, and K. Shawn Smallwood. 2001. A Sustainable Agro-ecological Solution to Water Shortage in North China Plain (Huabei Plain). *Environmental Planning and Management* 44:345-355.
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- Smallwood, K. Shawn, Lourdes Rugge, Stacia Hoover, Michael L. Morrison, Carl Thelander. 2001. Intra- and inter-turbine string comparison of fatalities to animal burrow densities at Altamont Pass. Pages 23-37 in S. S. Schwartz, ed., Proceedings of the National Avian-Wind Power Planning Meeting IV. RESOLVE, Inc., Washington, D.C.
- Smallwood, K.S., S. Geng, and M. Zhang. 2001. Comparing pocket gopher (*Thomomys bottae*) density in alfalfa stands to assess management and conservation goals in northern California. *Agriculture, Ecosystems & Environment* 87: 93-109.
- Smallwood, K. S. 2001. Linking habitat restoration to meaningful units of animal demography. *Restoration Ecology* 9:253-261.
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- Morrison, M.L., K.S. Smallwood, and M. Robison. 2001. Draft Natural Environment Study for Highway 46 compliance with CEQA/NEPA. Report to the California Department of Transportation. 75 pp.
- Morrison, M.L., and K.S. Smallwood. 1999. NTI plan evaluation and comments. Exhibit C in W.D. Carrier, M.L. Morrison, K.S. Smallwood, and Vail Engineering. Recommendations for NBHCP land acquisition and enhancement strategies. Northern Territories, Inc., Sacramento.
- Smallwood, K. S. 1999. Estimation of impacts due to dredging of a shipping channel through Humboldt Bay, California. Court Declaration prepared on behalf of EPIC.
- Smallwood, K. S. 1998. 1998 California Mountain Lion Track Count. Report to the Defenders of Wildlife, Washington, D.C. 5 pages.
- Smallwood, K.S. 1998. Draft report of a visit to a paint sludge dump site near Ridgewood, New Jersey, February 26th, 1998. Unpublished report to Consulting in the Public Interest.
- Smallwood, K.S. 1997. Science missing in the "no surprises" policy. Commissioned by National Endangered Species Network and Spirit of the Sage Council, Pasadena, California.
- Smallwood, K.S. and M.L. Morrison. 1997. Alternate mitigation strategy for incidental take of giant garter snake and Swainson's hawk as part of the Natomas Basin Habitat Conservation Plan. Pages 6-9 and *iii* illustrations in W.D. Carrier, K.S. Smallwood and M.L. Morrison, Natomas Basin Habitat Conservation Plan: Narrow channel marsh alternative wetland mitigation. Northern Territories, Inc., Sacramento.
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- Smallwood, K.S. 1996. Assessment of the BIOPORT model's parameter values for pocket gopher burrowing characteristics. Report to Berger & Montague, P.C. and Roy S. Haber, P.C., Philadelphia. (peer reviewed).
- Smallwood, K.S. 1997. Assessment of plutonium releases from Hanford buried waste sites. Report Number 9, Consulting in the Public Interest, 53 Clinton Street, Lambertville, New Jersey, 08530.
- Smallwood, K.S. 1996. Soil Bioturbation and Wind Affect Fate of Hazardous Materials that were Released at the Rocky Flats Plant, Colorado. Report to Berger & Montague, P.C., Philadelphia.
- Smallwood, K.S. 1996. Second assessment of the BIOPORT model's parameter values for pocket gopher burrowing characteristics and other relevant wildlife observations. Report to Berger & Montague, P.C. and Roy S. Haber, P.C., Philadelphia.
- Smallwood, K.S., and R. Leidy. 1996. Wildlife and Their Management Under the Martell SYP. Report to Georgia Pacific, Corporation, Martel, CA. 30 pp.
- EIP Associates. 1995. Yolo County Habitat Conservation Plan Biological Resources Report. Yolo County Planning and Development Department, Woodland, California.
- Smallwood, K.S. and S. Geng. 1995. Analysis of the 1987 California Farm Cost Survey and recommendations for future survey. Program on Workable Energy Regulation, University-wide Energy Research Group, University of California.
- Smallwood, K.S., S. Geng, and W. Idzerda. 1992. Final report to PG&E: Analysis of the 1987 California Farm Cost Survey and recommendations for future survey. Pacific Gas & Electric Company, San Ramon, California. 24 pp.
- Fitzhugh, E.L. and K.S. Smallwood. 1987. Methods Manual – A statewide mountain lion population index technique. California Department of Fish and Game, Sacramento.
- Salmon, T.P. and K.S. Smallwood. 1989. Final Report – Evaluating exotic vertebrates as pests to California agriculture. California Department of Food and Agriculture, Sacramento.
- Smallwood, K.S. and W. A. Erickson (written under supervision of W.E. Howard, R.E. Marsh, and R.J. Laacke). 1990. Environmental exposure and fate of multi-kill strychnine gopher baits. Final Report to USDA Forest Service --NAPIAP, Cooperative Agreement PSW-89-0010CA.
- Fitzhugh, E.L., K.S. Smallwood, and R. Gross. 1985. Mountain lion track count, Marin County, 1985. Unpublished report on file at Wildlife Extension, University of California, Davis.

Comments on Environmental Documents

I was retained or commissioned to comment on environmental planning and review documents, including:

- Yuba Highlands Specific Plan (or Area Plan) Environmental Impact Report (2006; 37 pp.);
 - Replies to responses to comments on Mitigated Negative Declaration of the proposed Mining Permit (MIN 04-01) and Modification of Use Permit 96-02 at North Table Mountain (2006; 5 pp);
 - Mitigated Negative Declaration of the proposed Mining Permit (MIN 04-01) and Modification of Use Permit 96-02 at North Table Mountain (2006; 15 pp);
 - Windy Point Wind Farm Environmental Review and EIS (2006; 14 pp and 36 Powerpoint slides in reply to responses to comments);
 - Shiloh I Wind Power Project EIR (2005; 18 pp);
 - Buena Vista Wind Energy Project Notice of Preparation of EIR (2004; 15 pp);
 - Negative Declaration of the proposed Callahan Estates Subdivision (2004; 11 pp);
 - Negative Declaration of the proposed Winters Highlands Subdivision (2004; 9 pp);
 - Negative Declaration of the proposed Winters Highlands Subdivision (2004; 13 pp);
 - Negative Declaration of the proposed Creekside Highlands Project, Tract 7270 (2004; 21 pp);
 - Conditional Use Permit renewals from Alameda County for wind turbine operations in the Altamont Pass Wind Resource Area (2003; 41 pp);
 - UC Davis Long Range Development Plan of 2003, particularly with regard to the Neighborhood Master Plan (2003; 23 pp);
 - Anderson Marketplace Draft Environmental Impact Report (2003: 18 pp + 3 plates of photos);
 - Negative Declaration of the proposed expansion of Temple B'nai Tikyah (2003: 6 pp);
 - Antonio Mountain Ranch Specific Plan Public Draft EIR (2002: 23 pp);
 - Response to testimony of experts at the East Altamont Energy Center evidentiary hearing on biological resources (2002: 9 pp);
 - Revised Draft Environmental Impact Report, The Promenade (2002: 7 pp);
 - Recirculated Initial Study for Calpine's proposed Pajaro Valley Energy Center (2002: 3 pp);
 - UC Merced -- Declaration of Dr. Shawn Smallwood in support of petitioner's application for temporary restraining order and preliminary injunction (2002: 5 pp);
 - Replies to response to comments in Final Environmental Impact Report, Atwood Ranch Unit III Subdivision (2003: 22 pp);
 - Draft Environmental Impact Report, Atwood Ranch Unit III Subdivision (2002: 19 pp + 8 photos on 4 plates);
 - California Energy Commission Staff Report on GWF Tracy Peaker Project (2002: 17 pp + 3 photos; follow-up report of 3 pp);
 - Initial Study and Negative Declaration, Silver Bend Apartments, Placer County (2002: 13 pp);
 - UC Merced Long-range Development Plan DEIR and UC Merced Community Plan DEIR (2001: 26 pp);
 - Initial Study, Colusa County Power Plant (2001: 6 pp);
 - Comments on Proposed Dog Park at Catlin Park, Folsom, California (2001: 5 pp + 4 photos);
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- Pacific Lumber Co. (Headwaters) Habitat Conservation Plan and Environmental Impact Report (1998: 28 pp);
- Final Environmental Impact Report/Statement for Issuance of Take authorization for listed species within the MSCP planning area in San Diego County, California (Fed. Reg. 62 (60): 14938, San Diego Multi-Species Conservation Program) (1997: 10 pp);
- Permit (PRT-823773) Amendment for the Natomas Basin Habitat Conservation Plan, Sacramento, CA (Fed. Reg. 63 (101): 29020-29021) (1998);
- Draft Recovery Plan for the Giant Garter Snake (*Thamnophis gigas*). (Fed. Reg. 64(176): 49497-49498) (1999: 8 pp);
- Review of the Draft Recovery Plan for the Arroyo Southwestern Toad (*Bufo microscaphus californicus*) (1998);
- Ballona West Bluffs Project Environmental Impact Report (1999: oral presentation);
- California Board of Forestry's proposed amended Forest Practices Rules (1999);
- Negative Declaration for the Sunset Sky ranch Airport Use Permit (1999);
- Calpine and Bechtel Corporations' Biological Resources Implementation and Monitoring Program (BRMIMP) for the Metcalf Energy Center (2000: 10 pp);
- California Energy Commission's Final Staff Assessment of the proposed Metcalf Energy Center (2000);
- US Fish and Wildlife Service Section 7 consultation with the California Energy Commission regarding Calpine and Bechtel Corporations' Metcalf Energy Center (2000: 4 pp);
- California Energy Commission's Preliminary Staff Assessment of the proposed Metcalf Energy Center (2000: 11 pp);
- Site-specific management plans for the Natomas Basin Conservancy's mitigation lands, prepared by Wildlands, Inc. (2000: 7 pp);
- Affidavit of K. Shawn Smallwood in Spirit of the Sage Council, et al. (Plaintiffs) vs. Bruce Babbitt, Secretary, U.S. Department of the Interior, et al. (Defendants), Injuries caused by the No Surprises policy and final rule which codifies that policy (1999: 9 pp).

I also issued formal comments on the following documents:

- Draft Program Level EIR for Covell Village (2005; 19 pp);
- Bureau of Land Management Wind Energy Programmatic EIS Scoping document (2003: 7 pp.);
- NEPA Environmental Analysis for Biosafety Level 4 National Biocontainment Laboratory (NBL) at UC Davis (2003: 7 pp);
- Notice of Preparation of UC Merced Community and Area Plan EIR, on behalf of The Wildlife Society—Western Section (2001: 8 pp.);
- Preliminary Draft Yolo County Habitat Conservation Plan (2001; 2 letters totaling 35 pp.);
- Merced County General Plan Revision, notice of Negative Declaration (2001: 2 pp.);
- Notice of Preparation of Campus Parkway EIR/EIS (2001: 7 pp.);
- Draft Recovery Plan for the bighorn sheep in the Peninsular Range (*Ovis canadensis*) (2000);
- Draft Recovery Plan for the California Red-legged Frog (*Rana aurora draytonii*), on behalf of The Wildlife Society—Western Section (2000: 10 pp.);
- Sierra Nevada Forest Plan Amendment Draft Environmental Impact Statement, on behalf of The Wildlife Society—Western Section (2000: 7 pp.);

- State Water Project Supplemental Water Purchase Program, Draft Program EIR (1997);
- Davis General Plan Update EIR (2000);
- Covell Center Project EIR and EIR Supplement (1997);
- Turn of the Century EIR (1999: 10 pp);
- Proposed termination of Critical Habitat Designation under the Endangered Species Act (Fed. Reg. 64(113): 31871-31874) (1999);
- NOA Draft Addendum to the Final Handbook for Habitat Conservation Planning and Incidental Take Permitting Process, termed the HCP 5-Point Policy Plan (Fed. Reg. 64(45): 11485 - 11490) (1999).

Position Statements I prepared the following position statements for the Western Section of The Wildlife Society, and one for nearly 200 scientists:

- Recommended that the California Department of Fish and Game prioritize the extermination of the introduced southern water snake in northern California. The Wildlife Society--Western Section (2001);
- Recommended that The Wildlife Society--Western Section appoint or recommend members of the independent scientific review panel for the UC Merced environmental review process (2001);
- Opposed the siting of the University of California's 10th campus on a sensitive vernal pool/grassland complex east of Merced. The Wildlife Society--Western Section (2000);
- Opposed the legalization of ferret ownership in California. The Wildlife Society--Western Section (2000);
- Opposed the Proposed "No Surprises," "Safe Harbor," and "Candidate Conservation Agreement" rules, including permit-shield protection provisions (Fed. Reg. Vol. 62, No. 103, pp. 29091-29098 and No. 113, pp. 32189-32194). This statement was signed by 188 scientists and went to the responsible federal agencies, as well as to the U.S. Senate and House of Representatives.

Printed Mass Media

Smallwood, K.S., D. Mooney, and M. McGuinness. 2003. We must stop the UCD biolab now. Op-Ed to the Davis Enterprise.

Smallwood, K.S. 2002. Spring Lake threatens Davis. Op-Ed to the Davis Enterprise.

Smallwood, K.S. Summer, 2001. Mitigation of habitation. The Flatlander, Davis, California.

Entrikan, R.K. and K.S. Smallwood. 2000. Measure O: Flawed law would lock in new taxes. Op-Ed to the Davis Enterprise.

Smallwood, K.S. 2000. Davis delegation lobbies Congress for Wildlife conservation. Op-Ed to the Davis Enterprise.

Smallwood, K.S. 1998. Davis Visions. The Flatlander, Davis, California.

Smallwood, K.S. 1997. Last grab for Yolo's land and water. The Flatlander, Davis, California.

Smallwood, K.S. 1997. The Yolo County HCP. Op-Ed to the Davis Enterprise.

Radio/Television

KQED QUEST Episode #111. Bird collisions with wind turbines. 2007;

KDVS Speaking in Tongues (host Ron Glick), Yolo County HCP: 1 hour. December 27, 2001;

KDVS Speaking in Tongues (host Ron Glick), Yolo County HCP: 1 hour. May 3, 2001;

KDVS Speaking in Tongues (host Ron Glick), Yolo County HCP: 1 hour. February 8, 2001;

KDVS Speaking in Tongues (host Ron Glick & Shawn Smallwood), California Energy Crisis: 1 hour. Jan. 25, 2001;

KDVS Speaking in Tongues (host Ron Glick), Headwaters Forest HCP: 1 hour. 1998;

Davis Cable Channel (host Gerald Heffernon), Burrowing owls in Davis: half hour. June, 2000;

Davis Cable Channel (hosted by Davis League of Women Voters), Measure O debate: 1 hour. October, 2000;

KXTV 10, In Your Interest, The Endangered Species Act: half hour. 1997.

Posters at Professional Meetings

Smallwood, K. S. and C. G. Thelander. 2005. Lessons learned from five years of avian mortality research in the Altamont Pass WRA. AWEA conference, Denver, May 2005.

Neher, L., L. Wilder, J. Woo, L. Spiegel, D. Yen-Nakafugi, and K.S. Smallwood. 2005. Bird's eye view on California wind. AWEA conference, Denver, May 2005.

Smallwood, K. S., C. G. Thelander and L. Spiegel. 2003. Toward a predictive model of avian fatalities in the Altamont Pass Wind Resource Area. Windpower 2003 Conference and Convention, Austin, Texas.

Smallwood, K.S. and Eva Butler. 2002. Pocket Gopher Response to Yellow Star-thistle Eradication as part of Grassland Restoration at Decommissioned Mather Air Force Base, Sacramento County, California. White Mountain Research Station Open House, Barcroft Station.

Smallwood, K.S. and Michael L. Morrison. 2002. Fresno kangaroo rat (*Dipodomys nitratoides*) Conservation Research at Resources Management Area 5, Lemoore Naval Air Station. White Mountain Research Station Open House, Barcroft Station.

Smallwood, K.S. and E.L. Fitzhugh. 1989. Differentiating mountain lion and dog tracks. Third Mountain Lion Workshop, Prescott, AZ.

Smith, T. R. and K. S. Smallwood. 2000. Effects of study area size, location, season, and allometry on reported *Sorex* shrew densities. Annual Meeting of the Western Section of The Wildlife Society.

Presentations at Professional Meetings and Seminars

Environmental barriers to wind power. Getting Real About Renewables: Economic and Environmental Barriers to Biofuels and Wind Energy. A symposium sponsored by the Environmental & Energy Law & Policy Journal, University of Houston Law Center, Houston, 23 February 2007.

Lessons learned about bird collisions with wind turbines in the Altamont Pass and other US wind farms. Meeting with Japan Ministry of the Environment and Japan Ministry of the Economy, Wild Bird Society of Japan, and other NGOs Tokyo, Japan, 9 November 2006.

Lessons learned about bird collisions with wind turbines in the Altamont Pass and other US wind farms. Symposium on bird collisions with wind turbines. Wild Bird Society of Japan, Tokyo, Japan, 4 November 2006.

Responses of Fresno kangaroo rats to habitat improvements in an adaptive management framework. California Society for Ecological Restoration (SERCAL) 13th Annual Conference, UC Santa Barbara, 27 October 2006.

Fatality associations as the basis for predictive models of fatalities in the Altamont Pass Wind Resource Area. EEI/APLIC/PIER Workshop, 2006 Biologist Task Force and Avian Interaction with Electric Facilities Meeting, Pleasanton, California, 28 April 2006.

Burrowing owl burrows and wind turbine collisions in the Altamont Pass Wind Resource Area. The Wildlife Society—Western Section Annual Meeting, Sacramento, California, February 8, 2006.

Mitigation at wind farms. Workshop: Understanding and resolving bird and bat impacts. American Wind Energy Association and Audubon Society. Los Angeles, CA. January 10 and 11, 2006.

Incorporating data from the California Wildlife Habitat Relationships (CWHHR) system into an impact assessment tool for birds near wind farms. Shawn Smallwood, Kevin Hunting, Marcus Yee, Linda Spiegel, Monica Parisi. Workshop: Understanding and resolving bird and bat impacts. American Wind Energy Association and Audubon Society. Los Angeles, CA. January 10 and 11, 2006.

Toward indicating threats to birds by California's new wind farms. California Energy Commission, Sacramento, May 26, 2005.

Avian collisions in the Altamont Pass. California Energy Commission, Sacramento, May 26, 2005.

Ecological solutions for avian collisions with wind turbines in the Altamont Pass Wind Resource Area. EPRI Environmental Sector Council, Monterey, California, February 17, 2005.

- Ecological solutions for avian collisions with wind turbines in the Altamont Pass Wind Resource Area. The Wildlife Society—Western Section Annual Meeting, Sacramento, California, January 19, 2005.
- Associations between avian fatalities and attributes of electric distribution poles in California. The Wildlife Society—Western Section Annual Meeting, Sacramento, California, January 19, 2005.
- Minimizing avian mortality in the Altamont Pass Wind Resources Area. UC Davis Wind Energy Collaborative Forum, Palm Springs, California, December 14, 2004.
- Selecting electric distribution poles for priority retrofitting to reduce raptor mortality. Raptor Research Foundation Meeting, Bakersfield, California, November 10, 2004.
- Responses of Fresno kangaroo rats to habitat improvements in an adaptive management framework. Annual Meeting of the Society for Ecological Restoration, South Lake Tahoe, California, October 16, 2004.
- Lessons learned from five years of avian mortality research at the Altamont Pass Wind Resources Area in California. The Wildlife Society Annual Meeting, Calgary, Canada, September 2004.
- The ecology and impacts of power generation at Altamont Pass. Sacramento Petroleum Association, Sacramento, California, August 18, 2004.
- Burrowing owl mortality in the Altamont Pass Wind Resource Area. California Burrowing Owl Consortium meeting, Hayward, California, February 7, 2004.
- Burrowing owl mortality in the Altamont Pass Wind Resource Area. California Burrowing Owl Symposium, Sacramento, November 2, 2003.
- Raptor Mortality at the Altamont Pass Wind Resource Area. National Wind Coordinating Committee, Washington, D.C., November 17, 2003.
- Raptor Behavior at the Altamont Pass Wind Resource Area. Annual Meeting of the Raptor Research Foundation, Anchorage, Alaska, September, 2003.
- Raptor Mortality at the Altamont Pass Wind Resource Area. Annual Meeting of the Raptor Research Foundation, Anchorage, Alaska, September, 2003.
- California mountain lions. Ecological & Environmental Issues Seminar, Department of Biology, California State University, Sacramento, November, 2000.
- Intra- and inter-turbine string comparison of fatalities to animal burrow densities at Altamont Pass. National Wind Coordinating Committee, Carmel, California, May, 2000.
- Using a Geographic Positioning System (GPS) to map wildlife and habitat. Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.
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- Suggested standards for science applied to conservation issues. Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.
- The indicators framework applied to ecological restoration in Yolo County, California. Society for Ecological Restoration, September 25, 1999.
- Ecological restoration in the context of animal social units and their habitat areas. Society for Ecological Restoration, September 24, 1999.
- Relating Indicators of Ecological Health and Integrity to Assess Risks to Sustainable Agriculture and Native Biota. International Conference on Ecosystem Health, August 16, 1999.
- A crosswalk from the Endangered Species Act to the HCP Handbook and real HCPs. Southern California Edison, Co. and California Energy Commission, March 4-5, 1999.
- Mountain lion track counts in California: Implications for Management. Ecological & Environmental Issues Seminar, Department of Biological Sciences, California State University, Sacramento, November 4, 1998.
- “No Surprises” -- Lack of science in the HCP process. California Native Plant Society Annual Conservation Conference, The Presidio, San Francisco, September 7, 1997.
- In Your Interest. A half hour weekly show aired on Channel 10 Television, Sacramento. In this episode, I served on a panel of experts discussing problems with the implementation of the Endangered Species Act. Aired August 31, 1997.
- Spatial scaling of pocket gopher (*Geomys*) density. Southwestern Association of Naturalists 44th Meeting, Fayetteville, Arkansas, April 10, 1997.
- Estimating prairie dog and pocket gopher burrow volume. Southwestern Association of Naturalists 44th Meeting, Fayetteville, Arkansas, April 10, 1997.
- Ten years of mountain lion track survey. Fifth Mountain Lion Workshop, San Diego, February 27, 1996.
- Study and interpretive design effects on mountain lion density estimates. Fifth Mountain Lion Workshop, San Diego, February 27, 1996.
- Small animal control. Session moderator and speaker at the California Farm Conference, Sacramento, California, Feb. 28, 1995.
- Small animal control. Ecological Farming Conference, Asyloamar, California, Jan. 28, 1995.
- Habitat associations of the Swainson’s Hawk in the Sacramento Valley’s agricultural landscape. 1994 Raptor Research Foundation Meeting, Flagstaff, Arizona.
- Alfalfa as wildlife habitat. Seed Industry Conference, Woodland, California, May 4, 1994.
-

- Habitats and vertebrate pests: impacts and management. Managing Farmland to Bring Back Game Birds and Wildlife to the Central Valley. Yolo County Resource Conservation District, U.C. Davis, February 19, 1994.
- Management of gophers and alfalfa as wildlife habitat. Orland Alfalfa Production Meeting and Sacramento Valley Alfalfa Production Meeting, February 1 and 2, 1994.
- Patterns of wildlife movement in a farming landscape. Wildlife and Fisheries Biology Seminar Series: Recent Advances in Wildlife, Fish, and Conservation Biology, U.C. Davis, Dec. 6, 1993.
- Alfalfa as wildlife habitat. California Alfalfa Symposium, Fresno, California, Dec. 9, 1993.
- Management of pocket gophers in Sacramento Valley alfalfa. California Alfalfa Symposium, Fresno, California, Dec. 8, 1993.
- Association analysis of raptors in a farming landscape. Plenary speaker at Raptor Research Foundation Meeting, Charlotte, North Carolina, Nov. 6, 1993.
- Landscape strategies for biological control and IPM. Plenary speaker, International Conference on Integrated Resource Management and Sustainable Agriculture, Beijing, China, Sept. 11, 1993.
- Landscape Ecology Study of Pocket Gophers in Alfalfa. Alfalfa Field Day, U.C. Davis, July 1993.
- Patterns of wildlife movement in a farming landscape. Spatial Data Analysis Colloquium, U.C. Davis, August 6, 1993.
- Sound stewardship of wildlife. Veterinary Medicine Seminar: Ethics of Animal Use, U.C. Davis. May 1993.
- Landscape ecology study of pocket gophers in alfalfa. Five County Grower's Meeting, Tracy, California. February 1993.
- Turbulence and the community organizers: The role of invading species in ordering a turbulent system, and the factors for invasion success. Ecology Graduate Student Association Colloquium, U.C. Davis. May 1990.
- Evaluation of exotic vertebrate pests. Fourteenth Vertebrate Pest Conference, Sacramento, California. March 1990.
- Analytical methods for predicting success of mammal introductions to North America. The Western Section of the Wildlife Society, Hilo, Hawaii. February 1988.
- A state-wide mountain lion track survey. Sacramento County Dept Parks and Recreation. April 1986.
- The mountain lion in California. Davis Chapter of the Audubon Society. October 1985.
-

Ecology Graduate Student Seminars, U.C. Davis, 1985-1990: Social behavior of the mountain lion; Mountain lion control; Political status of the mountain lion in California.

Other forms of Participation at Professional Meetings

- Chair of Animal Damage Management Session, The Wildlife Society, Annual Meeting, Reno, Nevada, September 26, 2001.
- Chair of Technical Session: Human communities and ecosystem health: Comparing perspectives and making connection. Managing for Ecosystem Health, International Congress on Ecosystem Health, Sacramento, CA August 15-20, 1999.
- Student Awards Committee, Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.
- Student Mentor, Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.

Reviews of Journal Papers (Scientific journals for whom I've provided peer review)

Journal	Journal
American Naturalist	Journal of Animal Ecology
Auk	Journal of Raptor Research
Biological Conservation	National Renewable Energy Lab reports
Canadian Journal of Zoology	Oikos
Ecosystem Health	The Prairie Naturalist
Environmental Conservation	Restoration Ecology
Environmental Management	Southwestern Naturalist
Functional Ecology	The Wildlife Society--Western Section Trans.
Journal of Zoology (London)	Proc. Int. Congress on Managing for Ecosystem Health
Journal of Applied Ecology	Transactions in GIS
Ecology	Tropical Ecology

Committees

- Scientific Review Committee, Alameda County, Altamont Pass Wind Resource Area
- Ph.D. Thesis Committee, Steve Anderson, University of California, Davis
- MS Thesis Committee, Marcus Yee, California State University, Sacramento
- Board Member, Iron Mountain Conservancy

Other Professional Activities or Products

Testified in Federal Court in Denver during 2005 over the fate of radio-nuclides in the soil at Rocky Flats Plant after exposure to burrowing animals. My clients won a judgment of \$553,000,000. I have also testified in many other cases of litigation under CEQA, NEPA, the Warren-Alquist Act, and other environmental laws. My clients won most of the cases for which I testified.

Memberships in Professional Societies

The Wildlife Society
Society for Ecological Restoration
Association of Southwest Naturalists
Raptor Research Foundation
American Museum of Natural History

Honors and Awards

Certificate of Appreciation, The Wildlife Society—Western Section, 2000, 2001
Fulbright Research Fellowship to Indonesia, 1987.
Northern California Athletic Association Most Valuable Cross Country Runner, 1984.
J.G. Boswell Full Academic Scholarship, 1981 (Paid expenses for undergraduate education).
American Legion Award, Corcoran High School, 1981, and John Muir Junior High, 1977.
CIF Section Champion, Cross Country in 1978 and Track & Field 2 mile run in 1981.
National Junior Record, 20 kilometer run, 1982.
National Age Group Record, 1500 meter run, 1978

Community Activities

District 64 Little League Umpire, 2003-2007
Dixon Little League Umpire, 2006-07
Davis Little League Chief Umpire and Board member, 2004-2005
Davis Little League Safety Officer, 2004-2005
Davis Little League Certified Umpire, 2002-2004
Davis Little League Scorekeeper, 2002
Davis Visioning Group member
Petitioner for Writ of Mandate under the California Environmental Quality Act against City of Woodland decision to approve the Spring Lake Specific Plan, 2002
Served on campaign committees for City Council candidates

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SUPERIOR COURT OF CALIFORNIA
COUNTY OF SACRAMENTO

VINEYARD AREA CITIZENS FOR RESPONSIBLE GROWTH, INC., ENVIRONMENTAL COUNCIL OF SACRAMENTO, SIERRA CLUB, MARY E. DISKEN and DENNIS R. ROSS. Dept. 33 No. 02CS01214

Petitioners/Plaintiffs,

v.

CITY OF RANCHO CORDOVA, and DOES I-XX,

JUDGMENT AFTER APPEAL

Respondents/Defendants.

SUNRISE DOUGLAS PROPERTY OWNERS ASSOCIATION, SUNRIDGE PROPERTY OWNERS ASSOCIATION, AKT DEVELOPMENT CORPORATION, a California corporation, SUNRIDGE LLC, a California limited liability company, ANGELO K. TSAKOPOULOS, PAUL LAUSEVIC, MILKA LAUSEVIC, HOWARD E. DAVIS, VIRGINIA F. DAVIS, MATHER EAST, a California limited partnership, DOUGLAS ROAD 98 LIMITED PARTNERSHIP, a California limited liability partnership, LOUIE J. PAPPAS, VOULA L. PAPPAS, DOUGLAS-SUNRISE INVESTMENT CO., a California limited liability partnership, WILLIAM E. GEISREITER, RICHARD E. GEISREITER, ELSA D. GEISREITER, RICHARD GEISREITER TRUST, GEISREITER FAMILY TRUST, JAMES D. WEIDINGER AND CHRISTINA WEIDINGER REVOCABLE TRUST, ARCHEL C. AND MARY W. CUPP FAMILY TRUST, RONALD R. RINGEN, SARA J. RINGEN, STEVEN J. SLAGLE, NANCY WHITE, STEPHANIE ST. AMOUR, JAEGER CORNER ENTERPRISES, a general partnership, JAEGER 25, a general partnership, and DOES XXI-LXXX,

Real Parties in Interest..

1 Having considered the parties' respective proposals for a judgment to be entered in
2 this proceeding pursuant to the opinion and directions of the California Supreme Court and the
3 opinion on remand of the Court of Appeal:

4 IT IS ORDERED, ADJUDGED AND DECREED that:

5 1. Portions of the Final Environmental Impact Report (FEIR) for a project
6 comprised of the Sunrise Douglas Community Plan and the SunRidge Specific Plan do not
7 comply with the California Environmental Quality Act (CEQA). (*Vineyard Area Citizens for
8 Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 421.) With respect
9 to long-term water supplies for the project, substantial evidence in the administrative record does
10 not support the factual conclusion in the FEIR that sufficient water supplies are likely to be
11 available to supply the project's long-term water needs (40 Cal.4th at pp. 439-441, 445, 447); the
12 FEIR also fails to adequately identify and analyze the environmental impacts of using specified
13 water sources for the project's long-term water needs and measures to mitigate or avoid those
14 impacts (40 Cal.4th at pp. 441-444, 446); and the FEIR relies on a provision for curtailing later
15 stages of project development if water supplies do not materialize without analyzing the
16 environmental effects of such curtailment. (40 Cal.4th at pp. 444, 447.) With respect to
17 groundwater supplied from the North Vineyard Well Field to meet project water needs in the
18 near term, the FEIR newly discloses a potentially significant impact on flow levels and fish
19 migration in the Consumnes River which should have been analyzed in a revised draft EIR and
20 circulated for public comment under CEQA procedures. (40 Cal.4th at pp. 421, 448-449.)

21 2. A peremptory writ of mandate shall issue, requiring respondent City of Rancho
22 Cordova to:

23 (a) Set aside the certification of those portions of the FEIR for the Sunrise
24 Douglas Community Plan and the SunRidge Specific Plan that the California Supreme Court
25 held to be procedurally and factually inadequate, namely the portions of the FEIR concerning:

26 (1) long-term water supplies for the project; and

27 (2) the potential impact of groundwater pumping from the North Vineyard
28 Well Field on Consumnes River flows and fish migration.

1 (b) Rescind the approvals of the project comprised of the Sunrise Douglas
2 Community Plan and the SunRidge Specific Plan. Any approvals by respondent City of Rancho
3 Cordova of tentative subdivision maps in project areas subsequent to the project approvals are
4 excluded from this rescission order as beyond the court's jurisdiction. The project approvals
5 must be rescinded because the analysis of long-term water supplies required by paragraph 2(c)(1)
6 below pertains to and affects the entire project area, including the area of the SunRidge Specific
7 Plan and other project areas whose water needs are being met in the near term solely with
8 groundwater from the North Vineyard Well Field. As described in the FEIR, all project areas
9 will rely in the long term on the conjunctive use of groundwater and surface water supplied
10 through the Sacramento County Water Agency's Zone 40 system, following the connection of the
11 North Vineyard Well Field to the Zone 40 system during the second phase of the water supply
12 plan for the project. (See FEIR, vol. 1, pp. 7.4 -- 7.7. See also 40 Cal.4th at pp. 422-424, 436-
13 437.) Thus, the long-term water supply analysis required by CEQA must consider the water
14 needs of the entire project area, and no portion of the project may be excluded or severed for
15 purposes of the analysis. To the extent that the water needs of the SunRidge Specific Plan area
16 are to be supplied in both the near term and the long term with groundwater pumped from the
17 North Vineyard Well Field -- a contention by respondent and real parties not reflected in the
18 water supply discussion in the FEIR -- that water supply plan must be analyzed in CEQA
19 proceedings conducted pursuant to paragraph 2(c)(1) below. "The audience to whom an EIR
20 must communicate is not the reviewing court but the public and the government officials
21 deciding on the project." (40 Cal.4th at p. 443.) "CEQA entitles the decision makers and the
22 public to a legally proper procedure and to a clearer, more coherent and consistent explanation of
23 how, given the competing demands expected to arise for new water supplies, water is to be
24 provided to the project." (40 Cal.4th at p. 447.)

25 (c) In accordance with the requirements of CEQA, prepare the following
26 analyses in a revised draft environmental impact report, circulate them for public comment, and
27 take them into account in reconsidering approval of the project:
28

1 (1) an analysis of the long-term water needs of the project which identifies
2 intended water sources, explains how the identified sources are likely to meet the project's water
3 needs, evaluates the environmental impacts of exploiting the identified sources, and discusses
4 measures and alternatives to mitigate the impacts (40 Cal.4th at pp. 421, 449-450);

5 (2) an analysis of potential project impacts on Consumnes River flows and
6 fish migration (40 Cal.4th at pp. 421, 447-449) Contrary to the contention of respondent and real
7 parties, the Supreme Court's determination that these potential impact must be analyzed in a
8 revised draft EIR and recirculated for public comment has not been rendered moot by the
9 analyses and conclusion (that groundwater pumping has no potentially significant impact on
10 Consumnes River flows and fish migration) in the EIR certified by Sacramento County Water
11 Agency for its Zone 40 Master Plan Update in 2005 and the EIR certified by respondent for its
12 General Plan in 2006. The analyses and conclusion of these two later EIRs may not be
13 substituted by the court for the informed decisionmaking process mandated by CEQA for land
14 use projects, including the project comprised of the Sunrise Douglas Community Plan and the
15 SunRidge Specific Plan. Respondent rather than the court must initially and directly consider,
16 with participation by members of the public, the potential impacts of the project on Consumnes
17 River flows and fish migration. Respondent may incorporate relevant portions of the two later
18 EIRs into a revised draft EIR for the project (see 40 Cal.4th at pp. 442-443, citing Pub. Resources
19 Code § 21068.5; Cal. Code Regs., tit. 15, § 15150), but the informed decision-making process
20 and public participation mandated by CEQA may not be bypassed by respondent and real parties
21 in this court; and

22 (3) an analysis of project impacts on public trust resources within the
23 project area (Opinion on Remand, Court of Appeal Case No. C044653, slip opinion, pp. 11-12);

24 (d) File a return in this court within 120 days of receiving personal service of the
25 writ, specifying what has been done to comply with the writ.

26 3. The court retains jurisdiction to ensure compliance with the writ issued pursuant
27 to this judgment.

28

1 4. Petitioners shall recover their costs of suit pursuant to rule 3.1700 of the
2 California Rules of Court.

3 5. The court retains jurisdiction to consider a motion by petitioners for an award of
4 attorney fees pursuant to rule 3.1702 of the California Rules of Court.

5 Dated: May 29, 2008



LLOYD G. CONNELLY
JUDGE OF THE SUPERIOR COURT

SUPERIOR COURT OF CALIFORNIA
COUNTY OF SACRAMENTO

VINEYARD AREA CITIZENS FOR
RESPONSIBLE GROWTH, INC., et al.

Case Number: 02CS01214

vs.

CERTIFICATE OF SERVICE
BY MAILING (C.C.P. Sec. 1013a(4))

CITY OF RANCHO CORDOVA

I, the Clerk of the Superior Court of California, County of Sacramento, certify that I am not a party to this cause, and on the date shown below I served the foregoing **JUDGMENT AFTER APPEAL** and **PEREMPTORY WRIT OF MANDATE** by depositing true copies thereof, enclosed in separate, sealed envelopes with the postage fully prepaid, in the United States Mail at 720 9th Street, Sacramento, California, each of which envelopes was addressed respectively to the persons and addresses shown below:

STEPHAN C. VOLKER
436 14TH ST #1300
OAKLAND, CA 94612

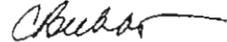
ADAM U. LINDGREN
MEYERS NAVE RIBACK SILVER & WILSON
555 12TH ST #1500
OAKLAND, CA 94607

JASON W. HOLDER
REMY THOMAS MOOSE & MANLEY
455 CAPITOL MALL #210
SACRAMENTO, CA 95814

I, the undersigned Deputy Clerk, declare under penalty of perjury that the foregoing is true and correct.

SUPERIOR COURT OF CALIFORNIA
COUNTY OF SACRAMENTO

Dated: May 30, 2008

By: C. BEEBOUT, 
Deputy Clerk

ORIGINAL

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SUPERIOR COURT OF CALIFORNIA
COUNTY OF SACRAMENTO

VINEYARD AREA CITIZENS FOR
RESPONSIBLE GROWTH, INC.,
ENVIRONMENTAL COUNCIL OF
SACRAMENTO, SIERRA CLUB,
MARY E. DISKEN and DENNIS R. ROSS,

Dept. 33

No. 02CS01214

Petitioners/Plaintiffs,

v.

CITY OF RANCHO CORDOVA, and
DOES I-XX,

PEREMPTORY WRIT OF MANDATE

Respondents/Defendants.

SUNRISE DOUGLAS PROPERTY OWNERS
ASSOCIATION, SUNRIDGE PROPERTY
OWNERS ASSOCIATION, AKT DEVELOPMENT
CORPORATION, a California corporation,
SUNRIDGE LLC, a California limited liability
company, ANGELO K. TSAKOPOULOS,
PAUL LAUSEVIC, MILKA LAUSEVIC, HOWARD
E. DAVIS, VIRGINIA F. DAVIS, MATHER EAST, a
California limited partnership, DOUGLAS ROAD 98
LIMITED PARTNERSHIP, a California limited
liability partnership, LOUIE J. PAPPAS, VOULA L.
PAPPAS, DOUGLAS-SUNRISE INVESTMENT CO.,
a California limited liability partnership, WILLIAM E.
GEISREITER, RICHARD E. GEISREITER, ELSA D.
GEISREITER, RICHARD GEISREITER TRUST,
GEISREITER FAMILY TRUST, JAMES D. WEIDINGER
AND CHRISTINA WEIDINGER REVOCABLE TRUST,
ARCHEL C. AND MARY W. CUPP FAMILY TRUST,
RONALD R. RINGEN, SARA J. RINGEN, STEVEN J.
SLAGLE, NANCY WHITE, STEPHANIE ST. AMOUR,
JAEGER CORNER ENTERPRISES, a general partnership,
JAEGER 25, a general partnership, and DOES XXI-LXXX,

Real Parties in Interest.

1 TO RESPONDENT CITY OF RANCHO CORDOVA:

2 Judgment after Appeal having been entered in this proceeding, ordering that a
3 peremptory writ of mandate issue from this court.

4 YOU ARE HEREBY COMMANDED immediately upon receiving personal service
5 of this writ to:

6 (1) Set aside the certification of those portions of the FEIR for the Sunrise
7 Douglas Community Plan and the SunRidge Specific Plan that the California Supreme Court in
8 *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40
9 Cal.4th 412 held to be procedurally and factually inadequate, namely the portions of the FEIR
10 concerning:

11 (a) long-term water supplies for the project; and

12 (b) the potential impact of groundwater pumping from the North Vineyard
13 Well Field on Consumnes River flows and fish migration.

14 (2) Rescind the approvals of the project comprised of the Sunrise Douglas
15 Community Plan and the SunRidge Specific Plan. Any tentative subdivision maps you approved
16 in project areas subsequent to the project approvals are excluded from this order to rescind the
17 project approvals.

18 (3) In accordance with the requirements of CEQA, prepare the following
19 analyses in a revised draft environmental impact report, circulate them for public comment, and
20 take them into account in reconsidering the project for approval:

21 (a) an analysis of the long-term water needs of the project which identifies
22 intended water sources, explains how the identified sources are likely to meet the project's water
23 needs, evaluates the environmental impacts of exploiting the identified sources, and discusses
24 measures and alternatives to mitigate the impacts (40 Cal.4th at pp. 421, 449-450);

25 (b) an analysis of potential project impacts on Consumnes River flows and
26 fish migration (40 Cal.4th at pp. 421, 447-449); and

27 (c) an analysis of project impacts on public trust resources within the
28 project area (Opinion on Remand, Court of Appeal Case No. C044653, slip opinion, pp. 11-12).

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(5) File a return in this court within 120 days of receiving personal service of the writ, specifying what has been done to comply with the writ.

Dated: May 29, 2008



DENNIS JONES, CLERK OF THE SUPERIOR COURT
By Christa Beebout
CHRISTA BEEBOUT, DEPUTY



**Urban Tree Planting and Greenhouse Gas
Reductions – Discussion Paper**

Greg McPherson, Ph.D.
USDA Forest Service
Center for Urban Forest Research
Davis, CA
March 7, 2007

Several stories have appeared recently in popular news outlets suggesting that trees are not a solution in the fight against global warming. In a report from Reuters (“Trees take on greenhouse gases at Super Bowl”, 30 January 2007), Dr. Ken Caldeira, a Carnegie Institute climate scientist, was reported to say, “It’s probably a nice thing to do, but planting trees is not a quantitative solution to the real problem.” Dr. Philip Duffy of Lawrence Livermore National Laboratory said, “If you plant a tree (CO₂ reductions are) only temporary for the life of the tree. If you don’t emit in the first place, then that permanently reduces CO₂.” Dr. Caldeira had made similar arguments previously in an op-ed in the *New York Times* (“When Being Green Raises the Heat, 16 January 2007).

A *New Scientist* article (“Location is key for trees to fight global warming,” 15 December 2006) reports results from a study by ecologist Dr. Govindasamy Bala of Lawrence Livermore National Laboratory. The model developed by Bala and colleagues indicates that, while trees planted in tropical regions have a clear net cooling effect, trees planted in mid-latitudes may absorb so much heat from the sun that they actually contribute to warming.

These stories fail to capture the complexity of the role that city trees play in fighting global climate change. Trees reduce carbon dioxide in the air, thereby reducing the warming “greenhouse” effect of the gas, in two main ways. First, as they grow, they take carbon dioxide out of the air and transform it into roots, leaves, bark, flowers, and wood. Over the lifetime of a tree, several tons of carbon dioxide are taken up (McPherson and Simpson 1999). In fact, trees are the only known feasible way to remove carbon dioxide from the atmosphere. Even if we were able to switch immediately to fuel sources that do not emit carbon dioxide, the current levels in the air are higher than at any time in the past 400,000 years, according to the UN’s International Panel on Climate Change, and because of the long “lifetime” of carbon dioxide, will remain so for decades or even centuries.

Second, by providing shade and transpiring water, trees lower air temperature and, therefore, cut energy use, which reduces the production of carbon dioxide at the power plant. Two-thirds of the electricity produced in the United States is created by burning a fuel (coal, oil, or natural gas) that produces carbon dioxide—on average, for every kilowatt hour of electricity created, about 1.39 lbs of carbon dioxide is released (eGRID 2002). It is certainly true, as Dr. Duffy states, that not emitting carbon dioxide in the first place is a good strategy. Lowering summertime temperatures by planting trees in cities is one way to reduce energy use and thereby reduce carbon dioxide emissions.

To address the other claims made above: *Are carbon dioxide and other greenhouse gas reductions from tree planting temporary?* In a sense, yes, greenhouse gas reductions are temporary if trees are removed and not replaced. To achieve long-term reductions, a population of trees must remain stable as a whole. This requires a diverse mix of species and ages so that the overall tree canopy cover remains intact, even as individual trees die and are replaced. Although sequestration rates will level off once an urban tree planting project reaches maturity, the reduced emissions due to energy savings will continue to accrue annually. Dead trees can be converted to wood products or used as bioenergy, further delaying, reducing, or avoiding greenhouse gas emissions.

Dr. Caldeira suggests in the Super Bowl article that tree planting projects are "risky." They may appear more risky than reducing emissions by building solar or wind farms because the tree-related climate benefits are less easy to document and because the 50- to 200-year life span of a tree seems less permanent than a new power plant. This uncertainty can be offset by legally binding instruments such as contracts, ordinances, and easements that guarantee tree canopy in perpetuity. And, of course, trees and alternative energy sources are not mutually exclusive—both have a place in reducing carbon dioxide emissions.

Will urban tree planting in mid-latitude cities result in zero or even negative climate benefits? Dr. Bala's study in the New Scientist article describes two main ways trees lower temperature: they remove carbon dioxide from the air, reducing the greenhouse effect, and they release water vapor, which increases cloudiness and helps cool the earth's surface. But because tree leaves are dark, they also absorb sunlight, which increases the temperature near the earth's surface. The difference between trees in tropical latitudes and those in mid-latitudes has to do with the difference in how much sunlight forests reflect compared to other possible surfaces, especially during winter. Snow reflects more sunlight back into the atmosphere than forest vegetation, resulting in less heat trapped near the earth's surface. Large-scale tree planting projects that replace highly reflective surfaces with forests will result in more heat trapped near the ground during winter.

In cities, this fact is less relevant. Asphalt, concrete, and roof surfaces account for 50 to 70% of urban areas, with the remaining area covered by trees, grass, and bare soil. The difference in the solar reflectances, or albedos, of the different urban surfaces is small. Vegetation canopies have albedos of 0.15 to 0.30, the albedo of asphalt is 0.10, that of concrete and buildings is 0.10 to 0.35, and the overall albedo in low density residential areas is 0.20 (Taha et al. 1988). In cities, increasing urban tree canopy cover does not appreciably alter surface reflectance, or increase heat trapping.

At the same time, as described above, a number of field and modeling experiments have found that urban trees reduce summertime air temperatures through evapotranspiration and direct shading (Akbari and Taha 1992, Rosenfeld et al. 1998, McPherson and Simpson 2003). This reduces energy consumption and the emissions related to energy generation.

Do tree-planting projects give people a "feel-good illusion that they are slowing global warming?" The climate benefits of trees in mid-latitude cities are not an illusion, although they certainly feel good. Reductions in atmospheric carbon dioxide are achieved directly through sequestration and indirectly through emission reductions. Still, planting trees in cities should not be touted as a panacea to global warming. It is one of many, complementary bridging strategies, and it is one that can be implemented immediately. Moreover, tree planting projects provide myriad other social, environmental, and economic benefits that make communities better places to live. Of course, putting the right tree in the right place remains critical to optimizing these benefits and minimizing conflicts with other aspects of the urban infrastructure:...

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"Zero-energy" homes planned in Issaquah

By Sonia Krishnan
Seattle Times Eastside bureau



Your future home could come from the recycling bin.

Solar energy would power it.

The best part? Utility bills would be next to nothing.

They're called "zero-energy" homes — homes designed to produce as much electricity as they consume. And in Issaquah, city officials are planning an unusual partnership with a builder to construct King County's first community by 2009.

"This would be the first step in a new paradigm for green development," said Brad Liljequist, sustainable-building and lead urban-design consultant for the Issaquah project.

The 10 energy-saving town houses in the Issaquah Highlands will be aimed at the median market.

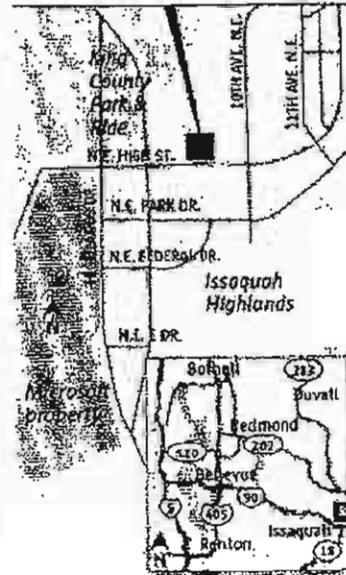
"We don't want this to be for an exclusive few," he said.

The city's efforts follow in the path of a U.S. Department of Energy program pushing zero-energy home construction. "Building America" began in 1995, with a goal to trim household energy use by 70 percent by 2020.

About 2,000 zero-energy homes have been built around the country since 2003, said Tim Merrigan, senior program manager for the National Renewable Energy Laboratory in Golden, Colo.

Federal and state tax credits, coupled with financial incentives from utility companies, are driving the trend forward, builders say.

Zero-energy project site



THE SEATTLE TIMES

While the ultimate goal is to get to zero, most homes end up slashing utility bills 50 percent to 70 percent, Merrigan said.

That's enough to draw increasing numbers of buyers in fast-growing states such as Arizona and California, where residents face some of the nation's highest energy costs. In Washington state, another zero-energy community is planned for Lopez Island, San Juan County.

The timing seems ripe.

In November, the environmental catchphrase "carbon neutral" was selected as The New Oxford American Dictionary's "Word of the Year." Three months later, a team of international climate scientists declared humans to blame for global warming. And late last month, former Vice President Al Gore's documentary on global warming, "An Inconvenient Truth," won an Oscar.

"You could say it's reached a tipping point," Merrigan said.

Residential buildings in America contributed 21 percent of the country's carbon-dioxide emissions to the environment in 2005, according to the U.S. Department of Energy. Inefficient heating and cooling systems, poor insulation and energy-sucking appliances, such as outdated refrigerators, are mostly to blame for high fuel consumption.

Then there's the "standby factor."

Keeping appliances such as stereos, computers and televisions plugged in all day consumes between 500 and 1,000 kilowatt-hours a year per household, said Alan Meier, scientist for Lawrence Berkeley National Laboratory, who has written on the phenomenon.

That's comparable to about one month of power consumption, he said, and equals at least 700 pounds in carbon-dioxide emissions.

"Standby power is one of the biggest obstacles to achieving a zero-energy home," Meier said.

In Issaquah, staff members say they're undeterred by the challenges. The City Council recently approved \$50,000 to study the project. Over the next two years, the city plans to collaborate with a builder and develop the project's design and energy-efficient standards. It will run an educational program for homebuilders and homeowners once the project is built.

The town homes would sit on a half-acre on Northeast High Street in the Issaquah Highlands. The proposed site was donated by Port Blakely Communities, developer of the Highlands, to use as a demonstration tool for future homebuilding, said Judd Kirk, president of Port Blakely.

According to preliminary plans, the homes will range from 500 to 1,700 square feet. The project would:

- Reduce water use by 50 percent over the average household by installing low-flush toilets that use stormwater collected from rooftops and filtered in a nearby tank. This reclaimed water would not be



PREMIER HOMES

This zero-energy community is in Sacramento, Calif. The 10 proposed town houses in Issaquah would have similar energy-efficient features.

used for drinking or showering.

- Produce no stormwater discharge through green roofs and permeable pavement.
- Use a "very high percentage" of locally sourced or recycled materials.
- Use highly durable materials, such as metal roofing instead of asphalt shingles and hardwood floors instead of carpeting.

Issaquah is ahead of most cities when it comes to building "green," environmental advocates say. In 2004, for instance, the city hosted tours and seminars on the Built Green Idea Home — a model home in the Highlands — to inspire people about eco-friendly choices.

"We're trying to be responsive to climate change," said David Fujimoto, manager of Issaquah's resource-conservation office. "Our goal is to really push the envelope and encourage new construction to achieve the highest level of environmental performance possible."

Recycled materials play a big role in zero-energy homes. Lumber planks made from wood and plastic bottles are used for decks, doors or window frames. And fibers taken from recycled newspapers are turned into insulation.

Using the latest technology, zero-energy homes are fitted with rooftop solar panels that convert the sun's rays into electricity.

During the Northwest's long summer days, the homes would send extra kilowatts back to the local utility grid. In the dark winter months, the homes would draw on that power. At the end of the year, the home's net energy use should, theoretically, equal zero.

Most zero-energy homes also come with tankless water heaters, energy-efficient appliances, heavy insulation and improved air-conditioning and heating systems.

The intricate systems help keep indoor temperatures stable, said Chuck Murray, energy specialist for Washington State University and a consultant for Issaquah's project.

If homeowners produce more electricity than they use, utility companies are required to credit them for it under Washington's net-metering law. And, under a state law that took effect last year, those who generate solar energy for the power grid could earn up to \$2,000 a year in cash reimbursements through 2014.

Zero-energy homebuilders say they're seeing more demand as fuel prices rise.

"When we started doing this four years ago, gas was \$1.50 a gallon. Energy efficiency was not in the top five things homeowners were looking for," said John Ralston, vice president of sales and marketing for Premier Homes in Roseville, Calif., near Sacramento.

But sales have taken off so well that an all-solar development is under way in Yuba City, Ralston said.

State-of-the-art-efficiency doesn't come cheap.

The features could tack about \$100,000 on to the Issaquah units, Liljequist said. Rebates and tax credits would help offset that, he said. And strides in technology have made solar panels cheaper and easier to work with than in years past.

But most of all, he said, shrinking square footage will keep costs in line.

"Rather than having that extra-large bonus room, we want to put that money towards living more lightly on the earth," he said.

Sonia Krishnan; 206-515-5546 or skrishnan@seattletimes.com

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**Pacific Northwest National Laboratory***...delivering breakthrough science and technology*[← Previous Page View](#)

Release date: February 16, 2004

Contact: [Bill Cannon](#)
(509) 375-3732

Global warming to squeeze Western mountains dry by 2050

SEATTLE — Global warming will diminish the amount of water stored as snow in the Western United States by up to 70 percent in the coastal mountains over the next 50 years, according to a new climate change model released here today.

The reduction in Western mountain snow cover, from the Sierra Nevada range that feeds California in the south to the snowcapped volcanic peaks of the Cascades in the Pacific Northwest, will lead to increased fall and winter flooding, severe spring and summer drought that will play havoc with the West's agriculture, fisheries and hydropower industry.

"And this is a *best case* scenario," said the forecast's chief modeler, L. Ruby Leung, a staff scientist at the Department of Energy's Pacific Northwest National Laboratory in Richland, Wash. Leung delivered the sobering report at the American Association for the Advancement of Science annual meeting, and the full results of her study will appear soon in the journal *Climatic Change*, now in press.

Leung emphasized the estimate's conservativeness, noting that the climate projections of warming devised by DOE and the National Center for Atmospheric Research are on the low end compared to most other models. Leung's clumping of the models is part of the DOE's Accelerated Climate Prediction Initiative, or ACPI.

ACPI assumes a 1 percent annual increase in the rate of greenhouse gas concentrations through the year 2100, for little change in precipitation and an average temperature increase of 1.5 to 2 degrees centigrade at least through the middle of 21st century. The result: more winter precipitation falling as rain instead of snow, two-tenths of an inch to more than half an inch a day, pushing the snowline in the mountains up from 3,000 feet to

higher than 4,000 feet.

Where we now have snow in the mountains into April, "at mid-century snow will melt off much earlier than that," Leung said, noting research that shows in the past 50 years coastal mountain ranges have already lost 60 percent of their snowpack.

"The change in the timing of the water flow is not welcome," Leung said. "The rules we have now for managing dams and reservoirs and irrigation schedules cannot mitigate for the negative effects of climate change."

If this picture isn't bleak enough, Leung noted that the model does not even address the possibility of population growth and increased demand on water resources. Mountain streams supply power and drinking water to Seattle, Portland and the San Francisco Bay Area and points south in densely populated Northern California, and they feed the booming agricultural industries in the Columbia and Willamette valleys of Washington and Oregon and the San Joaquin Valley in California.

If there is any good news, it can be found farther east, in the Rockies. There, the winters are so much colder that small temperature increases will have less effect on the snowpack, Leung said.

PNNL is a DOE Office of Science research center that advances the fundamental understanding of complex systems and provides science-based solutions in national security, energy, chemistry, the biological sciences and environmental quality. Battelle, based in Columbus, Ohio, has operated PNNL for DOE since 1965.

Webmaster: webmaster@pnl.gov

Reviewed: February 2006



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Performing your original search, **global warming and dry western United States**, in *Science* will retrieve [210978 results](#).

Originally published in *Science Express* on 6 July 2006

Science 18 August 2006:

Vol. 313, no. 5789, pp. 927 - 928

DOI: 10.1126/science.1130370

PERSPECTIVES

CLIMATE CHANGE:

Is Global Warming Causing More, Larger Wildfires?Steven W. Running¹

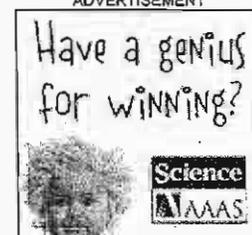
On 3 April 2006, the U.S. weekly news magazine *Time* ran a report on global warming with the cover title "Be worried, be very worried." Similar coverage of global warming has emerged in other general-interest magazines in recent months, triggered by scientific studies that are finding evidence for adverse impacts of global warming occurring today, not merely projected for future decades. These adverse impacts—from higher probabilities of category 4 and 5 hurricanes (1, 2) to higher rates of sea-level rise (3)—are found not in some distant unpopulated region, but rather right in our own back yards.

On page 940 of this issue, Westerling *et al.* (4) come to a similarly discomfiting conclusion for wildfires. They show that warmer temperatures appear to be increasing the duration and intensity of the wildfire season in the western United States. Since 1986, longer, warmer summers have resulted in a fourfold increase of major wildfires and a sixfold increase in the area of forest burned, compared to the period from 1970 to 1986. A similar increase in wildfire activity has been reported in Canada from 1920 to 1999 (5).

Westerling *et al.* used the most comprehensive data set of wildfire occurrences yet compiled for the western United States to analyze the geographic location, seasonal timing, and regional climatology of the 1166 recorded wildfires with an extent of more than 400 ha. They found that the length of the active wildfire season (when fires are actually burning) in the western United States has increased by 78 days, and that the average burn duration of large fires has increased from 7.5 to 37.1 days. Based on comparisons with climatic indices that use daily weather records to estimate land surface dryness, Westerling *et al.* attribute this increase in wildfire activity to an increase in spring and summer temperatures by -0.9°C and a 1- to 4-week earlier melting of mountain snowpacks. Snow-dominated forests at elevations of ~ 2100 m show the greatest increase in wildfire activity.

The hydrology of the western United States is dominated by snow; 75% of annual stream-flow comes from snowpack. Snowpacks keep fire danger low in these arid forests until the spring melt period ends. Once snowmelt is complete, the forests can become combustible within 1 month because of low humidities and sparse summer rainfall. Most wildfires in the western United States are caused by lightning and human carelessness, and therefore forest dryness and hot, dry, windy weather are the necessary and increasingly common ingredients for

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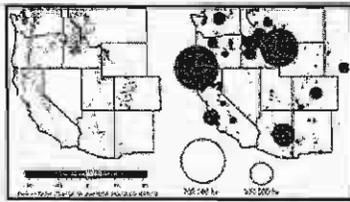


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wildfire activity for most of the summer. Snowpacks are now melting 1 to 4 weeks earlier than they did 50 years ago, and stream-flows thus also peak earlier (6, 7).

Westerling *et al.* found that, in the 34 years studied, years with early snowmelt (and hence a longer dry summer period) had five times as many wildfires as years with late snowmelt. High-elevation forests between 1680 and 2690 m that previously were protected from wildfire by late snowpacks are becoming increasingly vulnerable. Thus, four critical factors--earlier snowmelt, higher summer temperatures, longer fire season, and expanded vulnerable area of high-elevation forests--are combining to produce the observed increase in wildfire activity.

The fires in Yellowstone Park in 1988 (see the first figure) seemed to inaugurate this new era of major wildfires in the western United States. The fires lasted more than 3 months, burning 600,000 ha of forest, and--despite the investment of \$120 million and deployment of 25,000 firefighters--were only extinguished when snow began to fall in mid-September (8).



Less moisture--more fires. Between 1970 and 2003, spring and summer moisture availability declined in many forests in the western United States (left). During the same time span, most wildfires exceeding 1000 ha in burned area occurred in these regions of reduced moisture availability (right). [Data from (4)]

The Yellowstone fires exemplify a common statistic of wildfires: Less than 5% of all wildfires account for more than 95% of the area burned. A small fraction of fires get very large and become uncontrollable despite human efforts to suppress them, regardless of money expended. Such efforts can cost more than \$20 million per day, and seasonal expenditures by governmental agencies in recent years have reached \$1.7 billion.

Fire is an important process for recycling dead biomass in the arid west, where natural decomposition rates are extremely slow (historical repeat photography has shown untreated wooden fenceposts still intact after 100 years). However, this benefit is balanced by the annual damages in the western United States from wildfires that have exceeded \$1.0 billion in 6 of the past 15 years (9).

In 2002, the U.S. Departments of Agriculture and the Interior embarked on a controversial new land management policy called "Healthy Forests," whose stated objective is to clean out dead and dying trees in the west to reduce the risk of wildfires. This initiative blames increasing wildfire activity in the western United States solely on increasing stand density and the buildup of dead fuel as a result of fire exclusion policies; it does not acknowledge any role of changing climate in recent wildfire trends. In contrast, the analysis of Westerling *et al.* suggests that observed increased wildfire activity is at least partially the result of a longer wildfire season acting over a larger forested area. This increased wildfire trend correlates with observed higher temperatures and reduced moisture availability (see the second figure).



Too close for comfort. Wildfire is seen approaching Old Faithful Village, Yellowstone National Park, in 1988.

CREDIT: NPS PHOTO

As part of the upcoming 4th Assessment of the Intergovernmental Panel on Climate Change (IPCC) (10), seven general circulation models have run future climate simulations for several different carbon emissions scenarios. These simulations unanimously project June to August temperature increases of 2° to 5°C by 2040 to 2069 for western North America. The simulations also project precipitation decreases of up to 15% for that time period (11). Even assuming the most optimistic result of no change in precipitation, a June to August temperature increase of 3°C would be roughly three times the spring-summer temperature increase that Westerling *et al.* have linked to the current trends. Wildfire burn areas in Canada are expected to increase by 74 to 118% in the next century (12), and similar increases seem

likely for the western United States.

Wildfires add an estimated 3.5×10^{15} g to atmospheric carbon emissions each year, or roughly 40% of fossil fuel carbon emissions (13). If climate change is increasing wildfire, as Westerling *et al.* suggest, these new sources of carbon emissions will accelerate the buildup of greenhouse gases and could provide a feed-forward acceleration of global warming.

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In Hot Water

Water Management Strategies to Weather the Effects of Global Warming

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The Natural Resources Defense Council is an international nonprofit environmental organization with more than 1.2 million members and online activists. Since 1970, our lawyers, scientists, and other environmental specialists have worked to protect the world's natural resources, public health, and the environment. NRDC has offices in New York City, Washington, D.C., Los Angeles, San Francisco, the Midwest, and Beijing. Visit us at www.nrdc.org.

About the Water Policy Program

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Table of Contents

Foreword.....	iv
Executive Summary.....	vi
Water Management in a Changing Climate	vi
Highlights of Efforts to Incorporate Climate Change into Water Management	x
<i>Chapter 1</i>	
An Overview of Major Scientific Findings on Climate Change	1
<i>Chapter 2</i>	
How Climate Change Will Affect Western Water Supply and Management	4
Climate Change Effects Will Reshape Water Supply in the West	5
Climate Change Will Affect Flood Management	10
Climate Change Will Affect Water Quality	12
Climate Change Will Affect Aquatic Ecosystems.....	12
How Climate Change Will Affect Western Hydropower	15
<i>Chapter 3</i>	
The Water and Energy Connection	17
<i>Chapter 4</i>	
A Guide for Water Managers: Designing a Comprehensive Response to Climate Change	21
Vulnerability Analysis	21
Response Strategies for Dealing with Water Supply Impacts.....	25
Prevention	44
Public Outreach.....	50
<i>Chapter 5</i>	
Conclusions and Recommendations.....	52
Conclusions	52
Recommendations	53
Additional Research Needs.....	57
<i>Appendix A</i>	
Case Studies: Water Agency Action on Climate Change.....	58
<i>Appendix B</i>	
Decoupling Population Growth and Water Use.....	69
Endnotes.....	74

Foreword

The effects of global warming on the health of the planet has been a topic of discussion for decades. However, only recently have the potential impacts of climate change on Western communities become a focus for water resource scientists, planners, and managers. In the American southwest, the severe drought on the Colorado River that began in 2000 served as a wakeup call to water utility managers regarding the possible implications of global warming. Those implications are sobering.

During the last century, long-range forecasts of population growth and water demands in the West have often been underestimated. Add to this fact the reality that stable and reliable water supplies in the West are, for the most part, already allocated. In this age of scarce water supplies, the prospect of climate change should serve as a catalyst for paradigm shifts in the way we manage water. Long-term climate change is adding even more uncertainty to the already difficult task of water resource planning and management.

To respond to the challenges posed by climate change, water managers will need to reevaluate their assumptions concerning storage and use of existing supplies, the amount of water expected to be available in the future, and how scarce or limited supplies should be shared among competing interests. Continued scientific study and dialogue will be of paramount importance to this effort, not only in terms of providing data to help individual utilities manage their respective situations, but also

to facilitate the development of practical local, regional, and national policies.

With this in mind, the Natural Resources Defense Council, Desert Research Institute, and Southern Nevada Water Authority co-sponsored a 2005 conference entitled "Urban Water Supplies and Climate Change in the West." The objectives of the conference were threefold: to educate participants about the most recent studies of climate change and potential water supply impacts; to increase understanding and facilitate dialogue between water scientists and water managers; and to discuss options for addressing the potential impacts of climate change on water supplies. The presentations and discussion at that conference led to this report.

It is clear that global warming is occurring, particularly in the West. In general, temperatures are increasing. Scientists predict that this will likely lead to more runoff from rain, less alpine snow pack, larger winter streamflows, and hotter, drier summers. Communities are likely

to face more flooding and more frequent drought. As the West experiences earlier snowmelts and warmer, rainier winters, rivers and streams will be altered. Natural recharge to groundwater basins could decrease.

To cope with these changes effectively, water utilities will need to act quickly to develop diverse and flexible water resource portfolios that will allow them to reduce demands and adapt their supplies to changing climatic and hydrological conditions. However, from a regional and national perspective, perhaps the most important goal for water utilities will be to pursue increased cooperation and collaboration. In the past, models of water resource planning have emphasized competition for water resources. However, as communities throughout the West become more dependent upon each other to manage available resources, and as these resources prove to be interconnected in a myriad of ways, this competitive model of resource allocation is no longer prudent. Without open, collaborative dialogue among utilities and other

stakeholders, competition for scarce water resources will only result in conflict, stalemate, and shortages.

The accompanying report and recommendations, and the conference that led to them, represent a first step toward addressing some of these difficult long-term issues. This report summarizes the broad potential water management impacts of climate change, the many existing climate-related activities of water managers around the West, and a full range of recommendations for water managers and staff to consider as they incorporate global warming into the planning and management of their agencies.

As the drought on the Colorado River has shown us in the West, even seemingly “permanent” water resources are susceptible to climatic variability. The time to prepare is now.

Patricia Mulroy
General Manager
Southern Nevada Water Authority

Executive Summary

The world's climate is warming—by an average of 1.3 degrees Fahrenheit in the past century. Unless current trends are reversed, global warming pollution is projected to keep increasing rapidly, raising temperatures by as much as 11.5 degrees Fahrenheit by the end of this century and compromising our water supply, flood management systems, and aquatic ecosystems. Experts predict that rising temperatures will lead to less alpine snowpack, earlier and larger peak streamflows, potential reductions in total streamflows, greater evaporative losses, declining ecosystem health, sea level rise, more extreme weather events—including both floods and droughts—and hotter, drier summers. We're already seeing evidence of these trends around the West.

Water managers—including water districts and local, state, and federal agencies with water-related resource management responsibilities—play a key role in Western communities by identifying potential water-related problems and pointing the way to solutions. As stewards of one of the West's most valuable—and scarce—resources, water managers can lead the response to ongoing climate changes and help stave off further damage.

WATER MANAGEMENT IN A CHANGING CLIMATE

Global warming presents challenges regarding water supply, water quality, ecosystem protection, and flood

management—issues that water managers face every day. NRDC has created a blueprint for action, including a set of specific strategies water managers and other decision makers can use as they incorporate climate change issues into management decisions.

Action 1: Evaluate the Vulnerability of Water Systems to Global Warming Impacts

- *Conduct agency assessments of climate change impacts on water supply.* Assessments should analyze water supply and other impacts from projected climate change effects, including reductions of snow pack and earlier



peak streamflows, as well as from projected increases in temperature, which may result in greater environmental protection requirements and higher urban and agricultural water demand.

- *Work with other water managers to evaluate regional vulnerability.* Regional analyses can help water managers understand the common challenges they face and lay the groundwork for cooperative responses. They are especially important for water agencies in large watersheds and regions facing similar climate change–related challenges.

Action 2: Develop Response Strategies to Reduce Future Impacts of Global Warming

- *Consider the impact of climate change on future water management tools.* Water management tools will be affected significantly—but not equally—by climate change. In general, climate change will make increases in efficiency more effective and reduce the yields from traditional surface storage and diversion projects. The table on the next page shows which water management tools will be most helpful in a climate-altered world.

- *Put conservation first.* Increased investments in water efficiency represent a sound and basic “no regrets” water management approach to future climate change impacts.

Cost-effective water conservation investments can generate significant benefits for water supplies and aquatic ecosystems, as well as reduced energy consumption and greenhouse gas emissions.

- *Incorporate climate and energy issues into statewide water planning.* State-level planning efforts should incorporate climate change vulnerability analyses, global warming impacts on management tools, and the energy implications of water management decisions.

- *Consider integrated regional water management strategies.* Water managers should carefully consider an integrated regional water management approach to climate change response. A robust climate change response strategy should include:

- Analysis of potential climate impacts on existing systems, as well as future water supply strategies
- Multiple benefits (e.g., supply, water quality, energy, flood management, and ecosystem benefits)
- An examination of unique regional conditions
- Potential partners to assist in financing and implementation (e.g., energy, stormwater, wastewater, and land use agencies)
- Institutional strengths and responsibilities

The Impacts of Climate Change on Water Management

Global warming is not an issue that we can afford to address with a “wait and see” approach. We must take action immediately or we are at risk of irreversibly damaging some of the West’s precious water resources:

- For every rise of one degree Celsius (1.8 degrees Fahrenheit) in the West, researchers predict that snow levels will retreat upward by 500 feet in elevation.
- Extreme weather events such as floods and large storms could increase in size and frequency, straining the limits of flood control systems and exposing some floodplains and low-lying coastal regions to damage reminiscent of Hurricane Katrina.
- The IPCC projects that sea level will rise by 7 to 23 inches by 2100, affecting water supplies, eroding wetlands, diminishing coastal protection from storms, and exposing residents to severe flood damage. This projection assumes no acceleration of ice melt in Greenland or Antarctica. A new study, published after the deadline for consideration by the IPCC, projects that sea levels will rise by 20 to 55 inches this century based on recent observations.
- The stability of levees in the San Francisco Bay-Delta, which provides a portion of the water supply for more than 20 million Californians, will be threatened by rising sea levels.
- Higher temperatures will decrease salmon, trout, and other fish habitat, thereby increasing conflicts over water resources. Scientists estimate that up to 38 percent of locations currently suitable for coldwater fish could become too warm to provide habitat by 2090.

- A full range of potential water supply and demand strategies
- A full range of flood management options
- “Efficiency first” investments
- A clear “with and without” project analysis for major infrastructure investments
- Stronger, enforceable environmental protections, such as flow and temperature requirements for protected species

- Economic analysis and “beneficiary pays” financing
- Clear objectives and performance standards
- Educating the public and decision makers about climate change
 - **Collaborate with energy utilities.** Water conservation generates substantial water and energy savings, and thus reductions in greenhouse gas emissions. Water agencies should work with local energy utilities to develop joint programs, such as rebate offers, to encourage customers to conserve water and energy.
 - **Consider climate change when making commitments about future water deliveries.** In particular, agencies should avoid promising increased water deliveries based solely on current hydrology, without consideration of future climatic conditions.
 - **Factor in flood management.** For agencies with flood management responsibilities, an awareness of climate change should be integrated into future management decisions. Managers should investigate opportunities such as the reoperation of existing facilities, floodplain restoration, groundwater recharge, and flood-compatible agriculture. To reduce future damage, floodplains should be managed with an awareness that they will be inundated more frequently. This suggests placing an increased emphasis on land use issues.
 - **Protect and restore aquatic ecosystems.** Degraded aquatic ecosystems result in the loss of species and create endangered species conflicts. Healthy aquatic ecosystems will be more resistant to climate impacts, help reduce conflicts, and provide other benefits to water quality, recreation, and flood protection.

Action 3: Prevent Future Impacts by Reducing Greenhouse Gas Emissions

- **Support policies including mandatory caps on emissions.** The IPCC found with at least 90 percent certainty that the current global warming trend is caused primarily by greenhouse gas emissions—particularly carbon dioxide—released through the burning of fossil fuels. Enforcing a mandatory national cap on the pollution that causes global warming is the single most important step in controlling and reducing the future impacts of global warming. While caps would be most effective at the federal level, local, state, and regional initiatives are also important tools in the face of federal inaction.

Table ES-1: Performance of Water Management Strategies After Considering Global Warming Effects

More effective	Not affected	Less effective
<ul style="list-style-type: none"> ▪ Landscape conservation ▪ Conservation rate structures ▪ Agricultural water conservation ▪ Water marketing ▪ Urban stormwater management ▪ Saltwater groundwater intrusion barriers to protect coastal aquifers ▪ Water system reoperation ▪ Interagency collaboration and integrated water management strategies ▪ Floodplain management ▪ Watershed restoration 	<ul style="list-style-type: none"> ▪ Wastewater recycling ▪ Interior water conservation ▪ Groundwater cleanup 	<ul style="list-style-type: none"> ▪ Traditional river diversions ▪ Traditional groundwater pumping ▪ Traditional surface storage facilities ▪ Ocean water desalination*

*Given existing energy requirements.

■ **Take action at the district level.** Water agencies should develop programs to reduce their energy consumption and greenhouse gas emissions. A thorough understanding of the energy implications of water management decisions can lead to a range of options for achieving this goal. (NRDC's 2004 report *Energy Down the Drain* explores this relationship in detail.)

Action 4: Increase Awareness of Global Warming and Water Impacts

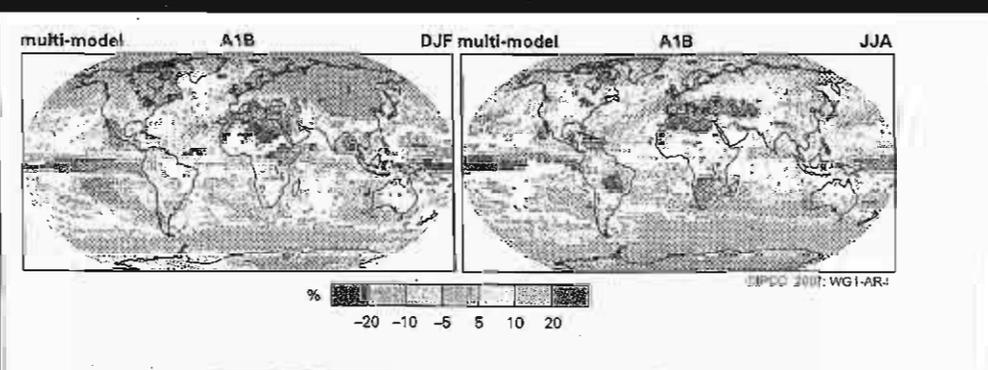
■ **Educate customers and decision makers.** Global warming is not just an environmental concern—it affects the future of all Western communities, particularly through water-related issues. Addressing the impacts

of climate change on water management will require increased awareness and involvement by water district customers and decision makers, including elected officials.

■ **Raise public awareness.** Given the global nature of climate change and the need for far-reaching actions to address its causes, raising public awareness is essential to encouraging effective action. Water managers can play an important role in increasing awareness of global warming and the need to take action. Outreach can take the form of advertisements, media outreach, discussions with business groups, conferences, community forums, and more.

Western communities look to water managers for leadership on water issues. With global warming changing

Figure ES-1: Projected Patterns of Precipitation Changes for Period 2090-2099, relative to 1980-1999



Source: IPCC 2007:: WG1-AR4

the way we think about water in the American West and around the globe, water managers and other decision makers must lead the way in ensuring that our drinking water supply is safe, that our communities are protected from floods, and that our aquatic ecosystems support healthy fish and wildlife populations. The time to prepare is now.

HIGHLIGHTS OF EFFORTS TO INCORPORATE CLIMATE CHANGE INTO WATER MANAGEMENT

Across the West, water agencies and other water managers have begun taking action to address the challenges presented by climate change. Here are a few highlights of those efforts.

Evaluating the Vulnerability of Water Systems to Global Warming Impacts

- Many Western communities, including Seattle, Portland, Denver, the San Francisco Bay Area, and water districts in the Sierra Nevada foothills have undertaken analyses of potential impacts to their existing water systems.
- New Mexico and California have released statewide vulnerability analyses.
- In 2005, the American Water Works Association Research Foundation released *Climate Change and Water Resources: A Primer for Municipal Water Providers*.

Implementing Response Strategies to Reduce Future Impacts

- Denver Water has decided to dramatically accelerate its long-range water conservation program, partially in response to potential impacts from global warming.
- California's Department of Water Resources has issued multiple reports regarding climate impacts, including *Progress on Incorporating Climate Change into Management of California's Water Resources*.
- Southern California's Santa Ana Watershed Project Authority has created a national model for integrated regional water management, producing far-reaching water supply, water quality, energy, and climate benefits.

Preventing Future Impacts by Reducing Greenhouse Gas Emissions

- In California, three water agencies—the Santa Clara Valley Water District, the East Bay Municipal Utility District, and the Marin Municipal Water District—supported AB 32, which Governor Schwarzenegger signed into law in September 2006, creating the nation's first state-level mandatory cap on greenhouse gas emissions.
- The Santa Clara County Water District has helped to create a public/private partnership called Sustainable Silicon Valley, which is working to reduce the emission of global warming gases and other pollutants.
- The Bay Area's East Bay Municipal Utility District (EBMUD) has joined the California Climate Action Registry to report its greenhouse gas emissions, earning the district a "Green Power Leadership" award from the Environmental Protection Agency. Since EBMUD joined the registry, more than a dozen California water agencies have joined as well as Seattle Public Utilities and the Salt River Project.
- The Marin Municipal Water District has joined the Cities for Climate Protection campaign, uniting with dozens of other Western cities that run municipal water utilities to create a strategic agenda to reduce global warming.

Increasing Public and Decision Maker Awareness

- The Santa Clara Valley Water District has added a discussion of global warming to its website, stating that "The reality of global warming and climate change is the most significant long-term threat to water resources management in Silicon Valley."
- In January 2007, the San Francisco Public Utilities Commission convened a Water Utility Climate Change Summit attended by more than 150 water managers and other stakeholders. The conference received significant media coverage.

Chapter 1

An Overview of Major Scientific Findings on Climate Change

All elements of water systems, from watershed catchment areas to reservoirs and conveyance systems to wastewater treatment, will likely be affected by climate change and variability.¹ Rising temperatures, a greater proportion of annual precipitation falling in the form of rain instead of snow, altered streamflow timing, reduced snowpack, increased evaporation and transpiration, greater risk of fires, and a sea level rise—all effects of climate change—will require changes in how our current water systems are managed. And with virtually every major water supply source in the West already overallocated beyond its physical and/or legal capacity to be sustained, the consequences could be significant for Western water supply, water quality, and aquatic ecosystems.

There is broad scientific agreement that climate change is occurring, that emissions of heat-trapping pollution are the primary cause, and that the resulting climate change and variability pose significant dangers to our environment, our health, and our economy.

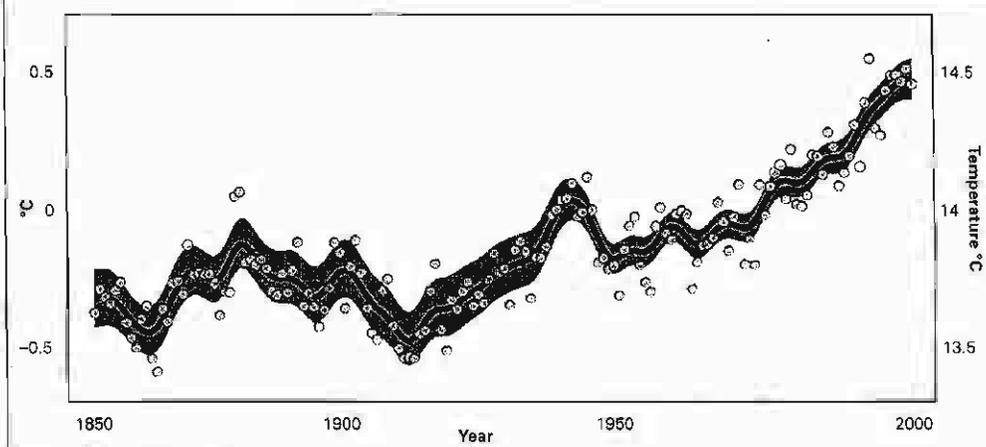
The Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report released in 2007 found, with at least 90 percent certainty, that human activities are causing global warming.² This comprehensive review confirms and lends even greater confidence to the conclusions of the U.S. National Research Council's (NRC) Committee on the Science of Climate Change 2001 report, *Climate Change Science: An Analysis of Some Key Questions*, which found that greenhouse gases are accumulating in the earth's atmosphere as a result of human activities, causing surface air temperatures and subsurface

ocean temperatures to rise. Temperatures are, in fact, rising.³ It also found that the combustion of fossil fuels (coal, oil, and natural gas) is the major source of greenhouse gas emissions (see Figures 1-1 and 1-2).

The IPCC in 2007 projected that the rate of warming over the 21st century—up to 11.5 degrees Fahrenheit—would be much greater than the changes observed during the 20th century. The IPCC projects the following changes as a result of increased temperatures:

- more frequent hot extremes, heat waves, and heavy precipitation events
- more intense hurricanes and typhoons
- decreases in snow cover, glaciers, ice caps, and sea ice

Figure 1-1: Changes in Global Average Temperatures, 1850-2000



Source: IPCC 2007: WG1-AR4

Global Warming Basics

The basic dynamic of global warming is that the earth's temperature is largely regulated by gases that trap heat in the earth's atmosphere. This so-called greenhouse effect allows the earth's temperature to be in the range at which all life on earth has evolved. Increased concentrations of specific gases increase the heat-trapping ability of the atmosphere and are responsible for increasing temperatures. The composition of the earth's atmosphere is particularly important, because certain gases (including water vapor, carbon dioxide, methane, halocarbons, ozone, and nitrous oxide) absorb heat radiated from the earth's surface. Changes in the composition of the atmosphere alter the intensity of the greenhouse effect.

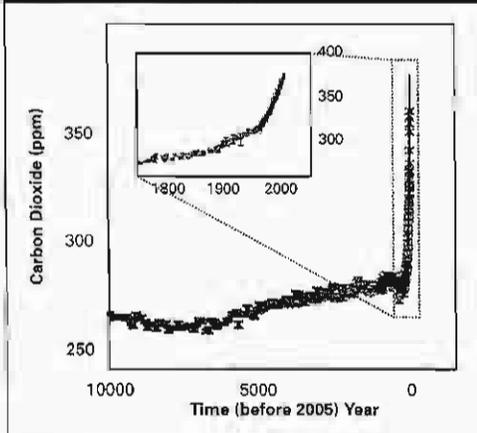
Although natural variability in climate occurs, it is now clear that human activities have been causing most of the global warming since the mid-20th century. We are exerting a major and growing influence on some of the key factors that govern climate by changing the composition of the atmosphere and by modifying the land surface. The concentration of carbon dioxide (CO₂) has risen about

30 percent since the late 1800s. The concentration of CO₂ is now higher than it has been in for at least the last 650,000 years. This increase is the result of the burning of coal, oil, and natural gas and the destruction of forests around the world to provide space for agriculture and other human activities. Rising concentrations of CO₂ and other greenhouse gases are intensifying earth's natural greenhouse effect. Projections of population growth and energy use indicate that, on our current course, the CO₂ concentration will continue to rise, likely reaching between two and three times late-19th-century levels by 2100. This dramatic doubling or tripling will have occurred in the space of about 200 years.

Sources: National Assessment Synthesis Team, 2001. *Climate Change Impacts on the United States, report for the United States Global Change Research Program*. Cambridge University Press, p.12. <http://prod.gcrio.org/nationalassessment/>.

Climate Change 2007: The Physical Science Basis: Summary for Policymakers. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, p.4.

Figure 1-2: Changes in Atmospheric Concentrations of Carbon Dioxide from Ice Core and Modern Data



Source: IPCC 4 Summary for Policy Makers, p. 3

- a rise in global mean sea level of 7 to 23 inches (this projection does not include accelerated ice-sheet melting and other factors)⁴

Recent studies indicate that the range of possible sea level rise may be even greater. A report in *Science* magazine projects a 20- to 55-inch rise in sea levels over the 21st century, based upon recent observations.⁵ This study was published after the deadline for consideration for the IPCC's Fourth Assessment Report.

Changes caused by a warming climate will not necessarily occur in a steady and predictable fashion. A recent report from the NRC, *Abrupt Climate Change: Inevitable Surprises*, shows that some major and widespread climatic changes have occurred with startling speed. The study notes that abrupt changes were most common when the earth's climate was being heated most rapidly, conclud-

ing that "greenhouse warming and other human alterations of the earth system may increase the possibility of large, abrupt, and unwelcome regional or global climatic events."⁶

Although difficult to predict or plan for, climatic shifts—gradual or dramatic—are among the scenarios that water managers must consider in future modeling and planning. Fortunately, some in the water management community are actively engaged in the analysis of climate change impacts and are undertaking analyses of water system vulnerabilities to future climate change effects. For example, in 2005, the American Water Works Association Research Foundation (AWWARF) and the National Center for Atmospheric Research (NCAR) released a report entitled *Climate Change and Water Resources: A Primer for Municipal Water Providers*, and in July 2006 the California Department of Water Resources released *Progress on Incorporating Climate Change into Management of California's Water Resources*.^{7,8} It is clear that water managers will have to adapt to changing climate conditions.

"The water supply for any utility will depend on the quantity and timing of local and regional precipitation, both of which may change with global climate change... Climate change is an additional source of uncertainty that will become increasingly relevant to water resource managers in the 21st century. Just as with any other source of uncertainty, best practice requires understanding as much as possible about the changes that can occur and their implications for operation and management of the utility."

Source: Kathleen Miller and David Yates, *Climate Change and Water Resources: A Primer for Municipal Water Providers* (AWWARF 2006).

Chapter 2

How Climate Change Will Affect Western Water Supply and Management

The snow and ice of western mountain ranges are the lifeblood of water supply and storage in the western United States; their melting snowpack feeds rivers that provide that area of the country with as much as 75 percent of its water supply.¹ An elaborate system of reservoirs, aqueducts, pumping plants, treatment facilities, and other engineered facilities moves the West's water supply from two principal sources: (1) surface water, which is often stored in reservoirs and (2) groundwater.

This water supply infrastructure, matched by an even more elaborate set of laws and policies that govern water use and rights, was designed and engineered for timing and magnitudes of runoff based on our understanding of past hydrological conditions, including temperature, precipitation, and snowmelt patterns.

Climate change and variability will affect the timing, amounts, and form of precipitation, in turn, affecting all elements of water systems from watershed catchment areas to reservoirs, conveyance systems, and wastewater treatment plants.² These systems are already stressed today. Overdraft and contamination of groundwater sources have reduced the availability of groundwater supplies in many areas. Saltwater intrusion in coastal aquifers is a problem in many areas. Climate change has the potential to exacerbate these situations, requiring increased attention from water managers. Extreme events such as droughts and major flood events are particularly challenging for water managers. Climate modeling indicates that these kinds of extreme events are likely to become

more frequent and intense in the future. In fact, there is strong evidence that wildfires, precipitation patterns, and

Figure 2-1: Total Surface and Groundwater Withdrawals by U.S. County



The Western United States withdraws more water than any other region in the nation. The changes to hydrology and water supply that are likely to be caused by global warming threaten to have serious implications for western water management.

Source: USGS 2004

“Climate change has the potential of affecting a wide variety of water resource elements. These range from water supply, hydroelectric power, sea level rise, more intense precipitation events, water use, and a number of miscellaneous items which include water temperature changes.”

Source: Maurice Roos, California’s state hydrologist in draft materials prepared for the California Energy Commission for the Public Interest Research Program (PIER) on Climate Change.

snowmelt are already being influenced by anthropogenic climate change.³

CLIMATE CHANGE EFFECTS WILL RESHAPE WATER SUPPLY IN THE WEST

As the U.S. National Assessment water sector report summarizes, “More than 20 years of research and more than 1,000 peer-reviewed scientific papers have firmly established that a greenhouse warming will alter the supply and demand for water, the quality of water, and the health and functioning of aquatic ecosystems.”⁴ The most significant impacts of global warming on water management—rising temperatures, increasing proportions of annual precipitation in the form of rainfall, disrupted streamflow timing, altered snowpack conditions, increased evaporation and transpiration, greater risk of fires, and sea level rise—are discussed in more detail in the following sections.

Rising Temperatures Could Mean Earlier Snowmelts and Outflows

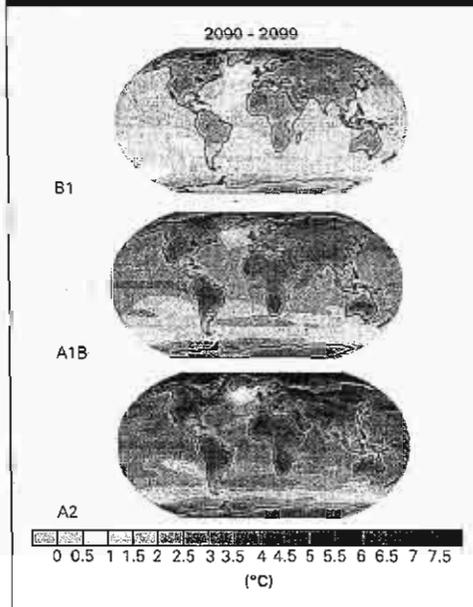
The IPCC 2007 report found that “11 of the last 12 years (1995 to 2006) rank among the 12 warmest years... since 1850.”⁵ Climate models also consistently indicate a warmer future for the U.S. West (see Figure 2-2). Evidence of warming trends is already being seen in winter temperatures in the Sierra Nevada, which rose by almost 2 degrees Celsius (4 degrees Fahrenheit) during the second half of the 20th century. Trends toward earlier snowmelt and runoff to the San Francisco Bay-Delta over the same period have also been detected.⁶ Water managers are particularly concerned with the mid-range elevation levels where snow shifts to rain under warmer conditions, thereby changing the snow storage. Research is also in-

dicating earlier melting and spring flows, as described in more detail in a later section.

Greater Extremes in Precipitation Will Challenge Flood Control and Water Storage

Climatologists expect that global average precipitation will increase, however, some areas will become wetter while others will become drier. In addition, the timing, location, and form (rain versus snow) will likely differ from historical norms. Studies have found an average increase in precipitation in the continental United States of about 10 percent over the last century. The intensity of precipitation has increased for very heavy and extreme precipitation days, with most of the increase in the highest annual one-day precipitation events. Plots of global and U.S. precipitation changes over roughly the past century reveal considerable variation by region. Such findings have serious implications for flood control as well as water supply storage.⁷

Figure 2-2: Projections of Surface Temperature Changes for Late 21st Century



Source: *Climate Change 2007: The Physical Scientific Basis: Summary for Policymakers*. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change

Although there is uncertainty regarding how climate change will affect regional precipitation patterns throughout the American West, several analyses indicate that the Southwest may be drier and that high latitudes may be wetter in the future. For example, a 2007 National Research Council report on Colorado River basin hydrology concluded, "Over the next 10–40 years, there is a tendency in the results of climate model super-ensembles to forecast slightly increased annual precipitation in the Northwestern United States by about ten percent above current values and to forecast slightly decreased annual precipitation in the Southwestern United States by less than ten percent below current values, with relatively little change in annual precipitation amounts forecast for the headwaters regions of the Colorado River."⁸ Potential changes in precipitation patterns will have far reaching implications for water managers, par-

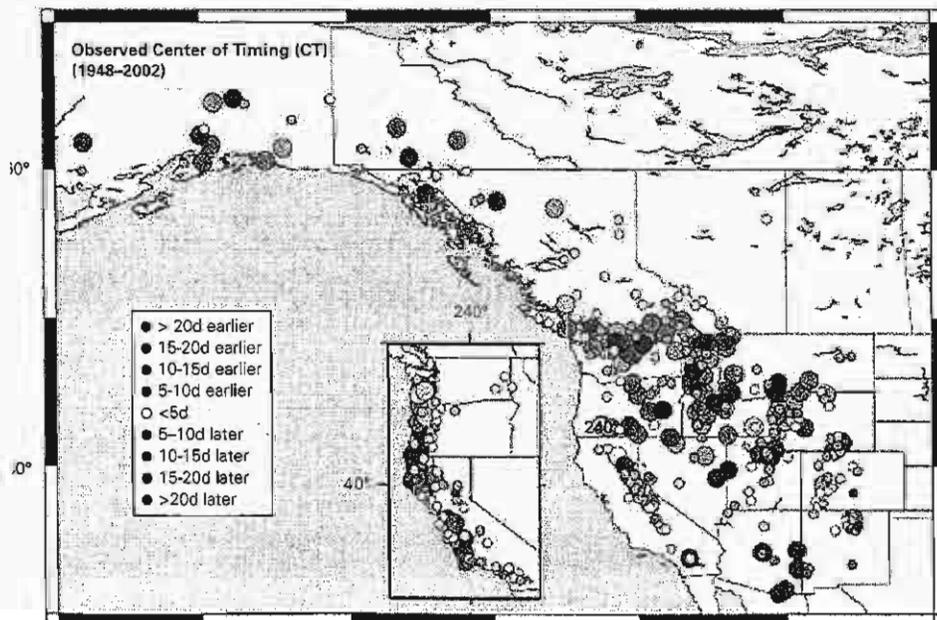
ticularly in oversubscribed river basins—which includes most rivers in the West.

Reduced Snowpack and Earlier Snowmelt Disrupt Streamflows

In the West, streamflow is often strongly influenced by runoff from melting winter snowpacks. Streamflow is characterized by timing, magnitude, frequency, and duration of water flows, all of which are affected by climate change. Water management strategies for supply and flood control are therefore highly attuned to streamflow timing, making any changes in streamflow timing a critical management issue.

Recent studies indicate that changes have already occurred in snowmelt and spring runoff throughout the western region of North America. The United States Geological Survey (USGS), which has been measuring

Figure 2-3: Accelerated Runoff in the West, 1948-2002



Spring runoff in the West, measured in terms of center of timing—the date at which 50% of annual runoff is reached—now occurs 1–4 weeks earlier than 50 years ago.

Source: Steward, Iris T., Daniel R. Cayan, Michael D. Dettinger, April 2005. "Changes toward Earlier Streamflow Timing across Western North America". *Journal of Climate*. http://meteora.ucsd.edu/cap/pdffiles/stewart_timing.pdf

streamflows and spring runoff since the late 19th century, observes that "both measures indicate that flows in many western streams arrive a week to almost 3 weeks earlier now than they did in the middle of the 20th century. The largest changes have been identified in the Pacific Northwest, but the trends also are present in the Sierra Nevada of California, in the Rocky Mountains, and in parts of British Columbia and southern Alaska."⁹ Figure 2-3 shows accelerated spring runoff across the West for the latter half of the 20th century.

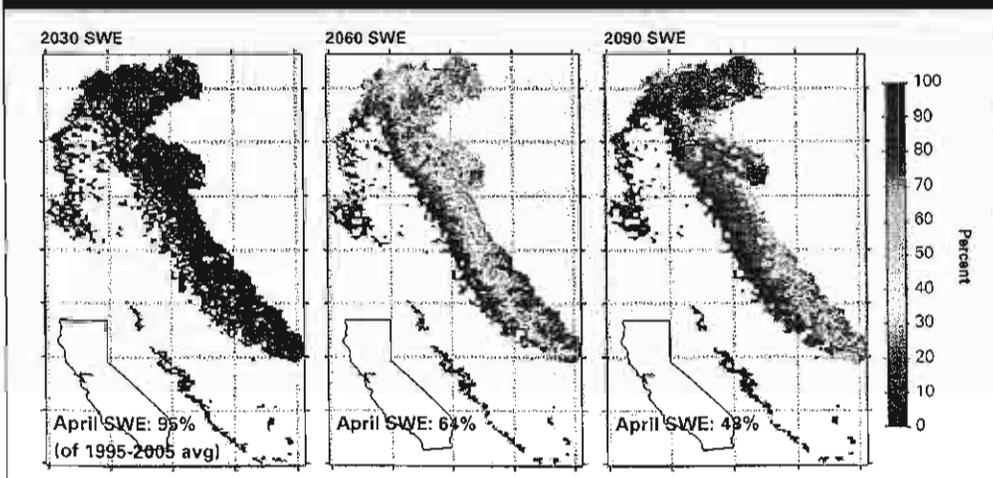
Water agencies have found the same changes in streamflow when analyzing climate changes impacts upon their water systems. For example, Seattle Public Utilities sponsored a study by University of Washington's Climate Impact Group (CIG) to examine global warming's potential effects on Seattle's water system. Their modeling indicates an average decrease in combined inflow volumes to its two primary water sources, the Cedar and Tolt Reservoirs, of approximately 6 percent per decade through 2040—totaling about 5,000 acre-feet by 2040 when compared to historical record.¹⁰

Other recent studies indicate that both early snowmelt and diminished snowpack in the West may be related to increased temperatures due to global warming.¹¹ Runoff indexes for both the Sacramento and San Joaquin rivers in California, for example, show a marked decline in flows during the critical April to July period over the past

century. And researchers have shown that for most of the second half of the 1900s, snowmelt-generated runoff came increasingly early in the water year in many basins in California.¹² A declining fraction of the annual runoff was occurring during the months of April to June in middle-elevation basins, while an increasing fraction was occurring earlier in the water year, particularly in March.¹³ Other studies have reached similar findings of increasing winter and spring floods under conditions in which rain falls on snow.¹⁴

Future changes in snowpack are a cause for concern. One study projected that snow levels will retreat 500 feet in elevation in California for every rise of one degree Celsius.¹⁵ Figure 2-4 shows projections for snowpack impacts in California through the 21st century. An analysis by Peter Gleick published in the journal *Water Resources Research* examined the potential for shifts in runoff in California due to increased temperature.¹⁶ For the study, Gleick used a water-balance model developed for the Sacramento Basin. He based his climate change scenarios on increases in average monthly temperature of 2 and 4 degrees Celsius (4 and 7 degrees Fahrenheit) and changes in precipitation of +/-10 and 20 percent. The study found that summer runoff decreased in all scenarios, whereas winter runoff rose in all those scenarios in which precipitation was kept constant or increased. With an increase in temperature of 4 degrees Celsius (7 degrees

Figure 2-4: Evolution of Average Annual Snow Water Equivalent as a Percentage of Average 1995-2005 Values



Source: Knowles, N. and Dan Cayan. Potential effects of global warming on the Sacramento/San Joaquin watershed and the San Francisco estuary. September 28, 2002. *Geophysical Research Letters*. Vol. 29, No. 18.

Fahrenheit) and an increase in precipitation of 20 percent, the winter runoff rose by 75 percent and the summer runoff decreased by 49 percent.

Increased Evapotranspiration Reduces Total Streamflows

Although there is still significant uncertainty regarding how climate change will affect precipitation patterns in the West, a significant body of analysis suggests that total streamflows in the future will be reduced in comparison with historical levels. This change has powerful implications for water managers.

Increased temperatures are expected to lead to increased evaporation and transpiration, which will increase water loss from standing water and decrease soil moisture levels. A seminal study by Gleick and Nash of the Colorado River basin demonstrated the crucial role evapotranspiration plays in water availability. The authors found that with no change in precipitation, a 2 degree Celsius increase in temperature would reduce mean annual runoff by 4 to 12 percent and that the reduction in runoff for a 4 degree Celsius increase would be between 9 and 21 percent. The authors concluded that if temperature rose by 4 degree Celsius, precipitation would need to jump by nearly 20 percent to maintain historical runoff levels.¹⁷

In 2007, the National Research Council reached similar conclusions in a review of the science regarding hydrologic variability in the Colorado River basin. The investigation included analyses of historical hydrology and likely future variability, as a result of climate change. The report projects that future reductions in total Colorado River streamflow are likely:

"This body of research collectively points to a future in which warmer conditions across the Colorado River region are likely to contribute to reductions in snowpack, an earlier peak in spring snowmelt, higher rates of evapotranspiration, reduced late spring and summer flows and a reduction in annual runoff and streamflow."¹⁸

This projected reduction in total runoff is anticipated as a result of increased losses to evapotranspiration. Specifically, "(h)igher temperatures will cause higher evaporative losses from snowpack, surface reservoirs, irrigated land and land cover surfaces across the river basin."¹⁹

The report discusses the significance of this change from a policy perspective. "Any future decreases in Colorado River streamflow, driven primarily by increasing temperatures, would be especially troubling because the quantity of water allocations under the Law of the River already exceeds the amount of mean annual Colorado River flows."²⁰

Other efforts have also projected potential decreases in total streamflows. For example, analysis by the California Climate Change Center in 2006 found that climate change could lead to significant reductions in total reservoir inflows and total Delta inflows. Approximately two-thirds of model runs revealed likely reductions in total inflows for major northern California reservoirs, with maximum projected reductions of approximately 12 percent.²¹ It is important to note that this analysis does not clearly separate the factors anticipated to cause this reduction.

Potential reductions in total streamflows have far-reaching implications for water managers. This is particularly true because, in many cases, additional water

Table 2-1: Predicted Changes in California's Reservoir and Delta Inflows in 2050 with Climate Change

	Lake Shasta			Folsom Lake			Total Delta Inflows		
	Annual Avg. Inflow (TAF)	Change From Base (TAF)	Change From Base (%)	Annual Avg. Inflow (TAF)	Change From Base (TAF)	Change From Base (%)	Annual Avg. Inflow (TAF)	Change From Base (TAF)	Change From Base (%)
Base	5492			2670			20850		
GFDL A2	5442	-51	-1%	2355	-315	-11.80%	20258	-592	-3%
PCM A2	5177	-315	-5.70%	2410	-260	-9.70%	19939	-911	-4%
GFDL B1	5601	109	2.00%	2368	-302	-11.30%	20071	-778	-4%
PCM B1	5854	362	6.60%	2829	159	6.00%	21789	939	5%

Data derived from Chapter 4 of California Department of Water Resources, Progress on Incorporating Climate Change into Management of California's Water Resources. Technical Memorandum Report, July 2006.

development could be designed to capture flows that are not captured by the current infrastructure. If future average streamflows are lower, it suggests that this infrastructure could be wasted—designed to capture flows that may not be there in the future.

A Warmer Climate Increases the Risk of Fires

Fire is already a serious concern in the West. Where wildlands meet development, fire poses a particular danger to life and property. But fire also provides important benefits and is a necessary process in the West's ecosystems. Many plants actually depend on periodic fire cycles to maintain health and some plants require fire for seed germination. Whether a benefit to the ecosystem or a threat to property, fire can have serious water supply impacts in terms of reduced downstream water quality and loss of reservoir storage capacity due to sedimentation.²²

Studies show that earlier loss of snowpack will lead to increased stress on vegetation, reduced summer soil moisture, and, therefore, increased threat of fire, particularly in the arid West. There is strong evidence from research at Scripps Institute that this is already occurring in the western United States.²³ Two primary ways for climate change and variability to increase the threat of fire are: an oscillation between periods of increased precipitation and periods of drought—as projected in some climate scenarios—could increase fuel loads and create extreme fire conditions, and; warmer temperatures and consequent low moisture content in soils and fuel could create increased fire risk. Heat waves and high winds would exacerbate these conditions. Frank Davis at University of California Santa Barbara notes that “fire behavior models predict a sharp increase in both ignition and fire spread under warmer temperatures combined with lower humidities and drier fuels.”²⁴

A particularly interesting finding from the Southwest Regional Assessment is the relationship of climate to fire cycles evident in the tree-ring record.²⁵ Reconstruction from tree-ring data of wildfire occurrence in the Southwest reveals simultaneous changes occurring after 1700 that reflect climate impacts to wildfire patterns over interannual to centennial time scales.²⁶ Research by Swetnam et al. highlights the importance of understanding how lag times between climatic events and vegetation response influence subsequent fire patterns.²⁷ These lag times have important implications for long-range fire hazard forecasting and ecosystem management. For example, based on a 300-year

record of climate and fire derived from tree-ring analysis, a pattern of one or more wetter-than-normal El Niño winters in the Southwest, followed by a drier-than-normal La Niña winter, establishes preconditions for unusually large and intense wildfires.²⁸ Further, certain kinds of episodic ecological disturbances, such as insect outbreaks, may be traceable to patterns in climatic variability.²⁹

Sea Level Rise Threatens Water Supply, Water Quality and Wetlands

Global warming drives two primary mechanisms of sea level rise: thermal expansion of seawater as the oceans warm, and; melting of mountain glaciers and massive bodies of polar ice—particularly the Antarctic and Greenland ice sheets.

The Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report projects that sea levels will rise by 7 to 23 inches by the year 2100—a consequence that brings profound implications for water resources in the West.³⁰ This estimate does not account for the accelerated melting of the Antarctic and Greenland ice sheets.

The melting of ice sheets brings the largest potential rise in total sea levels, as their complete melting would result in a 70-meter increase in global sea levels.³¹

A great deal of uncertainty exists regarding ice sheet dynamics and the limitations of current modeling. For example, a NASA/University of Kansas study published in the March 24, 2006 issue of *Science* by Jonathan Overpeck and co-authors, estimated that the last time Arctic temperatures were as high as those projected for the 21st century (about 125,000 years ago), sea levels was 4 to 6 meters higher than it is today.³² It is difficult to estimate how long it would take for sea level to rise this much, University of Texas researchers determined that the Greenland ice sheet is currently melting three times faster than during the previous five years, underscoring the already accelerating rates of ice sheet melting.³³ Although uncertainties exist in forecasting the rate of ice sheet melting, acceleration in sea level rise is real, bringing serious implications for coastal land and water supply.

On the West coast, sea level rise presents potentially severe impacts. For example, for the San Francisco Bay and the Sacramento-San Joaquin River Delta, global warming impacts will compromise ecosystem health, water supply, and water quality (see “The Rising Costs of Rising Sea Level”). Sea level rise could also affect water supply by causing wetland erosion and surface water and

The Rising Costs of Rising Sea Level

The predicted increase in physical damage to the coastal structures and coastal erosion associated with sea level rise inundation will have significant and far-reaching costs. The IPCC Third Assessment Report estimates that in the case of a 0.5-meter sea level rise, the financial costs of cumulative flooding impacts to U.S. coastal property would reach at least \$20 billion to \$150 billion. Storm surges and floods have the potential to breach levees, leading to massive economic and social costs—as seen in the aftermath of Hurricane Katrina in New Orleans. These costs must be considered when evaluating the reliability of future water supply projects, particularly those that include the building of storage facilities and physical ocean barriers, such as levees.

Source: Burkett, V., J.O. Codignotto, D.L. Forbes, N. Mimura, R.J. Beamish, V. Ittekkot. "Coastal Zones and Marine Ecosystems" in *Climate Change 2001: Impacts, Adaption, and Vulnerability*, James J. McCarthy, Osvaldo F. Canziani, Neil A. Leary, David J. Dokken, Kasey S. White, eds. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change. 881 p.

groundwater salination. The inundation of wetlands induced by climate change could weaken their critical role as a natural water filtration system.³⁴ In addition, inundation due to sea level rise will increase salinity intrusion into coastal aquifers.³⁵

CLIMATE CHANGE WILL AFFECT FLOOD MANAGEMENT

Flood management has been the cause of growing concern—and cost—throughout the United States, particularly in the West as floodplains are urbanized. According to data from the National Weather Service, from 1955 to 2003 the average annual cost of flood damages combined for California, Washington, Oregon, Nevada, New Mexico, Utah, Colorado, Arizona, and Montana has been more than \$332 million in today's dollars.³⁶ However, for the period between 1994 and 2003 the annual average was almost \$930 million per year—an increase reflecting the growing severity of a situation that will only be made worse by the effects of climate change.

In the West, the majority of the annual precipitation occurs in the winter and early spring. That timing creates

a tension between flood control and water supply. Most large reservoirs serve a dual purpose: providing flood protection during the wet months and water supply during the rest of the year. In order to provide flood protection, reservoirs must keep a percentage of their total storage capacity empty in the event that space is needed to capture high flows and prevent flooding downstream. But as the end of the wet season nears, water managers must balance the risk need to maintain sufficient storage space in their reservoirs for flood protection against the risk of leaving too much storage space and not filling reservoirs with water that will be needed during the dry season.

Scientists indicate that climate change will exacerbate the problem of flooding by increasing the frequency and magnitude of large storms, which in turn will cause an increase in the size and frequency of flood events. The increasing cost of flood damages and potential loss of life will put more pressure on water managers to provide greater flood protection. At the same time, changing climate conditions (decreased snowpack, earlier runoff, larger peak events, etc.) will make predicting and maximizing water supply more difficult. Water managers should be prepared to respond to these new challenges by improving floodplain management, and considering the reoperation of existing reservoirs and other water supply infrastructure.

Walking the Tightrope: Managing Dams for Water Supply and Flood Protection

Even under normal circumstances, maximizing water supplies is complicated by the inherent unpredictability of weather. To walk this tightrope, water managers work throughout the spring with snowpack data, and often aided

"Intensification of the hydrological cycle could make reservoir management more challenging, since there is often a tradeoff between storing water for dry-period use and evacuating reservoirs prior to the onset of the flood season to protect downstream communities. It may become more difficult to meet delivery requirements during prolonged periods between reservoir refilling without also increasing the risk of flooding."

Source: Climate Change and Water Resources, AWWARF

by computer models, to assess likely runoff into storage facilities. However this is an imprecise science at best because forecasting seasonal weather patterns for even a few weeks, let alone a month or two, is highly uncertain. The changes in snowpack and precipitation patterns related to

global warming will make maximizing water supplies without increasing the risks of flooding even more challenging.

Despite some increases in winter precipitation, much of the mountainous West has experienced declines in spring snowpack over the past 50 years. According to two studies by climate scientists at the University of

The Other New Orleans: California's Delta and Sea Level Rise

Sea level rise has the potential to be among the most visible, harmful, and costly impacts of climate change. A rising sea level presents particular challenges for low-lying urban areas. California's San Francisco Bay-Delta provides an important example of the potential water supply impacts of climate-driven sea level rise.

The Delta represents the upper tidal reach of San Francisco Bay, the largest estuary on the western coast of the Americas. The Delta's watershed includes 40 percent of the state. The Delta is a significant surface water source and the state's largest riverine ecosystem—a resource of enormous environmental and economic value.

More than 20 million people rely on it for a portion of their water supply; water for Central Valley farms, parts of the San Francisco Bay Area, and Southern California is diverted by massive water pumps in the Southern Delta. And although most of the 1,000-square-mile tule marsh that was once the Delta has been converted to farmland, the Delta still plays a critical role in supporting the biggest salmon run south of the Columbia River. Every winter its islands fill with swans, geese, and sandhill cranes. The hundreds of miles of channels that wind through dozens of leveed agricultural islands are a Mecca for boaters, windsurfers, and anglers. Four-hundred-thousand Californians live in Delta communities. The Delta is also crisscrossed by infrastructure, including power lines, and highways.

The Achilles heel of the San Francisco Bay-Delta may be the confluence of three factors: subsidence, sea level rise, and high levels of water diversions. When the Delta's light peat soils are farmed, they blow away, compact, and oxidize, causing the elevation of these farmlands to fall. Today, thousands of acres of Delta islands are 20 feet or

more below sea level. It's not uncommon to stand on Delta farmland and look up at a boat 20 feet overhead as it sails by on the other side of a levee. In parts of the Delta, subsidence is continuing at 1 to 3 inches per year.

A recent study by Jeffrey Mount of the University of California at Davis and Bob Twiss of the University of California at Berkeley found that the Delta's

future is threatened by several factors: ongoing subsidence, shaky century-old levees, floods, earthquakes, and sea level rise. Mount and Twiss estimated that the Delta has a 64 percent chance of a catastrophic failure of multiple Delta levees by 2050. Such a failure would threaten the Delta's residents, farms, and infrastructure.

If many islands were to flood simultaneously, particularly during the summer when less fresh water flows from the rivers that feed the Delta, it could draw salty San Francisco Bay water into the Delta, threatening important water supplies. The economic impacts of such a catastrophic failure could be widespread and long lasting. The failure of New Orleans' levees has awakened California water users and agencies to the long-term risks to stability of the Delta. Of all of the challenges facing the San Francisco Bay-Delta, sea level rise may be the most critical. There are more than 1,100 miles of Delta levees, many of which are in poor repair. Improving and raising all of these levees several feet may be financially infeasible.

Sources: U.S. Geological Survey, "Delta Subsidence in California," April 2000. <http://science.calwater.ca.gov/pdf/fs00500.pdf>.

Mount, Jeffrey, UC Davis, and Bob Twiss, UC Berkeley.

"Subsidence, Sea Level Rise and Seismicity in the Sacramento-San Joaquin Delta." *San Francisco Estuary and Watershed Science*, Vol. 3, No. 1, March 2005.



Farm flooding resulting from 2004 Jones Tract levee failure

“Models project that increasing atmospheric concentrations of greenhouse gases result in changes in frequency, intensity and duration of extreme events, such as more hot days, heat waves, heavy precipitation events and fewer cold days. Many of these projected changes would lead to increased risks of floods and droughts in many regions...”

Source: Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2001: Synthesis Report, Summary for Policymakers*

Washington and the University of Colorado, snowpack has decreased by 15 to 75 percent in parts of Oregon, western Washington, northern California and the northern Rockies, mainly because of climate change.³⁷ Increased temperatures cause a greater percentage of wintertime precipitation to fall as rain instead of snow.³⁸ The resulting reduction in snowpack causes a drop in the total amount of spring snowmelt runoff. The snowpack that does form is melting earlier in the year, further exacerbating changes in stream hydrology.³⁹

The magnitude and frequency of larger high flow events are predicted to increase under climate change for two primary reasons. The first is related to the decrease in snowpack. Several 2002 climate change studies found that in California, peak streamflow occurred up to two months earlier in the year due to a decrease in the number of freezing days in the season, a drop in snowpack, and an increase in early snow melt.⁴⁰ The studies also showed that such changes “suggest that 50 percent of the season runoff will have occurred early in the year for many snow melt driven watersheds in the West, and the resulting early snow melt implies higher streamflow increases and an increased likelihood of more flood events in future years.”⁴¹

A second factor causing higher peak flows is the basic relationship among temperature, evaporation rates, and the amount of moisture in the atmosphere. Climate models show that the warming of the earth’s surface increases evaporation and the amount of water vapor in the atmosphere. Increases in water vapor, a primary factor in providing moisture for rain, will mean heavier precipitation during storm events. The USGS modeled the effects of climate change on increased storm intensity and found that the risk of a 100-year flood event will grow larger in the 21st century. Instead of a 1 percent chance that in any year there will be a 100-year flood event, the likelihood in a single year could become as high as one in seventeen.⁴²

CLIMATE CHANGE WILL AFFECT WATER QUALITY

Changes in precipitation, flow, and temperature associated with climate change will likely exacerbate water quality problems. Changes in precipitation affect water quantity, flow rates, and flow timing.⁴³ Decreased flows can exacerbate the effect of temperature increases, raise the concentration of pollutants, increase residence time of pollutants, and heighten salinity levels in arid regions.⁴⁴

On the one hand, higher water flows can dilute point-source pollutants, drive up loadings from non-point source pollutants, and reduce the residence time for contaminants. Higher flows can also increase the export of pollutants to coastal wetlands and deltas.⁴⁵ In addition, higher flows can cause higher turbidity in lakes, which reduces the light penetration crucial to the health of aquatic life.⁴⁶ On the other hand, where surface flows decline, erosion rates and sediment transport may drop, and lake clarity may improve but this may increase the concentration of pollutants.

The effect of climate change on water quality will also be felt at our beaches, as the rate of beach closures will likely go up. In recent years, beaches have been closed repeatedly because of unhealthy levels of bacteria and other contaminants in the water.⁴⁷ The primary cause of these high bacterial levels is runoff from storms. Rain that is channeled into storm drains and backed up into sewage systems flushes bacteria, feces, pesticides and pollutants such as motor oil and trash into coastal waters. The increase in severe storm events predicted by global warming models is likely to mean more polluted runoff in a climate-altered future.

Finally, as discussed earlier, climate change is likely to increase fire risks in much of the West. This increase in burning in western watersheds has the potential to increase downstream fire-related sedimentation and other water quality problems. For example, heavy rainfall in Colorado in 1996, following the 12,000-acre Buffalo Creek fire, deposited 600,000 cubic yards of sediment into a Denver Water storage facility in the Upper South Platte River basin.⁴⁸ This amounted to more than 13 years of average siltation in just a few days. Such events may be larger and more frequent with climate change.

“Aquatic and wetland ecosystems are very vulnerable to climate change. The metabolic rates of organisms and the overall productivity of ecosystems are directly regulated by temperature. Projected increases in temperature are expected to disrupt present patterns of plant and animal distribution in aquatic ecosystems. Changes in precipitation and runoff modify the amount and quality of habitat for aquatic organisms, and thus, they indirectly influence ecosystem productivity and diversity.”

Source: Pew Center on Global Climate Change, *Aquatic Ecosystems and Global Climate Change: Potential Impacts on Inland Freshwater and Coastal Wetland Ecosystems in the United States*, 2002.

CLIMATE CHANGE WILL AFFECT AQUATIC ECOSYSTEMS

The United States is home to more than 800 fish species and thousands of aquatic invertebrates and insects found nowhere else.⁴⁹ The extinction rate for freshwater species in this country equals or exceeds that of other ecosystems.⁵⁰ The aquatic ecosystems found within our streams, lakes, and wetlands have been negatively affected for decades by changes in the environment such as dam construction and flow diversions, loss of habitat associated with development, decreased water quality, and now, climate change. Climate change will further exacerbate the current challenges faced by aquatic ecosystems. Understanding how climate change impacts aquatic ecosystems will allow water managers to implement appropriate strategies that support long-term aquatic ecosystem health, reduce endangered species related conflicts, and minimize impacts on water supplies. There are two major ways that climate change will impact ecosystems: increased temperatures and altered hydrology.

Increased Temperatures

Water temperature influences aquatic ecosystems primarily in terms of ecological and biological factors such as dissolved oxygen levels and the ability of a species to exist within the range of temperatures. Climate change will increase air temperatures, and hotter air will translate into warmer water temperatures in streams and rivers.^{51,52} Warmer water will cause increased stress on aquatic spe-

cies that may already be near their limit of temperature tolerance because they inhabit low-elevation areas or are near the southern edge of their distribution.

In response to climate change, many species will need to expand their range northward, or into cooler, higher elevations upstream, otherwise they will disappear from the watershed. Studies have found that a 4 degree Celsius increase would require some species to move approximately 420 miles northward to find temperature conditions similar to that of their original habitat.⁵³ The ability of species to adjust their range depends on its ability to move and find suitable habitat. Although avian species may be more mobile, resident fish and plants are less likely to be able to disperse to new locations, even over several generations. Migration barriers and the highly fragmented nature of most of our remaining riverine ecosystems pose many challenges to such geographic shifts.

Even if species can move within a watershed, new conditions at higher elevations may not be suitable for the displaced species. Fish that need deep pools or the lower flow velocities conditions typical of lower elevations within a watershed may be unable to find such conditions in the steeper reaches upstream. Dams and other infrastructure may also prevent access to portions of the river upstream. Overcoming these challenges is made all the more difficult by the fact that the current rapid rate of climate change will pressure species to adapt over decades, not the centuries normally needed to adapt to historic climate change.

Increased water temperatures and seasonally reduced streamflows will alter many ecosystem processes, with potential direct societal costs.⁵⁴ In addition to negatively impacting species, higher water temperatures will decrease water quality. As water temperatures rise, the amount of dissolved oxygen in water drops.

On the lower San Joaquin River in California, reduced dissolved oxygen levels have caused fish kills and created temporary seasonal barriers to the migration of salmon. Upstream dams and diversions have lowered streamflows. Lower flows have in turn led to increased water temperatures, concentrated nutrient loading from agriculture runoff and wastewater discharge.⁵⁵

When higher water temperatures promote the growth of algae, this can further cut the amount of dissolved oxygen in the water, creating stressful or fatal conditions for fish. Higher water temperatures can also negatively impact ecosystem dynamics, including predator-prey relationships. On the Columbia River in Washington, for instance, warmer temperatures have created a thermal

Fish at Risk: Salmon in the Klamath River and Silvery Minnow in the Rio Grande

In recent years, the West has seen numerous water resource conflicts pitting protection of threatened and endangered species against the need for water supplies. The salmon kills on the Klamath River and the near extinction of the silvery minnow on the Rio Grande are the kinds of conflicts likely to become more common due to climate change impacts on already impaired aquatic water ecosystems.

A series of dams and diversions provide water for agriculture on the Klamath River in the northern California. At the same time, these dams and diversions significantly reduce in-stream flows. In 2002, low flows contributed to high water temperatures, which impeded migration and



caused the death of more than 35,000 adult salmon. As a result of the adult fish kills in 2002 and the severely reduced population of juveniles the following year, salmon fisheries were heavily restricted in 2006 in California to protect the few returning Klamath adults, even though strong runs of salmon were returning on other rivers along the coast and in the Central Valley. The fishing restrictions hit the already struggling fishing industry hard.

Similarly, the Rio Grande silvery minnow was listed under the Endangered Species Act in 1994; it faced possible because of loss of habitat and the effects of dams and diversions constructed for municipal and agricultural use. Continued declines in the silvery minnow population lead to lawsuits against the Bureau of Reclamation and the Army Corps of Engineers. Today, this species is found in less than 5 percent of its historic range and is heavily managed to prevent its extinction.

Climate change will add new stresses to those associated with water supply diversions. As a result, aquatic ecosystems and sensitive species may be pushed to the point of collapse, thereby increasing the likelihood of even greater conflicts and the need to reduce water supply diversions to meet regulatory protections.

Source: Ikenson, B., 2002. "Rio Grand Silvery Minnow." *Endangered Species Bulletin*, March/June 2002, Vol. XXVII, No. 2.

barrier to migration for Coho salmon and have resulted in increased predation on juveniles by predator species.⁵⁶

Not all impacts of warming will be harmful. For species that are limited in range due to cold temperatures, particularly in the northern latitudes, a warmer climate may have benefits. However, the benefits to relatively few species are vastly outweighed by the negative impacts that climate change will have on other species and ecosystems in the western states.

Altered Hydrology

The effects of climate change on seasonal variations in streamflows may have significant impacts on fish species, regardless of changes in water temperature. The hydrology of streams—including the timing, magnitude, frequency, and duration of flows—significantly influences the nature of stream ecosystems, particularly the

physical characteristics such as the shape of the channel. Many species time their movements up or downstream or out to sea to take advantage of often temporary in-streamflow conditions. Regional shifts in climate that substantially and permanently alter the timing and magnitude of flows can further impact habitat suitability for many species.⁵⁷ As a result, alterations in timing and amount of rainfall can significantly impact their ability to reproduce and cause decreases in population numbers.

In the West, the typical snowmelt-driven stream hydrology entails high spring flows followed by lower summer, fall and winter base flows. But global warming is causing earlier snowmelt by increasing winter and springtime temperatures. Earlier snow melt changes the timing of high flows that are important to aquatic species for reproduction and predator avoidance.⁵⁸ In many western streams, spring runoff is critical to the rearing of

juvenile fish and the downstream migration for salmon on their way to the sea.

Earlier runoff can also result in lower streamflows in the summer and fall. Lower flows may result in warmer and shallower stream conditions that make it more difficult for migratory fish. Similar impacts of reduced in-streamflows already occur on many major rivers due to impoundment or flow diversion. Climate change could exacerbate this problem by shifting seasonal patterns of precipitation and in-streamflow.

Increased frequency and magnitude of peak flows have been observed and they are predicted by a number of climate models.^{59,60} In the West, models show that an increased percentage of precipitation falling as rain instead of snow will mean higher peak flows even if total precipitation stays the same. The resulting increase in peak flows has implications for public safety as discussed earlier in this report and can also negatively impact aquatic ecosystems. Increased intensity of precipitation will lead to more runoff, which in turn can cause more sediment and pollution from the contributing watershed to make their way into water bodies. Higher flows can increase the rate at which beneficial nutrients are flushed out of the watershed and can displace species downstream to potentially less suitable habitat. The cumulative effects of higher peak flows can also cause significant shifts in species composition and may change some habitats so much that some species are eliminated from affected areas.⁶¹

For many species that are already struggling, the relatively rapid change in seasonal hydrology combined with increasing water temperatures will further degrade important habitats, increasing the need for environmental protection measures, such as flow and temperature requirements. The extent to which water supplies are affected by management actions requiring decreased flow diversion will largely depend on whether there are other management options to mitigate the impacts related to climate change. Adequate flows are essential to sustain aquatic ecosystems and sensitive species. But nonflow actions such as removing migration barriers, improving water quality, and restoring habitat can significantly reduce the need for additional flows.

HOW CLIMATE CHANGE WILL AFFECT WESTERN HYDROPOWER

The West relies on dams, in addition to water supply and flood control, for hydropower generation. In California,

Cold-Water Fish Such as Trout and Salmon Threatened by Warmer Waters

Cold-water species such as trout and salmon will be particularly vulnerable to warming waters. A study by Eaton and Scheller found that higher maximum temperatures in streams across the continental United States caused by an average air temperature increase of about 4 degrees Celsius would result in a decline of about 50 percent in thermally suitable habitat for 57 species that require cold or cool water—including game fish such as trout, salmon, and perch. Other researchers have predicted that an increase in air temperature of 3 degrees Celsius in streams of the Rocky Mountain region would reduce suitable stream habitat for trout by up to 54 percent.

Of particular concern is the number of streams that will cease to support a wide range of trout and salmon species due to increased temperatures. An analysis based on emission scenarios provided by the Intergovernmental Panel on Climate Change (IPCC) found that up to 38 percent of locations currently suitable for cold-water fish will become too warm to provide habitat by 2090.

Sources: Eaton, J.G., and R.M. Scheller, 1996. "Effects of Climate Warming on Fish Thermal Habitat in Streams of the United States." *Limnology & Oceanography* 41:1,109-1,115.

Keleher, C.J., and F.J. Rahel, 1996. "Thermal Limits to Salmonid Distributions in the Rocky Mountain Region and Potential Habitat Loss Due to Global Warming: A Geographic Information System (GIS) Approach." *Transactions of the American Fisheries Society* 125:1-13.

Rahel, F.J., C.J. Keleher, and J.L. Anderson, 1996. "Habitat Loss and Population Fragmentation for Coldwater Fishes in the Rocky Mountain Region in Response to Climate Warming." *Limnology & Oceanography* 41:1116-1123.

O'Neal, K., 2002. *The Effects of Global Warming on Trout and Salmon in U.S. Streams*. Natural Resources Defense Council and Defenders of Wildlife.

for example, hydropower provides an annual average of 15 percent of California's electricity production.⁶² But hydropower production is heavily influenced by variations in weather. In 2001, low snowpack in the Pacific Northwest diminished hydropower generation and contributed to energy shortages along the West Coast, illustrating just how vulnerable hydropower in the West is to climate change.⁶³

Global warming could have a detrimental effect on the relationship between hydropower production and energy

demand. As discussed in earlier sections, scientists anticipate a shift in hydrology that includes in reduced winter snowpack, higher peak flows, earlier snowmelt runoffs in spring, and decreased summer streamflows. This shift would likely increase hydropower production supply in winter and spring, but decrease it during summer when less water is available as inflows. However demand for power, intensified by climate change, is likely to follow an opposite trajectory. An overall increase in temperatures could lead to lower winter demand for heating and greater summer demand for air conditioning. Thus, when energy is needed in summer to meet the greater demand for air conditioning, hydropower's energy production will likely be hindered, given the predicted decrease in summer flows. Another vulnerability of higher peak streamflows is an elevated risk of reservoir spills, are a key vulnerability of higher peak streamflows, which would contribute to an overall reduction of net generation.

The Portland Water Bureau (PWB) sponsored a study by Richard Palmer and Margaret Hahn of the University of Washington. The study concluded that

a change in runoff timing would create problems for both water supply reliability and hydropower capacity. In Palmer and Hahn's analysis of future climate change scenarios, they found that the PWB system's winter flows could increase by as much as 15 percent and that late spring flows could decrease by 30 percent.⁶⁴ These changes, combined with an summertime increases in water and electricity use, present serious challenges for PWB. Simply put, early runoff results in water being less available when demand is highest for both water supply and hydropower energy production. Further, the Palmer and Hahn study found that global warming could exacerbate this water and energy supply problem because one of its key effects is an increased possibility of flooding. As fewer freezing days may raise runoff levels, the need intensifies to manage hydroelectric dams for greater flood protection at the expense of hydropower production and water supplies.⁶⁵

For more information regarding the Palmer and Hahn study, please see the Portland Water Bureau Case Study in Appendix A.

The Water and Energy Connection

The strong connection between energy use and water management is often overlooked. Because the energy implications of water supply decisions can be so large,¹ the water/energy nexus will be increasingly important to future efforts to reduce greenhouse gas emissions. The California Energy Commission estimates that 19 percent of the state's electricity use, more than 30 percent of the natural gas use (aside from what is consumed by power plants), and 88 million gallons of annual diesel fuel consumption, are associated with water use.² In fact, the California State Water Project (SWP) is the single largest energy user in the state. The water and energy connection is discussed in greater detail in the report *Energy Down the Drain*, by NRDC and The Pacific Institute.

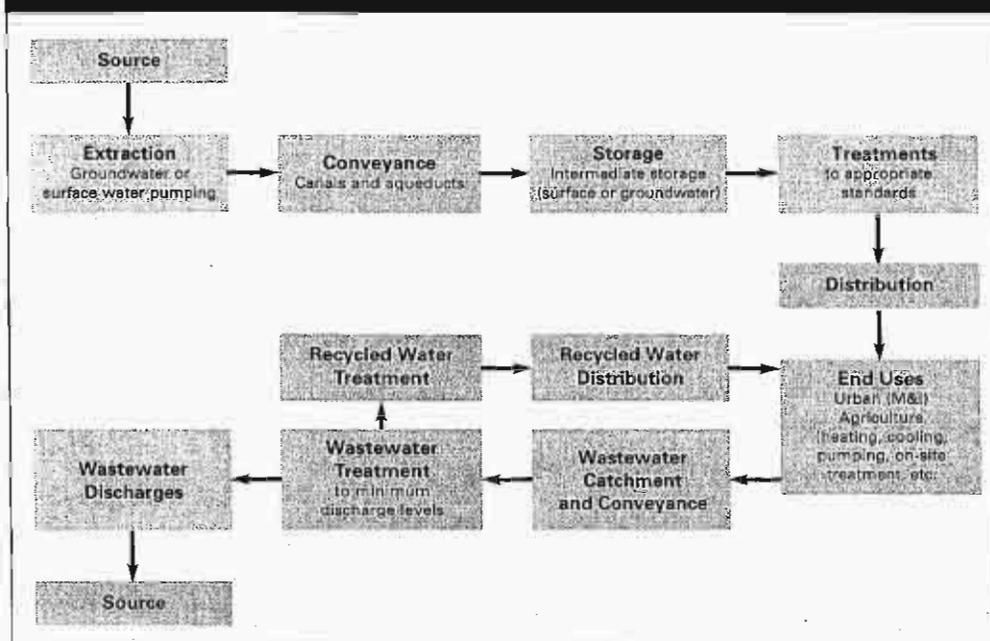
Water use efficiency and water recycling, along with groundwater recharge and stormwater management options, can provide significant opportunities for water managers to simultaneously improve water supply reliability, cut costs, save energy and reduce greenhouse gas emissions. An improved understanding of the relationship between energy and water will assist water managers in incorporating climate change into management plans (see Figure 3-1).

The four principal elements of water systems use energy are: (1) water extraction, conveyance, and storage; (2) water treatment and distribution within service areas; (3) end use, including on-site water pumping, treatment, and thermal inputs (heating and cooling); and (4) waste-

water collection, treatment, and discharge. Energy intensity, or embedded energy, is the total amount of energy calculated on a whole-system basis that is required for the use of a given amount of water in a specific location (see Figure 3-1).

Energy inputs to water systems, and related greenhouse gas emissions, vary considerably by energy sources and geographic location of both end users and water sources and end users. Water use in certain areas is highly energy intensive due to the combined requirements of extraction, conveyance, local treatment and distribution, and wastewater collection and treatment processes. In areas where a large percentage of power is provided by coal-fired plants, the greenhouse gas intensity of water use is particularly high.

Figure 3-1: Flow Diagram of Energy Inputs to Water Systems



Source: This schematic and method is based on Wilkinson (2000) with refinements by Gary Klein, California Energy Commission; Gary Wolff, Pacific Institute; and others. It is available as a simple spreadsheet tool from Wilkinson at Wilkinson@es.ucsb.edu.

Source and Conveyance of Water

Significant amounts of energy are often required to extract a source of water usable and to move the water to where it will be treated and used. Most water used in the United States is diverted from surface sources, such as rivers, streams and lakes, or pumped from groundwater aquifers. Conveying water often requires pumps to lift the water over hills and mountains, a process that can require large amounts of energy. In California, the State Water Project lifts water 2,000 feet over the Tehachapi Mountains—the highest lift of any major water system in the world. Where water is stored in intermediate facilities, additional energy may be required to store and then recover it. Smaller amounts of freshwater are produced from saltwater, brackish water, or wastewater using desalination or recycling technologies. Desalination requires energy to remove salts from water through reverse osmosis or other processes. Water recycling also requires energy to remove pollutants from wastewater.

Treatment and Distribution

Water treatment facilities use energy to pump and process water. The amount of energy required for treatment depends on source water quality. The energy required nationally for water treatment is expected to increase over the next decade as treatment capacity expands, new water quality standards are put in place, and new treatments are developed to improve drinking water quality, including taste and color. After water is treated, additional energy is typically required for local pumping and pressurization, but gravity pressurization and distribution is also possible when reservoirs are sufficiently higher than residences and businesses. Agricultural water generally is not treated before use.

End Uses

Water users require energy to further treat water supplies (e.g., softeners and filters), circulate and pressurize water supplies (e.g., building circulation pumps), and heat and cool water for various purposes. End use energy comprises

a major portion of water-related energy use. For example, water heating for one inefficient showerhead can use up to 2,800 kilowatt hours per year—almost as much energy as it takes to pump the annual water supply for two Southern California homes over the Tehachapi Mountains.³

Wastewater Collection and Treatment

Wastewater is collected and treated by a wastewater system (unless a septic system or other alternative is being used) and discharged. Wastewater is often pumped to treatment facilities where gravity flow is not possible and standard treatments requires energy for pumping, aeration, and other processes.

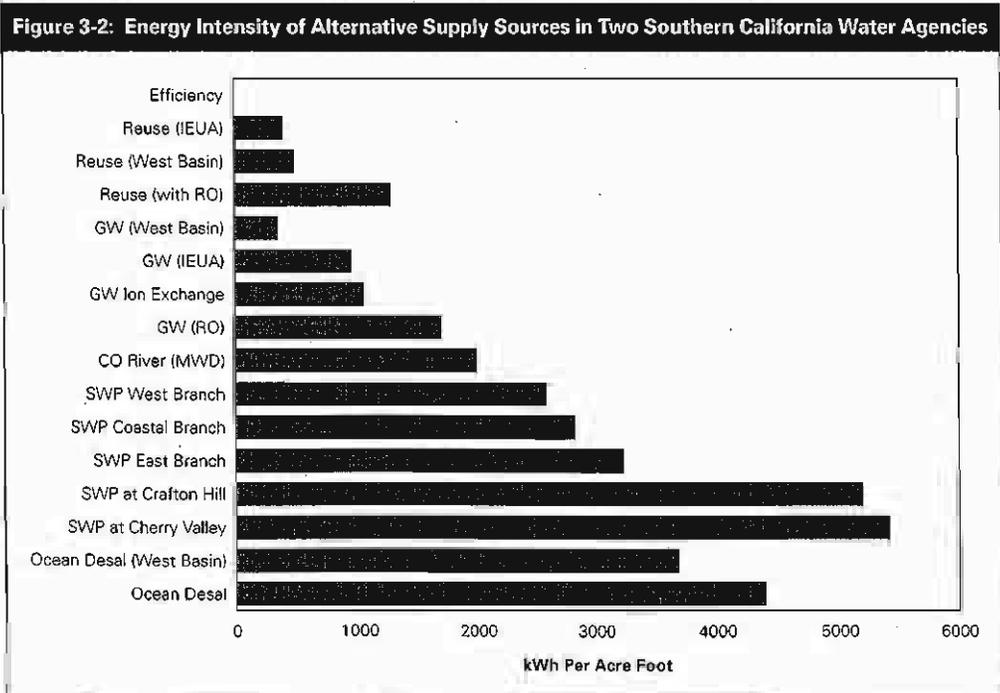
Reducing Water-Related Energy Use

Water use efficiency is the single best way to reduce water-related energy use. As noted above, the energy required for end uses of water (e.g., washing machines, cooling towers) is a major component of energy use in the

urban water supply cycle. Water use efficiency saves end use energy, as well as the upstream energy needed to convey, treat, and distribute that water and the downstream energy needed to treat and dispose of wastewater. Therefore, improving water use efficiency, particularly for energy intensive uses of water, is important regardless of the source of the water or location of its use.

An analysis of water management options for the San Diego County Water Authority found that the total energy savings from relying on improved water use efficiency instead of additional State Water Project deliveries to provide the next 100,000 acre-feet of supply would be approximately 770 million kWh. This would be enough to supply electricity to 118,000 households—25 percent of the homes in San Diego—for a year.⁴

Most local sources are more energy efficient than imported water supplies. Figure 3-2 shows the energy intensity of water supply options for two southern California water agencies:



Source: Wilkinson based on data from Inland Empire Utilities Agency (IEUA), West Basin Municipal Water District, and California Department of Water Resources.

the Inland Empire Utilities Agency and the West Basin Municipal Utility District. The analysis indicates that water use efficiency is the least energy intensive option and that recycled water and local groundwater sources are a relative energy bargain compared with imported supplies. Even the Chino desalter, a reverse osmosis (RO) process for contaminated groundwater that includes groundwater pumping and RO filtration, is far less energy intensive than any of the imported sources of water. From an energy standpoint, local sources of reclaimed water and groundwater—including contaminated sources requiring advanced treatment—are remarkably efficient. Similar findings were made for the Central Basin Municipal Water District.

The energy intensity of many water supply sources may increase in the future due to regulatory requirements for water quality.⁵ Advanced treatment systems such as reverse osmosis (RO) are being used to treat groundwater, reclaimed supplies, and ocean water. They can produce very high quality water. As a result, they are likely to face fewer energy impacts from more stringent water quality regulations. By contrast, some of the raw water supplies, such as Colorado river and Delta water, may require larger incremental energy inputs for treatment, due to high salinity, including arsenic and perchlorate. This may further increase the advantage of obtaining water from local sources.

Recent State and National Actions to Address Energy-Water Issues

Recently, the link among water, energy, and climate has been getting increased attention. For example, the California Energy Commission (CEC) issued a report on the water/energy relationship and incorporated recommendations into its *Integrated Energy Policy Report* (IEPR) submitted to the state legislature in December 2005. According to the IEPR, investing in water conservation can achieve 95 percent of the energy and demand-reduction goals planned by the state's investor-owned energy utilities for the 2006–2008 program period at 58 percent of the cost of traditional energy efficiency measures.⁶ The CEC report noted that “water agencies are seldom given credit, nor are they able to secure funding, for the electricity savings that result from water conservation and efficiency efforts.”⁷

In the IEPR, the CEC recommended that “the California Public Utilities Commission (CPUC), Department of Water Resources, the Energy Commission, local water agencies and other stakeholders should assess efficiency improvements in hot and cold water use in homes and businesses and include these improvements in 2006–2008 programs.”⁸ To address this important implementation obstacle to integrated water and energy conservation programs, the CPUC has embarked upon a process for rulemaking on issues related to embedded energy, and is currently evaluating proposals for pilot programs that focus on saving embedded energy through improved water use efficiency.⁹

Building on the CEC work, California's Climate Action Team recently took the unprecedented step of identifying water use efficiency as a tool to reduce climate change emissions and the California State Legislature is considering legislation requiring water agencies to evaluate the energy impacts of its water management alternatives. As California implements AB 32, The Global Warming Solutions Act, water efficiency measures are among the suite of actions that will be evaluated for their ability to help the state meet its greenhouse gas emission reduction goals.

On the national level, the U.S. Department of Energy's Sandia National Laboratory is leading the National Energy/Water Roadmap Program initiated in 2005, as requested by Congress. The purpose of this integrated energy/water research and development program is “to assess the effectiveness of existing programs within the Department of Energy and other Federal agencies in addressing energy and water related issues, and to assist the DOE in defining the direction of research, development, demonstration, and commercialization efforts.”¹⁰

These efforts represent the beginning of better-integrated water, energy, and climate policy. Information about the energy and climate implications of water use can help improve public policy and facilitate combined investment and management strategies among energy, water, and wastewater entities. Potential benefits include improved allocation of capital, avoided capital and operating costs, reduced burdens on ratepayers, emission reductions, and environmental benefits.

Chapter 4

A Guide for Water Managers: Designing a Comprehensive Response to Climate Change

Many water managers are already taking action to understand and address impacts related to climate change. This section is designed to summarize some of these actions and review “best management practice” approaches to these important challenges. Given the wide range of potential climate change impacts on water systems across the West, water managers have numerous options at their disposal to address the effects of climate change.

If well designed, these tools can provide a robust response, potential climate change impacts on water management, and a broad array of additional benefits. This chapter outlines four critical steps water managers can take to ensure a steady supply of quality water in the face of the challenges that climate change poses to the system. It sets forth strategies to make each step successful given the limited resources every water manager faces. Here are the four steps:

1. *Vulnerability analysis:* Evaluating the vulnerability of water supply systems, flood management systems, watersheds, and aquatic ecosystems to water-related climate impacts.
2. *Response strategies:* Implementing response strategies to reduce future impacts of climate change in two major areas: water supply and water management, including flood management and aquatic ecosystems.
3. *Prevention:* Taking immediate and sustained action to reduce greenhouse gas emissions in order to minimize future impacts.

4. *Public outreach:* Increasing public awareness of climate change and potential water-related impacts and opportunities.

VULNERABILITY ANALYSIS

An essential first step for water managers is to examine both local and regional effects of climate change. Given that a variety of factors can influence how climate change affects water resources, including the geographic location of sources, end uses, and the nature of the existing water supply infrastructure, each water resource agency should undertake an agency-level analysis to understand how climate change will impact their specific water-related resources and to lay the groundwork for the development of a response plan.

Agencies should also consider joining with other agencies to undertake analysis on a regional level because the impacts of climate change will affect agencies that derive water supplies from a larger shared resource (e.g., the

Colorado River, San Francisco Bay-Delta) and because some agencies in the same region may face similar challenges (e.g., the Sierra Nevada, the Rocky Mountains and the Northwest). Regional analysis will also facilitate cooperative responses and leverage limited resources to produce better results.

Elements that should be considered in conducting local and regional analyses of the effects of climate change on water supply are provided on the following pages. See Appendix A for detailed case studies illustrating how particular water agencies have tackled the challenge of climate change at the local, state and regional levels.

Assessing Water Supply System Vulnerabilities

Water supply systems are designed and operated to meet numerous objectives including water supply, flood protection, hydropower generation, and in-streamflow requirements—all of which are based on a retrospective view of hydrology. As climate change occurs, water infrastructure systems will face conditions different from those for which they were designed, presenting significant challenges for managers. Vulnerability analysis should be done to investigate how specific systems will react to climate-related changes. An analysis should examine a range of fundamental factors, including watershed characteristics, allocation, storage versus runoff ratio, diversity of water supply, flood management, shared regional water resources, water quality impacts, resource allocation and environmental water requirements.

Location and Watershed Characteristics

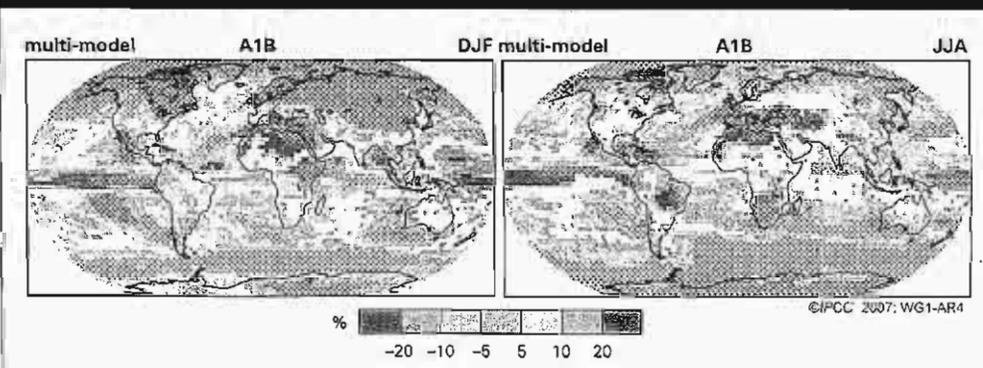
The geographic location and the watershed characteristics of the area being assessed are critical starting points. Although precipitation predictions are coarse, there are studies predicting regional changes related to climate change. Some analyses suggest that northern latitudes may become slightly wetter and drier regions, such as the Southwest, may receive even less precipitation.¹ As the science improves regarding regional impacts on precipitation patterns and total precipitation, water agencies will be increasingly able to identify regional or watershed-specific impacts. In addition, watersheds in the Southwest may be more significantly affected in the future by increases in evaporative losses within watersheds and from reservoirs.² Potential regional changes should be considered as a basis for further analysis.

Watershed characteristics are important. Elevations within the watershed will affect many attributes of a watershed's runoff characteristics including snowline, evaporation, dew point, and temperature. Other important characteristics are vegetation, slope aspect, and soils. A useful model focusing on the Sierra Nevada was developed by the American River Watershed Institute to examine these elements. Climate scenarios can be analyzed for specific watershed conditions to examine potential impacts.^{3,4}

Allocation

Vulnerability analyses should include a determination of how much of the annual runoff is committed to use, including extraction for municipal, industrial, and agricultural uses; and in-stream, recreational, and

Figure 4-1: Projected Patterns of Precipitation Changes for Period 2090-2099, relative to 1980-1999



Source: IPCC 2007: WG1-AR4

environmental uses. If most, all, or more than all of the annual runoff is needed to meet existing uses, then the system is already stressed. Therefore, changes to the timing of hydrology from climate change, much less a change in natural inflow quantities, are likely to exacerbate the stress and result in negative impacts on the reliability of supplies. It is important to assess the reliability of water supplies to meet demands under both past and future climate variability.

Storage Versus Runoff Ratio

Vulnerability analyses should examine to what extent structural storage (dams) and non-structural storage (snowpack, groundwater) are relied on to meet demands. Although individual water supply systems vary in the degree to which they rely on storage, most of the West's water supplies depend on snowpack, reservoirs, and groundwater basins to provide annual and carryover storage. The amount of surface and groundwater storage in relation to the mean annual runoff diverted for beneficial use is one simple indicator of a water provider's reliance on snowpack. It is, however, important to recognize that each of these forms of storage has different operational characteristics. Climate change is expected to negatively affect water storage by reducing the snowpack and changing the timing and volume of runoff inflow, which may affect the yield of existing reservoirs. Climate change could also impact groundwater storage by reducing natural recharge and surface water supplies available for groundwater recharge.

Water managers have a wide range of tools to meet future needs. Some tools, such as water transfers, dam reoperation, floodplain management, and landscape conservation, can help conserve water in storage or provide "virtual" storage through cooperation with other agencies. Thus, water managers could respond to a potential future loss of supplies from existing storage by implementing a range of water management tools.

Diversity of Water Supply

Different water supply sources, including groundwater, surface supplies, transfers, and importation, have important water management implications. With climate change likely causing alterations in timing of precipitation and runoff, reduction of natural snowpack storage, and management of surface supplies, a portfolio of water supply alternatives can serve as a hedge strategy. Having a variety of alternatives available, such as wastewater recycling, increased groundwater, water conservation, and

transfers among users, can reduce vulnerability of an individual system.

Water agencies seeking to diversify their existing water supplies should carefully consider potential pitfalls. For example, many river basins are already overcommitted and environmentally degraded. In some areas groundwater is overdrafted or contaminated. In many cases, increasing the diversity of supply for one agency could increase stress for other communities or environments (e.g. over-allocated river systems). Moving from a reliance on vulnerable supplies (e.g. surface and groundwater sources) toward water use efficiency and reuse represent measures to diversify water supply portfolios that are appropriate in nearly all circumstances.

Flood Management

Water managers are constantly challenged with balancing flood safety and water supply. Surface storage operations are often designed to provide multiple benefits, including recreation, hydropower production, and flood safety. Flood management presents a particular challenge because when storage space within a multipurpose reservoir is set aside for attenuating flood flows, storage operating rules often can pit flood protection against operations that would maximize water supply.

Climate change is likely to complicate these operational choices. The earlier snowmelt brought on by a warming climate could increase the likelihood that snowmelt runoff will need to be released to maintain flood storage, but this may increase the risk that a given reservoir will not end the rainy season full. In some watersheds, an increase in storm intensity could directly increase peak flows and increase the likelihood of "rain on snow" events, which can result in dramatic increases in flows. If peak flows increase, the existing operating rules may no longer provide an appropriate level of protection. There will likely be a need to increase flood reservation capacity within existing storage facilities thereby exacerbating existing tensions with water supply. However, in some areas with limited existing snowpack, declining snowpack could decrease the likelihood of "rain on snow" events, providing an opportunity to reoperate existing facilities.

Shared Regional Water Resources

Dividing water resources among several water providers can result in shared risks and benefits. A relevant factor in assessing climate change impacts on water supply is whether a particular water supply is wholly appropriated

by local, regional, state, or federal entities. As illustrated by the Colorado River Compact, the effects of climate change may be addressed by increased coordination and planning among agencies and states.

Water Quality Impacts

Water supply could be threatened by water quality changes resulting from increased temperatures, increased peak runoff, decreased summer flows, and sea level rise with saltwater intrusion into coastal aquifers, streams, and estuaries. Where water quality standards are already in issue, climate change will likely exacerbate conditions. Watersheds may see an increase in sediment and non-point source pollution related to larger storm events. In California, for example, saltwater intrusion exacerbated by sea level rise could result in groundwater degradation. In the San Francisco Bay-Delta, saltwater intrusion could increase the salinity of Delta water. Increases in sedimentation due to climate change could result in lost storage capacity, degraded water quality, and increased treatment costs.

Assessing Water Demand Vulnerabilities

A critical consideration in evaluating the stresses and vulnerabilities of a water system is the current level of demand and the ability to manage increases in demand. Demand for water is as much a response to land use and resource management policies as it is a response to climate signals. Higher temperatures will push up demand for agricultural and landscape irrigation water. Those demands may be offset by conservation, changes in crop types, and irrigation practices for agriculture as well as increased use of xeriscaping and more efficient irrigation systems on the municipal side.

Conservation

Communities throughout the West have implemented a wide variety of water conservation measures to improve water use efficiency. Some of these efforts have produced striking results (see Appendix B). Per capita consumption gives a rough estimate of the degree to which a water provider can mitigate water supply impacts through increased investments in water conservation measures. For example, areas with large landscape water use have greater potential for benefits from landscape water conservation. Communities with high interior per capita use have the potential for significant savings from interior water conservation tools. It is

important to note that because the technology of water conservation will improve over time, this water source will grow in the future.

Peak summer water use should also be considered when evaluating possible conservation opportunities. This factor takes into account the difference between summer and winter water use patterns. High peak summer water use in many municipal systems indicates a high degree of outdoor use, which can be reduced through landscape water conservation programs. Many providers have also developed effective indoor residential and industrial/commercial/institutional water user programs to reduce overall consumption.

Resource Allocation

The allocation of water to various sectors (agriculture, commercial, institutional, industrial, and residential) is an important consideration when analyzing the potential flexibility of a water provider to cope with dry years. Each sector has varying degrees of flexibility and requires different strategies for managing decreased water supplies, particularly in extremely dry years. For example, agricultural water users can fallow fields planted with annual crops during critical dry years. Different sectors will be affected differently by climate change. For example, outdoor residential and agricultural water consumption may increase with warmer temperatures. Industrial use may not.

Assessing Environmental and Water Quality Requirements

Rising temperatures, decreased summer streamflows, and increased evapotranspiration will likely increase the need for in-streamflow to meet ecosystem and water quality needs. Environmental requirements such as minimum in-streamflows and water quality standards are increasingly common for western rivers, wetlands, and lakes. Such requirements can significantly affect the operations of both large and small water systems. Most large dams must release water to maintain downstream water quality and provide benefits to aquatic ecosystems, including protected species. Often minimum flow requirements are based on meeting critical temperature and other standards that will require greater releases to maintain. Agencies should assess the degree to which climate change will alter existing environmental conditions with an eye on potential future environmental constraints on operations.

RESPONSE STRATEGIES FOR DEALING WITH WATER SUPPLY IMPACTS

Although prompt action to lessen greenhouse gas emissions can reduce the future impacts of climate change on western water supplies, it is clear that climate change will produce supply impacts for which water managers should be prepared. A vulnerability analysis can reveal the extent of the climate change-related risks to an existing system. This section discusses how climate change will affect the tools available to respond to these climate impacts and presents a framework for a robust, resilient, and flexible water management approach to handling the effects of climate change on water resources.

Seven Guiding Principles for Responding to Water Supply Impacts

The scope of the potential impacts of climate change makes this issue different from other challenges facing water managers. The following guiding principles are designed to assist forward-thinking water decision-makers in crafting strategies to respond to this challenge.

Strengthen Institutional Capacity. Responding to climate change will require a broad set of management and technical skills, including expertise that builds on traditional water management, such as:

- reoperating existing water systems
- understanding climate impacts
- evaluating opportunities to finance and implement integrated strategies for multiple benefits

Water managers should evaluate their institutional strengths and weaknesses, seek opportunities to improve institutional capacity, and recognize that responding to climate change will require new skills. As Roger Revelle and Paul Waggoner recommended in a 1990 American Association for the Advancement of Science publication, "Governments at all levels should reevaluate legal, technical, and economic procedures for managing water resources in the light of climate changes that are highly likely."⁵

Build In Flexibility. Climate change places managers in a difficult position. There is now a strong scientific consensus that climate change is happening and that it will result in significant impacts because preparing effectively

will require investment of effort and time, water managers should begin such efforts immediately. However, there is still uncertainty regarding how rapidly these impacts will develop and how climate change will affect some water resource characteristics (e.g., total precipitation.)

The solution to this apparent paradox is to design flexible responses to climate change. Locking in large, long-term capital investments under conditions of uncertainty is a risky strategy. Whenever possible, flexibility is desirable as a management strategy. Specifically, strategies that allow for mid-course corrections and redirection of investments toward the most effective tools and that reduces the risk of stranded investments will increase the flexibility of water systems and the ability of water managers to adapt to changing conditions.

Increase Resilience. Even absent any change in climate, we can expect both wet and dry conditions. The relatively new science of paleoclimatology has revealed that the climate in the West has, historically, experienced significant variation, including extended drought periods. For example, the Colorado River basin has seen extended drought periods. In particular, the period used as the historical baseline for Colorado River water allocations was one of the wettest periods in five centuries, resulting in an overallocated river.⁶ Climate change is likely to result in even greater divergence from the recent historical record. Scientists agree that we will see increased temperatures in coming years and we may see wetter wet periods and drier dry periods. Therefore, it makes sense to consider a range of water management options that build resilience through cost-effective strategies to meet future needs under conditions of greater variability and uncertainty.

Seek "No Regrets" and "Multiple Benefits" Strategies. Management strategies that cost-effectively improve a water system's ability to deal with existing stresses and problems (e.g., drought, population growth, land-use changes, and environmental impacts) are often characterized as no-regrets strategies because they make sense today, even before factoring in climate change. Where possible, water managers should seek to implement no-regrets strategies and secure multiple benefits (e.g., water, energy, and cost savings, emissions reductions and reduced environmental impacts) through well-designed policies, investments, and strategies. The focus of good policy is to build resilience in various systems ranging from whole water systems to local landscape conservation programs.

Multiple benefits strategies address more than one objective through a single targeted investment or policy measure. Some multiple benefit strategies that can enhance performance and build resilience through a single investment include:

- improving water use efficiency
- designing policies and management systems that provide better signals to consumers regarding the cost and scarcity of resources
- instituting flood plain management approaches that reduce damage from flooding, provide habitat, and increase groundwater recharge

Address Multiple Stresses. Climate change is just one of a number of factors putting pressure on water supply systems. Rapid population growth, land-use changes, contamination of surface and groundwater resources, and the need for ecosystem protection and restoration are all occurring simultaneously. Many water managers and users are effectively addressing these combined challenges through measures such as dramatically improving water use efficiency and restoring and protecting watersheds and groundwater sources. (See Appendix A.)

Invest in Cross-Agency Relationships. Many of the measures discussed in this chapter begin with developing relationships among agencies that can be partners in innovative approaches to water management. (Integrated approaches are discussed in more detail later in this section and Appendix A includes a number of case studies showing ways in which water managers across the West are developing their own integrated approaches.) Water managers seeking to position their agencies to best respond to climate challenges should begin by strengthening their relationships with potential partner agencies, including neighboring water agencies, as well as those with authority on energy, wastewater, stormwater, environmental quality, and land use issues.

Incorporate Climate Change into Ongoing Project Design. Water managers constantly face a wide range of design decisions regarding existing and new facilities. The design of those facilities should incorporate climate impacts. Managers should begin such work now, rather than waiting for the completion of a comprehensive response plan to address climate change. Several examples illustrate where climate issues are being incorporated into design

decisions. For example, the California Department of Water Resources (DWR) is working to design operable barriers in the Sacramento-San Joaquin River Delta. Those barriers are designed to use tidal currents to control water levels and circulation in the south Delta. DWR recognizes that climate change is likely to produce significant sea level rise. Such changes could affect the operations and effectiveness of these Delta barriers. To reduce this risk, DWR decided to redesign these barriers so they could be retrofitted in the future to accommodate up to an additional foot of sea level rise. Given the probable useful life of these barriers, DWR believed that this was an appropriate design target. This decision required a redesign for a larger foundation, capable of accommodating larger gates in the future—and resulted in significant expense.⁷

The San Francisco Public Utilities Commission (SFPUC) is currently developing a long-term wastewater master plan designed, in part, to address climate change impacts. Perhaps the most significant climate change-related challenge for San Francisco is the potential for rising sea levels to result in seawater intruding through outfalls into waste treatment facilities.⁸ Such saltwater intrusion could kill the microbes that serve as the foundation of secondary treatment. The SFPUC has already experienced these seawater intrusion events, even without storms, as the result of 7 inches of sea level rise in the past century. The SFPUC is currently designing valves to prevent such sea level rise-related inflows into the wastewater system. Seattle Public Utilities has made several significant design decisions to address potential climate change impacts.⁹ Such water agencies are beginning to discuss how climate change could affect decisions such as the design of drinking water treatment facilities.

By incorporating climate change in ongoing design decisions, water managers can reduce risks and expenses in the future.

Expand Dialogue with the Scientific Community. The scientific community is an essential resource to water managers. Expanded dialogue with the scientific community can increase the effectiveness of measures designed to meet the challenges posed by climate change. A healthy dialogue with water managers will also help scientists develop a more realistic and accurate analysis of potential climate change impacts on water management. The September 2005 conference in Las Vegas, co-sponsored by the Natural Resources Defense Council, the Southern

Nevada Water Authority, and the Desert Research Institute represents an example of this kind of extended dialogue. Such conferences should be held with greater frequency.

The AWWARF Public Advisory Forum developed the following two recommendations regarding climate and science:

- * Cooperation of water agencies with the leading scientific organizations can facilitate the exchange of information on state-of-the-art thinking about climate change and impacts on water resources.
- * The timely flow of information from the scientific global change community to the public and the water-management community would be valuable. Such lines of communication need to be developed and expanded.¹⁰

Given the need discussed earlier to improve institutional capacity, a robust dialogue between water managers and scientists could be particularly valuable as water agencies move past vulnerability analyses to develop future response strategies that incorporate climate issues.

Determining the Best Mix of Water Management Tools

A century ago, water managers had a limited range of water management tools. Today, water managers have a much greater range of options to manage water in communities around the West:

- * Technological advances have dramatically improved the water use efficiency of wide range of devices, including

low-flow showerheads, low-flush toilets, water-efficient washing machines and dishwashers, and water-saving irrigation systems guided by satellite weather data.

- * Wastewater recycling, groundwater cleanup, urban stormwater capture projects, water marketing, and active groundwater storage projects have also become proven water management tools.
- * Pricing mechanisms, such as inclining block rates (the practice of increasing volumetric prices with increasing water use) and seasonal rates (which modify summer water rates to encourage landscape conservation), can encourage efficient water use.
- * In some coastal areas, urban water agencies are beginning to explore desalination, previously dismissed as impractically expensive.

Given the impressive array of water management tools available, how should water managers determine the best mix of responses to climate change—particularly as the performance of water management tools will be affected in different ways as a result of climate change? This section is designed to help water managers answer this question. (See Table 4-1 for a summary of NRDC's findings.)

Water Management Tools that Will Perform Better as the Climate Changes

Some water management tools are likely to perform better in the future in the face of global warming. This effect is likely to be most significant for tools that reduce landscape water use.

Table 4-1: Performance of Water Management Strategies After Considering Global Warming Effects

More effective	Not affected	Less effective
<ul style="list-style-type: none"> • Landscape conservation • Conservation rate structures • Agricultural water conservation • Water marketing • Urban stormwater management • Saltwater groundwater intrusion barriers to protect coastal aquifers • Water system reoperation • Interagency collaboration and integrated water management strategies • Floodplain management • Watershed restoration 	<ul style="list-style-type: none"> • Wastewater recycling • Interior water conservation • Groundwater cleanup 	<ul style="list-style-type: none"> • Traditional river diversions • Traditional groundwater pumping • Traditional surface storage facilities • Ocean water desalination*

* Given existing energy requirements.

Landscape Irrigation Conservation. Urban water conservation programs often underemphasize the demands of urban landscaping. With climate change likely to increase evaporation and transpiration rates in planted landscapes, a lawn or landscape could consume more water in the future than it consumes today. One implication of this trend is that landscape irrigation conservation programs have the potential to save more water in a warmer future than they do today.

Landscape irrigation already represents a significant percentage of urban water use in the West. For example, it accounts for approximately half of urban water use in California, or about 10 percent of statewide water use.¹¹ Urban water agencies are increasingly turning to landscape irrigation to find new opportunities to increase urban water use efficiency.¹² For example:

- The Southern Nevada Water Agency offers customers a \$1 per square foot rebate for all turf that is removed and replaced with drought-tolerant landscaping.¹³
- The Metropolitan Water District of Southern California has developed a website (www.bewaterwise.com) devoted to educating ratepayers about landscape conservation opportunities.¹⁴
- The East Bay Municipal Utility District (EBMUD) in California has published a comprehensive book aimed at encouraging appropriate landscape design. EBMUD also offers residential landscape conservation rebates of up to \$1,000.¹⁵
- The Marin Municipal Water District, also in California, offers financial incentives to encourage the installation of weather-based irrigation controllers.¹⁶

As climate change reduces late season snowmelt, measures such as landscape conservation that reduce peak summer demands—often a key constraint on water systems—could be particularly effective. Water managers should incorporate such conservation measures in their plans to meet future water needs and respond to climate change impacts.

Conservation Water Rate Structures. Water rate structures are among the most effective tools to encourage water conservation because they give customers a price signal about the value of this resource. To maximize the effectiveness of this signal, agencies should strive to recover as much revenue as possible through volumetric charges, rather than high fixed charges. Increasing block, or tiered

“We have to attack both sides of the supply-demand equation when faced with more variable water supply due to global warming.”

Source: Chips Barry, General Manager, Denver Water, 2006.

rate structures, offer an initial allocation at a base rate. Additional tiers or blocks of water increase in price. Some utilities offer a lifeline, or below cost rate, for low-income customers. University of California economists Hewitt and Hanemann found a significant positive response to block rate structures in California applications.¹⁷ In addition, seasonal water rates, which increase prices during the warm irrigation season, can be particularly effective in encouraging landscape conservation and in reducing peak summer demands. Water managers seeking to encourage conservation in the future should pay particular attention to rate structures designed to encourage conservation.

Agricultural Water Conservation. According to the U.S. Department of Agriculture, agricultural water represents 81 percent of all consumptive water use in the nation.¹⁸ In the West, agriculture represents 90 percent of the consumptive use of the developed water supply.¹⁹ Future agricultural water use is difficult to predict because of complex interactive impacts of climate change on international trade, crop selection, and yields. Nevertheless, as in the case of urban landscaping, rising temperatures may increase evapotranspiration rates—meaning that irrigating an acre of crops such as alfalfa or lettuce could take more water in the future than is currently required.²⁰ As a result, agricultural water conservation and fallowing could generate even more water savings in the future than they do today.

Even without considering potential climate change impacts, there is significant potential for agricultural water conservation around the West. For example, in much of the arid West, flood irrigation is still the predominant irrigation technology, and in states including Arizona, Montana, and Idaho, water application rates often exceed 5 feet per acre.²¹ In agricultural areas working to cope with the impacts of climate change, conservation programs and related water transfers could provide valuable revenue.

Market-Based Transfers, Sales of Water. With agricultural water conservation and fallowing programs increasing in effectiveness as temperatures rise, there also may be

Restoring the Wet Meadows of Sierra Nevada's Feather River Basin

A public/private partnership called the Feather River Coordinated River Management Group (CRM) has been working for more than a decade to implement wet meadow restoration projects in the Sierra Nevada's Feather River Basin. The Feather River is an important source of water for California's State Water Project, which provides a portion of the water supply for Southern California, the San Joaquin Valley, and Silicon Valley. There are 250,000 acres of high altitude meadows and valleys in the Feather River's Sierra Nevada watershed. These mountain meadows have been degraded by decades of grazing, road building, and other activities. Streams have eroded deep gullies in meadows, rapidly draining groundwater from these natural high-altitude reservoirs; and incised creek beds have dramatically reduced natural infiltration of runoff.

The Feather River CRM has used several techniques to help restore its degraded meadows. For example, creek beds have been regraded to restore natural drainage elevations by the replacement of incised gullies with barriers and pools. Subsequent monitoring has verified that such projects can significantly increase natural storage in these meadows,

thus retaining additional winter rainfall and snow-melt. This additional stored water is naturally released later in the spring and summer. Analysis of the CRM Big Meadow Cottonwood Creek project found that groundwater levels were within 1 foot of the surface for an average of 8 days prior to restoration, and an average of 223 days after. As a result, the ephemeral stream in the meadow returned to nearly perennial flows, increasing from 214 to 344 days of flow.

This project creates additional active water storage, which could have increasingly important water supply and ecosystem benefits in the future. These projects can also decrease stream temperatures, addressing a key potential climate change impact on cold-water fisheries. As a result, the CRM estimates that large-scale restoration projects have the potential to create large amounts of increased natural groundwater storage.

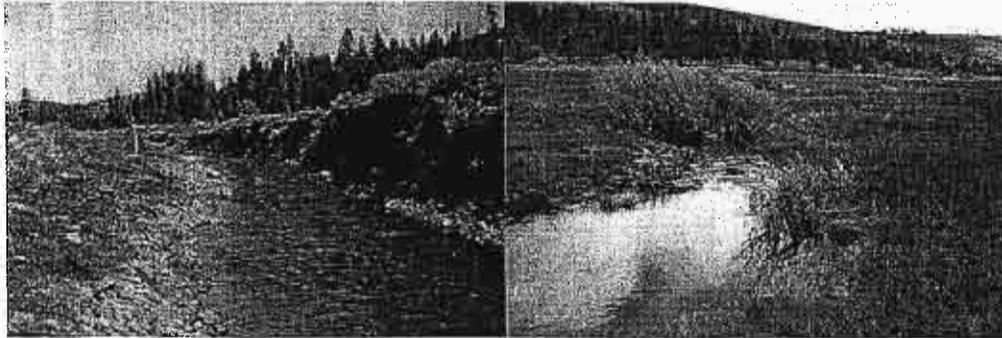
Sources: <http://www.feather-river-crm.org/>.

Wilcox, Jim, January 2005. "Water Management Implications of Restoring Meso-Scale Watershed Features." <http://www.feather-river-crm.org/publications/tech/IAHS%20Full%20Paper.htm>.

a growing incentive for some farmers to sell a portion of their water supplies through voluntary, market-based transfers. Three factors suggest that incentives for water marketing that moves water from low-value agriculture to high-value urban uses are likely to increase as a result of global warming. First, as urban water agencies face reduced yields from existing water systems, they may be increasingly motivated to pursue, and increasingly willing to pay for, water transfers. Increasing scarcity could raise prices received by agriculture for marketed water. Second, climate change will create increasing uncertainty for agriculture. It may be a challenge for some farmers to cope with warming temperatures and more extreme weather events, increasing their interest in water transfers that could provide them with greater flexibility and revenue. And third, around the West, many agricultural water users have more senior water rights than their urban counterparts have. To a certain extent, this system will insulate the holders of senior water rights holders from the impacts of climate change—making their water supply more reliable than that of junior holders (including many growing urban areas). All of these factors suggest that the economic rationale for water marketing may increase.

It should be noted that water marketing does not create new water, it simply reallocates it. Various sources of water can potentially be transferred by market transactions, each constrained by legal, regulatory, market, and physical parameters. A California Legislative Analyst's Office report identifies the following sources:²²

- Land fallowing and crop shifts to less water-intensive crops.
- Water recycling, such as recycling water from wastewater treatment plants for industrial and irrigation purposes.
- Groundwater pumping instead of using surface water rights, thereby freeing up surface water for transfer.
- Storing excess surface water from wet years in underground aquifers to be pumped in the future when surface supplies are low.
- Water conservation, in both the agricultural and urban sectors. This includes, for example, farmers using water-saving irrigation technologies and homes and businesses using water-efficient landscaping and bathroom fixtures.



Cottonwood Creek in California's Sierra Nevada, with Degraded Meadow. Before (left) and After (right) Restoration.

• Withdrawals from surface storage supplies that were not otherwise planned to be made.

If a water marketing system is to work optimally, care must be taken to design appropriate transfers and to avoid impacts to third parties and the environment. Efficient markets require that buyers and sellers bear the full costs and benefits of transfers. However, when water is transferred, third parties are likely to be affected. Where such externalities are ignored, the market transfers not only water, but also other benefits and costs from non-consenting third parties to the participants in the transfer.²³ Finally, the practice of “paper water” transfers—attempts to sell rights to water that exist only on paper—must be prevented.²⁴ Paper transfers can be highly disruptive, leading to environmental impacts and water management challenges.

Watershed Restoration. Watershed restoration has the potential, in some cases, to help mitigate impacts of climate change. As climate change reduces natural storage through a reduction of snowpack, watershed restoration efforts may be increasingly valuable to reduce peak flows, recharge groundwater, and delay spring runoff. Restoration projects may also decrease stream temperatures—reducing another impact of climate change—and provide additional environmental benefits such as riparian habitat. (See Restoring the Wet Meadows.)

Urban Stormwater Management. Throughout the West, there are abundant opportunities to manage urban stormwater to reduce runoff, flood damage, and pollution and to improve water supply availability and quality. As climate change affects rainfall volumes and storm intensity,

the value of water supply tools that provide stormwater management benefits may increase.²⁵ Climate change will likely force urban communities to invest in additional flood management, creating willing partners for water agencies seeking to invest in integrated stormwater management and water supply strategies.

One approach is to direct stormwater runoff from impermeable surfaces, such as roofs and paved areas, to landscaped areas where the water can percolate into the soil, and recharge the groundwater. Impervious surfaces increase runoff during storm events. The first “flush” often collects and concentrates contaminants from those surfaces such as oils and sediment. When flows exceed the infiltration capacity of the soils, water flows into storm drains. By diverting a portion of the first flows, improved stormwater management reduces demands on storm drain systems. This strategy slows the rate of runoff and allows for recharge. Designs such as shallow depressions, or “swales” and the sloping of both the paved areas and the landscaped areas to follow normal drainage patterns facilitate the redirection of stormwater runoff to landscaped areas where it is intercepted and infiltrated into groundwater aquifers. Some of the most innovative work in this area has been done by Tree People, a non-profit organization in Los Angeles that is advocating the construction of a citywide system of cisterns, groundwater infiltration facilities and urban forestry in order to recharge groundwater and provide other benefits.²⁶

Another stormwater management related strategy, called “daylighting,” involves taking surface flows that are currently conveyed in underground culverts and restoring them to creeks. Daylighting can offer groundwater recharge and environmental benefits, as well as increase property values and recreation in adjacent communities.

Another strategy involves diverting water into groundwater infiltration basins from urban streams during high flow events.

Reoperation of Water Systems. Water agencies have extensive experience with water system management, particularly the operation of storage facilities to meet the different demands of flood management and water supply. As a result of climate change, it will likely be necessary in the future to reconsider operating rules for major water supply systems. The Intergovernmental Panel on Climate Change (IPCC) called for "a systematic reexamination of engineering design criteria, operating rules, contingency plans, and water allocation policies," noting that "water demand management and institutional adaptation are the primary components for increasing system flexibility to meet uncertainties of climate change."²⁷ Investigations of reoperation opportunities should be broadly conceived to reflect the interactions of the many elements of complex water systems.

For example, the Seattle Public Utilities (SPU) analysis of potential climate change impacts to the water supply system (see Appendix A) helped SPU identify potential future management challenges that could arise from climate change. SPU created a series of adaptive management strategies for reoperating the water system to improve day-to-day management and to provide greater flexibility. They now use a dynamic reservoir elevation rule curve to help guide the management of flood storage capacity and refill of mountain reservoirs, thereby adjusting reservoir level targets based on real-time snowpack measurements and soil moisture conditions. This information, coupled with simulation models, helps to set reservoir targets during the refill season. Using a dynamic rule curve allows SPU to be more adaptive than if they used a traditional fixed rule curve.

SPU's experience during the winter of 2005 demonstrates the operational flexibility that can be provided by utilizing the dynamic rule curve. Low snowpack in the winter reduced the probability of floods from snowmelt. Due to this reduced probability of flooding, SPU water managers captured more spring rains than in a normal year. This adaptation of operations to weather conditions provided Seattle with enough water to return to normal supply conditions by early summer, despite the lowest snowpack on record. It also demonstrated the flexibility in the water system to adjust operations for changing weather conditions, whether they are low snowpack or abnormal levels of precipitation. This system reoperation not

only helps in managing the system for the variations in weather that occur now, but also can be used in the future to adjust to further climate change.²⁸

The potential to reoperate reservoirs can also be increased by investments in groundwater storage, downstream channel conveyance capacity and integrated operations of operationally connected reservoir systems.

Saltwater Intrusion Barriers. In many coastal areas, increased seawater intrusion resulting from sea level rise threatens coastal aquifers. In some areas, high rates of groundwater pumping are already drawing saltwater into aquifers, threatening the utility of aquifers and wells. In order to prevent such intrusion, some water districts are injecting freshwater into aquifers to create a saltwater intrusion barrier. For example, Southern California's West Basin Municipal Water District is injecting highly treated wastewater into coastal aquifers. As sea level rise increases, such saltwater intrusion barriers may be increasingly important to protect coastal aquifers. These barriers may be given additional value in the future because of the importance of local groundwater storage as part of wastewater reclamation and stormwater management programs. As agencies expand their use of wastewater reclamation and stormwater management programs to respond to climate change, seawater intrusion barriers may become key tools.

Water Management Tools Relatively Unaffected by Climate Change

In general, the tools discussed in this section are more resistant to the effects of climate change because they do not rely on precipitation, snowpack or other climate-sensitive water sources. During the past several decades, these tools have proven themselves to be highly productive and cost-effective. For example, in California, these tools are expected to be the backbone of efforts to meet future water needs. They will likely become even more valuable in water management portfolios.

Water managers are starting to link major new investments in water conservation to their desire to prepare for potential climate change impacts. For example, Denver Water is addressing the potential effects of climate change by ramping up its water conservation efforts with its recent \$400 million conservation plan. This plan is designed to cut annual water use by 22 percent, or 16.7 billion gallons per year, during the next 10 years. Although this plan was initially developed without regard to potential climate change effects upon its system, Denver Water is now seeking to reach this 22 percent reduction goal far

more rapidly in order to further protect water users from climate change impacts. The plan includes new strategies and increased investments in existing conservation programs, such as rebates for low-flow toilets and efficient clothes washers. The plan's new programs include:

- establishing a water efficiency rating program for new construction so that builders who do not meet new standards could find it more difficult to connect to the water system.
- installing water meters for landscape irrigation systems.
- initiating water audits of homes before they are sold, and requiring the replacement of leaking or inefficient plumbing fixtures.
- installing low-flow urinals in new commercial buildings.

The actions in the plan are expected to pay for themselves, through reduced water bills, within six years. Denver water users have already cut consumption by about 20 percent since local drought conditions began in 2002. The plan's first year has been approved by Denver Water's board and executive staff, with an initial \$8 million.²⁹

Interior Water Conservation. Although climate change is likely to improve the performance of landscape conservation programs, it will leave interior water conservation programs relatively unaffected. Interior water conservation technology, including water efficient showerheads, toilets, urinals, dishwashers and washing machines, will not perform significantly differently as a result of climate change. However, the value of the saved water may increase over time.

Water Recycling. Just as other forms of recycling have become commonplace, wastewater recycling has increased dramatically in recent decades. Today, for example, Southern California recycles approximately 500,000 acre-feet of water annually.³⁰ (This represents approximately 10 percent of total wastewater generated in this region.) The California Department of Water Resources projects that by 2030, an additional 0.9 million to 1.4 million acre-feet of water recycling will be developed. This still represents a small fraction of total wastewater. One of the advantages of this tool is its resistance to drought effects. Similarly, because the sourcewater supply for water recycling is municipal wastewater, it is far less susceptible

to potential climate change impacts than traditional water supply projects.

Groundwater Cleanup and Protection. Although traditional groundwater pumping may be negatively affected by climate change (discussed in more detail in the next section), water projects, such as those in the Santa Ana watershed that are designed to clean up contaminated groundwater, may be less affected (see Integrated Regional Management Case Study: Santa Ana). The relative stability of groundwater cleanup, in the context of global warming, comes from the fact that the purpose of many of these projects is not simply to withdraw water but to comply with regulatory requirements and to create more usable, uncontaminated groundwater storage capacity. Where groundwater cleanup is intended to provide opportunities for conjunctive use, water managers should pay careful attention to the potential impacts of climate change on the source of water to be stored.

Water Management Tools That May Perform Poorly in the Future

The water management tools that are most likely to be negatively affected by climate change are those that rely primarily on historical precipitation, runoff, and recharge patterns, including both groundwater and surface water sources.

Traditional Groundwater Extraction. As discussed above, some analyses suggest that climate change may lead to significant reductions in groundwater. Shorter periods of high streamflows may decrease percolation, while longer, hotter summers are likely to decrease soil moisture. Therefore, projects that rely on traditional pumping of natural infiltration of precipitation could suffer a loss of yield in the future. In already overdrafted areas, this impact could increase competition for groundwater resources. We have not identified conjunctive use, the combined use of surface and groundwater systems, including active groundwater recharge, as a separate category in this report. Climate change impacts on conjunctive use projects will be determined in significant part by the source of stored water. Conjunctive use projects designed to rely on current snowpack or traditional river diversions may be negatively affected by climate change; however, conjunctive use projects using recycled wastewater may not be affected. Conjunctive use projects in low elevation coastal areas may be negatively affected by sea level rise.

The Conservation Technology Edge: A Water Management Tool That Will Be Increasingly Important in the Face of Climate Change

Conservation will remain a highly effective water management tool in a climate-altered world. Because climate change may make snowpack-based supplies and diversions less reliable over time, the advantages of new supplies produced by technological innovation should increase. The water sector analysis of the National Assessment of the Potential Consequences of Climate Variability and Change confirms this finding: "Evidence is accumulating that such improvements can be made more quickly and more economically, with fewer environmental and ecological impacts, than future investments in new supplies." Conservation tools have been central to the significant progress made in Los Angeles, the San Francisco Bay Area, Seattle, and Denver to meet the needs of growth without increasing water use (see Appendix B).

Innovation and technology development in the areas of end-use water applications have progressed rapidly in the past few decades. Techniques and technologies from laser leveling of fields and high-efficiency irrigation systems to the design of toilets, urinals, and showerheads have changed the demand side of the equation. Efficiency standards and code requirements have been particularly effective in promoting widespread application of these water saving technologies. End-use applications of water now require much less volume than before to provide equivalent or superior services, and uses of these new technologies often provide immediate economic savings.

These analyses of conservation potential are based on existing technology. Despite significant investments in conservation already, considerable potential remains. In California, 2.5 million toilets have been replaced with high-efficiency models since 1992. There's still room for expansion, with approximately

10 million low-efficiency toilets remaining to be replaced.

The impetus for technological development and innovation in efficient use comes from both price signals and policy. As water gets more expensive and because legal requirements are enacted prohibiting waste and limiting extraction from natural systems, technology has provided a wide range of options for expanding the benefits derived from a given amount of water. Broader application of these techniques will yield significant new supplies and innovations are likely to create improved water conservation technologies. The waterless urinal represents an example of such a relatively recent innovation. It is reasonable to anticipate that ongoing technological innovation will continue to expand the potential benefits of water conservation. In addition, collaborations among agencies with different missions (e.g., water and energy) are expanding water conservation efforts. In short, water use efficiency programs have several significant advantages that are likely to grow over time as a result of collaborations among agencies, technological innovation, and the direct and indirect effects of climate change.

Sources: California State Water Plan, Department of Water Resources, Vol. 2, p.16.1. <http://www.waterplan.water.ca.gov/docs/cwpu2005/>

Gleick, Peter H. et al., 2000. *Water: The Potential Consequences of Climate Variability and Change for the Water Resources of the United States*. The report of the Water Sector Assessment Team of the National Assessment of the Potential Consequences of Climate Variability and Change, U.S. Global Change Research Program, Pacific Institute for Studies in Development, Environment, and Security.

Gleick, Peter H., Dana Haasz, Christine Hanges-Jeck, Veena Srinivasan, Gary Wolff, Katherine Kao Cushing, and Arundip Mann, November 2003. *Waste Not, Want Not: The Potential for Urban Water Conservation in California*. Pacific Institute.

Finally, conjunctive use projects designed to take advantage of floodplain restoration, storing and infiltrating high flows, may be an increasingly important tool in the future. Water managers should evaluate local conditions to understand the implications of climate change on local groundwater resources.

Traditional River Diversions. Declining snowpack, receding glaciers, increased evaporation, flood control requirements, more frequent droughts, reduced dry-season run-

off, and potential reductions in total runoff could render surface water diversion projects less reliable in the future. For example, the Canadian city of Calgary has concluded that the melting of glaciers as a result of climate change could reduce the long-term yield of its surface water supply.³¹ Colorado River water users are increasingly concerned about reduced flows and loss of stored supplies to evaporation, due to climate change.³²

Changes in river hydrography expected as a result of global warming will likely result in alterations in stream-

flows and a direct reduction in water supply reliability. The most obvious impact in this regard is the increase in peak flows and the reduction of dry season streamflows.

The environmental impacts of climate change could exacerbate impacts on the reliability of surface water diversions. As discussed in Chapter 2, climate change could lead to environmental impacts including increased stream temperatures, exacerbated water quality problems and damage to sensitive and listed species—impacts likely to result in more requirements to protect aquatic resources, and greater competition for and conflict over surface water resources.

In addition, as rivers approach the ocean, climate change-driven sea level rise could result in a serious reduction in the reliability and cost-effectiveness of traditional river diversion projects. This has serious implications for coastal communities that rely on low-elevation surface water diversions or on groundwater diversions with a direct connection to surface waters. The Sacramento–San Joaquin Delta is an example of an area vulnerable to these potential effects.

Traditional Surface Storage. Although dams are central to water supply in the West, they have often led to high-profile, protracted policy conflicts. This is true of proposed dams on the Colorado, Yellowstone, Green, Missouri, Platt, Tuolumne, Stanislaus, and American rivers. There are cases in which new surface storage projects have generated significantly less conflict, particularly when the surface storage system is well designed, such as in the case of the existing Los Vaqueros Reservoir in the eastern San Francisco Bay Area. This off-stream project was designed to improve water quality and provide emergency supplies and was seen by many as having fewer environmental impacts than traditional surface storage development.^{33,34} However, most dam sites have

high financial and environmental costs, with low potential water supply yields. Given the high capital cost of surface storage projects, water managers should consider how climate change will affect this water management option.

Western dam operators could face increased challenges from seven potential climate-related impacts: reductions in reservoir inflows, increases in the percentage of precipitation falling as rain, rather than snow (and related increases in flood control requirements), decreased snowpack, more severe weather events (both droughts and floods), greater environmental requirements, increased evaporative losses from reservoirs and increased spills from existing reservoirs.

Potential climate change impacts have been cited by some agricultural water agencies as justification for more surface storage facilities.³⁵ Some new surface or groundwater storage may be developed in the West to cope with the challenges presented by climate change. However, it is important for water managers to recognize that, just as climate change can reduce the yield of existing reservoirs, it can also reduce the potential water yield of new dams.

Although site-specific analyses will be required to evaluate potential climate change impacts on proposed new storage facilities, particularly in highly engineered watersheds, some general conclusions are clear. In relatively undeveloped watersheds, a shift toward more rainfall and less snowpack is likely to reduce the yield of most new proposed dams. With shorter high-flow periods, the window for filling off-stream storage facilities could be shorter in the future. Potential reductions in total streamflows as a result of climate change could have profound implications for new surface storage projects. Frequently, new surface storage facilities utilize junior water rights in a river basin. If climate change reduces average total runoff in a basin, water managers could find themselves in a position where they have constructed a new surface storage facility to capture runoff that may be lost in the future as a result of climate change impacts.

In highly engineered watersheds, the potential interactions of existing and proposed facilities can be complex. For example, the climate change effects listed earlier could reduce potential yield from a proposed new storage facility but at the same time, increased climate-driven spills from existing dams could increase the amount of water that could be captured by a new facility.

Finally, surface storage projects in some river systems could face increased operating restrictions to mitigate for the environmental impacts of climate change. The most likely additional operating restrictions include flow

“Immediate prospects for major new water supply reservoirs or inter-basin transfers are limited. Consequently, new water project prototypes that emphasize conservation, landscaping, new technologies, and other measures are being promoted across the West.”

Source: Committee on the Scientific Bases of Colorado River Basin Water Management, February 2007. *Colorado River Basin Water Management: Evaluating and Adjusting to Hydroclimatic Variability*. National Research Council, p.96.

Summary of Potential Climate Change Impacts on Potential New Traditional Surface Storage Facilities

Climate Change Impacts that Could Reduce Potential Yields from New Traditional Surface Storage

- potential decreases in total annual runoff
- decreased late-season runoff, as a result of reduced snowpack
- increased winter runoff, as a result of greater rainfall, increasing spills and flood control storage requirements
- more extreme weather events (droughts and storms)
- increased evaporative losses from reservoirs.
- potential new environmental requirements regarding flow and temperature

Climate Change Impacts that Could Increase Potential Yields

- increased uncaptured spills from existing storage facilities

and temperature requirements. Such requirements could decrease the expected water supply yield of existing and proposed surface storage facilities.

The authors of this report are not aware of any proposed new surface storage facilities that have undergone a comprehensive analysis mentioning the seven factors addressed above. It is likely in many cases that estimates of potential yields from proposed new surface storage projects will be reduced when climate impacts are considered. As a result, these projects, already expensive today, could be more expensive per acre-foot of yield, when future climate change impacts are considered. The potential impact of climate change on new surface storage facilities should be carefully evaluated.

This report is not the first to suggest diminishing prospects for traditional surface storage development in the West and an increase in alternative approaches. For example, the National Research Council's 2007 report on Colorado River basin hydrology observed that "(t)he declining prospects for traditional water supply projects are perhaps more correctly seen not as an end to 'water projects', but as part of a shift toward non traditional means for enhancing water supplies and better managing water demands."³⁶ The report went on to state that "(i)mmEDIATE prospects for major new water supply res-

ervoirs or inter-basin transfers are limited. Consequently, new water project prototypes that emphasize conservation, landscaping, new technologies, and other measures are being promoted across the West."³⁷

Desalination. Evaluating the performance of desalination in the context of climate change raises issues different from those raised by other water management tools and some of these emerging issues support different conclusions. Ocean water, the source for many proposed desalination projects will be far less affected than freshwater sources by climate change. However, water managers making decisions on siting and design for coastal desalination facilities should carefully consider the likelihood of significant sea level rise as a result of climate change. For water managers in coastal areas with existing water systems that could be negatively affected by climate change (e.g. those that rely on snowpack and rivers), the reliability of seawater desalination could be an important consideration.

However, desalination raises another significant issue in the context of climate change. As discussed in Chapter 3, ocean water desalination is a very energy intensive water supply option. Indeed, energy is the primary operating cost of ocean water desalination facilities. Climate change prevention efforts are likely to result in a dramatic increase in efforts to reduce energy consumption, in order to decrease greenhouse gas emissions. Thus, a dramatic increase in energy-intensive seawater desalination facilities raises significant issues in the context of climate change. In addition, because of its high energy requirements, seawater desalination is also particularly vulnerable to any future energy price fluctuations.

Although climate change will not have the same impact on this tool as it is likely to have on water management tools that rely on rivers, historical groundwater recharge and snowpack, consideration of climate change raises serious concerns regarding the energy implications of desalination. Energy requirements of desalination have declined significantly in the past decade, largely as a result of the improvement of membrane technology for reverse osmosis plants and improvements in pressure recovery.³⁸ In addition, desalination of less saline sources, such as brackish and contaminated groundwater, requires significantly less energy. Efforts to reduce greenhouse gas emissions will raise additional issues regarding desalination. This climate change-related implication for desalination is less direct than the impacts affecting the other tools discussed in this section. As technology improves, this con-

cern will lessen. In fact, if the energy required for ocean desalination declines by a relatively small amount, some Southern California water agencies could save energy by substituting ocean water desalination for diversions from the Bay-Delta estuary.

Integrated Regional Water Management Planning

Many of the tools discussed above—water conservation, wastewater reclamation, and stormwater management—offer potential benefits to other public entities, including wastewater and stormwater agencies, energy utilities, and

Six Concerns Regarding Surface Storage Analyses

In some cases, project evaluation methodologies have exacerbated controversies around proposed surface storage projects. Future evaluations of surface storage projects should address these issues. Problematic approaches in past dam feasibility studies include:

1. Projections based on historical hydrology:

Traditional water development has not considered the potential impacts of global warming on future hydrology. The case of the Colorado River shows how important assumptions regarding future hydrology can be. On the Colorado River, a relatively short hydrologic record led water managers to conclude that the river's long-term average flow would be higher than it has proven to be. As a result, the Colorado River Compact assumed that river flows would average 17 million acre-feet. In fact, average flows have proven to be less than 15 million acre-feet. This discrepancy has significantly increased conflicts on the river. With additional climate change impacts, reliance on historic hydrology will be even riskier.

2. Lack of demand side analysis: The supply side approach has traditionally focused on increasing supply through dams and diversions. Demand management and alternative approaches, which can be less expensive and environmentally damaging, have often been overlooked or their potential underestimated. Addressing both supply and demand side strategies—and comparing all available tools on a level playing field—is a key feature of an integrated approach to water management planning.

3. Flawed economic analysis: Some surface storage studies, particularly those undertaken by the federal government, have failed to include credible economic analysis. For example, the U.S. Bureau of Reclamation is currently studying a potential surface storage project in California's upper San Joaquin River basin to provide additional supply for agricultural water users. Water from this facility is likely to cost far more than the new water supply would be worth to the agricultural community. When

the Bureau of Reclamation last studied a surface storage project in this region, the agency concluded that raising Friant Dam would produce water costing approximately \$3,000 per acre-foot—twice the cost of desalinated seawater and approximately 100 times the cost of water provided by federal water contracts in the region. Recent analysis of Auburn Dam by the Bureau of Reclamation revealed lower water yields and a significantly higher cost than had been previously estimated.

4. Subsidies that encourage waste: In many water projects, a reliance on subsidies and artificially low water prices encourage under-investment in efficiency and over-use of water resources. Supply-side subsidies skew water management plans against conservation programs. These subsidies have, historically, been focused primarily on dramatically lowering costs for agricultural water users.

5. Underestimates of environmental damage:

There is a long history of promises regarding environmental benefits from dams. However, dam building has a clear record of negative impacts on the environment. For example, 60 years ago, Friant Dam in California was authorized, in part, due to claimed benefits to the San Francisco Bay-Delta. In practice, Friant Dam has resulted in severe degradation of water quality and fisheries.

6. Unrealistic anticipated benefits: For many dam projects, a portion of the cost has been written off (i.e. paid by taxpayers rather than water users) because of claimed environmental, recreation, or other benefits. These benefits have frequently proven to be illusory.

Sources:

<http://www.sciencedaily.com/releases/2006/05/060529082300.htm>.

Committee on the Scientific Bases of Colorado River Basin Water Management, February 2007.

Department of the Interior, Bureau of Reclamation Mid-Pacific Region, Fish and Wildlife Service, October 1995. "Least-Cost CVP Yield Increase Plan," pp.111-41, 111-51.

Bureau of Reclamation Mid-Pacific Region, December 2006. "Auburn-Folsom South Unit Special Report: Benefits and Cost Update."

local governments. These approaches are also often less centralized and less capital-intensive than traditional water development. Integrated regional water management offers the potential to maximize the benefits from these new tools.

Wastewater, stormwater, and conservation programs are often best implemented through collaborations among agencies. Where a water supply agency does not have wastewater or stormwater responsibilities, designing and implementing climate change response strategies in these areas will require interagency collaboration. In addition, water conservation offers significant energy benefits, inviting the participation of energy utilities and state agencies with energy regulatory and planning responsibilities. Finally, water conservation and stormwater management programs can benefit greatly through the participation of local governments with land-use authority.

Agencies with different missions do not always share identical service boundaries, creating a potential obstacle to interagency efforts. In many cases, this obstacle can be overcome by bringing together multiple agencies on a regional basis. Such an integrated regional approach can offer broad benefits. Integrated regional water management is emerging as a particularly important strategy. The 2005 California State Water Plan identifies integrated regional water management as an initiative co-equal with statewide water management planning efforts.³⁹

California's Proposition 50, The Water Security, Clean Drinking Water, Coastal and Beach Protection Act, and Proposition 84, which were approved by the voters in November of 2002 and 2006 respectively, provided a total of \$1.5 billion in general obligation bond financing for integrated regional water management efforts across the state. This new direction represents a decreased reliance on large traditional water projects and on state and federal agencies to guide planning and decision making. Increasingly, innovative thinking is showing how integrated regional strategies can supplement traditional statewide and federal planning.

Integrated regional planning has several advantages. It encourages collaboration among the diverse agencies in a particular region. As in the case of the projects in the Santa Ana watershed to clean up contaminated groundwater and generate electricity through "cow-power" (see Integrated Regional Management Case Study: Santa Ana), an integrated approach can reveal opportunities that cannot be implemented without cooperation among stakeholders and agencies. It tailors strategies to meet unique local needs. It can maximize the potential for

multiple funding partners and multiple benefits, including reduced dependence on water supplies vulnerable to climate change impacts, reduced urban runoff pollution, groundwater cleanup and improved groundwater management, flood damage reduction, ecosystem restoration, energy conservation, and public education. And integrated regional planning offers the potential for water managers to address, in one program, multiple stresses facing current water supplies. These include population growth, land-use changes, contamination of surface and groundwater resources, and the need for ecosystem protection and restoration.

Moreover, an integrated approach can increase system flexibility. The massive investment required for a traditional water project can be highly inflexible because, if the construction cost of such a water project proves to be higher than expected, water managers with a partially constructed project cannot redirect investments, without losing the yield of the entire project. These large projects create a significant sunk cost risk. By contrast, investments in an integrated portfolio of conservation, reclamation, and stormwater projects, all of which can be scalable and less capital-intensive, can be more easily redirected to respond to changing conditions or to adjust for an underperforming water management tool.

Effective integrated planning can require the use of many water management tools, with varying potential benefits in different regions. For example, without debating the merits of desalination in general, we can examine how desalination might fit into an integrated regional strategy. In Southern California's Chino Basin, desalination is being used to clean up contaminated groundwater, thus fixing an existing problem and generating water supply reliability and wetland restoration benefits. In San Diego, desalination, although energy intensive and expensive, could provide high quality water that could be blended with existing supplies, facilitating energy-conserving wastewater reclamation programs. In contrast, on California's Central Coast, seawater desalination could be highly growth-inducing, leading to urban sprawl, with potentially serious environmental impacts. The implications of this technology and the case for public funding can be very different in different regional settings.

Integrated Water and Energy Management

Integrated water management efforts should pay particular attention to energy issues. Managing and using water more efficiently can reduce related energy requirements and greenhouse gas emissions. Efficiency as used here

Integrated Regional Management Case Study: The Santa Ana River Watershed

Water managers in Southern California's Santa Ana River watershed are leaders in designing integrated regional water management strategies, relying on an array of tools to produce a wide range of water management and environmental benefits.

The Santa Ana River drains 2650 square miles and runs 100 miles from the peaks of the San Bernardino Mountains to the beaches of Orange County. Five million people live within this "Inland Empire" watershed, a population that is expected to double within 50 years. The watershed is also home to the world's densest populations of cows, a fact that surprises most outsiders. At its peak, the basin held more than 300 dairies, with up to 400,000 head of cattle, operated in less than 220 square miles of the upper part of the watershed—the Chino Basin. These cows produce 1 million tons of manure per year and another 2 million tons of manure currently sit on dairy lands. Runoff from these dairies has contaminated one of Southern California's largest groundwater sources with salts, dissolved solids and nitrates.

Urbanization, dairy operations, habitat destruction and other activities have taken a toll on the Santa Ana River's ecosystem. Today, some of the river's residents, including the Santa Ana sucker, the Least Bell's vireo and the southwestern willow flycatcher, are listed under the Endangered Species Act.

In 1968, local water agencies formed the Santa Ana Watershed Project Authority (SAWPA) in order to develop an integrated approach to address the challenges discussed above. After decades of effort, this integrated approach includes strategies such as water conservation, wastewater reclamation, and storm water infiltration. What makes the SAWPA case study so interesting is that it shows how multiple problems can be addressed simultaneously.

The juxtaposition of the local dairy industry with growing cities has created challenges—and opportunities—for local leaders. The Inland Empire Utility Agency (IEUA) is diverting dairy waste for composting and marketing to agricultural users. The methane derived from anaerobic digestion of this waste is used to generate renewable electricity. Thus, by diverting dairy waste and reducing ongoing groundwater contamination, IEUA has created a new energy source and a marketable compost product.

The value of new water sources, as well as regulatory and legal pressure to clean up groundwater contamination have also led IEUA to construct two groundwater desalters, which use desalination technology to clean up contaminated groundwater. (Desalting groundwater requires far less energy than desalinating seawater.) The two desalters have a combined capacity of more than 23 million gallons per day. These facilities provide usable water supply and help remediate contaminated groundwater basins. Agencies in the watershed are also recharging the basin's aquifers using storm water runoff and recycled wastewater.

The energy and climate benefits of this integrated approach are also notable. By reducing reliance on energy-intensive imported water (see discussion in Chapter 3), IEUA is able to reduce the electricity consumed to meet water supply needs. In addition to avoiding energy and other costs associated with imported water supplies, increasing local supplies reduces pressure on stressed ecosystems such as the San Francisco Bay-Delta. IEUA has also built a new energy-efficient headquarter building that has received a platinum certification from the U.S. Green Building Council's LEED program. The building uses waste heat to reduce heating and cooling costs, and photovoltaic cells to generate electricity.

The benefits of SAWPA's integrated approach are impressive, including:

- creation of local drought-proof water supplies.
- reduced reliance on imported water supplies that are vulnerable to environmental constraints and climate impacts.
- reductions in groundwater contamination
- flood management improvements
- enhanced wetlands
- marketable organic composed dairy waste
- improved air quality
- renewable energy generation
- reduced energy use and greenhouse gas emissions
- marketable greenhouse gas credits

The roots of this effort are more than three decades old. Climate considerations did not lead SAWPA and IEUA to launch this integrated regional effort. However, the energy and climate benefits of their approach are significant. The integrated approach reduces the vulnerability of the region to water supply impacts from climate change. It also shows how water utilities can make cost-effective contributions to efforts to reduce greenhouse gas emissions, through water and energy conservation, wastewater reclamation, better groundwater management and renewable electricity generation.

This integrated approach demonstrates how far water management has come from the days when dams and increased water diversions were the all-purpose solutions to meeting water supply needs. In California, the SAWPA effort has become a model for other integrated efforts around the state.

Sources: Santa Anna Integrated Watershed Plan, 2005 Update, Santa Anna Watershed Project Authority, Riverside, CA, June 2005.

Atwater, Rich and Paul Sellow. "Organics management, clean water and renewable energy: Focus on California." *BioCycle: The Journal of Composting & Organics Recycling*, February 2002.

<http://www.ieua.org/desalter.html>.

The LEED program itself reflects an integrated approach to green building. IEUA was able to use its institutional strengths to design on-site stormwater recharge facilities and to locate the headquarters building adjacent to a wastewater treatment plant, in order to provide renewable energy from its digesters and reclaimed water for use on site. The design reduced potable water demand by 73 percent and energy use by 90 percent.

describes the useful work or service provided by a given amount of water. Significant economic and environmental benefits can be cost-effectively achieved through improving water system efficiency. The energy/water nexus will make water conservation programs more attractive to

agencies planning a response to climate change. In particular, as greenhouse gas emission reduction programs increasingly emphasize energy conservation, water agencies are likely to find additional benefits from more fully integrating energy and water management. Taking both

12 Elements to Consider When Designing an Integrated Response to Climate Change

When evaluating options for responding to the water management challenges presented by climate change, water agencies should consider the benefits of comprehensive integrated regional water management planning (IRWMP). Such strategies should incorporate the following elements:

1. Climate Impacts on Existing Systems and Future Strategies.

Water agencies should analyze the potential impacts of climate change on existing facilities and on the tools under consideration to meet future demands.

2. Unique Regional Conditions. A careful examination of regional conditions will reveal challenges and suggest unique opportunities for future strategies to produce multiple benefits.

3. Evaluation of Multiple-Benefits and Funding Partners. IRWMP can provide potential multiple benefits and attract new funding partners to address water, energy, and environmental challenges.

4. Efficiency First. In most cases, greater investments in water-use efficiency are cost-effective and environmentally preferable—and result in significant energy savings. California electricity utilities recently adopted a “loading order” that requires investments in efficiency as a first priority before additional supply-oriented power strategies are pursued.⁵⁴ Water utilities should consider adopting a similar approach in response to anticipated climate change impacts.

5. A Full Range of Water Supply and Demand Options. All of the many supply and demand-side water management options should be considered in designing an effective response to climate change.

6. A Full Range of Flood Management Options. Land use controls, setback levees, floodways, and other floodplain management techniques are likely to become increasingly important flood management tools in the future. Given the high cost of new surface storage facilities and levees, and the residual flood risk for communities behind levees (e.g., pre-Katrina New Orleans), decision makers should encourage appropriate land use in floodplains to reduce risk to life and property.

7. Clear Objectives and Performance Standards. In order to evaluate the costs and benefits of alternative strategies, water managers should include clear objectives and performance standards to evaluate all tools on a level playing field.

8. “With-and-Without Project” Baseline Analysis. Analysis of proposed surface storage projects and other large infrastructure investments should include an accurate baseline and a clear “with and without project” analysis. Such analysis can help avoid stranded investments.

9. Economics and Cost-Based Financing. IRWMP should include careful evaluation of the economic costs and benefits of alternative strategies. Financing plans in which beneficiaries, rather than taxpayers, pay for the benefits they receive will provide incentives to ensure cost-effective investments.

10. Enforceable Environmental Protections. IRWMP efforts to restore and enhance the aquatic environment should take the form of specific, enforceable commitments.

11. Institutional Capacity. IRWMP will benefit from efforts to strengthen particular disciplines, including economics, climate-related expertise, and designing interagency partnerships.

12. Outreach to the Public and Decision Makers. IRWMP efforts to educate the public will increase public acceptance of investments to address climate-related problems. Agencies preparing plans to respond to climate change should also encourage decision makers to take prompt action to lessen future climate change-related impacts by reducing greenhouse gas emissions.

Together, the above recommendations represent a new approach to the foreseeable water management impacts of climate change. Though this approach is a dramatic departure from historic water project planning efforts, it is based on the experiences of water agencies around the West. This integrated regional approach can produce water supply, water quality, environmental, and other water management benefits, as well as greenhouse gas reduction and other societal benefits.

resources into account will improve the cost-effectiveness of water use efficiency programs, allowing, for example, higher rebates that should result in greater participation. Eventually, greenhouse gas reduction programs are likely to generate new opportunities for funding and revenue for water agencies that master the connections between energy and water.

The energy intensity of water varies considerably by source, geographic location and end use. A number of water management entities, government agencies, professional associations, private-sector users, and non-governmental organizations have already demonstrated potential savings in the area of combined end-use efficiency strategies:

- *Water-efficiency improvements:* Implementing cost-effective water efficiency improvements can generate significant energy savings. For example, in some areas, water, and energy utilities have designed joint rebate programs for appliances that save water and energy (e.g. washing machines). Some efficiency improvements can result in direct energy savings for water districts. For example, most of the electricity use in water and wastewater treatment plants is for pumping. Programs that reduce the volume of wastewater can result in significant energy savings for agencies with treatment plants. In addition, water conservation efforts that reduce peak water use can also reduce energy consumption, thus reducing peak energy demands as well.
- *Operations-efficiency improvements:* Energy management benefits can also be obtained by improving pumping equipment and operational control systems at existing facilities, including the use of high-efficiency motors and adjustable-speed drives, efficient pumps, and effective instrumentation and controls. In many applications, these measures can be implemented with payback periods of three years or less.⁴⁰

Response Strategies for Addressing Other Water Resource Impacts

Climate change will have direct effects on water supply resources as discussed in the sections above. However, impacts to water supplies will be compounded by indirect effects that climate change will have on other water resources including aquatic ecosystems and flood management. It is essential to understand and address these

Goods and Services of Aquatic Ecosystems

Water supply

Drinking, cooking, washing and other household uses
Manufacturing, thermoelectric power generation and other industrial uses
Irrigation of crops, parks, golf courses, etc.
Aquaculture

Supply of goods other than water

Fish
Waterfowl
Clams, mussels, other shellfish, crayfish
Timber products

Nonextractive benefits

Biodiversity
Transportation
Recreational swimming, boating, etc.
Pollution dilution and water quality protection
Hydroelectric generation
Bird and wildlife habitat
Enhanced property values
Coastal shore protection

Source: Pew Report on the Climate Effects on Aquatic Ecosystems.

important water resource in order to formulate an effective response plan to minimize water supply impacts.

Aquatic Ecosystems

Climate change will likely have significant impacts on riverine and estuarine ecosystems throughout the West, diminishing the wide array of societal benefits these ecosystems provide. As water managers consider how to respond to climate change, they should evaluate the need to manage and protect aquatic systems to maintain these benefits. In the West, water supply has often been prioritized over competing concerns, resulting in a loss of other benefits—particularly environmental benefits. As a result, many western rivers have been degraded to the point where species have been listed as threatened or endangered.

Today, the public seeks—and environmental laws require—a better balance among beneficial uses, and water managers must help find that balance. Water resource managers and the public share a mutual interest in addressing the impacts of global warming on aquatic ecosystems, in order to reduce future conflicts such as

"The manner in which humans adapt to a changing climate will greatly influence the future status of inland freshwater and coastal wetland ecosystems. Minimizing the adverse impacts of human activities through policies that promote more science-based management of aquatic resources is the most successful path to continued health and sustainability of these ecosystems. Management priorities should include providing aquatic resources with adequate water quality and amounts at appropriate times, reducing nutrient loads, and limiting the spread of exotic species."

Source: Pew Center on Global Climate Change, *Aquatic Ecosystems and Global Climate Change: Potential Impacts on Inland Freshwater and Coastal Wetland Ecosystems in the United States*, 2002.

those that have occurred on the Klamath, Rio Grande, and other rivers.

Around the West, many water managers have been leaders in implementing practices that can minimize the effects of climate change and help preserve the health of aquatic ecosystems. These practices include:

Protecting the Ability for Aquatic Species to Adapt to Changing Conditions. Species naturally seek out conditions favorable to their survival and success. In a warmer climate, some aquatic species experiencing increased stress will try to move higher within watersheds to find suitable habitat. Therefore, maintaining or improving conditions necessary for migration within a watershed is critical for the survival of species at the limits of their temperature tolerances. For example:

- Existing water infrastructure has, in many cases, reduced the ability of species to move throughout a watershed. Barriers such as dams and diversion structures should be assessed to determine the potential for improving movement of critical species. In some cases, particularly regarding antiquated infrastructure, retrofitting structures to enable passage, or removing barriers altogether, can allow species to utilize suitable habitat upstream.
- Maintaining free-flowing rivers allows natural migration to take place and helps maintain other physical processes such as sediment transports that are critical

for functioning ecosystems. When developing new storage, seek to locate new storage off-stream or utilize groundwater resources.

Restoring aquatic ecosystems. Restoring in-stream, riparian and floodplain ecosystems will increase the resilience of ecosystems to the effects of climate change and other stressors. Aquatic ecosystems where the natural, physical (i.e., sediment transport) and biological processes (i.e., recruitment of new riparian trees) are largely intact will be healthier and better able to support aquatic species, reducing the challenges that managers will face as climate change impacts intensify. Specifically, managers should consider that:

- Restoration of riparian habitat can play a crucial role in mitigating the effects of increased temperatures. Shading from trees reduces water temperatures. Riparian vegetation provides nutrients critical to aquatic species and improves the stability of stream banks, reduces bank erosion, and creates important aquatic habitat. In addition, large trees that fall into streams provide important in-stream habitat, particularly for juvenile salmon and other small fish.
- In many systems, restoration of periodic high flows is vital for maintaining in-stream habitat. High flows, often in the spring, are needed to establish riparian vegetation. Mobilization of sediment in the channel during high flows is essential for maintaining spawning habitat for salmon and trout. High flows also help move out-migrating juvenile anadromous fish downstream. They can also inundate natural floodplains, which are critical for some species to reproduce.
- Restoration of floodplain ecosystems can provide increased flood protection, groundwater infiltration for water supply, and improved water quality by reducing runoff into streams.

Improving Water Quality by Reducing Runoff of Pollutants. Runoff from urban, agricultural and other managed landscapes into rivers and streams can severely impair water quality through discharges of excess nutrients, sediment, and toxic chemicals. Poor water quality can in turn reduce the biological productivity of rivers and stress aquatic species. Increased flows may be required to mitigate adverse water quality impacts, or meet water quality standards. Reductions in polluting runoff can be achieved through a variety of approaches:

- Support practices such as increased use of permeable surfaces that allow infiltration of rainwater. Impervious surfaces can produce up to 16 times the volume of urban runoff compared to natural, permeable surfaces, reducing natural groundwater recharge and moving pollution into waterways. These practices can not only directly support multiple benefits including water quantity and community aesthetics, but can be more cost effective water quality solutions compared to traditional storm water management which relies on wastewater treatment.
- Riparian and floodplain habitats act as buffers between surface water sources and adjacent land uses, by filtering runoff and reducing direct input of pollutants.
- Watershed education programs have been effective at informing people about actions they can take to protect their local rivers and lakes. Water supply and flood management districts have a unique ability to educate their customers about the need to protect the quality of their water supplies.

Managing Water Supply Systems to Meet the Temperature Needs of Sensitive Species. Maintaining the health of aquatic ecosystems while meeting water supply needs will require data collection, analysis and actions to mitigate or prevent temperature impacts on sensitive species. Such efforts include:

- Data collection and computer modeling of seasonal water temperatures downstream of reservoirs to enable water managers to identify potential temperature problems before a crisis occurs.
- Data collection and computer modeling of reservoir temperatures under different operations scenarios to help water managers identify opportunities to reoperate reservoirs in order to preserve cold water for release later in the year, and to minimize potential water supply impacts.
- Retrofitting existing surface storage with flow curtains or installing flow outlets at a range of elevations within the reservoir to help meet water temperature needs downstream.
- Managing local groundwater levels to preserve subsurface inflow of cold water that may be critical to maintaining cold-water habitat for fish. Local groundwater pumping can also harm riparian vegetation that provides temperature and other ecosystem benefits.⁴¹

Flood Control

The frequency and the size of flood events are expected to increase due to climate change. Water managers are considering the challenge of reoperating reservoirs that serve the dual purpose of flood control and water supply. Because there are competing operational elements between these two purposes, reoperation may result in reduced water supply yield. Flood protection actions downstream of reservoirs, such as levee setbacks, can in some cases reduce the tension that dam operators face in managing for water supply and flood protection.

The most common form of flood protection has been the construction of storage facilities, levees and flood bypasses, but today there are a number of options for improving flood protection that may be more cost effective and provide additional benefits. This section discusses a number of planning considerations as well as structural and nonstructural options for improving flood management in order to address the impacts of climate change. Emphasis has been placed on response measures that not only increase flood protection, but also benefit ecosystem health, water quality, and water supply. Many of these measures may be significantly more cost effective than traditional approaches—particularly over time—because they reduce the potential for flood damage.

Manage Floodplains Knowing that They Will Flood Eventually.

Regardless of existing reservoirs or levees, most lands within the floodplain of a river will flood at some point, damaging property and resulting in the potential loss of life. It is not a question of *if*, but rather *when* such floods will happen. However, many local, state, and federal land-use and planning agencies only plan for the 100-year flood event. With climate change likely increasing the frequency and size of peak events, existing flood control systems may not be adequate. As such, the extent to which land uses within the floodplain can be limited to those compatible with periodic flooding will reduce the cost of flood damages and the need for increased levels of protection.

Many cities and counties currently use planning guidelines and zoning requirements to manage development within the floodplain to provide for public safety. Often only areas within the 100-year floodplain are subject to such regulations. Land that is adjacent to a river but protected by a levee built to withstand a 100-year flood event may not be considered to be within the floodplain. Areas deemed to have a 100-year level of protection may not be adequately protected in the future. The California

"A reasonably foreseeable flood is a flood event that is realistically probable for a particular area. In many cases, this event could exceed a predicted "100-year" flood... Sources of information on reasonably foreseeable floods may include historic floods, paleo-floods, hydrologic modeling using transposition, historical flood damage data, and hydrologic models."

Source: California Floodplain Management Report, 2002

Department of Water Resources notes that "during a typical 30 year mortgage period, a homeowner living behind a levee has a 26 percent chance of experiencing a flood larger than a 100 year event. This is almost twice the likelihood of a house fire."⁴²

The single most effective flood management strategy is to avoid development in floodplains that is not compatible with occasional flooding.

Plan for More Extreme Flood Challenges. Current climate modeling does not yet provide precise estimates of the degree to which climate change will increase the frequency and magnitude of flood events in any given area. The need to prevent future flood damage and the time required to implement mitigation measures suggests the importance of immediate planning for increases in flood events. Because simply planning for the 100-year flood may not be adequate in the future, water resource managers should therefore plan for the "reasonably foreseeable flood", taking into consideration the hydrologic impacts of climate change among other factors.

Restore Floodplain Habitat. Traditional flood control projects have been designed to control flows without considering the importance of maintaining floodplains as part of a healthy riverine ecosystem. Floodplain ecosystems provide essential habitat for a multitude of plants, aquatic species, and other wildlife. Lands adjacent to rivers, particularly those subject to frequent or deep flooding should be strongly considered for preservation or restoration as floodplain habitat. In the last several decades, a growing number of flood management projects are incorporated floodplain protection and restoration as a strategy to reduce flood damage and increase ecosystem health.

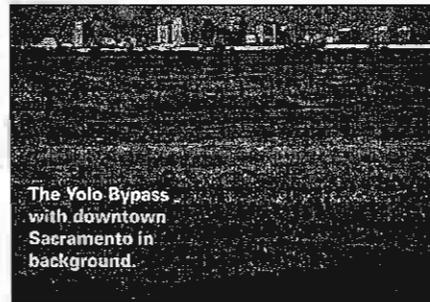
Promote Flood-Compatible Agriculture. One of the best economic uses of floodplain lands is for agriculture compat-

ible with periodic flooding. Not only does this encourage the preservation of productive agricultural lands, but periodic flooding also replenishes nutrients and soils, reducing the need for fertilizers. In addition, managed inundation of seasonal agricultural lands can provide valuable habitat for wildlife. The purchase of flood easements on private lands being used for flood control can also deliver financial benefits to farmers while creating a more cost effective way of meeting the need for improved flood management.

Build Flood-Resistant Infrastructure. In the valleys of large rivers such as the Sacramento, floodplain areas can extend great distances due to the low slope of the land. Making all of such land off-limits to development may not be necessary or feasible. Where construction occurs in an area that could be inundated to a shallow depth by a reasonably foreseeable flood event, structures should be built to withstand damage by requiring raised foundations or non-inhabited first floors. It is important for decision-makers to acknowledge and for residents to understand

Multi-beneficial Floodplains: The Yolo Bypass

The Yolo Bypass in California's Central Valley is a good example of incorporating agriculture and wildlife habitat into a local flood management plan. In the winter and spring months, the Bypass is employed as a flood control tool that plays a critical role in the Central Valley flood control system including protecting Sacramento and other neighboring cities. When flooded, the Bypass provides valuable habitat for native fish, and a resting stop for migratory birds. During the dry months of the year the Yolo Bypass is farmed with annual crops. Because of the important habitat the Yolo Bypass provides it is home to a national wildlife refuge.



TSP/ALD

that this approach will not eliminate risk as climate change increases the frequency and magnitude of floods.

Expand Flood Insurance. The most common form of flood insurance is obtained through the National Flood Insurance Program (NFIP). NFIP makes flood insurance available to communities that have enacted ordinances requiring, among other things, that all new construction have its lowest floor elevated at or above 100-year flood elevation. Under federal law, flood insurance must be purchased when obtaining a federally backed loan for a home within the Flood Insurance Rate Maps 100-year floodplain. But it is well recognized that these maps are often out of date and do not include areas that are within the 100-year floodplain due to the existence of levees. Cities and counties should assess the adequacy of their flood mapping based on existing and likely future flood hydrology. Additionally, all homes and businesses in areas at risk of flooding in a reasonably foreseeable flood event should be required to have flood insurance, particularly if they would be at risk of flooding to significant depth in the event of a levee failure.

Floodplain Mapping: The Need for Further Information

The West is growing rapidly and millions of people will be living in areas with the potential to flood. Yet many communities do not have the necessary information to determine the risk or the type of flooding they face. Floodplain mapping involves analyzing the hydrology of flood events of varying sizes and then charting what areas are likely to flood given current flood protection. Programs such as the Flood Insurance Rate Maps are essential tools in enabling cities and counties to make informed management decisions. They also help ensure that development within floodplains is sufficiently protected. Cities and counties, in coordination with state and federal agencies, should ensure that floodplain mapping is adequate by using updated hydrological information that reflects reasonably foreseeable flood events. Development, especially the increase in impermeable surfaces, can significantly alter natural hydrology, increasing downstream risks. Therefore, mapping should also incorporate the flood impacts related to past and future development within the watershed.

Improve Monitoring, Forecasting, and Early Warning Systems.

Collection of river and streamflow data is a critical component of water supply and flood management. To adequately manage rivers and meet ecosystem needs, water officials rely on streamflow data taken at all times of the year. Data collected during storm events is particularly relevant. Because every year is different, long records of data collection are extremely valuable in predicting future flows and rare high-flow events. Streamflow gauging is also an essential tool for developing early warning systems as part of evacuation plans that can both reduce flood damages and the loss of life. Unfortunately, recent cuts in federal spending have decreased the number of gauges throughout the West, undermining water resource managers and those responsible for public safety and ecosystem health. As climate change alters current hydrology, a robust stream gauge system will be essential to assist water managers and other decision makers.

Watershed and meteorological conditions vary greatly depending upon place, so no single strategy or suite of strategies will be appropriate for all locations. As a result, land-use planners and water resource managers should consider all options. They should also give priority to the response measures which are most cost effective, provide the most multiple benefits, and are easiest to implement given cost and political considerations.

PREVENTION

Decision makers in the West have traditionally looked to water leaders, particularly those from rapidly growing urban areas, to inform them about problems related to water supply, and to develop solutions. The scope and extent of potential worst-case climate change impacts, ranging from lost snowpack to rising sea levels, could result in serious challenges for water managers. As in the case of the gasoline additive methyl tertiary-butyl ether MTBE (see *The MTBE Story: Urban Water Agency Leadership*) the wisest course for water managers is to be proactive, to reach out to decision makers and the public, and to encourage preventative action. Regarding climate change, prevention means comprehensive, ambitious, and prompt action to reduce greenhouse gas pollution. Such actions could have profound benefits for water management for decades to come.

The MTBE Story: Urban Water Agency Leadership

Perhaps the best example of proactive action by water managers in responding promptly to threats to urban water supplies is the effort to address the contamination of groundwater by the gasoline additive methyl tertiary butyl ether (MTBE). Water agencies were on the forefront of efforts regarding MTBE contamination long before regulatory agencies took action regarding this suspected carcinogen. A decade ago, urban water managers became aware of the threat posed by MTBE contamination to water supplies. MTBE threatened thousands of wells across the country in places where this gasoline additive had leached into groundwater.

Instead of waiting for regulators to assess the scope of the problem and design a response, water managers proactively educated the public and decision makers about MTBE's sources, potential health impacts, and potential costs to water agencies. They took the lead in urging regulatory agencies and legislators to address the threat posed by MTBE. Water agencies also opposed oil company efforts to obtain a congressional waiver of liability. The consensus regarding MTBE among water managers led to the involvement of the American

Water Works Association (AWWA). Thanks to water managers, states began banning MTBE, reducing future contamination—and future costs—far more rapidly than would otherwise have been the case. The MTBE case illustrates the impact that proactive water managers can have on public education and prevention on critical water issues.

There were several reasons for this decision to take a leadership role in the MTBE debate. The scientific evidence regarding MTBE contamination was clear. The water management implications of MTBE were serious in terms of public health, the contamination of existing water supplies, and economic costs. Regulatory agencies were slow to respond to the problem when action by policymakers could have had a major impact. And finally, water managers are respected community leaders; decision makers and the public look to them for information about serious water-related problems. Each of these factors now applies in the case of climate change.

For many of the same reasons as the MTBE case, water managers should take the lead in advocating climate change prevention measures.

This would not be the first time that water managers have taken the lead on water management issues without waiting for intervention by regulatory agencies. In December 1991 in California, urban water agencies and environmental organizations signed a memorandum of understanding regarding urban water conservation. This landmark agreement included 14 best management practices for urban conservation. Membership in the California Urban Water Management Council has now grown to 354 members.⁴³ These urban water agencies could have waited for the state legislature or regulatory agencies to mandate conservation efforts. Although the state has raised significant concerns regarding the pace of implementation of the best management practices, this agreement remains a significant pro-active step.⁴⁴

Western water agencies and other decision makers with water management responsibilities have already demonstrated a broad approach as they begin to reduce climate change impacts. The pace of action to prevent future damage from climate change is accelerating dramatically. Concerns about water impacts are a significant factor in these developments, and water managers are

beginning to take clear, action to help prevent climate change. This section provides a brief survey of best practices regarding these actions at the local, state, regional, and national levels.

Action at the Local Level

Although reducing the future impacts of climate change will require action at all levels of government, steps taken at the local level can result in innovative approaches to prevention, and can point the way to broader action. Several examples of such local action are cited here.

Action by Individual Water Agencies

Some water agencies are laying the groundwork for programs to reduce their greenhouse gas emissions. For example, the East Bay Municipal Utilities District (EBMUD) is working to minimize the district's climate change footprint. EBMUD is the first water district to join the California Climate Action Registry. As a member of the registry, EBMUD pledges to annually track, report, and certify its greenhouse gas emissions. The district has also replaced nearly its entire passenger vehicle fleet

with electric-gas hybrids and installed microturbine and photovoltaic systems on the roofs of its two main offices to power business operations. EBMUD was recently awarded the Environmental Protection Agency's Green Power Leadership Club award for exemplary green power production—the first water/wastewater agency to receive this honor. (See Appendix A for a detailed discussion of EBMUD's approach to climate change.) Since EBMUD joined the registry, more than a dozen California water agencies have joined as well as Seattle Public Utilities and the Salt River Project.

Public/Private Partnerships

In some areas in the West, water agencies are collaborating with local businesses to address global warming. The Santa Clara Valley Water District's (SCVWD) partnership with Sustainable Silicon Valley is an excellent example. Formed in 2001, Sustainable Silicon Valley (SSV) is a collaboration of businesses, government agencies, and nongovernmental organizations aimed at addressing environmental and resource pressures in the San Francisco Bay Area's Silicon Valley.⁴⁵ SSV is working towards a goal of reducing regional carbon dioxide emissions to 20 percent below 1990 levels by 2010.

To meet the goal, the partnership is focusing on energy efficiency, fuel efficiency, and increased use of renewable energy. This partnership with high technology firms reveals an understanding of the need to take action to prevent climate change and of the opportunities for businesses pioneering. It also shows an understanding of effective new technologies that assist in achieving this goal. Many Silicon Valley entrepreneurs see climate change reduction efforts as a major growth industry. As part of this effort, SCVWD has installed high-efficiency photovoltaic cells above a parking area on its San Jose campus, reducing carbon dioxide emissions by an estimated 412,699 pounds per year and supplying 20 percent of the facility's energy needs with clean energy. (See Appendix A for a detailed discussion of how SCVWD is working to address climate change.)

Cities for Climate Protection

Local governments across the United States are beginning to address the challenge of reducing climate change emissions. More than 670 cities worldwide have joined the Cities for Climate Protection campaign. These include at least 150 in the United States, more than 45 of which are in the West.⁴⁶ These local governments include many

with water management responsibilities. Of the western cities that are members of the campaign, more than 30 serve as direct municipal water providers. In addition, the Marin (California) Municipal Water District has signed on to the campaign as an individual water district—the first water district to do so. As part of the agreement, signatories analyze their greenhouse gas emissions, set emissions reduction goals, develop and implement local greenhouse actions plans, and monitor and report results. This campaign represents a major movement of cities to address climate change-related issues directly.

U.S. Mayors' Climate Protection Agreement

On June 13, 2005, the U.S. Conference of Mayors unanimously passed a resolution regarding global warming.⁴⁷ Remarkably, this measure received more support than any resolution in the organization's history.⁴⁸ Of the more than 410 mayors who had signed the agreement as of March 8, 2007, (representing more than 60 million people), at least 133 are mayors of western cities. At least 85 of those cities provide water services directly through municipal water agencies.⁴⁹ The agreement commits signatories to strive to meet or exceed Kyoto Protocol targets for reducing climate change pollution—a reduction of 5.2 percent below 1990 emissions levels by 2012.

Action at the State Level

Around the nation, a growing number of states are also taking action to address climate change. In the West, governors are stressing the potential impacts on water supplies as major reasons for taking comprehensive action. State-based strategies include gubernatorial initiatives, programs to reduce carbon pollution, and a move toward renewable portfolio standards.

Comprehensive Gubernatorial Initiatives

California. On June 1, 2005, Governor Arnold Schwarzenegger signed an executive order establishing greenhouse gas emissions targets for the state. The targets call for reducing California's emissions 11 percent below current levels by 2010, 25 percent by 2020, and 80 percent by 2050. Scientists agree that reductions of about 80 percent below current levels are needed to stave off the most serious effects of climate change.

In addition to highlighting potential impacts to water supply, the California initiative also emphasizes that water managers can be part of a comprehensive climate change strategy. The final March 2006 report from the

Governor's Climate Action Team underscores the fact that water conservation has the potential to generate significant energy savings, thus reducing greenhouse gas emissions. (See the discussion of energy and water issues in Chapter 3 for a more complete discussion of this issue.)

Three California urban water agencies have become directly involved in supporting the state's efforts to mandate cuts in climate change pollution. The East Bay Municipal Utility District, the Santa Clara Valley Water District, and the Marin Municipal Water District have all written to the governor, urging him to adopt an aggressive greenhouse gas pollution control strategy. For example, the Santa Clara Valley Water District stated in its letter to Governor Schwarzenegger, "(W)e are very concerned about the impacts of global warming on Sierra snow pack and on water quality in the Delta. The district has supported policies that would reduce the effects of greenhouse gases. We urge you to take the necessary next steps to further the goals and commitments made by your Administration to prevent and defer global warming in California."⁵⁰

Arizona. On February 2, 2005, Governor Janet Napolitano signed an executive order creating a 36 person Climate Change Advisory Group. The group was charged with producing a Climate Change Action Plan that gives recommendations for reducing greenhouse gas emissions in Arizona.⁵¹ The suite of recommendations issued by the task force would reduce emissions to 20 percent below 2006 levels, while saving the state approximately \$6 billion, creating 300,000 new jobs, and saving 172,000 barrels of oil.

Oregon. On April 13, 2005, Governor Ted Kulongoski announced five new initiatives designed to curb climate change. These initiatives, based on the Governor's Advisory Group on Global Warming, include:

- establishing new greenhouse gas reduction goals
- developing a plan for stricter emission standards for vehicles, along the lines of California's program
- developing carbon dioxide reduction schedules for utilities and other large emitters
- reducing state agency energy use by 20 percent by 2025
- increasing renewable and bio-fuel production and use⁵²

New Mexico. On June 9, 2005, Governor Bill Richardson signed an executive order setting greenhouse gas emis-

Western Leaders Speak Out About Climate—and Potential Water Impacts

"Global warming threatens California's water supply, public health, agriculture, coastlines and forests, our entire economy and way of life. We have no choice but to take action to reduce greenhouse gas emissions." (California Governor Arnold Schwarzenegger, July 3, 2005)

"Arizona and other Western States have particular concerns about the impacts of climate change and climate variability on our environment, including the potential for prolonged drought, severe forest fires, warmer temperatures, increased snowmelt, reduced snow pack and other effects." (Governor Janet Napolitano, Climate Change Executive Order, February 2, 2005)

"Coastal and river flooding, snowpack declines, lower summer river flows,... and increased pressure on many fish and wildlife species are some of the effects anticipated by scientists at Oregon and Washington universities." (Oregon Strategy for Greenhouse Gas Reductions, Governor's Advisory Group on Global Warming, p. i)

"The southwestern United States will likely suffer significant impacts from temperature changes, such as decreased annual precipitation, faster evaporation of surface water supplies, and increased runoff at the end of winter when snow will melt faster." (Governor Bill Richardson, Climate Change and Greenhouse Gas Reduction Executive Order, June 9, 2005)

"Montana has been locked in the grip of a drought for most of the past two decades...I am very concerned about the connection these conditions have to global climate change... I am intrigued by the fact that every city, state, corporation, province and country that has resolved to control its respective green house gas emissions has reaped substantial economic benefits from those efforts...I ask you to establish a Climate Change Advisory Group that will examine agriculture, forestry, energy, government and other sectors of our state. I want this broad-based group of Montana citizens to identify ways in which we can reduce our collective greenhouse gas emissions while saving money, conserving energy and bolstering our economy." (December 13, 2005 letter from Governor Brian Schweitzer to Richard Opper, director of the state Department of Environmental Quality)

sions reduction targets at 2000 emissions levels by 2012, 10 percent below 2000 levels by 2020, and 75 percent below 2000 levels by 2050. The order created the New Mexico Climate Change Advisory Group to write a plan to meet the targets.⁵³ New Mexico thus became the first major energy producing state to set targets for cutting global warming emissions.

Montana. On December 13, 2005, Governor Brian Schweitzer called for the creation of a Climate Change Advisory Group, charged with developing recommendations to help Montanans save energy and reduce greenhouse gas emissions. The effects of climate change on water were cited first in the governor's letter, quoted below:

State-Level Programs to Reduce Carbon Pollution

States are taking a wide range of individual actions to reduce the emissions that cause global warming. For example, several states are adopting renewable portfolio standards or California's pioneering legislation regulating automobile tailpipe emissions of greenhouse gases. However, these efforts represent only two possible state-level responses to address global warming. In addition to the broad gubernatorial initiatives discussed above, state-based programs include:

- Automobile tailpipe emissions standards
- Appliance efficiency standards
- Renewable energy generation requirements, known as renewable portfolio standards
- Incentives for renewable energy production and generation
- Green building standards, such as the U.S. Green Building Council's Leadership in Environmental Design (LEED) program
- Requiring utility energy plans to include the cost of carbon emissions

California's Global Warming Solutions Act. The Global Warming Solutions Act (AB 32) authored by Assembly Speaker Fabian Núñez (D-Los Angeles), was signed into law by Governor Arnold Schwarzenegger on September 27, 2006. This made California the first state in the nation to set limits on heat-trapping pollution by implementing the pollution reduction targets laid out by Governor Schwarzenegger in June 2005. It set limits

to cut the state's global warming pollution 25 percent by 2020. In recognition of the water supply benefits of reducing global warming, AB32 was supported by three California urban water agencies: the East Bay Municipal Utilities District, the Marin Municipal Water District, and the Santa Clara Valley Water District. Water agency staff and board members lobbied in support of AB 32 and helped spread awareness of the potential water-related impacts of climate change, and contributed to the bill's passage.

California's Vehicle Tailpipe Greenhouse Gas Emissions Program.

In 2002, California passed pioneering legislation to reduce global warming pollution from all new passenger cars and trucks sold in the state, the largest automobile market in the United States. The law takes effect with the 2009 model year. At least 10 states, including Arizona, Oregon, and Washington, and Canada have adopted or indicated their intention to adopt California's tailpipe pollution standards. Together, these states and Canada represent one-third of the North American automobile market, providing a significant incentive for automobile manufacturers to improve the emissions of their entire fleet.

Renewable Portfolio Standards.

At least seven western states have adopted renewable portfolio standards, which require electric utilities to purchase specified percentages of their power from renewable energy sources by specific target dates.⁵⁴ There are many benefits of such standards, including reduced pollution from coal-fired power plants and lower greenhouse gas emissions.

- Arizona: Requires electricity retailers to purchase 15 percent of their power from renewable sources by 2025
- California: Requires 20 percent renewables by 2017
- Colorado: Requires 10 percent renewables by 2015
- Montana: Requires 15 percent renewables by 2015
- Nevada: Requires 20 percent renewables by 2015
- New Mexico: Requires 10 percent renewables by 2011
- Washington: Requires 15 percent renewables by 2020

Action at the Regional Level

Western Regional Climate Action Initiative

On February 26, 2007, the governors of Arizona, New Mexico, Oregon, Washington and California, launched

"In the Southwest, water is absolutely essential to our quality of life and our economy... Addressing climate change now, before it is too late, is the responsible thing to do to protect our water supplies for future generations."

Source: Governor Bill Richardson, February 28, 2006

a joint effort to reduce their emissions of global warming pollution. Through the Western Regional Climate Action Initiative, these states will create a regional system to promote clean energy and energy efficiency to slow emissions of carbon dioxide and other heat-trapping pollutants that are contributing to global warming. The new agreement is similar to the Regional Greenhouse Gas Initiative among 8 northeastern states and will include regulatory and market mechanisms.

West Coast Governors Global Warming Initiative

In September 2003, the governors of California, Oregon, and Washington launched a regional initiative designed to address climate change.⁵⁵ This effort includes setting emissions targets for state vehicle fleets, creating targets and incentives for renewable energy, and developing efficiency standards for appliances.

Southwest Climate Change Initiative

In February 2006, Governor Richardson of Arizona and Governor Napolitano of New Mexico announced the creation of the Southwest Climate Change Initiative, aimed at reducing global warming effects and cutting greenhouse gas emissions.

Regional Greenhouse Gas Initiative

The largest regional global warming effort, known as the Regional Greenhouse Gas Initiative (RGGI), has been launched among eight Northeast and mid-Atlantic states.⁵⁶ The initiative's goals include capping carbon dioxide emissions from power plants at current levels in 2009 and reducing them by 10 percent from current levels by 2019. RGGI may become the nation's first cap and trade carbon program. This market-based approach to emission reductions is expected to drive investments to the least cost strategies, encourage technological innovation, and bring net economic benefits to the region. State modeling has estimated that, along with expected investments in

Sense of the Senate Resolution— Passed on June 22, 2005

On June 22, 2005, the United States Senate passed a resolution (54–43), which for the first time called for mandatory limits on U.S. global warming pollution. The bipartisan resolution was offered by Senators Bingaman (D-NM), Byrd (D-WV), and Domenici (R-NM). The passage of the resolution marked the first time that a majority of the Senate has voted in support of mandatory caps to limit global warming pollution. The resolution read: Congress finds that

(1) Greenhouse gases accumulating in the atmosphere are causing average temperatures to rise outside of the range of natural variability and are posing a substantial risk of rising sea levels, altered patterns of atmospheric and oceanic circulation, and increased frequency and severity of floods and droughts;

(2) There is a growing scientific consensus that human activity is a substantial cause of greenhouse gas accumulation in the atmosphere; and

(3) mandatory steps will be required to slow or stop the growth of greenhouse gas emissions into the atmosphere.

(b) Sense of the Senate—It is the sense of the Senate that Congress should enact a comprehensive and effective national program of mandatory market-based limits and incentives on emissions of greenhouse gases that slow, stop and reverse the growth of such emissions at a rate and in a manner that

(1) will not harm the United States economy; and

(2) will encourage comparable action by other nations that are major trading partners and key contributors to global emissions.

efficiency, RGGI will result in a net savings on consumer energy bills of more than \$100 per household.

Action at the National Level

Progress on global warming can be made at the local, state, and regional level. However, the United States will not fully or adequately address climate change-related issues until it develops a mandatory national program to slow, stop, and reverse the emissions of pollutants that cause global warming. Though Congress has not passed

U.S. Climate Action Partnership: A Joint Business and Environmental Program

The business community is taking a leadership role in calling for an ambitious, effective national program to reduce greenhouse gas emissions. On January 22, 2007, the U.S. Climate Action Partnership, a diverse group of businesses and environmental organizations called on the federal government to quickly enact strong national legislation to achieve significant reductions of greenhouse gas emissions. It further stated:

"We, the members of the U.S. Climate Action Partnership, pledge to work with the President, the Congress, and all other stakeholders to enact an environmentally effective, economically sustainable, and fair climate change program consistent with our principles at the earliest practicable date."

This unprecedented alliance, called the U.S. Climate Action Partnership (USCAP), consists of businesses including Alcoa, BP America, Caterpillar, Duke Energy, DuPont, FPL Group, General Electric, Lehman Brothers, PG&E, and PNM Resources, along with four non-profit organizations, including NRDC. The USCAP document, "A Call for Action," includes a goal of reducing greenhouse gas concentrations to a level "that minimizes large-scale adverse climate change impacts to human populations and the natural environment." According to the group, "Each year we delay action to control emissions increases the risk of unavoidable consequences that could necessitate even steeper reductions in the future, at potentially greater economic cost and social disruption." The group supports "mandatory approaches" to reduce heat trapping pollutants, as well as flexible strategies to achieve these reductions. According to these business and environmental leaders, confronting this challenge "will create more economic opportunities than risks for the U.S. economy."

Source: United States Climate Action Partnership, January 2007. "A Call for Action." www.us-cap.org.

comprehensive legislation to this end, there has been some significant action at the federal level. The U.S. Senate has adopted a bipartisan resolution calling for mandatory limits on greenhouse gas emissions.

Mandatory Federal Limits on Global Warming Pollution

Recent scientific consensus has solidified around the need for decisive federal action to limit global warming pollution in order to stave off dangerous impacts on the earth's climate. Industry had recognized this urgency and called on Congress to act. Most significantly, in January of 2007, some of America's largest corporations called for mandatory limits on the pollution that causes global warming under a newly formed alliance called the United States Climate Action Partnership (USCAP). The group, which consists of such industry-leading companies as General Electric, Caterpillar, Duke Energy, Alcoa, Lehman Brothers and DuPont, noted in its report that "each year we delay actions to control emissions increases the risk of unavoidable consequences." USCAP went on to call for "prompt enactment of national legislation in the United States to slow, stop, and reverse the growth of greenhouse gas emissions over the shortest period of time reasonably achievable."⁵⁷

Like USCAP, NRDC supports aggressive emissions reductions measures such as those outlined in Congressman Henry Waxman's *Safe Climate Act* (HR 5642), and in Senators' James Jeffords and Barbara Boxer's *Global Warming Pollution Reduction Act* (S. 3698). Both pieces of legislation call for reducing emissions to 1990 levels by 2020, and for further reductions to levels approximately 80 percent below 1990 levels by 2050. Such cuts are needed to avoid atmospheric concentrations of carbon dioxide that would lead to dangerously increased global temperatures and catastrophic changes in the earth's natural systems.

For up-to-date information, on federal global warming legislation, please visit the NRDC Global Warming web page at: <http://www.nrdc.org/globalWarming/default.asp>.

PUBLIC OUTREACH

As respected community leaders, water managers can have a significant impact in shaping public opinion and awareness. The role of water managers in shaping public awareness is particularly significant in the American West; where water is scarce, water leaders bear a greater burden in educating the public and decision makers regarding water-related issues. Some water officials are already beginning to educate the public about the connections between climate change and water management. Water districts use a wide range of educational tools: materials for children, billboards and other paid advertising, outreach and meetings with—and letters to—elected officials. These educational efforts can have a significant effect on the public debate when it comes to climate change.

How Water Managers Are Leading the Way

Today, some western urban water managers are meeting the challenge of calling for action on global warming. As early as 1998, the Water Education Foundation, a California nonprofit organization with many board members from water agencies, major water users, and water-related engineering firms, devoted an issue of its magazine to climate change, discussing the growing scientific evidence regarding climate change and potentially significant water-related impacts such as a reduction of snowpack.⁵⁸ In October 2001, the American Water Works Association's journal discussed some of the potential climate-related impacts on water supplies that are reviewed in this report.⁵⁹ These discussions, in turn, have helped

water managers to begin to analyze how their systems are vulnerable to the impacts of climate change.

As public awareness about the threat posed by global warming has grown, so too has the awareness of water managers. In 2005 the American Water Works Association Research Foundation issued a seminal report entitled *Climate Change and Water Resources: A Primer for Municipal Water Providers*. Though written primarily for water managers, the report discusses the importance of public education about the water-related potential impacts of climate change. And there are more signs that awareness among water managers is continuing to build:

- The Santa Clara Valley Water District's website includes strong statements about climate change "The reality of global warming and climate change is the most significant long-term threat to water resources management in Silicon Valley."⁶⁰
- Three San Francisco Bay Area urban water agencies wrote to Governor Schwarzenegger in early 2006, urging him to take prompt action to address climate change. These three urban water agencies have also supported state legislation that would create mandatory caps on greenhouse gas emissions.
- In January 2007, the San Francisco Public Utilities Commission convened a Water Utility Climate Change Summit attended by more than 150 water managers and other stakeholders. The conference received significant media coverage.

The message is beginning to get through to decision makers, as indicated by public comments made by governors around the West about the need to act to reduce climate change impacts. Nearly all of those comments (see *Western Leaders Speak Out about Climate*) highlight the effect global warming will have on water resources.

Conclusions and Recommendations

The research, analysis, and best practices reviewed in this report suggest several broad conclusions related to climate change and water management. These conclusions, as well as the conclusions in the American Water Works Association Research Foundation (AWWARF) report, lead to a number of specific recommendations for water managers that fall into the four action areas outlined in the previous chapter: vulnerability analysis, response, prevention, and public awareness.

CONCLUSIONS

The Science Is Clear

The scientific community has provided clear and urgent evidence that global warming is already happening and that it is caused by the increase in greenhouse gas concentrations in the atmosphere, particularly carbon dioxide. This increase is largely human-caused, primarily through the burning of fossil fuels in power plants and cars.

Climate Change Will Affect Water Management

There are a variety of ways in which climate change will negatively affect water resources in the American West. Considered together, these changes could have a significant impact on water supply, water quality, aquatic ecosystems, and flood management. We are already experiencing serious impacts of climate change, includ-

ing sea level rise, decreased snowpack and earlier peaks in spring runoff.

Immediate and Sustained Action Can Reduce Future Impacts

Broad and strong actions will slow, stop, and reverse rising emissions of greenhouse gases, reducing future impacts on water resources. Immediate action is required to reduce long-lasting climate effects. Cost-effective opportunities for emission reductions can provide immediate multiple benefits.

Water Managers are Taking Action on Climate Issues

Water managers need to provide leadership to address the impacts of climate change on water resources and lead by example by reducing greenhouse gas emissions. Around the West, some water managers have undertaken

a broad range of actions on issues related to all aspects of climate change.

RECOMMENDATIONS

Water managers work with their communities to meet future water needs. The comprehensive recommendations presented in this section are designed to assist managers in helping Western communities face the new challenges posed by climate change.

Vulnerability Analysis

Local, regional, state and national water resource managers should assess the vulnerability of water supplies, flood management and aquatic ecosystems to impacts from climate change.

■ *Conduct Local Analyses*

Water managers should analyze the potential effect of climate change on water supply systems, water demand, and environmental and water quality requirements.

■ *Assess Regional Impacts*

Water managers should undertake cooperative regional vulnerability analyses to develop an understanding of the common challenges they face and lay the groundwork for cooperative responses. Such regional efforts could also produce better results and reduce expenses for individual participating agencies.

■ *Undertake State- and Federal-Level Evaluations*

Agencies should undertake state level analyses of likely climate change impacts on a full range of water management issues. Federal agencies including the Bureau of Reclamation, the U.S. Army Corps of Engineers, Fish and Wildlife Service, the Federal Emergency Management Agency, the Environmental Protection Agency, the National Oceanic and the Atmospheric Administration, Federal Energy Regulatory Commission and the United States Geologic Survey should undertake evaluations of the likely impacts of climate change on water resources, and federal facilities and on the communities they serve.

Response

The following recommendations are designed to help water managers respond effectively to likely climate change impacts.

■ *Guiding Principles for Water Resource Management Response*

The following general principles are designed to assist forward-thinking water decision makers in crafting strategies to respond to this challenge.

- *Strengthen Institutional Capacity.* Responding to climate change will require agencies to invest in inter-agency collaborations, stakeholder involvement and technical analysis.
- *Maximize Flexibility.* Develop strategies that allow for mid-course corrections and redirection of investments toward the most effective tools, and strategies that reduce the risk of stranded investments in order to increase the ability of water managers to adapt to changing conditions.
- *Increase Resilience.* Water managers should consider a range of water management options that increase their ability to meet future needs under conditions of greater variability and uncertainty.
- *Implement "No Regrets" and "Multiple Benefits" Strategies.* Choose cost-effective strategies providing multiple benefits that make sense both today, and in a world altered by climate change.
- *Address Multiple Stresses.* Climate change is intensifying the stress put on water resources by other factors (e.g., population growth, land-use changes, contamination of surface and groundwater resources, and the need for ecosystem protection.) Water managers should seek to address these combined challenges through measures such as improving water use efficiency and protecting surface and groundwater sources.
- *Invest in Inter-Agency Relationships.* Water managers should partner with neighboring water agencies, as well as with agencies managing energy, environmental resources, wastewater, stormwater, and land use.
- *Incorporate Climate Change into Ongoing Project Design.* Water managers should incorporate climate change impacts into the design of existing and new facilities now, rather than waiting for the completion of comprehensive response plans to address climate issues.
- *Expand Dialogue with the Scientific Community.* Water managers and scientists should exchange information to increase the effectiveness of measures designed to meet the challenges posed by climate change and should develop a more accurate analysis of potential impacts on water resources.

■ **Restore and Protect Aquatic Ecosystems in Preparation for Climate Change**

In recent years, the West has seen numerous water resource conflicts pitting protection of threatened and endangered species against the demand for water supplies. To prevent future conflicts, to minimize impacts to water supplies and to protect our aquatic ecosystems, water managers should incorporate the following actions into their climate change strategies:

- Restore degraded rivers and floodplain habitats to buffer the impacts of climate change and provide critical habitat for sensitive species.
- Improve water quality by reducing runoff of pollutants through watershed management, increasing urban retention and infiltration of precipitation.
- Manage water supply systems to meet the temperature needs of sensitive species.

■ **Implement Water Management Tools That Are Effective in the Context of Climate Change**

Prior to making long-term investment decisions, water managers should carefully consider climate change effects on the tools available to meet future water needs. Climate change is likely to improve, or leave unchanged, the performance of tools such as water use efficiency and water recycling. Other tools that rely on historical hydrology (e.g., traditional river diversions, traditional groundwater pumping and traditional surface storage), are likely to perform less effectively in the future.

■ **Put Conservation First**

Water efficiency represent a sound and basic “no regrets” water management approach to future climate change impacts. Cost-effective water conservation investments can generate significant benefits on multiple fronts, including water supply, environmental, energy use, and greenhouse gas emissions reductions. Water managers should support conservation strategies that:

- *Transform markets through plumbing code changes and appliance standards.* These changes are the most successful and cost-effective way to save water. In California, a recent study found that between 50 percent and 85 percent of the conservation likely to occur under a variety of scenarios by 2030 will be attributable to changes in the plumbing code.¹

- *Offer rebates for and make investments in interior water use efficiency.* Ultra-low flush or dual-flush toilets, low-flow showerheads and faucets, efficient appliances, and waterless urinals are proven cost-effective tools.
- *Promote landscape conservation.* Promote landscape water conservation including selection of drought-tolerant plants, landscape design that groups plants with similar water needs, efficient irrigation technology (including “smart-controllers” that automatically adjust to changes in weather), training for irrigation managers and maintenance personnel and seasonal rate structures
 - *Use water metering and volumetric pricing to provide accurate price signals.* Water metering remains the single most effective water conservation tool. Measures such as submetering for multiple-unit residential and commercial buildings, and dedicated landscape meters, are particularly effective.
 - *Price water to reflect its true cost and reduce existing water subsidies.* Water agencies should maximize the percentage of revenue recovered through volumetric charges rather than fixed charges, and should adopt tiered and seasonal water rate structures that encourage efficiency.
 - *Support efficient product labeling.* The EPA has initiated the WaterSense program, comparable to the Energy Star™ program, to label products that meet its standards for water efficiency. Such a labeling program will help guide customers to the water-efficient choices already on the market and will encourage manufacturers to develop new, efficient products.
 - *Use system leak detection to reduce unaccounted-for water.* In some systems these leaks can account for 30 percent or more of water use.
 - *Implement commercial, industrial, and institutional conservation programs.* These can include programs targeted at individual measures, such as cooling towers, pre-rinse spray valves in restaurants, X-ray machines, and more customized initiatives designed to address industrial processes, and institutions, including universities and hospitals.
 - *Create statewide and national programs for water conservation.* The California Urban Water Conservation Council is a good model for how to develop, implement, and monitor best management practices for water conservation. The new Alliance for Water Efficiency, which plans to bring together agencies, business interests

and environmental groups, should be an effective voice for advancing national water conservation standards and raising the profile of water conservation.²

- *Broaden public awareness.* Except in a handful of water-short regions, the public is generally unaware of the myriad benefits of water conservation. Regional campaigns to boost public awareness could generate substantial water savings.

■ **Incorporate Climate and Energy Issues in Water Planning**

By implementing tools ranging from efficiency improvements to reuse and recharge, there is an enormous opportunity to simultaneously save water and energy and to reduce greenhouse gas emissions. Water agencies should evaluate their energy consumption, particularly energy consumption driven by water use. Such an analysis should consider each phase of water use—storage and diversion, conveyance, treatment, local distribution, end use, wastewater treatment, and disposal.

■ **Collaborate with Energy Utilities.**

Water conservation generates substantial water and energy savings, and thus reductions in greenhouse gas emissions. Water agencies should work with local energy utilities to develop joint programs, such as rebates, to encourage water and energy conservation. Energy utilities should be appropriately credited for the embedded energy savings that accompany water conservation. Furthermore, water conservation activities that also save energy should qualify for public funding available for energy conservation.

■ **Integrate Regional Water Management**

Water managers should approach climate change response by utilizing an integrated regional water management approach, including a broad range of issues, multi-disciplinary analysis, stakeholders and agencies with multiple interests, and solutions tailored to local conditions. An integrated approach can produce broad benefits, including water supply, water quality, fish and wildlife, habitat improvements, recreational opportunities, flood damage reduction, energy supplies, greenhouse gas emissions, and regulatory compliance. Such integrated efforts should consider:

- potential climate change impacts on existing facilities and future water management tools
- unique regional conditions

An Integrated New Vision for the San Francisco Bay-Delta Ecosystem

California recently created a new “Delta Vision” process to develop a plan to address the multiple crises currently facing the Bay-Delta estuary, including climate change-caused sea level rise and increased flood risks. This plan will be developed by state agencies, with input from a new blue ribbon panel and a stakeholder group, including urban and agricultural water interests. A new plan for the Bay-Delta should include prompt action in several areas:

- strengthening efforts to reduce future global warming, thus minimizing future risks to the Delta,
- implementing short-term actions to protect and restore endangered species, including, when necessary, reductions in Delta pumping
- reducing reliance on the Delta for water supplies (by investing in more reliable alternatives), thus reducing the economic risks associated with reliance on a vulnerable Delta
- stopping ongoing urbanization that is putting more Californians at risk of a Katrina-style disaster as they move into homes on vulnerable Delta islands
- maintaining the most important Delta levees and
- restoring other Delta islands to natural habitat, thus lessening the risk of a catastrophic failure, lowering levee maintenance costs, and helping to restore a healthy ecosystem.

Although a successful solution will cost billions of dollars, the price tag could be far higher if California fails to respond effectively to this challenge.

- potential multiple benefits and potential funding and implementation partners (e.g. water supply, water quality, ecosystem management, recreation, land use and flood management)
- “efficiency first” investments
- a full range of potential demand and supply strategies
- a full range of potential flood management options
- clear objectives and performance standards for evaluating options

- “with and without project” baseline analysis for large infrastructure investments
- economic analysis and “beneficiary pays” financing
- enforceable environmental requirements
- strengthening institutional capacity
- educating the public and decision-makers about the need to reduce and prevent climate change

■ **Evaluate Surface Storage**

Evaluations of any potential surface storage facilities should take place as part of a fully integrated approach, including the following specific actions

- base analyses on likely future hydrology
- give demand side approaches an emphasis at least equal to alternatives that would increase supply
- include a comprehensive economic analysis
- establish beneficiary pays pricing policies, rather than relying on subsidies
- fully incorporate potential environmental impacts
- avoid assigning costs to unrealistic potential benefits

■ **Carefully Consider Commitments Regarding Future Water Deliveries**

Water agencies, including the Bureau of Reclamation, should consider climate change carefully when making commitments regarding future water deliveries. In particular, agencies should avoid promising increased water deliveries based on current hydrology.

■ **Factor Climate Change into Flood Management Decisions**

For agencies with flood management responsibilities, an awareness of climate change should be integrated into future management decisions. For example:

- avoid development in floodplains that is not constructed to be compatible with occasional flooding
- dam operators should develop plans to reoperate surface storage facilities and other infrastructure in response to changing hydrology, caused by global warming
- managers should investigate floodplain management opportunities, such as floodplain, riparian and wetland restoration and the establishment of flood-compatible

agricultural practices. These actions can generate public safety, flood damage-reduction, environmental and agricultural preservation benefits

- planners should incorporate climate change in analyses of future flood risk, including planning for the “reasonably foreseeable flood”, which is larger than the 100-year flood
- support expansions in flood insurance
- improve mapping, monitoring, forecasting, and early warning systems

Prevention

Water managers can contribute to efforts designed to reduce greenhouse gas emissions to reduce future climate change impacts.

■ **Support Mandatory Caps on Emissions**

Support the creation and enforcement of a mandatory national cap on the pollution that causes global warming (mainly carbon dioxide), as the single most important step in controlling and reducing the future impacts of global warming. The problem can be addressed most effectively addressed through federal caps, but local, state, and regional initiatives are also effective and important tools in the face of federal inaction.

■ **Support Alternative Energy and Energy Efficiency Programs**

Energy efficiency and renewable energy programs are necessary elements for any plan to achieve a dramatic reduction in carbon emissions. The following programs can be implemented at the state and/or national levels:

- appliance efficiency standards
- renewable energy generation requirements
- incentives for renewable energy production and generation
- green building standards, such as the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) standards
- requiring utility energy plans to include the cost of carbon emissions

■ **Take Action at the District Level**

Water agencies should develop programs to reduce their energy consumption and greenhouse gas emissions. Districts should consider joining the Cities for Climate Protection campaign.³

■ **Develop Community Partnerships**

Partnerships with the business community and local governments can enable water districts to broaden participation in ambitious greenhouse gas emissions reductions programs.

Public Outreach

Given the global nature of climate change and the need for far-reaching actions to address its causes, raising public awareness is essential to encourage effective action.

■ **Educate Ratepayers**

Ultimately, water district ratepayers could feel significant impacts and be forced to bear significant costs as a result of climate change. Water managers have a range of tools, such as newsletters, billboards, bill inserts, websites, and more, to educate ratepayers. An increased understanding of the challenges posed by climate change will promote ratepayer acceptance of programs designed to address this issue.

■ **Educate Decision Makers**

The involvement of water managers is important to convince agency and legislative decision makers that climate change is more than simply an environmental issue. Water managers are in a unique position in the West to educate decision makers about the water supply and economic consequences of climate change and the need to prevent worst-case climate scenarios.

■ **Educate the Media**

Water managers should strive to improve the media's understanding of these significant potential impacts and help raise awareness to reduce climate change impacts and risk.

■ **Incorporate Climate Issues into Conferences and Publications**

Water community conferences on water issues regularly include a presentation or two regarding climate issues. Given the significance of the potential effects, climate-related water management issues should play a more central role in water agency conferences, newsletters, reports,

and other publications. These efforts should be crafted to help water managers and users to take action.

ADDITIONAL RESEARCH NEEDS

The more we know about global warming and the effect it will have on our water resources, the better prepared water managers can be to prevent the most serious consequences of rising temperatures. Water agencies, academic institutions, and state and federal agencies should consider funding research designed to address the following areas:

- the potential groundwater impacts of climate change
- the impact of climate change on water demands.
- the impact of climate change on potential new surface storage facilities in highly engineered systems
- likely future changes in precipitation patterns (including totals and variability)
- potential future reductions in total streamflows
- improved maps and data showing flood risks and other flood-related information
- improved modeling of changes in the frequency and magnitude of peak flows
- potential impacts on water quality
- potential impacts on aquatic ecosystems
- downscale climate modeling for local and regional applications

Appendix A

Case Studies: Water Agency Action on Climate Change

Throughout the West, agencies of all sizes have conducted vulnerability analyses to evaluate the reliability of their water systems in the face of climate change. A number of agencies, such as the Santa Clara Valley Water District and Seattle Public Utilities have been studying potential climate change effects for years, while others have only recently begun to investigate these potential impacts. Each agency and utility's experience in analyzing potential climate change impacts has produced unique findings and has consistently given critical insight for water managers to prepare for the potential effects of climate change on their particular water systems.

Denver Water

Denver Water, a separate entity from the City of Denver, serves a total of 1,104,400 customers in the Denver Metro area, approximately one-fourth of Colorado's population. The agency uses one-third of the state's treated water supply. Its primary water sources are the Blue and South Platte rivers.

"We want to find out as much as we can about [climate change]," says Denver Water general manager Chips Barry.¹ To achieve that objective, Denver Water hired Stratus Consulting, an environmental and engineering research firm, to conduct an analysis of Denver's system in order to test the district's sensitivity to changes in temperature and precipitation as a result of climate change.² The findings of this analysis will be outlined in a general briefing paper presented to Denver Water on its completion.

In the district's next Integrated Resources Plan (expected to be completed in 2007), Denver Water plans to include a scenario designed to produce a rough estimate of possible impacts on its supply and demand.³ "Most of us operate on the premise that the future will be pretty much as it has been in the past," Barry points out. "Global warming has created greater doubt as to that proposition."⁴ By reducing the uncertainty regarding the particular impacts of climate change on its system, Denver Water can effectively plan to mitigate its effects and increase supply reliability:

Denver Water is ramping up its water conservation efforts with a \$400 million conservation plan designed to cut annual water use, over the next 10 years, to a level 22 percent below levels that prevailed prior to the 2002–2005 regional drought.⁵ Although this conservation

CITY LEVEL
Denver Water at a Glance

- hired an environmental engineering and research firm to analyze the effects of global warming on its system, including changes in temperature and precipitation.
- plans to include in its next Integrated Resources Plan a sample scenario of the potential effect of climate change on its supply and demand.
- accelerated investments in conservation, in part as a response to potential global warming impacts.

plan was initially established without regard to potential climate change effects on the Denver Water system, the agency accelerated its implementation, in part because it provides Denver Water with the ability to use saved water to mitigate impacts from climate change. Denver Water's board and executive staff approved the plan with an initial allowance of \$8 million for the first year. Moving forward, the plan's funding will be appropriated by the board and executive staff on an annual basis.⁶

Portland Water Bureau

The Portland Water Bureau supplies drinking water to more than 787,000 customers in the Portland region. The primary source of the bureau's water supply system is the Bull Run watershed, located in Mount Hood National Forest, 26 miles east of downtown Portland. Groundwater significantly supplements the agency's supply.

The Portland Water Bureau (PWB) incorporated climate change into its water supply planning analysis by commissioning a seminal study in 2002 by the University of Washington Climate Impacts Group.⁷ The study used a series of four linked Global Circulation Models—the Department of Energy's Parallel Climate Model, the Max Planck Institute's ECHAM4 model, and the Hadley Centre's HasCM2 and HasCM3 models—to estimate climate change impacts upon its system. The studies focused particularly on the Bull Run watershed, the district's primary water source.

All four models were used to develop water demand forecasts and a hydrologic model for the Bull Run watershed. The output of these models were then applied to its Supply Transmission Model, which takes inputs of

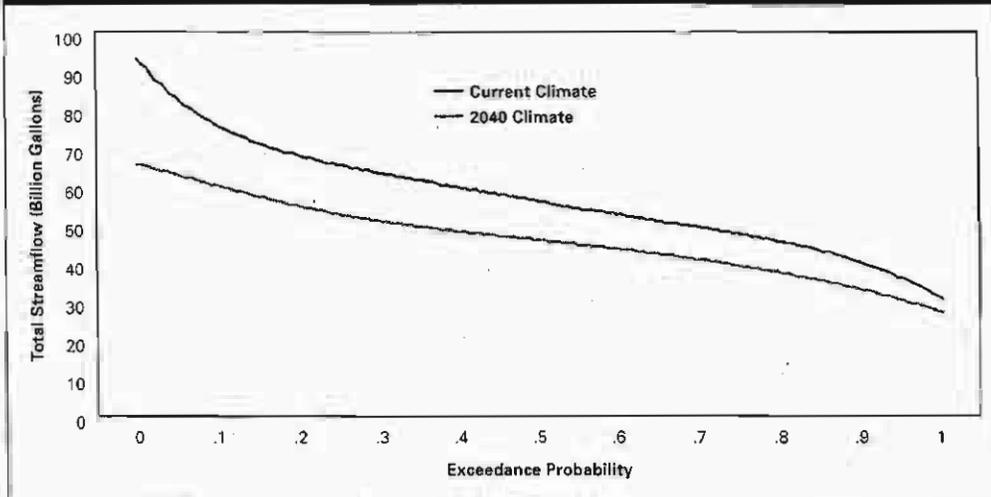
demand, weather, and water supplies to create different reliability scenarios. These model runs suggest that the Bull Run watershed will experience warmer and drier summers due to climate change, with an increase in general year-round temperature. The hydrologic models predict that precipitation will increase in the winter and decrease in the spring, with less snow melt remaining in the spring, making the Bull Run Watershed an increasingly rain-driven system with more years of lower summer streamflows into the storage reservoirs. This is particularly an issue in the Portland surface water storage system because the system's reservoirs are kept full during the winter, so an increase in earlier drawdown years with lower summer streamflows will affect overall system yield.⁸

Using the 60-year hydrological record, the study then evaluated the impacts of climate-altered streamflows and increased water demands on water supply performance with consideration given to three factors: (1) changes in water availability, (2) changes in water demand created by anticipated regional growth, and (3) changes in water demand as a result of hotter summer temperatures. The study estimated that the average impact of climate change alone on the current storage system could require approximately 1.3 billion gallons more water per year to meet demand. A change in runoff timing is PWB's supply threat, as it could reduce storage levels in comparison with historical record. This shift in runoff increases the number of years with longer drawdown periods due to lower flows and higher demand, requiring increased use of alterna-

CITY LEVEL
Portland Water Bureau at a Glance

- commissioned a study to analyze the potential effects of climate change on its system, with a particular focus on the district's primary water source.
- found that climate change will alter basic hydrology of the Bull Run watershed.
- projected that demand on the system will increase during the summer as a result of global warming, requiring an additional 1.3 billions gallons to meet demand.
- concluded that overburdening of the system will ultimately result in a reduction of Portland's surface water system safe yield during the summer, requiring additional conjunctive use of Portland's existing groundwater system.

Figure A-1: Portland Water Bureau's Projected Streamflow Shift Due to Climate Change



From the Powerpoint Presentation, "The Impacts of Climate Change on Portland's Water Supply." Portland Water Bureau and University of Washington Climate Impacts Group. 8/29/06

tive sources of supply, in addition to already anticipated reductions due to conservation measures. The study concludes that climate change will alter the basic hydrology of the Bull Run watershed as well as the system's demand, ultimately resulting in a reduction in the reliable yield of Portland's surface water system.

PWB is exploring the many alternatives to enhance its water supply reliability in the face of climate change, with an emphasis on flexibility in infrastructure development. Some of the strategies PWB is considering are conservation and conjunctive use that could be coordinated with reoperated existing surface and groundwater supplies. Other water suppliers in the Portland metropolitan area have conducted similar studies, in recognition of the need to collaboratively assess the impacts of climate change on regions with multiple water supplies.⁹

Santa Clara Valley Water District

The Santa Clara Water District (SCVWD) is the primary water agency for the residents of Santa Clara County, California. SCVWD provides water for the 1.7 million residents of the county, as well as serving as its flood protection agency and as the steward of the county's streams, creeks, underground aquifers, and reservoirs.

The Santa Clara Valley Water District (SCVWD) began incorporating the uncertainties posed by climate change in its water supply planning processes about a decade ago. The district is continuously updating its analyses

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Santa Clara Valley Water District at a Glance

- conducted a risk analysis in 2003 and determined that global warming could have serious implications for the district's water supply after 2020.
- concluded that the district's projects to meet water demand beyond 2020 must consider the effects of climate change on water quality, saltwater intrusion, imported and local water supplies, and the water transfer market.
- plans to complete a Water Supply Sustainability Plan in 2008, which will update its Integrated Water Resources Plan to include more detailed regional climate modeling and an analysis of local and regional impacts of future climate scenarios.
- is analyzing its climate footprint and has started tracking and reporting CO₂ emissions.

is more information about climate change emerges. In SCVWD's 2003 Integrated Water Resources Planning Study (IWRP), the district assessed global warming's threat to supply reliability. It applied vulnerability assessment models on five portfolios composed of various water supply options. These five hybrid portfolios were built to meet three planning objectives: high water quality, natural environment protection, and minimum cost impacts.

- SCVWD's "Extend" simulation model analyzed potential portfolio performance through 2040 based on historical hydrology
- The Economic Analysis Tool compared water supply options on equal economic footing
- The Risk Analysis Tool used statistical techniques and estimation of seven risk likelihoods to test the portfolios under a variety of possible future scenarios, including climate change

SCVWD considered its results over three time frames: Phase I (2003 through 2010), Phase II (2011–2020), and Phase III (2021–2040).¹⁰

In its risk analysis, SCVWD determined that global warming could have serious implications for the district's water supply after 2020. The analysis concluded that the district's projects designed to meet water demand beyond 2020 must consider the effects of climate change on water quality, saltwater intrusion, imported and local water supplies, and the water transfer market. SCVWD has concluded that its water supply is particularly vulnerable to certain climate change effects such as sea level rise, loss of snowpack, and a shift in runoff timing. Pursuant to its 2005 Urban Water Management Plan, SCVWD is assessing various options to address the impacts of climate change, including additional water recycling, additional water banking, and dry-year transfer options. Another option the agency is considering is employing additional treatment options to address water quality impacts such as increased salinity in the Delta, from which the district receives approximately 50 percent of its water supply.¹¹

A key aim of the district is to increase the flexibility of its water supply portfolio in the face of potential water supply threats by securing baseline water supply programs, investing in "no regrets" actions, and focusing on the long term.¹² The district is moving forward by developing a robust framework for sustainability and investment decision making. It also plans to complete a Water Supply Sustainability Plan in 2008, which will update its IWRP analyses to include more detailed regional climate model-

ing and an analysis of both local and regional impacts of future climate scenarios. As a comprehensive water management agency, SCVWD is gearing up to both mitigate and adapt to global climate change. SCVWD is also analyzing its own climate change footprint and reporting its CO₂ emissions as a member of the Sustainable Silicon Valley Initiative (SSV).¹³ See page 46 for more on the district's involvement with SSV.

Additionally, SCVWD is communicating its concern about the impacts of climate change to the community it serves and to state decision-makers. SCVWD wrote a letter in March 2006 supporting the governor's acknowledgement of global warming's effects on California industry in his 10-Year Strategic Growth Plan. The following month, the district wrote a letter of support for California Assembly Bill 32 (AB 32), which places a cap on greenhouse gas emissions from the electrical power, industrial, and commercial sectors, and establishes a program to track and report greenhouse gas emissions.

Seattle Public Utilities

Seattle Public Utilities provides water to a customer base of more than 1.3 million people in the metropolitan area of Seattle, Washington. The utility receives almost all of its water supply from two watersheds in the Cascade Mountains: the Cedar and Tolt River watersheds.

Seattle Public Utilities (SPU) has been actively involved in climate change as related to water supply issues for more than 15 years. Based on currently available information regarding the potential effects of climate change, the utility's analyses concluded that it is unlikely to need new water supply sources to meet water demand in the next 40 to 50 years, despite its region's

CITY LEVEL

Seattle Public Utilities (SPU) at a Glance:

- uses a dual approach to climate change vulnerability analysis process that incorporates both a bottom-up perspective (historical hydrology) and a top-down strategy (using modeling to assess local watershed levels).
- forming partnerships with other regional groups—including state agencies, county and city governments, water districts, and an Indian tribe—to better prepare the region for the effects of climate change.

growing population. However, SPU acknowledges the many uncertainties surrounding climate change's potential impacts on its water system. SPU's 2007 Water System Plan describes how the utility will continue to monitor its system vulnerabilities, engage in research, and employ scenario planning in order to make system investments and operational changes that will prepare the utility for possible impacts.¹⁴

SPU uses a two-pronged approach to investigate its system's vulnerabilities to climate change. To assess climate change from a bottom-up perspective, SPU began by examining its historical hydrology, using streamflow records to reconstruct inflows into its surface water supplies. The utility now has an inflow dataset for the past 76 years, from water year 1929 through 2004. SPU also uses a system stimulation model to estimate the firm yield of its supply in order to meet the utility's 98 percent reliability standard, while accounting for climate variability. This bottom-up approach has underscored that a key vulnerability of SPU's water supply system is the timing of the return of fall rains. SPU's reservoirs are operated on a single-year drawdown cycle, and delays in the fall rainy season can force SPU to draw down deeper into reservoir storage. When this occurs, SPU relies on emergency storage reserves to meet the needs of its customers and downstream habitat. Research on future climate change has not directly addressed the timing of fall rains, but SPU is taking steps to ensure that its emergency supplies can be relied on during times of extreme drought.¹⁵

Potential climate change-driven loss of snowpack represents another system vulnerability. To mitigate this threat, SPU routinely monitors snowpack conditions and uses a dynamic rule curve that adjusts reservoir refill targets according to actual snowpack and soil-moisture conditions. This approach utilizes real-time conditions to regulate reservoir management and increases the likelihood of a full reservoir refill prior to the summer drawdown period. The dynamic rule curve also assists in managing the utility's risk from increases in precipitation variability, another potential climate change impact. SPU does not have a sizeable reservoir capacity compared to many other water systems, and it therefore relies on the dynamic rule curve and other operational management strategies to make the most of current water supplies.

As mentioned earlier in this report, SPU worked with the University of Washington's Climate Impacts Group (CIG) to analyze its water system's susceptibility to climate change from a top-down perspective. CIG's analysis involved examining the SPU watershed's suscep-

tibility by employing a statistical downscaling method to translate the average monthly meteorological data from the General Circulation Models (GCMs) at nearby grid points down to local weather station locations. This method used cumulative distribution curves and historic weather patterns to generate a time series of meteorological data representing future climate from the GCMs. These data were input into a hydrology model and then fed into Seattle Public Utilities' system simulation model using some simplifying assumptions, including the use of static reservoir operating rules. These loosely linked models complete the process of translating information from the GCMs to the local watershed level.¹⁶

This downscaling method reveals a series of potential climate change impacts that affect water supply. Although there is significant cumulative modeling uncertainty associated with this method, the modeling results are useful for water supply planning purposes and for reexamining existing and planned water management systems under a wider range of climatic conditions. This model examined several elements that affect water supply, including temperature, snowpack, yield and precipitation. The results show:

- an increase in temperature of 2.3 degrees Fahrenheit in the Seattle region by 2040
- a decrease in snowpack of 50 percent by 2040
- a 6 percent decrease in combined inflows from the Cedar and Tolt reservoirs from June to September per decade through 2040
- a reduction in yield of 24 million gallons per day by 2040

The model results also indicate that the predicted deviation in precipitation does not range significantly outside the range of natural variability.

SPU is widening the scope of its climate change analyses by co-sponsoring regional studies with King County (in which Seattle is located), the Cascade Water Alliance, and the Washington Department of Ecology as part of a larger regional water supply planning process, which also incorporates climate change. A wide cross-section of organizations are participating in the planning process—including state agencies, county and city governments, water districts, and the Muckleshoot Indian Tribe—with the University of Washington's Climate Impacts Group as the technical lead on climate change. The process is designed to develop information regarding

current and emerging water resource management issues in and around King County, including climate change. This partnership is a multi-year effort to analyze water resource conditions and management in order to better meet the region's water demand. The process will examine all available water sources, including reclaimed water and conservation. Climate change is one of five resource management issues under study, with a technical committee in place on each issue to produce reports and recommendations that could be included in water planning processes in the region.¹⁷

Building on past research and other endeavors, SPU plans to expand its knowledge of the evolving science behind climate change by continuing to partner with leading scientists. This research will help to further refine SPU's understanding of the local impacts of climate change and provide an increased understanding of how its system can adapt over time. SPU is particularly interested in learning more about the impacts of climate change on frequency of flood events, water demand, and fall rains, because the timing and intensity of these events are key vulnerabilities for the Seattle water supply system. Additionally, SPU seeks to develop hydroclimatic reconstructions, a practice that involves using tree-ring samples to reconstruct past hydroclimatic conditions in order to assess its system's vulnerability to climate change. The utility also aims to utilize more scenario planning, employ physical downscaling methods, and quantify the effectiveness of its changes in operations.¹⁸ SPU anticipates revisiting its climate change analysis at least every six years in conjunction with its Water Supply Plan update, or sooner, if new significant information becomes available.

East Bay Municipal Utility District

The East Bay Municipal Utility District supplies water and provides wastewater treatment for customers in parts of Alameda and Contra Costa counties in the Eastern portion of the San Francisco Bay Area, including Oakland and Berkeley. Its water system serves approximately 1.3 million people in a 325-square mile region.

East Bay Municipal Utility District (EBMUD) is another agency that has emerged as a leader in assessing the impacts of climate change on water resources. In 2003, EBMUD conducted a dual-faceted vulnerability analysis to quantify impacts on its system: a planning model operated on a monthly timestep, and an operations model based on a daily hydrograph. Its monthly planning model used a database of historical river flows and tested

CITY LEVEL East Bay Municipal Utility District (EBMUD) at a Glance

- conducted a dual-faceted vulnerability analysis to quantify climate change impacts on its system: a planning model operated on a monthly time step and an operations model based on a daily hydrograph.
- concluded that changes in precipitation patterns and flooding due to climate change could compromise system reliability.
- became the first water district to join the California Climate Action Registry by pledging to annually track, report, and certify its greenhouse gas emissions.

its sensitivity to climate change by shifting 28 percent of historical April to July runoff volume into the November to March period, to estimate the reliability of system operations with less late-season snowmelt. The 28 percent figure was based on a study conducted by Maurice Roos, Chief Hydrologist of the California Department of Water Resources, which assessed how a shift in climate would impact the Mokelumne watershed, EBMUD's primary water source. Roos estimated that a 5 degree Fahrenheit temperature increase in the Mokelumne watershed might result in a 28 percent shift in runoff. EBMUD's analysis did not reveal significant impacts from this shift, as the historical record shows that in most years there has been more snowmelt in the watershed than can be stored. However, the extent of future precipitation changes in this watershed due to climate change is unknown. In dry years, annual runoff volume is less than the total reservoir capacity, and the timing of snowmelt would have little effect on system reliability. An overall reduction in precipitation, however, would have direct effects on this runoff and the amount of water available for storage. Model simulation of the historical record adjusted for an earlier snowmelt confirmed that the district's water supply and carryover storage would not be reduced significantly in most years. The only exception is water year 1997, which was exceptionally wet and warm in early winter but dry beginning in February. If the spring runoff from snowmelt in that year reduced by 28 percent, EBMUD found that the carryover storage would have been reduced, which would affect system reliability if a drought period were to follow. Such a sequence of events is of concern to

EBMUD. The operations model analyzed the impacts of a 5 degree Fahrenheit temperature increase on water year 1997's daily hydrograph based on historical sequence of snowfall and rainfall inputs. The results of this analysis were intuitive: with a climate change-induced runoff shift, flood control consistently was revealed as an issue that the district must be prepared to address.^{19,20}

EBMUD has made it a priority to invest in the production, use, and refinement of new supply-forecasting tools. By developing and using these tools, the district further reduces the uncertainties of climate change impacts on its water supply. By better understanding its water system's particular vulnerabilities, EBMUD can effectively managing the stresses on its supply. In order to diversify its water supply sources, the district is also constructing the Freeport Regional Water Project, in partnership with the Sacramento County Water Agency. This project, which will allow EBMUD to divert water from the Sacramento River, was carefully negotiated with Sacramento County, environmentalists and other interests.

EBMUD is also working to prevent global warming by minimizing its climate change footprint. As discussed, it was the first water district to join the California Climate Action Registry—a non-profit public/private partner-

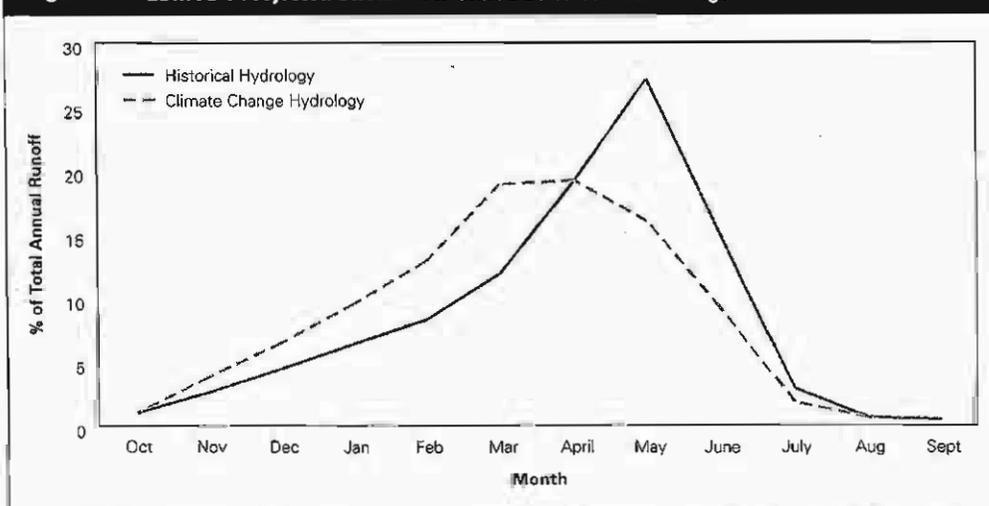
ship established by California statute, which provides a voluntary greenhouse gas (GHG) registry to promote early actions to reduce GHG emissions. As a member of the Registry, EBMUD pledges to annually track, report, and certify its greenhouse gas emissions. EBMUD's efforts to mitigate its own impact on global warming were recognized by the Environmental Protection Agency, who presented the district with a Green Power Leadership Award.²¹

Furthermore, EBMUD has taken its concerns about global warming beyond district boundaries to California Governor Arnold Schwarzenegger and the state legislature. In a December 2005 letter, General Manager Dennis Diemer urged the Governor and the Climate Action Team to proactively assess how global warming may affect water supply and the economy in California's 10-Year Strategic Growth Plan. Then in March 2006, the District actively supported California's Assembly Bill 32.

Cosumnes, American, Bear and Yuba (CABY) Watersheds

The Cosumnes, American, Bear and Yuba rivers are four adjacent watersheds located in California's central-Sierra region. The CABY alliance involves a diverse membership

Figure A-2: EBMUD's Projected Streamflow Shift Due to Climate Change



EBMUD's comparison of long-term average unimpaired runoff under historical conditions and with its climate change model's 28% shift from April-July runoff volume to the November-March time period.

body including representatives from agriculture, recreation, Native American tribes, the business community and local, state, and federal governments.

Various stakeholders of four watersheds: Cosumnes, American, Bear, and Yuba (CABY) have cited climate change as a guiding principle in their first-ever collective Integrated Regional Water Management Plan (IRWMP). The purpose of the IRWMP is to provide an integrative approach to water management that is oriented toward the collective goals of the region's water users.²² The plan was adopted by ten participating organizations as of December 2006, including the El Dorado Irrigation District, Gold County Fly Fishers, the U.S. Tahoe National Forest, the Yuba Watershed Council, the Bear River Watershed Group, American Rivers, Natural Heritage Institute, and the Nevada Irrigation District. Implementation by a regional entity is expected to begin in 2007, which will oversee the execution, monitoring, and success of projects in the IRWMP.

As it lays the framework for its IRWMP, CABY is assessing how it can prepare for climate change by maximizing its tools, policies, and current system infrastructure. CABY is using the Water Evaluation And Planning (WEAP) system to help measure potential climate change impacts on hydrology. The WEAP system, developed by the Stockholm Environmental Institute's Boston Center and the Tellus Institute, is a microcomputer tool developed for integrated water resources planning. It analyzes a

system's water supply generated through watershed hydrological processes using a water management model driven by water demand and environmental requirements, governed by the natural watershed and the region's network of reservoirs, canals, and diversions. WEAP generates scenarios that examine a full range of water planning issues, including climate change.²³

Liz Mansfield, CABY Project Director and El Dorado Irrigation District Watershed Coordinator, explains that WEAP can assist the region in developing a plan to manage climate change effects on its regional system. The CABY planning team has highlighted specific vulnerabilities to investigate, such as reservoir operations. A shift in runoff timing could have significant effects on the region's water supply, due to the delicate balance involved in reservoir management. The CABY region is at a high altitude with limited-capacity reservoirs that often remain full year-round for recreational and hydropower purposes. Analyzing how climate change will shift runoff in this region is critical to planning efforts for effective reservoir management.²⁴

CABY also recognizes its elevated susceptibility to fire in the face of climate change. The region is densely vegetated, with a high volume of forested areas. CABY's planning community is seeking to understand the extent to which the expected increase in fires brought on by climate change will affect regional water supply and water quality. By gaining a clearer sense of climate change's effects on their system, the CABY planners can develop proactive strategies to meet effectively the needs of the region's water users.

What we are seeing in the CABY regional planning effort is part of a new trend—water managers using climate change vulnerability analyses to shape integrated planning efforts. In the past, climate change analyses have generally been produced as stand-alone documents, CABY uses the findings from its vulnerability analyses as a pillar in its planning framework.

California Department of Water Resources

The California Department of Water Resources manages the State Water Project, including the California Aqueduct. The department's numerous roles include providing flood control services, aiding local water districts in water management and conservation activities, and planning for future statewide water demands.

In July 2006, The California Department of Water Resources (DWR) released the first statewide analysis of

AGENCY LEVEL CABY at a Glance

- the managers of four watersheds—Cosumnes, American, Bear, and Yuba (CABY)—joined forces to examine how global warming will impact its watershed on a regional level.
- used a microcomputer tool that analyzed climate change vulnerability.
- used the findings of the vulnerability analysis as a foundation of CABY's integrated planning efforts.
- determined that reservoir operations and vulnerability to forest fires were two particular threats to the region, and are planning response strategies to mitigate these risks.

likely climate change effects on water supply. The agency commissioned the study in response to Governor Arnold Schwarzenegger's June 2005 Executive Order, which established greenhouse gas emissions targets for California and required biennial reports regarding potential climate change effects in numerous areas.

Progress on Incorporating Climate Change into Management of California's Water Resources, is the product of the Climate Change Work Team, a group formed by DWR in conjunction with the U.S. Bureau of Reclamation to incorporate climate change science into California's water resources planning and management. DWR is communicating to local water agencies the results of the report and the various analysis tools used therein, which could be used by others to address climate change-related issues. The goal of these efforts is to assist water managers in future climate change analysis and to help them identify information gaps for future research.

DWR's report concludes that climate change has the potential to reduce the yield of the state's two major water projects by as much as 10 percent—a highly noteworthy figure considering that over 20 million California residents receive a portion of their water supply from those two projects (the State Water Project, or SWP, and the federal Central Valley Project, or CVP). The report notes that climate change creates a more active hydrological cycle, thereby altering the timing, intensity, location, amount and variability of precipitation. The study anticipates that these variations in precipitation events may lead to increases in extreme weather events, such as storms, flood events, and droughts. DWR expects more floodwaters to manage in winter, followed by less snowmelt to store in reservoirs for use during the warmer, summer months. By the year 2050, an average loss of 5 million acre-feet or more of annual water storage in the state's snowpack is expected—more than the capacity of the state's largest reservoir, Lake Shasta. In addition, the combination of more frequent extreme events coupled with lower winter reservoir storage levels, which may be required in response to higher peak streamflows, presents a key challenge for operators of the state's reservoirs.

In addition, the study points out that sea level rise due to climate change could have multiple implications for California, including erosion of coastal land area and possible sea water intrusion in coastal aquifers. Sea water flooding may pose a serious threat to land, at the mouths of rivers and streams, and in estuaries.

The San Francisco Bay-Delta, an important source of water for Southern California, the San Joaquin Valley and

STATE LEVEL
California Department of Water Resources
(DWR) at a Glance

- commissioned a study to determine how global warming will affect California's water resources on a state-wide level.
- helped local and regional water managers understand how its climate change response strategies fit into the larger statewide plan for action, enabling decision makers to plan a more coordinated response to rising temperatures.

the Bay Area, is particularly susceptible to several effects of climate change. From a water resources perspective, the most significant effects of climate change on the Delta are increased salinity intrusion, as well as increased vulnerability of Delta levees to sea level rise. An increase in sea water intrusion in the Delta could lead to a degradation of water quality for the State Water Project and the Central Valley Project. Climate change also has significant, if uncertain, implications for the Delta's fragile ecosystem, which is home to various threatened and endangered species. (See *The Other New Orleans: California's Delta Water Supply and Sea Level Rise*.)

DWR researchers expect that higher air temperatures due to climate change will likely elevate water temperatures in the ocean as well as in the state's lakes and waterways. These increased water temperatures may harm aquatic species sensitive to temperature, particularly threatened and endangered aquatic species. In addition, some foreign invasive species may thrive in these new warmer conditions, further threatening the health of aquatic ecosystems. Water quality could be compromised as well, including a reduction in dissolved oxygen levels. Warmer water will raise the need for temperature control releases from reservoirs. Simultaneously, however, cold-water storage in reservoirs will be constrained due to the expected effects of climate change, such as diminished snowpack and lower storage levels.

According to DWR, future water demand is expected to grow, as a result of global warming. The report finds that warming-caused impacts to evapotranspiration, commercial and industrial use, environmental water demand, and domestic water use may be some of the most significant climate change-related challenges facing California. Increases in evaporative cooling demand and a higher consumption of water by concentrated animal feeding

facilities are also expected. Moreover, climate change could require more water in order to control rising temperatures for sensitive aquatic species. This need to mitigate rising water temperatures could be an important issue in fragile areas such as the San Francisco Bay-Delta, a delicate ecosystem that provides habitat for many threatened and endangered species. In addition, DWR predicts that basic domestic water demand will rise with higher temperatures, mainly from drinking water for humans and pets, and increased bathing and evaporative cooling. Future population growth in the state promises to bring additional water demand, tightening the squeeze on this limited resource.

DWR emphasizes the need for water agencies and researchers to incorporate climate change impacts and potential associated risks into the planning and management of California's water supply. DWR emphasizes the need to understand the probability of various climate change scenarios and to evaluate how they could affect different regions. By better understanding these potential impacts, decision makers are better equipped to plan appropriate response strategies.²⁵

New Mexico Office of the State Engineer/ Interstate Stream Commission

The Office of the State Engineer is responsible for administering the state's water resources by supervising, measuring, appropriating, and distributing all surface and groundwater in New Mexico. The Interstate Stream Commission duties include protecting New Mexico's water rights under eight interstate stream basins, ensuring the state's compliances with each basin, and planning for future water needs.

New Mexico is the next state after California to analyze the potential impacts of climate change on its state's water resources. Governor Bill Richardson's 2005 Executive Order directed the New Mexico Office of the State Engineer to prepare an analysis of the likely effects of global warming on the state's ability to manage water resources in collaboration with other state agencies, research institutions, and water planners. The report, *The Impact of Climate Change on New Mexico's Water Supply and Ability to Manage Water Resources*, summarizes its findings.

Based on 18 climate simulations prepared by scientists throughout the world, the report highlights potential impacts to New Mexico that generally reflect those expected throughout the West, including changes in snowpack, variability in available water, increased unpredictability in precipitation patterns, and a rise in extreme events

STATE LEVEL

New Mexico Office of the State Engineer and Interstate Stream Commission at A Glance

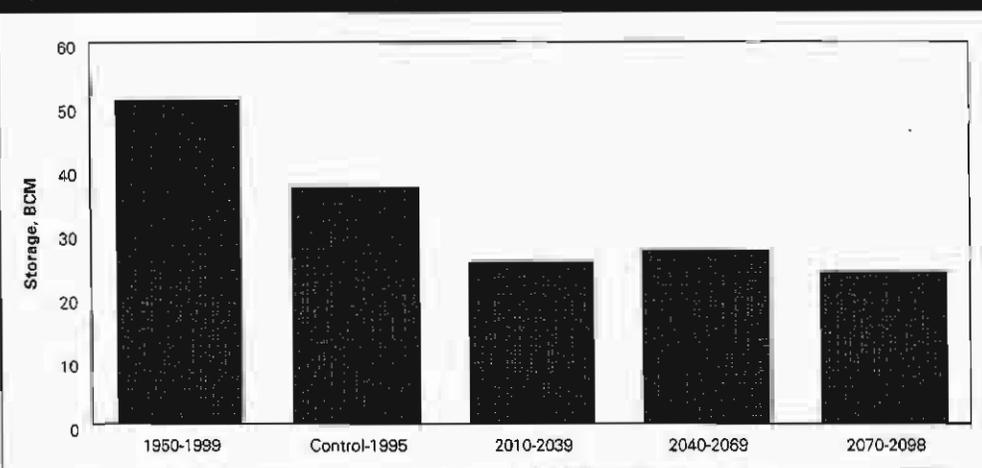
- commissioned a report to determine what specific global warming effects are likely to be of particular importance in New Mexico.
- recommended proactive, immediate action to mitigate the impacts of climate change, such as exploring options such as desalination of brackish water supplies and water reuse.
- recommended an integrated approach that brings together water management and policy expertise as well as state government, environmental, and agricultural representatives.

such as droughts and flooding. These changes will bring additional challenges to the management of the state's water resources. One such challenge is the fact that the water resources in the Colorado River Basin—one of New Mexico's primary sources of water supply—are expected to decline by as much as 40 percent over the next century. In addition, mountain snowpack in the state's southern half could vanish by the late 21st century, completely eliminating natural storage that is critical for meeting demands during peak summer months.

Climate change is likely to bring significant implications for the state's rangelands, farmland, and aquatic ecosystems. Warmer temperatures combined with changing precipitation patterns suggest the possibility of increased fire activity in the state's rangelands, which make up more than two-thirds of the state's land area. In turn, the more fires are likely to intensify stress on future water resources. New Mexico's farming community is also predicted to feel serious effects from climate change. Farmland in the state could decrease as much as 25 percent as a result of increased evaporation and earlier spring runoff. Additionally, shifts in water temperature and changes in runoff timing could critically alter aquatic habitats, resulting in species loss or migration and causing new combinations of species.

The state's report emphasizes the need for water managers to begin preparing for these potential impacts. The first step for water managers is to identify and quantify the range of climate change vulnerabilities specific to their area. Water managers are advised to conduct a vulnerability analysis of current reservoir infrastructure in order to ensure that they are capable of withstanding the additional

Figure A-3: Projected Changes in Average Total Colorado River Basin Reservoir Storage



For downscaled climate simulations of the U.S. Department of Energy/National Center for Atmospheric Research Parallel Climate Model (PCM) based on projected 'business-as-usual' (BAU) greenhouse gas emissions and a control climate simulation based on static 1995 greenhouse gas concentrations, and an ensemble of three 105-year future climate. Simulations for three periods, and a comparison with observed historical (1950-1999) climate. From p. 21 of report.

Source: <http://www.nmdrought.state.nm.us/ClimateChangeImpact/completeREPORTfinal.pdf>

pressures likely to be caused by climate change. The report also suggests that as science and technology advance, water managers should consider expanding water supplies through reuse, desalination of brackish water supplies, weather modification, expanded use of low-quality water, and reduced reservoir evaporation.

The report determines that the key to successful adaptation is a "robust scenario-based planning structure."²⁶ The report, compiled with input from numerous published reports and assistance from a broad group of professionals, emphasized that while a degree of uncertainty regarding possible effects of global warming will inevitably remain, we can control the degree to which climate

change will affect water sources by planning for action today. The report encourages government collaboration with the various stakeholders in water planning—i.e., cities, agriculture, and the environment—as well as within the education and science community, in order to develop comprehensive planning strategies. It advises water resource planners and managers to employ an adaptive, proactive planning approach in conjunction with a "no regrets" decision-making process that focuses on desirable outcomes regardless of uncertainties.

Appendix B

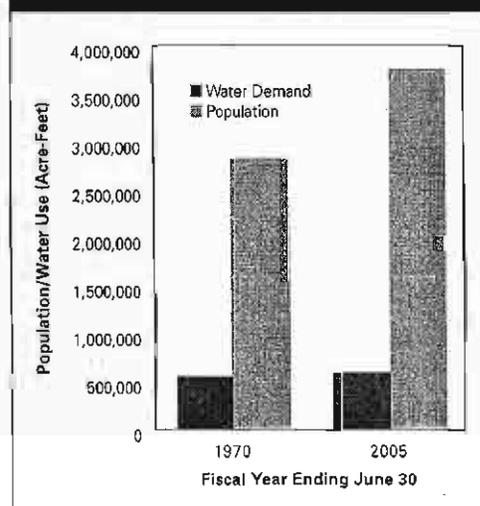
Decoupling Population Growth and Water Use

During the past several decades, many urban communities across the West have grown dramatically. Traditionally, many water planners have assumed that urban water use would grow in proportion to population. Yet in Western states, urban water use remains approximately 10 percent of the total developed water supply.¹

In fact, as the figures below indicate, some communities have succeeded in keeping water use relatively flat, despite dramatic population growth. Los Angeles, Seattle, the San Francisco Bay area, and Denver have all experienced significant population growth in the past quarter century, yet for each, total water use has remained relatively constant. This remarkable accomplishment has been made possible by significant investments in water conservation.

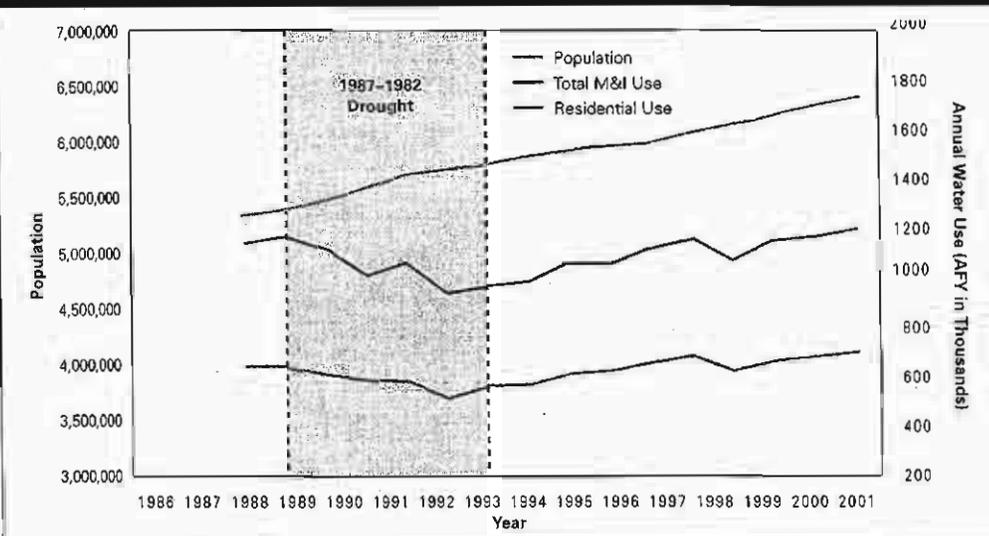
In addition to water conservation investments, some areas have also made major investments in wastewater recycling and groundwater cleanup. Several of these efforts have been prompted by droughts. In Southern California, conservation and recycling investments have also been motivated by pressure to reduce deliveries from the Colorado River and the Mono Lake basin (see Figure B-1). The progress made by these communities demonstrates the effectiveness of efficiency as a water supply tool. As discussed earlier in the report, California's new State Water Plan indicates that these tools are likely to remain the largest sources of supply for future growth. Figures B-2, B-3, and B-4 show similar progress in the San Francisco Bay area, Denver, and Seattle.

Figure B-1: Los Angeles Department of Water and Power Water Use and Population



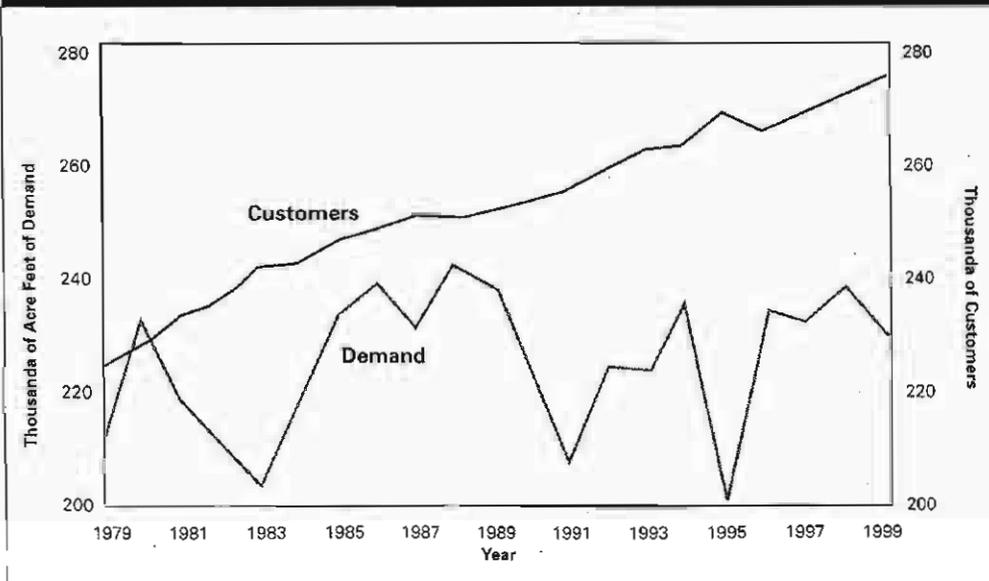
Source: Fatema Akhter, LADWP: 8/31/06 and from California Water Decisions booklet published by Environmental Water Caucus, 7/00.

Figure B-2: San Francisco Bay Area Population and Water Use



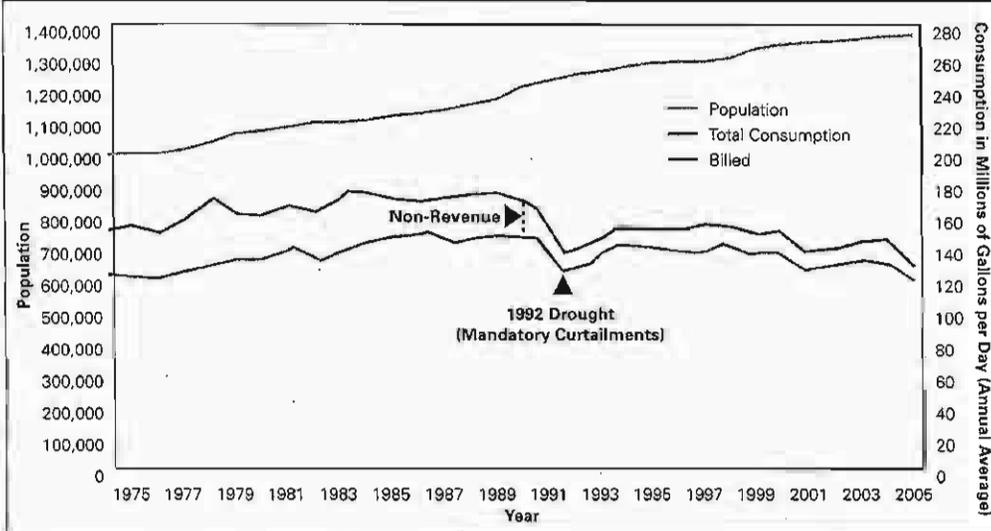
Source: Randy Kanouse, East Bay Municipal Utility District Sacramento Lobbyist. From Bay Area Integrated Regional Water Management Plan, Administrative Draft: 6/06.

Figure B-3: Denver Demand and Customer Growth of Treated Water



Source: Elizabeth Gardener, Denver Water Conservation Manager: 8/29/06.

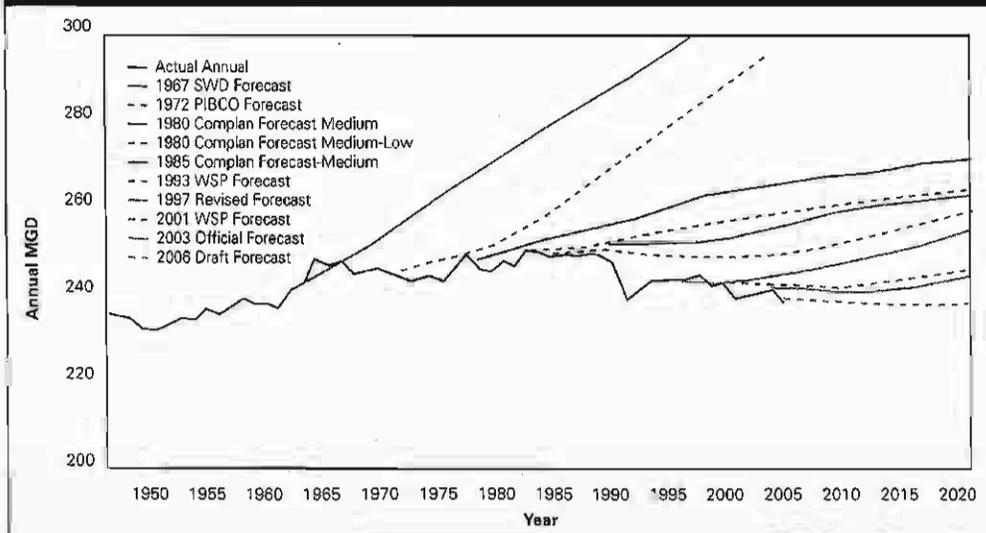
Figure B-4: Population Growth and Water Consumption from Seattle Public Utilities



Source: Pg. 2-15. Seattle Public Utilities, 2007 Water System Plan, Public Review Draft. Online access: http://www.cityofseattle.net/util/About_SPU/Water_System/Plans/2007WaterSystemPlan/index.asp.

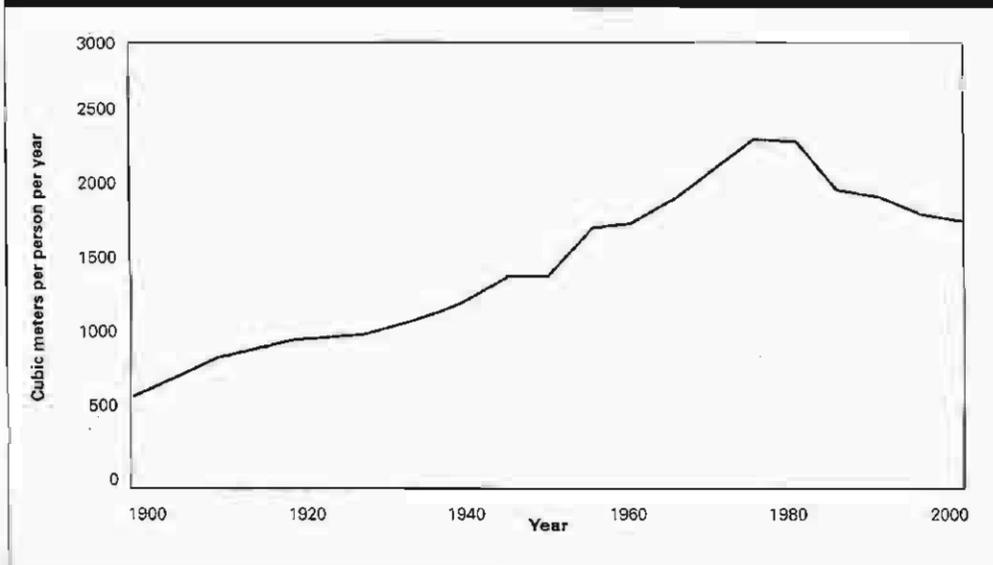
Note: Issaquah, Sammamish Plateau, and Covington area are not included in historic data because they did not become customers until 2004 when contract with CWA was signed.

Figure B-5: Seattle Public Utilities Forecasting Demand



Source: Chuck Clarke, Director, Seattle Public Utilities, personal communication with Barry Nelson.

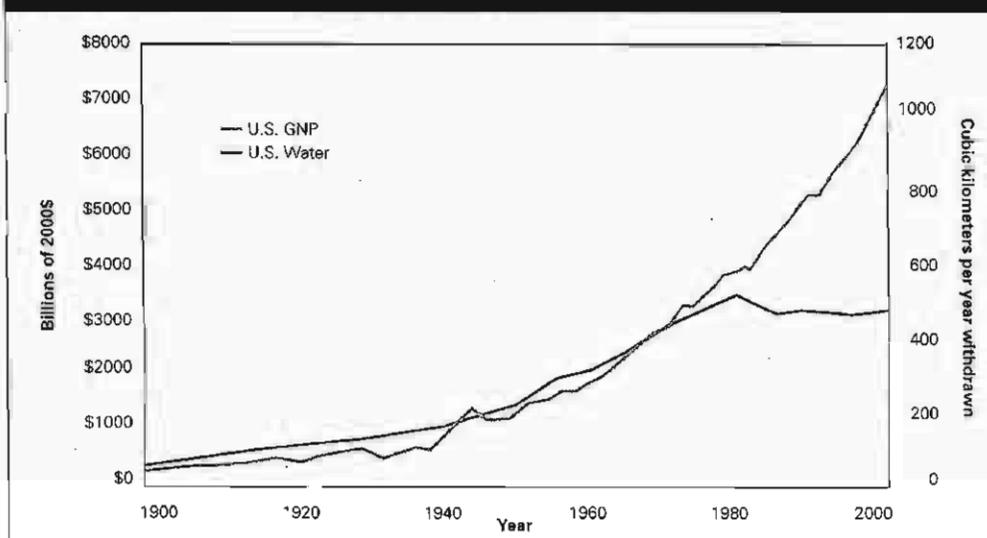
Figure B-6: United States Per Capita Water Withdrawals



Source: Source: Peter Gleick, Pacific Institute (www.pacinst.org). See also, *The World's Water* (Island Press, Washington DC

Note: Nationally, this figure diminishes to 6.5%.

Figure B-7: U.S. Economic Growth and Total Water Withdrawals



Source: Source: Peter Gleick, Pacific Institute (www.pacinst.org). See also, *The World's Water* (Island Press, Washington DC

Note: Nationally, this figure diminishes to 8.5%.

This decoupling of population and water use can be seen on the national level as well. Figure B-7 shows that, for the past quarter century, water withdrawals across the nation have remained essentially flat despite a significant increase in GNP. Figure B-6 shows that per capita water withdrawals have declined significantly over the same period. This trend is due to both increased investments in water use efficiency and a shift in the nation's economy toward industries that are less water-intensive.

INCORPORATING DEMAND MANAGEMENT IN PROJECTIONS OF FUTURE WATER USE—THE SEATTLE PUBLIC UTILITIES EXPERIENCE

Even where water agencies have made significant investments in conservation, it has taken a sustained effort for planners to incorporate fully the benefits of conservation—and the decoupling of growth and water use. Figure B-5 from Seattle Public Utilities illustrates this challenge. Total water SPU water demand has been remarkably flat for approximately three decades. For many years, however, demand forecasts projected dramatically higher future

demand than has proven to be the case based largely on assumptions that previous water use trends would continue. Demand forecasting methodologies have improved significantly in a number of areas in the past thirty years. For example, since the 1980's, SPU forecasters have worked to incorporate the long-term savings as a result of conservation programs. Figure B-5 indicates, in the most recent SPU projections, demand projections track actual past water use trends.

Water demand forecasts are often designed to be conservative, because water managers are understandably hesitant to risk underestimating future demand. However, overestimations of future demand—frequently based in part on underestimations of the performance of efficiency measures—tend also to overestimate the importance of water management tools designed to increase supply. Today, conservation, water recycling and other demand management tools are now well enough established that water managers can rely on their performance over time. These tools should be carefully incorporated into future demand projections. The results of this effort can be seen in SPU's increasingly accurate demand projections—which now anticipate a continued ability to meet future water needs without a significant increase in supply.

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Appendix B

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Linda Budge
Mayor
Dan Skoglund
Vice Mayor

Robert J. McGarvey
Councilmember

Ken Cooley
Councilmember

David Sander
Councilmember

NOTICE OF AVAILABILITY
RIO DEL ORO SPECIFIC PLAN
RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT/SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT

APRIL 15, 2008

LEAD AGENCY:

City of Rancho Cordova Planning Department (for the Revised Draft Environmental Impact Report [EIR] under the California Environmental Quality Act)

Department of the Army, U.S. Army Corps of Engineers (for the Revised Draft Environmental Impact Statement [EIS] under the National Environmental Policy Act)

PROJECT TITLE:

Rio del Oro Specific Plan

PROJECT LOCATION:

The Rio del Oro Specific Plan area is located south of White Rock Road, north of Douglas Road, and east of Sunrise Boulevard within the City of Rancho Cordova.

PROJECT DESCRIPTION:

The Rio del Oro project would permit a mixed-use development on approximately 3,828 acres in Rancho Cordova. Elliott Homes is seeking specific development entitlements (e.g., tentative subdivision maps) as part of the project. GenCorp is seeking overall development entitlements, but has not proposed specific development entitlements necessary for immediate or short-term development as part of this proposal. In addition to local development entitlement requests, the project applicants are requesting authorization from U. S. Army Corps of Engineers to place dredged or fill material into waters of the United States.

Buildout of the project would be split into five phases and is anticipated to occur over a 25- to 30-year period. The project provides for construction of approximately 11,601 residential dwelling units. Commercial land uses would include Village Commercial, Local Town Center, and Regional Town Center; Business Park; and Industrial Park. Various parks facilities (public and private) are proposed as well as open space areas and other public uses. A 507-acre wetland preserve area and two elderberry preserve areas are also proposed in the southern portion of the project site. The project also includes new water, sewer, drainage, electrical, natural gas, and telecommunications services. Five land use alternatives for the proposed Specific Plan (Proposed Project/Proposed Action, High Density Alternative, Impact Minimization Alternative,

No Federal Action Alternative and No Project/No Action Alternative) are evaluated in detail in the Draft EIR/EIS.

SIGNIFICANT ENVIRONMENTAL EFFECTS: This Recirculated DEIR/Supplemental DEIS includes a revised water-supply analysis that describes the various sources of water for the project, including short-term sources for development Phase 1 and long-term water supplies for all phases of development (development phases 1–5) and impacts from providing water to the project. The revised water-supply analysis addresses the elements set forth in the case of *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova*, 40 Cal. 4th 412 (2007), which was decided after the 2006 DEIR/DEIS was released. These elements include the reasonable likelihood of the water sources proving available; identification and quantification of water demand from project and cumulative development; reasonable likelihood of identified water supply meeting the demands of project and cumulative development; analysis of alternative sources of water and project contingencies (including curtailment) if water-supply sources are not reasonably likely; and impacts of water-supply infrastructure. The revised water-supply analysis includes consideration of potentially significant impacts that could result from constructing a new water conveyance pipeline and booster pump station, as well as potentially significant impacts that could occur from curtailment of development. These impacts were not discussed as part of the previously released 2006 DEIR/DEIS.

The Recirculated DEIR/Supplemental DEIS also contains a revised biological resources section and additional analysis of project consistency with the biological resources goals in the City's general plan. Although this analysis does not necessarily meet the CEQA standards for recirculation, the City wishes to provide the public with an opportunity to review and comment on this new information and analysis. The revised biological resources analysis also incorporates information that responds to comments raised during the DEIR/DEIS public review period to ensure that the analysis considers significant, relevant public comments. Additionally, this section contains new information related to additional biological resource studies that have been performed by the applicants since the DEIR/DEIS was circulated, and some of the mitigation measures have been expanded or clarified. The expanded mitigation measures do not result in new significant impacts.

Consistent with the requirements of Section 15088.5(c) of the State CEQA Guidelines, this Recirculated DEIR/Supplemental DEIS contains only those sections of the previously released 2006 DEIR/DEIS in which significant new information is provided (i.e., biological resources and water supply), and associated information.

The Recirculated Draft EIR/ Supplemental EIS identifies the following significant and unavoidable impacts:

- Impact 3.5-6 Need for Water Conveyance Facilities to Deliver Long-Term Water Supplies
- Impact 3.10-1 Loss and Degradation of Jurisdictional Wetlands and Other Waters of the United States and Waters of the State.
- Impact 3.10-2 Loss and Degradation of Sensitive Natural Communities
- Impact 3.10-4 Loss and Degradation of Habitat for Special-Status Wildlife
- Impact 3.10-6 Cumulative Biological Resources Impacts

Hazardous material sites (such as those identified under Section 65962.5 of the Government Code) that are known to be present on the project site are identified in Section 3.13 (Hazards and Hazardous Materials) of the 2006 Draft EIR/EIS.

PUBLIC REVIEW PERIOD/STATUS: A 45-day public review period will be provided to receive written comments on the adequacy of the Revised Draft EIR. The comment period will start on April 15,

2008 and end on **May 30, 2008**. Written comments should be sent to both of the following addresses:

Patrick Angell
City of Rancho Cordova Planning Department
2729 Prospect Park Drive
Rancho Cordova, CA 95670

Kathleen Dadey
U.S. Army Corps of Engineers, Sacramento District
Regulatory Branch
1325 J Street, Room 1480
Sacramento, CA 95814-2922
Kathleen.a.Dadey@spk01.usace.army.mil

Pursuant to procedures set forth in Section 15088.5(f)(2) of the State CEQA Guidelines, reviewers should limit their comments to the materials contained in this Recirculated DEIR/Supplemental DEIS. All written comments received on the 2006 Draft EIR/EIS and this Recirculated DEIR/Supplemental DEIS will be responded to in the Final EIR/EIS. The City will only respond to comments received during the initial circulation period of the 2006 DEIR/DEIS that were not revised or recirculated, and comments received during the recirculation period that relate to the portions of the DEIR/EIS that have been revised.

PUBLIC MEETING: A public meeting to receive comments on the adequacy of the Revised Draft EIR/EIS will be held on **May 22, 2008 at 6:00 pm at City of Rancho Cordova City Hall at 2729 Prospect Park Drive, Rancho Cordova, CA 95670** before the Rancho Cordova Planning Commission.

AVAILABILITY OF THE DRAFT EIR/EIS: Copies of the Revised Draft EIR/EIS are available for review at the following locations:

Rancho Cordova Planning Department
2729 Prospect Park Drive, Rancho Cordova, CA 95670
Phone: (916) 851-8750

Rancho Cordova Community Library
9845 Folsom Boulevard, Sacramento, CA 95827
Phone: (916) 264-2770

The Revised Draft EIR/EIS may also be reviewed on the City's web site (<http://www.cityofranhocordova.org>) on **April 15, 2008**. Referenced material used in the preparation of the Draft EIR may be reviewed upon request to the City of Rancho Cordova Planning Department.

RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT/ SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT

RIO DEL ORO SPECIFIC PLAN PROJECT SACRAMENTO COUNTY, CALIFORNIA

CEQA Lead Agency:
City of Rancho Cordova

City of Rancho Cordova

Responsible Official: Patrick Angell
2729 Prospect Park Drive
Rancho Cordova, CA 95670
PAngell@pncworld.com

NEPA Lead Agency:
U.S. Army Corps of Engineers
Sacramento District Regulatory Branch

**U.S. Army Corps of Engineers Responsible
Official:** Kathleen Dadey
1325 J Street, Room 1480
Sacramento, CA 95814-2922
Kathleen.a.Dadey@spk01.usace.army.mil

Submit Comments to:
City of Rancho Cordova
Attention: Patrick Angell

**U.S. Army Corps of Engineers
Attention:** Kathleen Dadey

ABSTRACT

This joint Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (Recirculated DEIR/Supplemental DEIS) documents the analysis of the potential effects of implementing each of five alternative scenarios for a mixed-use development in the approximately 3,828-acre Rio del Oro Specific Plan area, in the City of Rancho Cordova, Sacramento County, California as specifically related to biological resources and water supply. This abstract is provided in compliance with National Environmental Policy Act (NEPA) requirements. The EIR/EIS documents the existing condition of environmental resources in and around areas considered for development, and potential impacts on those resources as a result of implementing the alternatives. The alternatives considered in detail are: (1) Proposed Project (Applicants' Preferred Alternative); (2) High Density (Increased Densities Consistent with Sacramento Area Council of Governments Blueprint); (3) Impact Minimization; (4) No Federal Action (No Section 404 of the Clean Water Act Permit); and (4) No Project/No Action.

The Recirculated DEIR/Supplemental DEIS for the Rio del Oro Specific Plan Project is available for public comment and review 60 days from the date of publication of the notice of availability in the Federal Register. A copy can also be found on the Internet at <http://www.spk.usace.army.mil/organizations/cespk-co/regulatory/index.html>.

Your written comments must be postmarked 60 days from the date of publication of the notice of availability in the Federal Register. The notice of availability is expected to be published in the Federal Register on May 7, 2008. Please submit and address your written comments to the individuals noted above by July 7, 2008.

NOTE TO REVIEWER

Reviewers should provide EDAW or the U.S. Army Corps of Engineers (USACE), the NEPA lead agency, with their comments during the review period of the Recirculated DEIR/Supplemental DEIS. This will enable USACE to analyze and respond to the comments at one time and to use the information acquired in preparation of the Final Environmental Impact Report/Final Environmental Impact Statement (FEIR/FEIS), thus avoiding undue delay in the decision making process. Reviewers have an obligation to structure their participation in the NEPA process so that it is meaningful and alerts the agency to reviewers' positions and contentions. *Vermont Yankee Power Corp. v. NRDC*, 435 U.S. 519, 533 (1978). Environmental objections that could have been raised at the draft stage may be waived if not raised until after completion of the FEIS. *City of Angoon v. Hodel* (9th Circuit, 1986) and *Wisconsin Heritages, Inc. v. Harris*, 490 F. Supp. 1334, 1338 (E.D. Wis. 1980). Reviewers should limit their comments to the information contained in the Recirculated DEIR/Supplemental DEIS. Comments on the Supplemental DEIS should be specific and should address the adequacy of the statement and the merits of the alternatives discussed (40 CFR 1503.3).



Linda Budge
Mayor
Dan Skoglund
Vice Mayor
Robert J. McGarvey
Councilmember
Ken Cooley
Councilmember
David Sander
Councilmember

**REVISED NOTICE OF AVAILABILITY
EXTENSION OF PUBLIC COMMENT PERIOD**

**RIO DEL ORO SPECIFIC PLAN
RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT/SUPPLEMENTAL DRAFT
ENVIRONMENTAL IMPACT STATEMENT**

JUNE 3, 2008

LEAD AGENCY: City of Rancho Cordova Planning Department (for the Recirculated Draft Environmental Impact Report [EIR] under the California Environmental Quality Act)

Department of the Army, U.S. Army Corps of Engineers (for the Supplemental Draft Environmental Impact Statement [EIS] under the National Environmental Policy Act)

PROJECT TITLE: Rio del Oro Specific Plan

PROJECT LOCATION: The Rio del Oro Specific Plan area is located south of White Rock Road, north of Douglas Road, and east of Sunrise Boulevard within the City of Rancho Cordova.

PROJECT DESCRIPTION: The Rio del Oro project would permit a mixed-use development on approximately 3,828 acres in Rancho Cordova. Elliott Homes is seeking specific development entitlements (e.g., tentative subdivision maps) as part of the project. GenCorp is seeking overall development entitlements, but has not proposed specific development entitlements necessary for immediate or short-term development as part of this proposal. In addition to local development entitlement requests, the project applicants are requesting authorization from U. S. Army Corps of Engineers to place dredged or fill material into waters of the United States.

Buildout of the project would be split into five phases and is anticipated to occur over a 25- to 30-year period. The project provides for construction of approximately 11,601 residential dwelling units. Commercial land uses would include Village Commercial, Local Town Center, and Regional Town Center; Business Park; and Industrial Park. Various parks facilities (public and private) are proposed as well as open space areas and other public uses. A 507-acre wetland preserve area and two elderberry preserve areas are also proposed in the southern portion of the project site. The project also includes new water, sewer, drainage, electrical, natural gas, and telecommunications services.

EXTENDED PUBLIC REVIEW PERIOD/STATUS: The City has granted an additional extension to the public comment period on the Recirculated Draft EIR/Supplemental Draft EIS. **The Recirculated Draft EIR/Supplemental Draft EIS comment period will now end on June 20, 2008.**

Written comments should be sent to both of the following addresses:

Patrick Angell
City of Rancho Cordova Planning Department
2729 Prospect Park Drive
Rancho Cordova, CA 95670

Kathleen Dadey
U.S. Army Corps of Engineers, Sacramento District
Regulatory Branch
1325 J Street, Room 1480
Sacramento, CA 95814-2922
Kathleen.a.Dadey@spk01.usace.army.mil

Pursuant to procedures set forth in Section 15088.5(f)(2) of the State CEQA Guidelines, reviewers should limit their comments to the materials contained in this Recirculated Draft EIR/Supplemental Draft EIS. All written comments received on the 2006 Draft EIR/EIS and this Recirculated Draft EIR/Supplemental Draft EIS will be responded to in the Final EIR/EIS. The City will only respond to comments received during the initial circulation period of the 2006 DEIR/DEIS that were not revised or recirculated, and comments received during the recirculation period that relate to the portions of the DEIR/EIS that have been revised.

AVAILABILITY OF THE DRAFT EIR/EIS: Copies of the Recirculated Draft EIR/Supplemental Draft EIS are available for review at the following locations:

Rancho Cordova Planning Department
2729 Prospect Park Drive, Rancho Cordova, CA 95670
Phone: (916) 851-8750

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9845 Folsom Boulevard, Sacramento, CA 95827
Phone: (916) 264-2770

The Recirculated Draft EIR/Supplemental Draft EIS may also be reviewed on the City's web site (<http://www.cityofranhocordova.org>). Referenced material used in the preparation of the Draft EIR may be reviewed upon request to the City of Rancho Cordova Planning Department.

Kopper-R-1

The commenter has compiled comments on the Rio del Oro Project DEIR/DEIS from experts in traffic engineering, hydrology, wildlife biology, and acoustical engineering, and other individuals and organizations. The commenter opposes the City approving the project and requested entitlements based on deficiencies identified by these experts and other individuals.

The comment is noted. The City will consider these comments when making a decision on whether or not to implement the Proposed Project Alternative or one of the other action alternatives evaluated in the 2006 DEIR/DEIS and 2008 RDEIR/SDEIS.

Kopper-R-2

The comment states that global warming will cause an increase in frequency of dry years; therefore, the City would be unable to assure adequate water supplies for the project.

Global climate change and its relationship to water supplies are discussed in detail on pages 3.5-25 through 3.5-30 of the 2008 RDEIR/SDEIS. Impact 3.5-9 on pages 3.5-85 through 3.5-89 and the cumulative impact analysis on pages 3.5-98 and 3.5-99 of the 2008 RDEIR/SDEIS analyze impacts of global climate change on surface-water and groundwater supplies.

Kopper-R-3

The comment states that the project would increase traffic gridlock in eastern Sacramento County, resulting in increases in air pollutants that pose human health risks.

Section 3.14, "Traffic and Transportation," and Section 3.15, "Air Quality," of the 2006 DEIR/DEIS address traffic and air quality impacts associated with the construction and operation of the Rio del Oro project.

Kopper-R-4

The comment cites the legal basis for providing an accurate and stable project description. The comment states that because the water supply for Phase 1 is uncertain, the time frame for development Phase 1 becomes uncertain, thereby rendering the project description in the DEIR/DEIS insufficient to serve as a project-level EIR. The comment further states that the changes in the time frame for development Phase 1 would result in changes to the construction schedule and result in uncertainty about when various components of Phase 1 identified in Table 2-5 of the 2006 DEIR/DEIS would be implemented. The comment concludes that the 2008 RDEIR/SDEIS does not include enough information about how the change in phasing would affect the environmental analyses and impact conclusions provided in the 2006 DEIR/DEIS.

The 2006 DEIR/DEIS and 2008 RDEIR/SDEIS included a detailed description of phasing in Table 2-5 in Chapter 3, "Alternatives," and on Exhibit 2-14, "Phasing Plan" (page 2-49). Phase 1 was analyzed throughout the EIR/EIS at a project level. The revised project phasing is shown on Exhibit 2-1 attached to this FEIR/FEIS. The project's entitlement requests have been modified, as discussed in Chapter 2 of this FEIR/FEIS such as entitlements that would allow for actual site development would occur in a subsequent stage of processing at the City, rather than concurrent with certification of the EIR. Impact 3.5-4 on pages 3.5-51 through 3.5-58 in the 2008 RDEIR/SDEIS analyzes the effects of curtailing project development if water supplies are not available to meet the demands of all the subphases of Phase 1 development. This analysis identifies

whether impacts related to curtailment would be greater than, the same as, or less than those identified for the Proposed Project Alternative for each resource area. The analysis also evaluated whether any new impacts associated with curtailing development would occur or whether any new mitigation measures would be required. As stated in Impact 3.5-4, curtailment of development would likely be only temporary and would be ameliorated upon receipt of the long-term water supply. Construction under development Phase 1 would continue according to Exhibit 2-14 of the 2006 DEIR/DEIS after the resumption of project construction.

Kopper-R-5

The comment states that changes in the time frame for development Phase 1 would result in changes to the construction schedule and uncertainty about when various components of Phase 1 would be implemented. The commenter opines that without this information, environmental analyses and impact conclusions provided in the 2006 DEIR/DEIS would be affected and the analysis of construction emissions and toxic air contaminants is incomplete and the traffic analysis is inaccurate.

See response to comment Kopper-R-4, above. The change in development phases does not involve any change to the extent of development evaluated in the 2006 DEIR/DEIS; the EIR/EIS analysis examines impacts at full buildout under both existing conditions and 2030 conditions.

Kopper-R-6

The comment states that because the water supply for Phase 1 is uncertain, the time frame for development Phase 1 becomes uncertain, thereby rendering the project description in the 2006 DEIR/DEIS insufficient to serve as a project-level EIR. The comment also states that without information on the construction schedule and implementation of the various components of Phase 1, the analysis of construction emissions and toxic air contaminants is incomplete and traffic analysis is inaccurate.

See response to comment Kopper-R-4, above.

Kopper-R-7

The comment states that the North Service Area Pipeline is required to serve the proposed project; therefore, the DEIR/DEIS should address specific impacts associated with the construction of this pipeline.

The North Service Area Pipeline is discussed on pages 3.5-4 and 3.5-5 of the 2008 RDEIR/SDEIS, and the impacts associated with construction of the North Service Area Pipeline Project are summarized under Impact 3.5-6 on page 3.5-68 of the 2008 RDEIR/SDEIS. This pipeline was identified in the 2005 Zone 40 WSMP EIR, and the environmental impacts of the construction of the pipeline were analyzed at a programmatic level in the Zone 40 WSMP. These impacts are summarized under Impact 3.5-6 of the 2008 RDEIR/SDEIS. The North Service Area Pipeline Project has not undergone project-level CEQA review. SCWA expected that an EIR for the North Service Area Pipeline Project would be prepared in 2008; however, no EIR has yet been prepared. Therefore, Impact 3.5-6 summarizes potential impacts identified in the 2005 Zone 40 WSMP EIR associated with the North Service Area Pipeline Project; however, it is not known specifically what impacts would result from construction of the North Service Area Pipeline Project until a project-level EIR is prepared and certified by SCWA. Although the Rio del Oro project is reliant on the North Service Area Pipeline Project to convey water supplies to the project site, it is the responsibility of SCWA to conduct the environmental analysis, prepare and certify the EIR, and approve and construct the North Service Area Pipeline Project. The North Service Area Pipeline Project is a separate project from the Rio del Oro project because it will go forward whether or not Rio del Oro is developed as proposed. Therefore, the North Service Area

Pipeline Project is not required to be analyzed as part of the Rio del Oro project under CEQA.

Kopper-R-8

The comment states that the DEIR/DEIS does not indicate whether sufficient capacity at the Sacramento Regional Wastewater Treatment Plant would be available to serve the proposed project.

This comment is based on information contained in the 2006 DEIR/DEIS, not the 2008 RDEIR/SDEIS. The NOA for the 2008 RDEIR/SDEIS noted that pursuant to procedures set forth in Section 15088.5(f)(2) of the State CEQA Guidelines, reviewers should limit their comments to the materials contained in the 2008 RDEIR/SDEIS. The NOA further noted that the City would respond only to comments on the 2006 DEIR/DEIS that were received during the initial circulation period of the 2006 DEIR/DEIS and comments received during the recirculation period that relate to the 2008 RDEIR/SDEIS. Therefore, this comment is outside the scope of the documents identified in the NOA of the 2008 RDEIR/SDEIS for which comments were invited, and no response is required under CEQA (State CEQA Guidelines, CCR Section 15088.5[f][2]). Although not required under CEQA, the USACE is required under NEPA to assess and consider comments individually and collectively and has determined that substantive comments received prior to the release of the Final EIR/EIS will be considered under NEPA. In addition, in the interest of clarity, the City as CEQA lead agency, has chosen to respond to this comment. See also Master Response 3, “Comments Outside the CEQA Public Review Period,” in Chapter 3 of this FEIR/FEIS.

Impacts associated with the increased demand for wastewater treatment facilities are discussed in Impact 3.5-6 on pages 3.5-24 and 3.5-25 of the 2006 DEIR/DEIS. The SRWTP receives and treats an average of 165 mgd (as of 2005) and has a permitted dry-weather flow design capacity of 181 mgd. Project buildout would generate 6.6 mgd of average dry-weather flow and 12.95 mgd peak wet-weather flow. There is expected to be sufficient SRWTP capacity to accommodate project flows through 2020, after which the project would be accommodated by planned SRWTP capacity. Implementing Mitigation Measure 3.5-6 would ensure that sufficient wastewater treatment capacity would be available to all project development phases, because capacity would be documented before approval of improvement plans.

The comment further states that impacts from construction of interim wastewater conveyance facilities are not analyzed.

Impacts associated with the construction of interim wastewater conveyance facilities are analyzed in Impact 3.5-4 on pages 3.5-17 through 3.5-19 of the 2006 DEIR/DEIS.

Kopper-R-9

The commenter states that the DEIR/DEIS does not include information on the environmental impacts of constructing interim wastewater flow facilities.

The commenter refers to information contained only in the 2006 DEIR/DEIS and not in the 2008 RDEIR/SDEIS. Therefore, this comment is outside the scope of the documents identified in the NOA of the 2008 RDEIR/SDEIS for which comments were invited, and no response is required under CEQA (State CEQA Guidelines, CCR Section 15088.5[f][2]). Although not required under CEQA, the USACE is required under NEPA to assess and consider comments individually and collectively and has determined that substantive comments received prior to the release of the Final EIR/EIS will be considered under NEPA. In addition, in the interest of clarity, the City as CEQA lead

agency, has chosen to respond to this comment. See also Master Response 3, “Comments Outside the CEQA Public Review Period,” in Chapter 3 of this FEIR/FEIS.

The commenter states that the EIR does not include information on the environmental impacts of constructing interim wastewater flow facilities. As discussed in the 2006 DEIR/DEIS, the project site is almost entirely within CSD-1’s AJ Douglas White Rock Trunk Shed sewer system. Discharge from the project site would ultimately flow into the AJ Interceptor and would be conveyed south to the Laguna Creek Interceptor.

A sewer master plan was therefore completed for the project, including designs for interim facilities (Wood Rodgers 2005). Interim facilities for the portion of the project site within the AJ Douglas White Rock Trunk Shed would direct flow into the Bradshaw Interceptor. The Bradshaw Interceptor has already been constructed (built in 2005–2006) and would be put into service by SRCSD before the project area would need service.

Development before completion of the AJ and Laguna Creek Interceptors would require construction of on-site facilities to a common point near the intersection of Sunrise Boulevard and Douglas Road, where off-site facilities would then be required to convey flows to existing facilities. The *Sewer Master Plan for Rio del Oro* identifies an interim force main extending from the intersection of Sunrise Boulevard and the future Rio del Oro Parkway south 1,400 feet along Sunrise Boulevard to Douglas Road, then west 6,500 feet along Douglas Road to the future extension of Zinfandel Drive. The force main would then extend north 4,500 feet along the future Zinfandel Drive alignment to North Mather Drive, where it would connect to the Bradshaw Interceptor. SRCSD is currently designing the Mather Interceptor as a gravity interceptor along the same alignment, beginning at the intersection of Sunrise Boulevard and Douglas Road. SRCSD will analyze the Mather Interceptor under a separate CEQA document and expects construction of this section of the Mather Interceptor to occur in 2010–2011. It is likely that the Mather Interceptor will be constructed and in service by the time sewer service is needed in the project area. However, the 2006 DEIR/DEIS includes the force main as an interim facility in case SRCSD construction falls behind schedule.

The 2006 DEIR/DEIS notes that off-site facilities required to connect with existing facilities would be constructed in existing, disturbed rights-of-way. Before construction of the force main across the Folsom South Canal, the contractor would prepare a storm water pollution prevention plan and implement standard BMPs for construction activities (2006 DEIR/DEIS, page 3-18). Analysis of impacts of construction activities is contained in 2008 RDEIR/SDEIS Impact 3.5-3 for each issue area (see pages 3.5-42 through 3.5-51). Because the construction of the interim force main is one of the anticipated construction activities for the project, no further analysis is necessary.

Kopper-R-10

The commenter requests clarification regarding the initial water supply from GSWC for development up to “600 dwelling units” and asks how that corresponds to enough water to supply Phase 1A.

As discussed on page 3.5-34 of the 2008 RDEIR/SDEIS, County Improvement Standards (2006) assume 1 gpm per dwelling unit; therefore, 600 dwelling units would be equal to a maximum water supply of 600 gpm, or 968 afy. As shown in Table 3.5-9, the total demand for the 861 units in Phase 1A is 902.6 afy. Therefore, the 968-afy water supply available from GSWC is sufficient to satisfy the demand for Phase 1A. In addition, entitlements allowing for the subdivision of land and construction of residential uses are now part of the Tier 2 entitlements (see Chapter 2 of this FEIR/FEIS).

Kopper-R-11

The comment states that the documentation for the water supply for Phase 1A of the project is not adequate because the DEIR/DEIS relies on only a personal communication in 2005, rather than a contract, a memorandum of agreement, or an adjudication of water rights.

The commenter states that a personal communication from Ernest Gisler, the engineering and planning manager at GSWC, is not sufficient evidence to rely on for water supply availability but provides no legal authority for this assertion. Furthermore, as noted in Chapter 6, “References,” of the 2008 RDEIR/SDEIS, the personal communication from Ernest Gisler is not an oral representation, as claimed by the commenter; rather, it is a signed letter from Ernest Gisler, stating that GSWC would have an adequate water supply to serve the initial phases of development up to 600 dwelling units and that water supplies would be provided by GSWC until long-term water facilities have been constructed by SCWA. (See page 5-2 of the 2008 RDEIR/SDEIS, which includes the following reference: Gisler, Ernest. Engineering and planning manager. Golden State Water Company [formerly Southern California Water Company]. Rancho Cordova, CA. July 29, 2005—letter to Russell Davis of Elliott Homes regarding water supply.) Based on this commitment in writing, the 2008 RDEIR/SDEIS properly concluded that there is reasonable certainty about the availability of water supply for Phase 1A.

Kopper-R-12

The comment states that the alternate initial water supplies for Phase 1 may not be considered a reliable source of potable water, and the City would be required to comply with Government Code Section 66473.7 to ensure an adequate water supply for development.

As discussed in response Kopper-R-10, the water supply available from GSWC is sufficient to satisfy the demand for Phase 1A. The 2008 RDEIR/SDEIS, moreover, acknowledges that there is not a reasonable likelihood that initial water supplies needed to serve the remaining development in Phase 1, above and beyond the first 600 units, would be available. Consistent with the commenter’s claim, Mitigation Measure 3.5-2 sets forth a requirement that, before subsequent (after adoption of the proposed Specific Plan) project-specific discretionary land use entitlements and approvals are issued, a factual showing must be made or the City must impose conditions similar to those required by California Government Code Section 66473.7 to ensure an adequate water supply for development authorized by the project. (See 2008 RDEIR/SDEIS, page 3.5-41.)

Kopper-R-13

The commenter claims that the discussion in the 2008 RDEIR/SDEIS of Option A and Option B as alternative water sources does not satisfy the requirements of Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova (2007) 40 Cal.4th 412 (Vineyard).

Pursuant to *Vineyard* (pages 445–446), an EIR is required to demonstrate a reasonable likelihood of adequate long-term water supply (i.e., that future water sources will be available). Where “despite a full discussion, it is impossible to confidently determine the anticipated future water sources will be available, CEQA requires some discussion of possible replacement sources or alternatives to use of the anticipated water, and of the environmental consequences of those contingencies” (*Vineyard*, page 432). In this case, although the long-term water supply is available and reasonably likely (GET remediated water of up to 8,900 afy and Zone 40 WSMP water of up to 1,500 afy), the infrastructure to deliver the water to the project area will not be completed until after project approval. Therefore, the 2008 RDEIR/SDEIS identified the initial water supply from GSWC to satisfy the demand of Phase 1A, which is considered a reasonably likely supply, and

Option A and Option B, as sources of initial water for the remaining development within Phase 1. Absent a reasonably likely long-term supply to complement and ultimately supersede the reasonably likely supply for Phase 1A, Option A and Option B would take on greater legal significance under *Vineyard*. Nothing in that case, however, requires extensive analysis of impacts of alternatives to short-term supplies where a reliable long-term supply has been identified.

The discussion of Option A notes that the water would come from GSWC wells that were decommissioned as a result of groundwater contamination and that the wells contain low concentrations of contaminants that are potentially above the action levels, but that wellhead treatment would be applied to wells that exceed regulatory criteria to treat the water to drinking water standards. The discussion further notes that the California Department of Public Health would need to approve the wellhead treatment. (2008 RDEIR/SDEIS, page 3.5-36.)

A similar discussion is provided for Option B, which would pipe groundwater treated at an Aerojet GET facility to the Coloma/Pyrites WTP to be blended with groundwater and surface-water supplies. As discussed on page 3.5-6 of the 2008 RDEIR/SDEIS, Aerojet's GET facilities currently extract and treat contaminated groundwater and are operated under one or more directives from EPA, the Central Valley RWQCB, and DTSC. The discussion of Option B also notes that the GET remediated water is treated to drinking water standards. (2008 RDEIR/SDEIS, page 3.5-37.)

Because a short summary of potential impacts is provided for both Option A and Option B, the discussion satisfies the mandates of *Vineyard* (see *Vineyard*, pages 445–446, which states that “CEQA requires *some* discussion of...the environmental consequences of those contingencies” [emphasis added]). Furthermore, both Option A and Option B would require GSWC water conveyance infrastructure to convey water to SCWA's existing infrastructure in White Rock Road. Such infrastructure is the same as that described in Impact 3.5-3, which provides a detailed discussion of the potential impacts, in all issue areas, related to construction of initial off-site water conveyance facilities. (See pages 3.5-42 to 3.5-50 of the 2008 RDEIR/SDEIS.)

Kopper-R-14

The commenter states that the North Vineyard Well Field does not have sufficient long-term water supplies to serve the Sunrise Douglas Community Plan, and therefore cannot be relied on as an alternative long-term supply for Rio del Oro.

The 2008 RDEIR/SDEIS does not identify the North Vineyard Well Field as an alternative *long-term* supply. Rather, the document notes that the idle capacity of the North Vineyard Well Field could potentially provide an alternative *initial* supply for Rio del Oro until the infrastructure to deliver the available long-term water supply (GET remediated water of up to 8,891 afy and Zone 40 WSMP water of up to 1,500 afy) is in place. The court in *Vineyard* found no fault with the ability of the North Vineyard Well Field to supply near-term needs (see *Vineyard*, pages 436–437).

Furthermore, the discussion of the North Vineyard Well Field as an alternative initial supply does include a short summary of potential impacts, which satisfies the mandates of *Vineyard* (see *Vineyard*, pages 445–446, which states that “CEQA requires *some* discussion of...the environmental consequences of those contingencies” [emphasis added]).

The comment further states that the FEIR/FEIS must include information on the environmental impact on fish resources in the Cosumnes River associated with using

excess capacity of the North Vineyard Well Field to serve the Rio del Oro Specific Plan area.

The environmental review of the Cosumnes River issue, as it relates to the use of groundwater, was contained in the Zone 40 WSMP EIR prepared and certified by SCWA 3 years after Sacramento County certified the EIR at issue in *Vineyard*. The Zone 40 WSMP EIR considered whether groundwater withdrawals, including withdrawals from the North Vineyard Well Field, had the potential to significantly affect biological resources in the Cosumnes River. Importantly, the Zone 40 WSMP EIR unequivocally concluded that such groundwater withdrawals do *not* have the potential to adversely affect the Cosumnes River and its biological resources, including fish. Specifically, the Zone 40 WSMP EIR addressed this issue by incorporating the findings of sophisticated modeling and field studies and concluding that anticipated groundwater pumping in Zone 40, the area that includes the North Vineyard Well Field, would not cause significant impacts on biological resources in the Cosumnes River:

- ▶ Impact 4.6-3 of the Zone 40 WSMP DEIR concluded that implementing the 2002 Zone 40 WSMP would not deplete groundwater underlying the Cosumnes River and Deer Creek and that impacts on biological resources associated with the Cosumnes River/Deer Creek corridor would be less than significant: “The groundwater and streamflow hydrographs comparing the 2000 Baseline and various project alternative scenarios show virtually no change in surface water flows or groundwater levels beneath the Cosumnes River as a result of the project. Similarly, cumulative scenarios show virtually no change” (SCWA 2003:4.6-35).
- ▶ The Zone 40 WSMP DEIR also stated that Zone 40 WSMP groundwater withdrawals would “not deplete groundwater underlying the Cosumnes River” and would cause “virtually no change in surface water flows” (SCWA 2003:4.7-31 to 4.7-36).
- ▶ The Zone 40 WSMP FEIR, revising pages 4.6-33 and 4.6-34 of the DEIR, stated, “The modeling results indicate that flow conditions in the Cosumnes River are improved with the proposed projects of the WSMP. Conditions improve in the Cosumnes River because (1) groundwater pumping is moved in a large amount to the lower aquifer and (2) surface water supply and other conjunctive use programs are implemented. The positive impacts of the project on the Cosumnes River are in addition to any Cosumnes River flow augmentation programs” (SCWA 2004:5-5).

Because the Zone 40 WSMP EIR was subject to public review and comment and was never subject to legal challenge, it is presumed to be adequate as a matter of law. (Section 21167.2 of the California Public Resources Code states that when the statute of limitations has run out and no lawsuit has been filed, there is a conclusive presumption that the EIR is legally adequate.) The Zone 40 WSMP EIR has conclusively determined that groundwater pumping in the North Vineyard Well Field does not have the potential to adversely affect biological resources on the Cosumnes River. The fact that the EIR set aside in the *Vineyard* litigation must revisit this issue on remand does not preclude the City from relying on the Zone 40 EIR analysis for projects considered after the completion of the latter EIR.

Thus, the impacts of pumping groundwater in Zone 40, an area that includes the North Vineyard Well Field, have already been analyzed in the Zone 40 WSMP EIR. Furthermore, in accordance with Section 15150 of the State CEQA Guidelines, the Zone 40 WSMP EIR is already incorporated by reference on pages 3.5-32 and 3.5-33 of the 2008 RDEIR/SDEIS. No additional analysis is required.

Kopper-R-15

The comment states that in Table 3.5-10 of the 2008 RDEIR/SDEIS, the system loss is subtracted from the demand, rather than added to the demand.

The commenter is correct in stating that the system loss is subtracted from the demand, not added to the demand. As shown in Chapter 5 of this FEIR/FEIS, a portion of Table 3.5-10 on page 3.5-38 of the 2008 RDEIR/SDEIS is hereby revised as follows:

Table 3.5-10 Water Demands for Rio del Oro Remaining Phase 1 Development								
Land Use	Dwelling Units ¹	Acres	Unit Water Demand Factor ² (af/ac/yr)	Average Annual Water Demand (afy)	Maximum Annual Water Demand (afy)	Average-Day Demand (gpm)	Maximum-Day Demand (gpm)	Peak-Hour Demand (gpm)
Total	861	162.4	–	2,224.7	4,449.4	1,366.1	2,732.2	5,464.4
			7.5% system loss	166.9	333.8	102.5	205	410
			Total Demand	<u>2,057.8</u>	<u>4,115.6</u>	<u>1,263.6</u>	<u>2,527.2</u>	<u>5,055.4</u>
				<u>2,391.6</u>	<u>4,783.2</u>	<u>1,468.6</u>	<u>2,937.2</u>	<u>5,874.4</u>

Source: Wood Rodgers 2007a

Corrections to Table 3.5-10 do not change the significance of Impact 3.5-2. Table 3.5-11 under Impact 3.5-2 on page 3.5-39 of the RDEIR/SDEIS compares water supply available from Options A and B (7,800 afy) to the remaining water-supply demands for development Phase 1 (4,115.6 afy) to determine whether a reliable water supply would be available to serve the remaining Phase 1 development. The corrections to Table 3.5-10 would result in changes to Table 3.5-11. Table 3.5-11 is hereby revised as shown below. As shown in Table 3.5-11 below and as updated as follows in Chapter 5 of this FEIR/FEIS, the combined Options A and B would still result in adequate water supplies to meet projected water demands under the remaining Phase 1 development.

Table 3.5-11 GSWC's Options A and B Water Supply Compared to Water Demand Associated with the Remaining Phase 1 Development				
Option	Average Annual Water Demand (afy)	Maximum Annual Water Demand (afy)	Average-Day Demand (gpm)	Maximum-Day Demand (gpm)
Option A	750	1,500	464.5	929
Option B	3,150	6,300	1,951.5	3,903
Total	3,900	7,800	2,416	4,832
Remaining Phase 1 Development	<u>2,057.8</u>	<u>4,115.6</u>	<u>1,263.6</u>	<u>2,527.2</u>
	<u>2,391.6</u>	<u>4,783.2</u>	<u>1,468.6</u>	<u>2,937.2</u>
Surplus	<u>1,842.2</u>	<u>3,684.4</u>	<u>1,152.4</u>	<u>2,304.8</u>
	<u>1,508.4</u>	<u>3,016.8</u>	<u>947.4</u>	<u>1,894.8</u>

Notes: afy = acre-feet per year; gpm = gallons per minute; GSWC = Golden State Water Company
Source: Data compiled by MacKay and Somps in 2008 and EDAW in 2008

Kopper-R-16

The comment states that the 2008 RDEIR/SDEIS does not adequately explain the availability of water for the Rio del Oro project. The comment further questions why the

assumed constant supply of 15,000 afy of GET-remediated water is not considered part of the groundwater supply, but instead considered a separate source of water as if it were surface water.

Although GET-remediated water is extracted groundwater that is discharged to the American River, it remains legally groundwater as it is conveyed by the American River. It is discussed in the 2008 RDEIR/SDEIS in conjunction with the surface water facilities because SCWA is anticipated to ultimately manage the GET remediated water in the same manner that it would manage surface water (i.e., it would be diverted at the Freeport Regional Water Project facilities). Rediversion of an amount of water equivalent to that which originated as percolating groundwater that, under natural conditions, would not reach or recharge the stream is considered foreign and developed water. Water Code Section 7075 allows the use of a natural stream channel as a conduit for delivering water to another location downstream. With respect to whether the GET remediated water is part of the “groundwater supply” for Zone 40, the comment appears to assume that the GET facilities are extracting water from wells located within Zones 40 and 41. Only one well located within Zone 40 and no wells within Zone 41 extract GET remediated water that is discharged to the American River. The total quantity of water produced by this well within Zone 40 is in the range of 350–460 afy.

To the extent the commenter is concerned about the potential effects of pumping the GET remediated water, as discussed in Response Kopper-R-28, the Zone 40 WSMP evaluated a suite of options for the conjunctive-use water supply system, including surface water entitlements, groundwater, and GET-remediated water from the Aerojet and Boeing Company properties. Within the suite of water supplies contemplated in the EIR for the Zone 40 WSMP, SCWA evaluated the impacts of groundwater extraction that would occur as a result of remediation activities by Aerojet and the Boeing Company. When the EIR for the Zone 40 WSMP was being prepared (2003–2004), groundwater extraction volumes at the Aerojet and Boeing Company properties totaled an estimated 18,664 afy. Based on existing agreements at that time, the WSMP EIR projected that groundwater extraction rates would increase to an estimated 35,890 afy by 2030 (see Table 6.3 of Appendix F of the EIR for the Zone 40 WSMP). The EIR concluded that under various scenarios contemplating different levels of reuse of the estimated 35,890 afy of remediated groundwater, groundwater extraction volumes within the Central Basin would be slightly less than the negotiated sustainable yield of 273,000 afy, and groundwater levels would be higher than the minimum levels determined by the Water Forum Agreement. As concluded on page 3.5-15 of the 2008 RDEIR/SDEIS, groundwater pumping associated with the Zone 40 WSMP, including pumping of the contemplated GET-remediated water, would not cause sustainable-yield recommendations to be exceeded.

Kopper-R-17

The comment requests that the 2008 RDEIR/SDEIS provide greater detail about current facilities expansion plans to allow extraction, treatment, and discharge of more than 26,000 afy per year. The commenter asks whether the EIR and other environmental studies have been completed, whether the plans for increased extraction and treatment have been prepared, whether funding is in place, and when construction of the facilities will begin.

Although the 2008 RDEIR/SDEIS notes that the GET facilities will be expanded in the next few years, the expansion is not necessary to supply the long-term water supply for the project. Thus, any impacts from the expansion would not be attributed to Rio del Oro. The GET facilities already discharge up to 15,000 afy, and the Rio del Oro project would

require only up to 8,891 afy—even less with the up to 1,500 afy of Zone 40 WSMP water. Because the expansion of the GET facilities is not necessary for Rio del Oro, it is not considered a “part” of the project and therefore need not be analyzed in the RDEIR/SDEIS. (See *Plan for Arcadia, Inc. v. City Council of Arcadia* [1974] 42 Cal.App.3d 712, 724.)

Kopper-R-18

The comment states that claiming that 35,000 afy of treated groundwater would be available is merely speculation. The commenter states that the 2008 RDEIR/SDEIS should provide information about facilities, funding, and timing of availability of GET remediated water, beyond citing the [Eastern Sacramento County] Replacement Water Supply Project DEIR.

Although the 2008 RDEIR/SDEIS notes that the GET facilities will be expanded in the next few years to discharge up to 35,000 afy, the expansion is not necessary to supply the long-term water supply for the project. The 15,000 afy that the 2008 RDEIR/SDEIS notes that the GET facilities are already discharging is sufficient to supply the project, which would require only up to 8,891 afy of GET water, and require even less GET water with the up to 1,500 afy of Zone 40 WSMP water. Because the project would not rely on the GET facilities discharging up to 35,000 afy, the RDEIR/SDEIS does not claim that such supply is reasonably certain. Thus, the RDEIR/SDEIS need not provide any more detail for the expansion of the GET facilities than the background information that was supplied.

Kopper-R-19

The comment calls for the agreements regarding GET-remediated water for the Rio del Oro project to be provided as appendices to the 2008 RDEIR/SDEIS and attachments to the water supply assessment, and states that the failure to provide this information would appear to violate state law.

Because the agreements noted by the commenter have been terminated, it is not necessary to include copies of these agreements in the appendices of the 2008 RDEIR/SDEIS. Although the 2003 agreements between SCWA and Aerojet and the Boeing Company have been terminated, SCWA and Aerojet have entered into a new 2010 Agreement under which Aerojet is transferring 8,900 afy of GET water to SCWA. Under the 2010 Agreement, SCWA acknowledges that the 8,900 afy will provide SCWA with sufficient available water to supply the Project, and shall further confirm this fact in writing to the City. The 8,900 afy along with other available Zone 40 water (including 1,500 afy under the SCWA conjunctive use program) is sufficient to meet the Project demand of 8,891 afy. The amount of water available under the 2010 agreement – 8,900 afy – is sufficient for build-out for the entire project, even if the 1,500 afy expected through the SCWA conjunctive-use supplies, for whatever reason, does not become available as expected. Thus, it is a reasonably likely water supply for the Project under the standards set forth in *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal.4th 412. (See Master Response 1, “Adequacy of Long-Term Water Supply,” in Chapter 3 of this FEIR/FEIS.)

Kopper-R-20

The comment states that almost all of the GET remediated water appears to have already been committed without any being available for the Rio del Oro project.

See response to comment Kopper-R-21, below. Aerojet discharges and will continue to discharge in excess of 15,000 afy of GET remediated water to the American River. (In fact, the current design flow for GET remediated water discharged to the American River exceeds 20,000 afy.) The amount being discharged by Aerojet exceeds the amount of water needed to serve the Project. Furthermore, SCWA and Aerojet have entered into a

new 2010 Agreement under which Aerojet is transferring 8,900 afy of GET water to SCWA. Under the 2010 Agreement, SCWA acknowledges that the 8,900 afy will provide SCWA with sufficient available water to supply the Project, and shall further confirm this fact in writing to the City. The 8,900 afy along with other available Zone 40 water (including 1,500 afy under the SCWA conjunctive use program) is sufficient to meet the Project demand of 8,891 afy. The amount of water available under the 2010 agreement – 8,900 afy – is sufficient for build-out for the entire project, even if the 1,500 afy expected through the SCWA conjunctive-use supplies, for whatever reason, does not become available as expected. Thus, it is a reasonably likely water supply for the Project under the standards set forth in *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal.4th 412. (See Master Response 1, “Adequacy of Long-Term Water Supply,” in Chapter 3 of this FEIR/FEIS.)

Kopper-R-21

The comment states that if the replacement water supply plan is approved, SCWA would deliver 5,000 afy of GET remediated water to GSWC’s intake facility on the Folsom South Canal and up to 10,200 additional afy through the Freeport Regional Water Project to GSWC. The comment further states that up to 15,200 afy of GET-remediated water is committed to GSWC as replacement water for Aerojet’s contamination of the GSWC wells.

The commenter appears to set forth his interpretation of what might have transpired had the terminated agreements continued to be in force and the RWSP been approved. The agreements were terminated, however, and the RWSP was not approved. Any obligation SCWA may have had under the agreements to provide water to GSWC, moreover, would not affect the GET water available to serve the project. Although Aerojet continues to have the obligation to provide replacement water to GSWC (up to 5,000 afy), the quantity of GET water anticipated to be required for the project, up to 8,891 afy and even less with the up to 1,500 afy of Zone 40 WSMP water, is substantially less than the GET remediated water that Aerojet discharges (in excess of 15,000 afy). Moreover, this amount discharged will increase to up to 26,000 afy because of Aerojet’s obligation to discharge over time under both a current Unilateral Administrative Order for Operable Unit 3 and EPA’s proposed remedy plan for Operable Unit 5. The projected increase in the current GET extraction and discharge to higher volumes is based on EPA requirements already in place under the Unilateral Administrative Order and under estimated quantities required to meet upgraded GET facilities described in EPA’s proposed remedial plan. Therefore, the more than 15,000 afy of GET remediated water currently discharged is sufficient to provide replacement water to GSWC (up to 5,000 afy) and the amount transferred to SCWA for the Project under the 2010 Agreement (8,900 afy).

Kopper-R-22

The comment states that even if the GET-remediated water is increased in a few years to 26,000 afy, it would appear that all of that water is committed to GSWC, The Nature Conservancy, and Cal-Am, and that the 2008 RDEIR/SDEIS fails to explain how GET-remediated water would remain for the Rio del Oro project.

The comment appears to be based on a misunderstanding about the obligations of SCWA under terminated agreements and the effect termination of the agreements has on quantities of GET remediated water. The agreements were terminated, however, and the RWSP was not approved. Any obligation SCWA may have had under the agreements to provide water to GSWC, moreover, would not affect the GET water available to serve the project. Therefore, a detailed response to this comment would not appear to be necessary. It should be noted, however, that under those terminated agreements, SCWA received

GET remediated water reasonably projected to exceed 26,000 afy and undertook certain obligations. Some of the obligations were contingent on other circumstances; the responsibility to provide replacement water, for example, would arise only if Cal-Am or GSWC required such water. These contingent obligations of SCWA no longer exist now that the agreements establishing them have been terminated. SCWA's obligation to use GET remediated water to supply the lower Cosumnes River Environmental Water Management Memorandum of Agreement (MOA) was also contingent on the agreements that have now been terminated. The GET remediated water was not the sole source of SCWA's water for the MOA, however, and because the agreements have been terminated, SCWA will use other water supplies to satisfy the MOA.

Up to 15,000 afy of GET remediated water has been and will continue to be discharged to the American River by Aerojet. SCWA and Aerojet have entered into a new 2010 Agreement under which Aerojet is transferring 8,900 afy of GET water to SCWA. Under the 2010 Agreement, SCWA acknowledges that the 8,900 afy will provide SCWA with sufficient available water to supply the Project, and shall further confirm this fact in writing to the City. The 8,900 afy along with other available Zone 40 water (including 1,500 afy under the SCWA conjunctive use program) is sufficient to meet the Project demand of 8,891 afy. Therefore, by the 2010 Agreement, the 8,900 afy of GET remediated water is transferred to SCWA and is part of the available water to serve the Project. The amount of water available under the 2010 agreement – 8,900 afy – is sufficient for build-out for the entire project, even if the 1,500 afy expected through the SCWA conjunctive-use supplies, for whatever reason, does not become available as expected. Thus, there is a reasonably likely water supply available for the Project under the standards set forth in *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal.4th 412. (See Master Response 1, "Adequacy of Long-Term Water Supply" in Chapter 3 of this FEIR/FEIS.)

Kopper-R-23

The comment states that the 2008 RDEIR/SDEIS needs to include the impacts on Cosumnes River fish resources of pumping groundwater within the Zone 40 area, because the Rio del Oro DEIR/DEIS is relying on Zone 40 groundwater and the EIR for the Zone 40 Water Supply Master Plan did not include the environmental impacts of pumping such groundwater.

The commenter is mistaken. The Zone 40 WSMP EIR did consider whether groundwater withdrawals in Zone 40 had the potential to significantly affect biological resources in the Cosumnes River. Specifically, the Zone 40 WSMP EIR addressed this issue by incorporating the findings of sophisticated modeling and field studies and concluding that anticipated groundwater pumping in Zone 40 would not cause significant impacts on biological resources, including fish, in the Cosumnes River. The analysis showed no adverse changes in flows in the Cosumnes River and in fact showed positive impacts that presumably may be good for the fish:

- ▶ Impact 4.6-3 of the Zone 40 WSMP DEIR concluded that implementation of the 2002 Zone 40 WSMP would not deplete groundwater underlying the Cosumnes River and Deer Creek and that impacts on biological resources associated with the Cosumnes River/Deer Creek corridor would be less than significant: "The groundwater and streamflow hydrographs comparing the 2000 Baseline and various project alternative scenarios show virtually no change in surface water flows or groundwater levels beneath the Cosumnes River as a result of the project. Similarly, cumulative scenarios show virtually no change" (SCWA 2003:4.6-35).

- ▶ Pages 4.7-31 to 4.7-36 of the Zone 40 WSMP DEIR states that Zone 40 WSMP groundwater withdrawals would “not deplete groundwater underlying the Cosumnes River” and would cause “virtually no change in surface water flows” (SCWA 2003:4.7-31 to 4.7-36).
- ▶ Page 5-5 of the Zone 40 WSMP FEIR, revising pages 4.6-33 and 4.6-34 of the Draft EIR, states, “The modeling results indicate that flow conditions in the Cosumnes River are improved with the proposed projects of the WSMP. Conditions improve in the Cosumnes River because (1) groundwater pumping is moved in a large amount to the lower aquifer and (2) surface water supply and other conjunctive use programs are implemented. The positive impacts of the project on the Cosumnes River are in addition to any Cosumnes River flow augmentation programs” (SCWA 2004:5-5).

The Zone 40 WSMP EIR has conclusively determined that groundwater pumping in Zone 40 does not have the potential to adversely affect biological resources on the Cosumnes River because flow volume would not be affected in September, October, or November—the critical period for migrating Chinook salmon:

- ▶ Impact 4.7-7 of the Zone 40 WSMP DEIR concludes that modeling shows that Cosumnes River flows would be virtually unchanged as a result of implementing the 2002 WSMP, as would average annual Cosumnes River flow volume and average fall flows (September through November). Similarly, modeling showed virtually no change in Cosumnes River flow under cumulative scenarios, compared to the 2000 Baseline. Consequently, implementing the 2002 Zone 40 WSMP would not adversely change the duration, timing, or frequency of periods when surface flow in the Cosumnes River would occur. This would be a less-than-significant impact (SCWA 2003:4.7-31).

In accordance with Section 15150 of the State CEQA Guidelines, the Zone 40 WSMP EIR is incorporated by reference into the 2008 RDEIR/SDEIS. (See 2008 RDEIR/SDEIS, pages 3.5-32 and 3.5-33, incorporating *Zone 40 Water Supply Master Plan Final Environmental Impact Report* [SCH #95082041] [SCWA 2004] by reference.) No additional analysis is required.

Kopper-R-24

The commenter claims that the discussion of the alternative water sources for long-term water supply in the 2008 RDEIR/SDEIS does not satisfy the requirements established in the Vineyard decision.

The commenter claims that the discussion of the alternative water sources for long-term water supply does not satisfy the requirements of *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal.4th 412. Pursuant to *Vineyard*, an EIR is required to demonstrate a reasonable likelihood of adequate long-term water supply (i.e., that future water sources will be available) (*Vineyard*, pages 445–446). Where “despite a full discussion, it is impossible to confidently determine that anticipated future water sources will be available, CEQA requires some discussion of possible replacement sources or alternatives to use of the anticipated water, and of the environmental consequences of those contingencies” (*Vineyard*, page 432). When a reasonably likely source sufficient for buildout is identified, however, there is no need to look at possible replacement sources. In this case, as noted on page 3.5-64, the long-term water supply is currently available and thus reasonably likely. This conclusion is reinforced by the 2010 Agreement between SCWA and Aerojet. Under the 2010 Agreement, Aerojet is transferring 8,900 afy of GET water to SCWA. SCWA acknowledges, in the Agreement, that the 8,900 afy will provide SCWA with sufficient available water to supply the

Project, and shall further confirm this fact in writing to the City. The 8,900 afy along with other available Zone 40 water (including 1,500 afy under the SCWA conjunctive use program) is sufficient to meet the Project demand of 8,891 afy. The amount of water available under the 2010 agreement – 8,900 afy – is sufficient for build-out for the entire project, even if the 1,500 afy expected through the SCWA conjunctive-use supplies, for whatever reason, does not become available as expected. Thus, the water supply for the Project is reasonably likely under the standards set forth in *Vineyard*. (See Master Response 1, “Adequacy of Long-Term Water Supply,” in Chapter 3 of this FEIR/FEIS.) The identification and analysis of alternate sources of water and the impacts associated with those sources are, therefore, not required under *Vineyard*. Although not legally required, the discussion of alternative long-term water supply sources was included for informational purposes.

The commenter also states that the 2008 RDEIR/SDEIS identifies these sources as speculative.

Vineyard does not require certainty in the identified alternative sources (see page 432, which states that “CEQA requires some discussion of *possible* replacement sources...” [emphasis added]). Furthermore, because the discussion of alternative long-term water supplies in the 2008 RDEIR/SDEIS is not legally required, whether the level of certainty of these alternative supplies is not a material issue.

Kopper-R-25

The comment states that the 2008 RDEIR/SDEIS does not support the claim that the amount of groundwater projected to be used annually, which is close to the sustainable yield for Zone 40 groundwater as reported in SCWA’s 2005 Zone 41 Urban Water Management Plan (Zone 41 UWMP), would be available in Zone 40 in multiple dry years.

The commenter is mistaken in stating that the UWMP reports a sustainable yield of 40,900 afy for Zone 40 groundwater. The Zone 41 UWMP, in fact, notes that 40,900 afy is the long-term average yield of groundwater that has been identified in the Zone 40 WSMP, taking into account conjunctive use of both groundwater and surface water. The 40,900 afy assumes that in years when sufficient surface water is available, groundwater can be “banked” as in-lieu storage for use during dry years. The Zone 41 UWMP notes that the sustainable-yield objectives of the groundwater basin are met when the average long-term yield over the modeled 70-year hydrologic period does not exceed 40,900 afy (SCWA 2005:2-10).

In other words, taking into consideration those wet years when groundwater would be relied on less than surface water and those dry years when the reverse occurs, the average yield over a 70-year period should not exceed 40,900 afy. The 40,900 afy is not a limit on the amount of groundwater that can be extracted per year, as the commenter implies. The Zone 41 UWMP specifically acknowledges that in drier and driest years, the groundwater extraction rate exceeds Zone 40’s estimated long-term average use of 40,900 afy (SCWA 2005:2-11).

Furthermore, the supplies available during normal, single dry, and multiple dry years identified in Table 3.5-17 of the 2008 RDEIR/SDEIS are the same supplies identified in Table 2-4 of the Zone 41 UWMP. These supplies reflect the conjunctive-use pattern in Zone 40 where, in normal years, groundwater use averages 39,000 afy. In dry years, when the availability of surface water is limited, groundwater production increases to 70,000 afy to make up for the reduction in surface water (SCWA 2005:2-9). The 2008 RDEIR/SDEIS acknowledges, however, that actual groundwater pumping levels would

not exceed the amount identified in the Zone 40 WSMP (69,900 afy) and would be below the sustainable yield for the Central Basin identified in the Water Forum Agreement (273,000 afy). (See Tables 3.5-18 and 3.5-19 on pages 3.5-62 to 3.5-63 of the 2008 RDEIR/SDEIS, which note groundwater supply in dry year 2030 of 68,327 afy.)

Kopper-R-26

The comment notes that increasing numbers of dry years are likely as global warming becomes more pronounced, and states that the 2008 RDEIR/SDEIS fails to address the increased energy costs associated with pumping in multiple dry years.

Moreover, the Zone 40 WSMP already assumes delivery of 1,500 afy to the project area as part of the water supply analyzed in the Zone 40 WSMP EIR. Therefore, for delivery of 1,500 afy of water to the project area, there would be no increased energy demands over what was assumed in the Zone 40 WSMP EIR and/or the EIRs for the water treatment and conveyance facilities identified in the Zone 40 WSMP (i.e., the Vineyard Surface Water Treatment Plant, Freeport Regional Water Project, NSAPP).

With respect to the GET remediated water, Aerojet is already pumping, treating, and discharging more than the 15,000 afy identified in the 2008 RDEIR/SDEIS. The quantity of GET water anticipated to be required for the project, up to 8,891 afy and even less with the up to 1,500 afy of Zone 40 WSMP water, would be satisfied by this water (from the up to 8,900 afy of GET remediated water transferred under the 2010 Agreement); thus, implementing the project would not cause energy demands related to pumping GET remediated water to increase over energy demands under baseline conditions. Furthermore, as is the case with the Zone 40 water, the energy demands for the treatment and conveyance of this water are already accounted for in the EIRs for the water treatment and conveyance facilities identified in the Zone 40 WSMP. Please see “Global Climate Change and Water Supply Linkages” in Section 3.5, “Utilities and Service Systems—Water Supply,” of the 2008 RDEIR/SDEIS.

Kopper-R-27

The comment states that the 2008 RDEIR/SDEIS fails to address the impact on spreading the Aerojet toxic plume related to intense groundwater pumping.

There is no impact relating to the spread of the plume as a result of groundwater pumping for the project. The GET facilities, through which Aerojet’s groundwater is pumped, are designed to prevent the spread of the plume. Aerojet, under the oversight of EPA, DTSC, and Central Valley RWQCB, has been investigating the nature and extent of groundwater and soil contamination throughout the site since 1979. The cleanup approach for the Aerojet site is to control groundwater contamination moving across the facility boundary with two operable units (OUs) (Western Groundwater OU and Perimeter Groundwater OU). Studies to define the nature and extent of the groundwater contamination migrating from the western end of the Aerojet property (Western Groundwater OU [OU3]) were formally completed in 2001, when EPA signed a ROD specifying the selected groundwater cleanup plan for this part of the site. The ROD provides for an inner groundwater boundary to prevent further contamination from flowing off property on the western side of the Aerojet site, an outer boundary at the toe of the groundwater contamination to prevent the loss of further aquifer above the cleanup levels specified in the ROD, and the eventual restoration of the drinking water aquifer between the inner and outer boundaries as the contamination is flushed out of the various aquifer layers. The inner boundary consists of combined GET E/F and GET J (Area 2). The outer boundary consists of GET J (Area 1), GET K (Area 2), and GET L (Area 4).

A Remedial Investigation/Feasibility Study has been prepared for the Perimeter OU5, which covers groundwater containment on the north and south sides of Aerojet. EPA

recently issued a proposed remedial plan for public comment, and an ROD will be issued thereafter. The proposed plan describes modifications to existing GET facilities to expand extraction on the periphery of the Aerojet Operating Plant in areas not addressed in OU3.

Kopper-R-28

The commenter states that the 2008 RDEIR/SDEIS needs to address the impact on the availability of GET remediated water in dry years.

As discussed on page 3.5-13 of the 2008 RDEIR/SDEIS, the amount of remediated groundwater necessary to serve Rio del Oro (7,391 afy) was determined to be a reliable annual source, irrespective of wet or dry years. Zone 40 is located within the Central Basin. Preliminary studies indicate that the Sacramento Valley would experience only a small decline in groundwater levels as a result of global climate change, which would likely have little to no effect on available groundwater supplies that can be pumped from the Central Basin (Vicuña 2006). (See Response to Kopper-R-66.) The Zone 40 WSMP evaluated a suite of options for the conjunctive-use water supply system, including surface-water entitlements, groundwater, and GET-remediated water from the Aerojet and MDC/Boeing properties. Within this suite of water supply options, SCWA evaluated the impacts of groundwater extraction that would occur as a result of remediation activities by Aerojet and MDC/Boeing. At the time the EIR for the Zone 40 WSMP was being prepared (2003–2004), groundwater extraction volumes at the Aerojet and MDC/Boeing properties totaled an estimated 18,664 afy. Based on existing agreements at that time, the WSMP EIR projected that groundwater extraction rates would increase to an estimated 35,890 afy by 2030 (SCWA 2003:Appendix F, Table 6.3).

SCWA then evaluated in the Zone 40 WSMP EIR whether these projected future groundwater-extraction volumes, when combined with other groundwater pumping in Zone 40 and other groundwater pumping in the Central Basin, would exceed the Central Basin's negotiated sustainable yield (273,000 afy) as determined through the Water Forum Agreement stakeholder process. (See Alternatives 2a, 2b, 2c, and 3 in Appendix F of the EIR for the Zone 40 WSMP.) Various scenarios were examined, each contemplating different reuse levels for the estimated 35,890 afy of remediated groundwater. Based on these scenarios, the EIR concluded that groundwater extraction volumes within the Central Basin would be slightly less than the negotiated sustainable yield of 273,000 afy, and that groundwater levels would be higher than the minimum levels determined by the Water Forum Agreement. Assuming such reuse, average groundwater levels in the northern Zone 40 area would increase by about 4 feet, while those in the southern Zone 40 area would decrease by about 1 foot (SCWA 2003: Appendix F, page 6-21). Stabilized groundwater elevations at the Central Basin's cone of depression under the modeled scenarios would range from approximately 50 feet below mean sea level (msl) to 84 feet below msl. These groundwater elevations are all substantially higher than the Water Forum Agreement's projected level of 116 feet below msl to 130 feet below msl.

As concluded on page 3.5-15 of the 2008 RDEIR/SDEIS, groundwater pumping associated with the Zone 40 WSMP, including the contemplated GET-remediated water, would not cause sustainable-yield recommendations to be exceeded. Therefore, groundwater levels at the Central Basin's cone of depression are projected to be higher than those determined to be acceptable to the Water Forum, and this impact was considered less than significant in the Zone 40 WSMP EIR. As a result, there would be no impact on the availability of GET remediated water in multiple dry year conditions.

The comment states that the 2008 RDEIR/SDEIS must include an energy analysis related to the project's reliance on groundwater, as required by Appendix F of the State CEQA Guidelines.

Appendix F of the State CEQA Guidelines does not specifically require that a project's water-related energy use be addressed in the EIR; rather, it notes that a project's potentially significant energy implications should be considered in an EIR. (See Response to Comment Kopper-R-40.) Appendix F then goes on to list several possibilities for energy-related impacts, but acknowledges that not all the items suggested need be included in the EIR. These are only items that *may* be included in the EIR. The environmental impacts section of an EIR may discuss the following topics:

- ▶ the project's energy requirements and its energy-use efficiencies by amount and fuel type for each stage of the project's life cycle (construction, operation, maintenance, and/or removal), and if appropriate, the energy intensiveness of materials;
- ▶ effects of the project on local and regional energy supplies and on requirements for additional capacity;
- ▶ effects of the project on peak and base-period demands for electricity and other forms of energy;
- ▶ the degree to which the project complies with existing energy standards;
- ▶ effects of the project on energy resources; and
- ▶ the project's projected transportation energy use requirements and overall use of efficient transportation alternatives.

The analysis of the energy considerations discussed in Appendix F of the State CEQA Guidelines is contained in the 2006 DEIR/DEIS in Section 3.5, "Utilities and Service Systems." The project's impacts related to increasing demand for electricity and natural gas are analyzed in Impact 3.5-8 and Impact 3.5-9, respectively, of the 2006 DEIR/DEIS (pages 3.5-28 to 3.5-30). As noted in Impact 3.5-8, buildout of the project would increase electrical demand in Rancho Cordova by approximately 76 megavolt amperes. However, the Sacramento Municipal Utility District (SMUD) currently generates approximately 1,197 megawatts (MW) of electricity per day. Thus, the increase in demand for electricity created by the project would not be substantial in relation to the existing electricity consumption in SMUD's service area. Moreover, SMUD has stated that it has adequate electrical supplies to support the project without adversely affecting service to current users. (2006 DEIR/DEIS, page 3.5-28.)

As noted in Impact 3.5-9 of the 2006 DEIR/DEIS, implementation of the project would increase the demand for natural gas in Rancho Cordova. Pacific Gas and Electric Company (PG&E) has indicated that it has adequate natural-gas supplies to support the project without adversely affecting service to current users. The energy demands created by the project are not considered substantial in relation to the total amount of energy supplied by PG&E in its northern and central California service area (estimated in 2000 to be 887 million cubic feet per day of natural gas) and available energy expected in the future. (2006 DEIR/DEIS, page 3.5-29.)

The 2006 DEIR/DEIS and 2008 RDEIR/SDEIS need not analyze the energy requirements for pumping or delivering the Zone 40 WSMP water or the GET remediated

water. The Zone 40 WSMP already assumes the delivery of the 1,500 afy to the project area as part of the water supply analyzed in the Zone 40 WSMP EIR. Therefore, delivering the 1,500 afy of water to the project area would not increase energy demands over what was assumed in the Zone 40 WSMP EIR and/or the EIRs for the water treatment and conveyance facilities identified in the Zone 40 WSMP (i.e., the Vineyard Surface Water Treatment Plant, Freeport Regional Water Project, NSAPP).

With respect to the GET remediated water, Aerojet is currently already pumping, treating, and discharging 15,000 afy. The quantity of GET water anticipated to be required for the project, up to 8,891 afy and even less with the up to 1,500 afy of Zone 40 WSMP water, would be satisfied by this water (from the up to 8,900 afy of GET remediated water transferred under the 2010 Agreement); thus, implementing the project would not cause energy demands for pumping GET to increase over what is already occurring in the baseline conditions. Furthermore, as is the case with the Zone 40 water, the energy demands for the treatment and conveyance of this water are already accounted for in the EIRs for the water treatment and conveyance facilities identified in the Zone 40 WSMP (i.e., the Vineyard Surface Water Treatment Plant, Freeport Regional Water Project, North Service Area Pipeline Project).

Kopper-R-30

The comment states that the reliance of the 2008 RDEIR/SDEIS on the Zone 40 WSMP for the analysis of cumulative demand is inadequate because with respect to the 2030 scenario, most of the specific plan area is not included within Zone 40. The commenter calls for a much more thorough cumulative analysis of water demand and water supply to meet CEQA requirements, including identification of projects that will contribute to the long-term cumulative demand for water and compare that demand with the likely supply.

The commenter states that the 2008 RDEIR/SDEIS improperly relied on the Zone 40 WSMP for the analysis of cumulative demand because most of the project site is not within Zone 40. In fact, the project site lies wholly within Zone 40; however, only a portion of the site lies within the 2030 Study Area, for which the Zone 40 WSMP identified existing and projected water demands. For the portion of the project site within the 2030 Study Area, a water demand of 1,500 afy was assumed. The remaining water demand for project site (7,391 afy) would be met with GET remediated water. (See 2008 RDEIR/SDEIS, page 3.5-9, Master Response 1, “Adequacy of Long-Term Water Supply,” in Chapter 3 of this FEIR/FEIS.) Section 15130 of the State CEQA Guidelines requires a discussion of cumulative impacts when the project’s incremental effect is cumulatively considerable when viewed in connection with the effects of past projects, other current projects, and probable future projects. Because there would be no competing users for the 7,391 afy of GET remediated water, the 2008 RDEIR/SDEIS relied on the Zone 40 WSMP for analysis of cumulative demand. The terms of the 2010 Agreement reaffirm the facts on the GET remediated water used as the basis for the cumulative analysis in the 2008 RDEIR/SDEIS. The only water supply that may be affected by cumulative demand is the 1,500-afy supply of water designated for the project area as a part of the 2030 Study Area. (See 2008 RDEIR/SDEIS, page 3.5-93.) Notably, the amount of water available under the 2010 agreement – 8,900 afy – is sufficient for build-out for the entire project, even if the 1,500 afy expected through the SCWA conjunctive-use supplies, for whatever reason, does not become available as expected.

Kopper-R-31

The comment states that the 2008 RDEIR/SDEIS does not adequately address greenhouse gas emissions, and that nothing in CEQA would support the view that a statement of overriding considerations relieves a public agency of the duty to adopt feasible

mitigation measures simply because those measures would not reduce the impact to a less-than-significant level.

The commenter's recitation of CEQA requirements with respect to adoption of mitigation measures is noted. The analysis in the 2006 DEIR/DEIS regarding global climate change was not recirculated in the 2008 RDEIR/SDEIS, and the City therefore has no obligation to respond to this comment (State CEQA Guidelines, CCR Section 15088.5[f][2]). Nevertheless, responses to specific comments are provided in subsequent responses.

The 2006 DEIR/DEIS concluded that the impacts of GHG emissions would be significant and unavoidable, even with incorporation of proposed mitigation. However, the City's duty to incorporate additional mitigation measures to attempt to further reduce this significant and unavoidable impact arises only if such suggested mitigation measures are, in fact, feasible. (*Concerned Citizens of South Central Los Angeles v. Los Angeles Unified School District* [1994] 24 Cal.App.4th 826, 841 ["CEQA does not require analysis of every *imaginable* alternative or mitigation measure; its concern is with *feasible* means of reducing environmental effects."] [italics in original].)

Kopper-R-32

The comment states that the DEIR/DEIS does not set forth adequate mitigation for impacts of the project on global climate change.

The commenter's opinion that the DEIR/DEIS does not set forth adequate mitigation for impacts on global climate change is noted. The analysis in the 2006 DEIR/DEIS regarding global climate change was not recirculated, and the City therefore has no obligation to respond to this comment (State CEQA Guidelines, CCR Section 15088.5[f][2]). Nevertheless, responses to specific comments are provided in subsequent responses.

As discussed in the 2006 DEIR/DEIS, there are currently no statewide thresholds for determining thresholds of significance associated with GHGs from development projects. However, Assembly Bill (AB) 32 (Chapter 488, Statutes of 2006), the California Global Warming Solutions Act of 2006, codifies the state's goal to reduce the statewide greenhouse gas emission from stationary sources to 1990 levels by 2020 (California Health and Safety Code Section 38500 et seq.). This reduction is to be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. By January 1, 2011, ARB must adopt rules and regulations to achieve the maximum technologically feasible and cost-effective reductions in GHG emissions. ARB is authorized to enforce compliance with the program that it develops.

The discussion of global climate change in the 2006 DEIR/DEIS quantifies the project's estimated GHG emissions (see page 3.15-37 of the 2006 DEIR/DEIS). Notably, this quantification is conservative, in that it takes into account emissions that may not be "new." The GHG emissions for the project were calculated based on the total vehicle trips per day associated with the Rio del Oro project. Residential development, however, typically has an associated average-daily-trip generation rate that assumes that work-related, shopping-related, and other types of trips occur on a daily basis, originating and ending at the residential unit. It is reasonable to assume that these trips would occur without the project. The analysis is therefore conservative, in that it includes some emissions that are relocated rather than "new."

The City believes that the 2006 DEIR/DEIS does set forth adequate mitigation to reduce the impact of the project on global climate change. Mitigation Measure 3.15-2, as set forth in the 2006 DEIR/DEIS, would be required to reduce the project's impacts on air

quality and GHGs. Furthermore, the project would incorporate other energy efficiency and design measures that would tend to reduce GHG emissions. Despite the incorporation of all these measures, however, the impact would remain significant and unavoidable.

Although Mitigation Measure 3.15-2 is designed as mitigation for long-term GHG emissions during project operation, it is well recognized that conventional air pollution control measures have the additional benefit of reducing GHG emissions. (See, for example, *Report on the Integration of Air Quality Management and Climate Protection*, prepared by the Climate Protection Campaign and the Community Clean Water Institute [CPC and CCWI 2005].) For example, ARB's draft recommendations for discrete early-emissions measures, issued in 2007, lists the 10 conventional air pollution control measures that were scheduled for rulemaking in 2007, 2008, and 2009 as measures that would reduce GHG emissions (ARB 2007). ARB included these measures in the report based on its determination that "conventional air pollution controls make an important contribution to climate protection" (ARB 2007:17). Because conventional pollution control measures also reduce GHG emissions, implementing Mitigation Measure 3.15-2 to reduce emissions of conventional air pollutants (as analyzed in Impact 3.15-2 of the 2006 DEIR/DEIS) would likewise reduce GHG emissions for the Rio del Oro project (as analyzed in Impact 3.15-7 of the 2006 DEIR/DEIS).

Mitigation Measure 3.15-2 requires the project applicant(s) for all project phases to submit to the City a copy of the project's operational air quality plan, developed in consultation with and approved by SMAQMD. The operational air quality plan, included in the 2006 DEIR/DEIS as Appendix L, includes measures to reduce operational air quality impacts associated with the project by a minimum of 15%; these measures shall be included in the Rio del Oro Specific Plan. Implementation of the measures identified in the operational air quality plan is required as a condition of approval of the Rio del Oro project and enforceable by the City as lead agency under CEQA and applicable provisions of the Rancho Cordova Municipal Code. The operational air quality plan includes the following trip reduction and emission reduction measures designed to collectively reduce employees' peak-hour vehicle trips and reduce emissions from both mobile and stationary sources by 15%, while also reducing GHG emissions:

BICYCLE/PEDESTRIAN/TRANSIT

- 1. Bicycle Lockers and Racks:** Nonresidential projects provide bicycle lockers and/or racks
- 2. Additional Bicycle Parking Facilities:** Provide an additional 20% of required Class I and Class II bicycle facilities within each commercial development in the project area
- 3. Shower and Locker Facilities:** Nonresidential projects provide personal showers and lockers
- 4. Class I Bicycle Storage—Residential:** Bicycle storage (Class I) at apartment complexes or condos without garages
- 5. Class I and Class II Bicycle Facilities:** Entire project is located within 1/2 mile of an existing Class I or Class II bike lane and provides a comparable bikeway connection to that existing facility
- 6. Pedestrian Facilities:** The project provides for pedestrian facilities and improvements

7. **Uses Proximate to Planned Transit:** Bus service provides headways of 15 minutes or less for stops within 1/4 mile; project provides essential bus stop improvements
8. **Transportation Information:** Kiosk Provide a display case or kiosk within each commercial development, displaying transportation information

PARKING

17. **Carpool/Vanpool Parking:** Provide preferential parking for carpool//vanpools
21. **Parking Lot Design:** Provide a parking lot design that includes clearly marked and shaded pedestrian pathways between transit facilities and building entrances.

MIXED USE

30. **Mixed Use:** Have at least three of the following on-site and/or within 1/4 mile: Residential Development, Retail Development, Personal Services, Open Space, Office
31. **Neighborhood as Focal Point:** Neighborhood serving as focal point with parks, school, and civic uses within 1/4 mile
32. **Bicycle and Pedestrian Paths:** Separate, safe, and convenient bicycle and pedestrian paths connecting residential, commercial, and office uses.
33. **Elimination of Barriers:** The project provides a development pattern that eliminates physical barriers such as walls, berms, landscaping, and slopes between residential and nonresidential land uses that impede bicycle or pedestrian circulation.

BUILDING COMPONENTS

42. **Energy Efficient Heating:** Install lowest emitting commercially available furnaces in all project buildings.
43. **Ozone Destruction Catalyst:** Install ozone destruction catalyst air conditioners in all residential units.
45. **High-Speed Data Connection:** Install a connection for high-speed data transmission to each residential unit through the installation of fiber optic cable, T-1 wiring, or other comparable technology.

TRANSPORTATION DEMAND MANAGEMENT & MISC.

51. **TMA [Transportation Management Association] Membership:** Include permanent TMA membership and funding requirement. Funding to be provided by Community Facilities District or County Service Area or other nonrevocable funding mechanism
65. **Lawnmowers:** Provide a complimentary cordless electric lawnmower to each residential buyer

The project applicant(s) will also participate in the GreenPoint Rated New Home program, as discussed below in response to comment Kopper-R-34. Therefore, as shown in Chapter 5 of this FEIR/FEIS, the existing mitigation measure for Impact 3.15-7 is hereby renumbered to become Mitigation Measure 3.15-7a, and the following mitigation measure is hereby added to the 2006 DEIR/DEIS as Mitigation Measure 3.15-7b:

Mitigation Measure 3.15-7b: Incorporate Green Building Measures into Residential Construction.

PP, HD, IM,
NF

The project applicant(s) for all project phases containing residential uses shall participate in the GreenPoint Rated program or equivalent program. Each home shall be built to achieve the GreenPoint Rated label by earning a minimum of 50 total points and meeting the minimum point thresholds in specific categories: Energy (30), Indoor Air Quality/Health (5), Resources (6), and Water (9). The measures to achieve these points are outlined in the *New Home Construction Green Building Guidelines* (Build It Green 2007) and grouped into sections corresponding to the various stages of construction. Other programs may be used in place of the GreenPoint Rated program as long as they can be demonstrated to have equivalent green building measures. The measures incorporated into the project may include but are not limited to the following:

- ▶ **Site:** Manage the construction process to minimize disruptions to the building site, reduce waste, and prevent pollution of air, soil, and waterways.
- ▶ **Foundation:** Incorporate recycled fly ash in concrete, using frost-protected shallow foundations in cold climates, and installing radon-mitigation measures where appropriate.
- ▶ **Landscaping:** Utilize strategies to keep pollutants out of waterways, reduce water use, promote healthy soils, create fire-safe landscaping, and reduce excessive outdoor lighting.
- ▶ **Structural Frame and Envelope:** Implement measures to address the building's structural frame, including the walls, floors, and roof, for more durable buildings that use energy and other resources more efficiently.
- ▶ **Exterior Finish:** Install siding, roofing, and decking materials that will hold up well for decades and help protect the home from moisture damage, fire, and general wear and tear.
- ▶ **Insulation:** Follow proper insulation installation techniques, and use insulation products with recycled content and low or no formaldehyde emissions.
- ▶ **Plumbing:** Design the plumbing system to reduce hot-water runs, insulate hot-water pipes, and install water-efficient toilets.
- ▶ **Heating, Ventilation, and Air Conditioning:** Utilize high-efficiency heating and cooling equipment and effective ductwork and ventilation for better indoor air quality.
- ▶ **Renewable Energy:** Pre-plumb or install solar hot water systems and pre-wire or install photovoltaic systems.
- ▶ **Building Performance:** Design and build high-performance homes that meet or exceed the state's building energy efficiency standards by including improved insulation, installation of energy efficient windows, installation of tankless hot-water heaters, and other measures.
- ▶ **Finishes:** Utilize healthier options for paints, trim, cabinets, and countertops that perform well and are readily available and promote environmentally preferable materials for interior finishes.
- ▶ **Flooring:** Utilize finish flooring materials that are attractive, long-lasting, and environmentally friendly.
- ▶ **Appliances:** Install high-efficiency residential appliances that can significantly cut a home's energy and water use, including dishwashers, clothes washers, and refrigerators that exceed minimum federal efficiency standards.
- ▶ **Other:** Utilize innovative approaches to green building that go beyond the basic measures described in these guidelines.

Timing: Throughout project construction of all project phases containing residential uses.

Enforcement: City of Rancho Cordova Building and Safety and Planning Departments.

NP No mitigation measures are required.

In addition, in recognition of the state's ongoing efforts to reduce GHG emissions as discussed in Response to Kopper-R-34, and as shown in Chapter 5 of this FEIR/FEIS, the following mitigation is hereby added to the 2006 DEIR/DEIS as Mitigation Measure 3.15-7c:

Mitigation Measure 3.15-7c: Incorporate Green Building and Development Measures.

PP, HD, IM, NF Each increment of new development within the project site requiring a discretionary approval (e.g., proposed tentative subdivision map, conditional use permit), shall be subject to a requirement, the details of which shall be established through project-specific environmental review, that GHG emissions from construction and operation of the increment of development at issue will be reduced by 30% from business-as-usual 2006 emissions. In determining 2006 business-as-usual emissions, the assumptions and analysis regarding traffic and operational conditions of the project used in the EIR/EIS may be utilized.

For each increment of new development, the developer shall submit to the City, prior to the release of any project-specific environmental document, a proposed mitigation plan that lists the measures selected to be implemented as part of the proposed development increment and/or consideration of previously implemented measures in the specific plan area, including analysis demonstrating the associated reduction in GHG emissions. The list shall reflect the then-current state of the regulation of GHG emissions and climate change, which is expected to continue to evolve under the mandate of AB 32. The mitigation plan shall be accompanied by an analysis demonstrating why, in the developer's view, the selected measures are both feasible and efficacious. The City, in consultation with the SMAQMD, shall review the mitigation report for the applicable increment of development and shall include the proposed mitigation strategy and accompanying analysis, with any changes considered by City staff to be necessary and potentially feasible, as part of the project-specific environmental review for the proposed increment of new development. After receiving and considering any public input on the proposed mitigation strategy, the City shall ultimately approve the strategy (with modifications, if considered necessary and feasible) prior to granting any requested discretionary approval for that increment of development. In determining what sort of measures should appropriately be imposed by a local government under the circumstances to attain the overall, project-wide 30% emissions requirement, the City shall consider the following factors:

- ▶ The extent to which rates of GHG emissions generated by motor vehicles traveling to, from, and within the project site are projected to decrease over time as a result of regulations, policies, and/or plans that have already been adopted or may be adopted in the future by ARB or other public agency pursuant to AB 32, or by EPA;
- ▶ The extent to which mobile-source GHG emissions, which at the time of writing this EIR comprise a substantial portion of the state's GHG inventory, can also be reduced through design measures that result in trip reductions and reductions in trip length;
- ▶ The extent to which GHG emissions emitted by the mix of power generation operated by SMUD, that will serve the project site, are projected to decrease pursuant to the Renewable Portfolio Standard required by SB 1078 and SB 107, as well as any future regulations,

policies, and/or plans adopted by the federal and state governments that reduce GHG emissions from power generation;

- ▶ The extent to which replacement of CCR Title 24 with the California Green Building Standards Code or other similar requirements will result in new buildings being more energy efficient and consequently more GHG efficient;
- ▶ The extent to which any stationary sources of GHG emissions that would be operated on a proposed land use (e.g., industrial) are already subject to regulations, policies, and/or plans that reduce GHG emissions, particularly any future regulations that will be developed as part of ARB's implementation of AB 32, or other pertinent regulations on stationary sources that have the indirect effect of reducing GHG emissions;
- ▶ The extent to which the feasibility of existing GHG reduction technologies may change in the future, and to which innovation in GHG reduction technologies will continue, affecting cost-benefit analyses that determine economic feasibility; and
- ▶ Whether the total costs of proposed mitigation for GHG emissions, together with other mitigation measures, required for the proposed development, are so great that a reasonably prudent property owner would not proceed with the project in the face of such costs.

In considering how much, and what kind of, mitigation is necessary in light of these factors, the City shall consider the following list of options, though the list is not intended to be exhaustive, as GHG reduction strategies and their respective feasibility are likely to evolve over time. These measures are derived from multiple sources including the Mitigation Measure Summary in Appendix B of the California Air Pollution Control Officer's Association (CAPCOA) white paper, CEQA & Climate Change (CAPCOA 2008), the California Attorney General's Office (2008) and the Sacramento Metropolitan Air District Draft GHG Measures (2009).

Energy Efficiency

- ▶ Include clean alternative energy features to promote energy self-sufficiency (e.g., photovoltaic cells, solar thermal electricity systems).
- ▶ Site buildings to take advantage of shade and prevailing winds and design landscaping and sun screens to reduce energy use.
- ▶ Install efficient lighting in all buildings (including residential). Also install lighting control systems, where practical. Use daylight as an integral part of lighting systems in all buildings.
- ▶ Install Energy Star compliant highly reflective roofing materials.
- ▶ Install light-colored "cool" pavements, and strategically located shade trees along all bicycle and pedestrian routes.

Project developers should be encouraged to incorporate "green building" points into the construction and design of all projects (including additions of 25,000 square feet of office/retail commercial or 100,000 square feet of industrial floor area) for which "green building" points are available. Such points may be achieved through conformity with the checklists identified by New Home Construction Green Building Guidelines available at www.builditgreen.org (which were developed to apply to residential construction, but which include measures that are also pertinent to commercial construction), or through any similar list that distinguishes specific measures targeting efficiencies in energy, resource use, or other measures that would also directly or

indirectly result in GHG emission reductions. Specific efficiencies that would reduce GHG emissions shall be implemented where feasible, for all project areas including site design, landscaping, foundation, structural frame and building envelope, exterior finishing, plumbing, appliance use, insulation, heating, venting and air conditioning, building performance, use of renewable energy, finishes, and flooring.

Project developers should be encouraged to incorporate any combination of the following strategies to reduce heat gain of the non-roof impervious site landscape (including roads, sidewalks, courtyards, parking lots, and driveways) into the construction and design of all new (additions of 25,000 square feet of office/retail commercial) projects:

- ▶ Shaded (Within 5 years of occupancy)
- ▶ Paving materials with a Solar Reflective Index (SRI) of at least 29
- ▶ Open grid pavement system (pavement that is less than 50% impervious and contains vegetation in the open cells)
- ▶ Parking spaces under cover (defined as underground, under deck, under roof, or under building). Any roof used to shade or cover parking should have an SRI of at least 29.
- ▶ Optional level of LEED certification, such as silver or gold which can allow for further reductions in energy consumption and GHG emissions.

Water Conservation and Efficiency

The Project includes water conservation as part of the project. In addition, the project would comply with Title 22, Chapter 32.180, “Water Use and Conservation,” of the City’s Municipal Code, which specifies design criteria for irrigation systems and requirements for plant selection. These requirements include but are not limited to: installation of irrigation systems that minimize overspray and runoff, use of control valves to account for different site-specific characteristics and use of rain shutoff systems, and installation of plants that are suited to the local climate and require moderate amounts of water (Sections 22.180.070 and 22.180.080). In addition, the following should be considered:

- ▶ With the exception of ornamental shade trees, use water-efficient landscapes with native, drought-resistant species in all public area and commercial landscaping.
- ▶ Install the infrastructure to use recycled water for landscape irrigation. (Part of the project)
- ▶ Install water-efficient irrigation systems and devices, such as soil moisture-based irrigation controls.
- ▶ Design buildings and lots to be water-efficient. Install water-efficient fixtures and appliances. (e.g., Ultra low-flow toilets, no flow urinals etc.)
- ▶ Restrict watering methods (e.g., prohibit systems that apply water to non-vegetated surfaces). Prohibit businesses from using pressure washers for cleaning driveways, parking lots, sidewalks, and street surfaces unless required to mitigate health and safety concerns.

Solid Waste Measures

Project developers should be encouraged to incorporate any combination of the following strategies:

- ▶ Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard).
- ▶ Provide interior and exterior storage areas for recyclables and green waste at all buildings.
- ▶ Provide adequate recycling containers in public areas, including parks, school grounds, paseos, and pedestrian zones in areas of mixed-use development.
- ▶ Provide education and publicity about reducing waste and available recycling services.

Transportation and Motor Vehicles

Project developers should be encouraged to incorporate any combination of the following strategies:

- ▶ Promote ride sharing programs at employment centers (e.g., by designating a certain percentage of parking spaces for ride sharing vehicles, designating adequate passenger loading and unloading zones and waiting areas for ride share vehicles, and providing a web site or message board for coordinating ride sharing).
- ▶ Provide the necessary facilities and infrastructure in all land use types to encourage the use of low or zero emission vehicles (e.g., electric vehicle charging facilities and conveniently located alternative fueling stations).
- ▶ At commercial land uses, all forklifts, “yard trucks,” or vehicles that are predominately used on-site at non-residential land uses should be electric-powered or powered by biofuels (such as biodiesel [B100]) that are produced from waste products, or shall use other technologies that do not rely on direct fossil fuel consumption.
- ▶ Provide the necessary facilities and infrastructure to encourage the use of low or zero-emission vehicles (e.g., electric vehicle charging facilities and conveniently located alternative fueling stations).
- ▶ Prioritized parking within new commercial and retail areas shall be given to electric vehicles, hybrid vehicles, and alternative fuel vehicles.
- ▶ Incorporate bicycle lanes, routes, and intersection improvements into street systems within the Specific Plan.
- ▶ For commercial land uses, provide adequate bicycle parking near building entrances to promote cyclist safety, security, and convenience.
- ▶ For commercial land uses, provide “end-of-trip” facilities including showers, lockers, and changing space.
- ▶ Create Class II bicycle lanes and walking paths directed to the location of schools, parks and other destination points.

- ▶ Construction of transit facility/amenity (bus shelters, bicycle lockers/racks, etc.) for existing public and private transit.
- ▶ Provide secure bicycle storage at public parking facilities.
- ▶ Design site and building placement to facilitate the expansion and use of alternative modes of transportation, and integrate the project site with the surrounding development and circulation pattern by creating street and pedestrian/bicycle access throughout the project site to enable trips without depending exclusively on major roads, secondary roads, or the automobile.
- ▶ Design roadways to reduce motor vehicle speeds and encourage pedestrian and bicycle trips by featuring traffic calming features.

Timing: Throughout project construction of all project phases.

Enforcement: City of Rancho Cordova Planning Department.

NP No mitigation measures are required.

To further encourage the use of electrically powered equipment and make such usage feasible in the future, as discussed in Response to Kopper-R-40 and as shown in Chapter 5 of this FEIR/FEIS, the following mitigation measure is hereby added as Mitigation Measure 3.15-7d:

Mitigation Measure 3.15-7d: Locate Electrical Outlets to Support Use of Electrical Landscaping Equipment.

PP, HD, IM, NF The project applicant(s) for all project phases containing residential uses shall promote a reduction in residential emissions by encouraging the installation of conveniently located electrical outlets within the front, side, and rear yards of all residential structures, as appropriate, to support the use of electrical landscaping equipment.

Timing: Throughout project construction of all residential phases.

Enforcement: City of Rancho Cordova Planning Department.

NP No mitigation measures are required.

In addition, the concept plan for Rio del Oro is intended to encourage internal pedestrian circulation and ease of access through the following design and land use features:

- ▶ a network of pathways, greenbelts, and landscaped boulevards that would provide a pleasant pedestrian experience;
- ▶ the location of compatible and complementary land uses in close proximity; and
- ▶ many linkages between the internal pedestrian/bicycle network and new paths and trails or existing and planned region-serving facilities on the periphery of the project site.

The *Rio del Oro Development Standards and Design Guidelines* ensure that pedestrian-friendly features would be liberally incorporated into the project. Such features would include a street tree planting program, open space corridors, pedestrian and vehicular

linkages, and connections between parking lots and development sites and between residential and commercial development.

The *Rio del Oro Development Standards and Design Guidelines* have been developed in accordance with the City's development standards, as well as the City's *Design Guidelines; Trails, Greenways, and Gathering Places*; the *Rio del Oro Specific Plan*; the Urban Design and Land Use Elements of the City General Plan); and other relevant documents. Many of the guidelines include energy efficiency measures or measures that would reduce fuel consumption (e.g., by promoting pedestrian and bicycle circulation and transit), which in turn would reduce GHG emissions. Specifically, the development standards and design guidelines set forth the following notable measures:

- ▶ Section 3.3.2, "Residential Design Guidelines" (pages 77 and 83):
 - Residential blocks and local streets should be pedestrian oriented and in a pattern that reduces regional through traffic.
 - Where practical, buildings should integrate resource friendly technology and green building practices into the building design. Use of energy efficient building design is encouraged. A more sustainable development can be achieved through the incorporation of passive and active solar systems.
 - Windows, especially those facing south and west, should be designed to reduce energy losses while maintaining the architectural integrity and quality of the building design.
- ▶ Section 3.4.2.2, "Commercial Circulation" (page 88):
 - Centers should be designed with internal circulation systems that allow for easy, efficient, and safe, slow-speed vehicular movement, and with well-defined pedestrian and bicycle paths.
 - Pedestrian circulation patterns within the vehicular rights-of-way should be clearly delineated with a change of paving, use of paving color, and special signage and lighting.
 - The overall site design should be organized around pedestrian activity and circulation. Building entrances should create a visually inviting storefront with direct, identifiable, and safe access from streets and pedestrian walkways.
 - On-site amenities for bicycle parking shall be provided at each center with direct, safe and convenient access to adjoining path systems without intruding into walkways.
 - Transit stops, if necessary due to route alignments, shall be provided in a convenient location within each center and designed as an integral part of the site. Bus transit stops shall include amenities that create an attractive, safe, and comfortable place for transit users.
- ▶ Section 3.5.1, "Business Park Guidelines" (page 98):
 - Building placement should take into account solar access to help lower heating and cooling costs.

- Pedestrian and vehicular access locations should be emphasized with high-quality landscape treatments and signage.
- Convenient and direct access to proposed transit stops shall be incorporated into the circulation system.

The City finds that the mitigation measures in the 2006 DEIR/DEIS and the design and emissions reductions elements set forth above constitute all feasible mitigation for reduction of the impact of the project on global climate change.

Kopper-R-33

The commenter states that the City should require “that all streets be planted with public or special district maintained street trees that will provide a canopy fully covering the streets within 15–20 years,” that wide streets include center planting areas, and that trees be planted in parking lots to provide full coverage in 15 years.

The Rio del Oro Specific Plan assumes regularly spaced street trees and landscaped/tree planted medians on streets 4 lanes or wider. The *Rio del Oro Development Standards and Design Guidelines* require the planting of street trees. Section 3.2.4, “Street Trees,” on page 74 of the development standards and design guidelines document presents the following guidelines with respect to selection of street trees:

- ▶ Large-canopy trees that provide dense shade at maturity should be chosen for placement along pedestrian routes. Narrow, columnar trees are more suitable for street medians.
- ▶ Street trees should be easy to maintain. They should thrive in an urban environment where tree roots may be affected by sidewalks and other obstacles. Trees should be selected to reduce sidewalk damage, and species with spreading or invasive roots should be avoided.
- ▶ Street trees should be planted at sufficient intervals to accommodate mature growth. The appropriate interval will depend on the species and variety of tree. When trees are planted in formal patterns, maximum spacing shall be no farther than 50 feet on center.
- ▶ Planting intervals can be modified to create interest, with clusters of trees placed near intersections, Neighborhood Greens, or Neighborhood Parks.
- ▶ Accent trees that display seasonal interest are encouraged at entryways or important intersections.

Based on the typical spread of trees at reasonable spacing (30 feet on center) plus the inability to shade intersections, the likely maximum coverage of the paved area of streets would be approximately 50%. The same is true for parking lots. The *Rio del Oro Development Standards and Design Guidelines* (Section 3.4.2.8, page 93) require that parking lots contain landscaped areas with large shade trees in sufficient size and spacing to provide shade to surrounding parking spaces. For specific tree coverage requirements, refer to the City’s current standards. In addition, Rancho Cordova has an ordinance requiring that 50% of the typical parking lot be shaded at 15 years.

The commenter suggests a 100% canopy as mitigation, but does not provide any information on why a 100% canopy would be feasible.

The City is not aware of any jurisdiction or other project in which 100% coverage has been required or achieved. A 50% canopy is consistent with the recommendations of the Sacramento Tree Foundation (2008) and other regional planning guides (e.g., the City of Davis's *Parking Lot Shading Guidelines and Master Parking Lot Tree List* [City of Davis 2008]) and would constitute a minimum coverage standard. Requiring a greater percentage of canopy coverage would be infeasible because parking lot dimensions would have to increase to accommodate tree root zones (typically 1.5 times the tree canopy) and because maintenance expenses associated with doubling the number of trees would be excessive. The 100% coverage advocated by the commenter is on its face impractical and inconsistent with other considerations common to parking area design, including visibility, safety, and lighting.

As for the commenter's suggestion to use redwood trees for their effectiveness at reducing GHGs, redwoods are one of the types of trees recommended for planting as street trees in the *Rio del Oro Development Standards and Design Guidelines* (page 74).

The commenter suggests that the DEIR/DEIS should consider as a mitigation measure the planting of urban forests in areas within and around the proposed project.

The commenter does not define "urban forest." "Urban forest" is generally defined as a collection of trees growing in an urban area and the plants that grow beneath them; the trees and associated living organisms in an urban area; or a dense, widespread growth of trees and other plants covering an urban area. The landscape and streetscape guidelines of the *Rio del Oro Development Standards and Design Guidelines* provide for a network of tree and plant growth in the greenbelts and vegetated multiuse drainage ways throughout the plan area that would meet the City's understanding of the definition of urban forest. In greenways, the *Rio del Oro Development Standards and Design Guidelines* specifically require that shade trees be provided in appropriate groupings, which would aid in carbon sequestration (see Section 3.1.2.5 on page 62).

Kopper-R-34

The comment suggests that the City require installation of solar water heaters for domestic hot water at each house to reduce energy consumption.

The project would be required to comply with Title 24 of the California Code of Regulations regarding energy efficiency, which became in January 2010. These new energy efficiency standards were developed in response to the state's energy crisis as well as AB 970 (Chapter 329, Statutes of 2000), the California Energy and Reliability Act of 2000. The goals of the recent changes to Title 24 are to improve the energy efficiency of residential and nonresidential buildings, minimize impacts during peak energy usage periods, and reduce impacts on overall state energy needs. Title 24 represents state policy on building efficiency measures. Thus, by meeting Title 24 requirements, the project would comply with the relevant regulation for energy conservation that would reduce the need to generate power and indirectly reduce air quality emissions, and additional measures are not required. Furthermore, as noted in the *Rio del Oro Development Standards and Design Guidelines*, the project would incorporate energy efficient heating by installing furnaces with the lowest emissions of any commercially available model in all project buildings. The project would provide more efficient cooling by installing ozone-destruction-catalyst air conditioners in all residential units.

The commenter states that solar hot water is "cheap and effective" but provides no evidence that either claim is true. Although solar hot-water heaters can reduce energy costs, which may ultimately result in a reduction in GHGs, it is not feasible to require

installation of solar hot-water heating systems on each residence in the project area. Solar hot-water systems are very costly compared to conventional systems. The initial solar water system can cost between \$1,500 and \$3,500, compared to \$150–\$450 for conventional electric or natural-gas water heaters (EESI 2006).

The efficiency of such systems is also complicated by several variables: the constant change of the sun's position in the sky; the tilt and orientation of the solar collection surface; the existence or future development of structures adjacent to the solar collection surface that may interfere with solar collection; and the presence and type of vegetation adjacent to the collector. As such, installing a solar hot-water heater would not eliminate the need for the conventional hot-water heater. Rather, in household systems, a solar water heater usually connects to the existing water heater, which would turn on when needed (EESI 2006). Therefore, requiring a solar hot-water system would mean that both the solar system and the conventional hot-water heater would need to be installed.

A solar hot-water heating system is more expensive to install than a conventional hot-water heater because it must be installed by a qualified contractor. With installation, a solar water system can run from about \$3,000 to \$8,000, depending on system design (NAHB Research Center 2008). Thus, the two systems would likely be installed separately, resulting in additional cost. Depending on system type and complexity, maintenance costs are also higher for solar water-heating systems than for conventional systems. Given the current fee burden in Rancho Cordova, the existing housing market, and the availability of similar homes at similar or lower prices throughout the region, the additional cost would put the houses in the project area at such a competitive disadvantage that the project would not be considered feasible.

The City, however, believes that reducing residential energy consumption is important and that any reduction would provide a meaningful reduction in GHG emissions. The project applicant(s) will participate in the GreenPoint Rated New Home program or an equivalent program. A GreenPoint Rated New Home is a recognizable and independent seal of approval for green homes that assures homebuyers that a home is healthier, more energy efficient, and more resource efficient. GreenPoint Rated is a program of Build It Green, a professional nonprofit membership organization whose mission is to promote healthy, energy- and resource-efficient buildings in California. A GreenPoint Rated home is graded on five categories:

- ▶ energy efficiency,
- ▶ resource conservation,
- ▶ indoor air quality,
- ▶ water conservation, and
- ▶ community.

The GreenPoint rating process is a noninvasive physical examination of building systems, structures, materials, and components to assess energy and water efficiency, indoor air quality, resource efficiency of materials and construction methods, and construction quality. Ratings are performed by certified GreenPoint raters, independent professionals who are trained and certified by Build It Green. The points in GreenPoint Rated correspond to recommended green building measures in Build It Green's *New Home Construction Green Building Guidelines* and *Multifamily Green Building Guidelines*. Point values are assigned based on their benefits to the homeowner and the environment and reflect construction practices that exceed the requirements of California's Building and Energy Codes. Any eligible project that achieves the minimum of 50 total points and

meets the category-specific point thresholds earns the right to bear the GreenPoint Rated label.

The project applicant(s) will identify the most appropriate means of achieving the GreenPoint Rated label or use an equivalent program. The best technologies and strategies could change over the lifetime of the project, however. Therefore, as shown in response to comment Kopper-R-32 and in Chapter 5 of this FEIR/FEIS, a new measure, Mitigation Measure 3.15-7b, “Incorporate Green Building Measures into Residential Construction,” has been added to the 2006 DEIR/DEIS to further mitigate increases in long-term atmospheric GHG emissions. Please refer to response to comment Kopper-R-32.

Furthermore, the State of California is taking several steps likely to result in stricter (greener) building codes within the foreseeable future to address the trend of increasing GHG emissions. Among those efforts are the plans and initiatives listed below.

- ▶ ***State of California Energy Action Plan:*** The California Energy Commission (CEC), California Power Authority (CPA), and CPUC have adopted an “energy action plan” (EAP) that sets forth a commitment to achieve joint goals for California’s energy future through specific actions. The second EAP (EAP II) describes a coordinated implementation plan for state energy policies that have been expressed through the governor’s orders, public positions, instructions to agencies, legislative direction, and other energy-related policies (CEC, CPA, and CPUC 2005). The overarching goal of the EAP II is for California’s energy to be adequate, technologically advanced, affordable, and environmentally sound. One of the key actions identified by the EAP II with respect to renewable energy and GHG emission reductions is to implement a cost-effective program to achieve the 3,000-MW goal of Governor Schwarzenegger’s “Million Solar Roofs” initiative. Another key action identified by the EAP is to establish a program to encourage solar hot-water heating.
- ▶ ***The California Solar Initiative:*** California has set a goal to create 3,000 MW of new solar-produced electricity by 2017. This initiative is administered by CPUC. On March 2, 2006, CPUC opened a proceeding to develop rules and procedures for the initiative and to continue considering policies for the development of cost-effective, clean, and reliable distributed generation of energy. On August 21, 2006, Governor Schwarzenegger signed Senate Bill (SB) 1, which directs CEC to implement the Solar Initiative program within certain budget limits and specific requirements. CPUC completed a rulemaking process to reconcile its decisions with SB 1. Current incentives under the initiative provide upfront, capacity-based payment for new solar systems. This incentive system changed in 2007, however, into performance-based payments (Go Solar California 2008). As of June 2009, California had more than 515 MW of cumulative installed solar photovoltaic capacity at nearly 50,000 sites (CPUC 2009).
- ▶ ***Title 24 Update:*** Title 24 is revised on a 3-year cycle. The most recent update, in 2008, included adoption of the state Green Building Standards. It is widely recognized that updates for the Title 24 building standards will be an effective method by which the state may reduce GHG emissions. For example, the EAP II (described above) directed CEC to adopt new building standards for implementation in 2008 that include cost-effective demand response technologies and the integration of photovoltaic systems. Similarly, Executive Order 2-3-05, the Climate Action Initiative, identifies Title 24 building standards as an explicit strategy in a menu of actions that will be necessary to meet the goals of the Climate Action Initiative.

In recognition of the state's ongoing efforts to reduce GHG emissions, and as shown in response to comment Kopper-R-32 and in Chapter 5 of this FEIR/FEIS, a new measure, Mitigation Measure 3.15-7c, "Condition Site-Specific Project Approvals on Adoption of State Mitigation Strategies for Reducing Contributions to Climate Change," has been added to the 2006 DEIR/DEIS. Please refer to response to comment Kopper-R-32.

In light of the foregoing, the City declines at present to go as far as the commenter suggests and impose an inflexible requirement necessitating the installation of solar water heaters at "each home" in Rio del Oro. In view of the ongoing efforts by the State of California to develop uniform standards for achieving even more energy conservation than is already required by Title 24 in its current form, the City believes that it should refrain from imposing even more mitigation obligations than it has already done. Doing more would potentially create a conflict with the measures ultimately adopted by the state (after all of the public input and process necessary for regulatory action at the state level). Such a conflict could lead to a piecemealed approach to energy conservation and air pollution reduction requirements; the project area could be subject to complex and expensive mandates that diverge from state norms, or from requirements imposed in surrounding jurisdictions before the adoption of new statewide requirements.

Kopper-R-35

The comment states that a mitigation measure should be added requiring the installation of solar electric panels on each house in Rio del Oro.

The commenter refers to an article from the *Seattle Times* dated March 31, 2007, discussing a development that will result in zero-energy homes. Notably, as described in the *Seattle Times* article, which is attached to the comment letter, only 2,000 zero-energy homes have been built in the United States since 2003. To the extent that the commenter is suggesting that the City add a mitigation measure requiring zero-energy homes, the City responds that such a measure would be infeasible for the same reasons discussed in response to comment Kopper-R-34.

The commenter goes on to note that zero-energy homes may not be feasible for the project, but that installing solar electric panels on each house in the development would be feasible. As an example, the commenter refers to a project in Yuba City that proposes an all-solar development.

The cost of the solar and energy-efficiency features included in the Yuba City development, called Bay Drive Estates by Premier Homes, would be approximately \$10,000–\$15,000. Bay Drive Estates is quite a different type of development than the proposed Rio del Oro project, however. The development is a small 35-home community, with homes up to 3,067 square feet in size. The homes in such all-solar developments are generally priced substantially higher than houses in traditional developments. The fact that such a boutique-style community in Yuba City, with few homes and located away from an urban center, is able to bear an increased home cost does not indicate that an all-solar home would be feasible for Rio del Oro, however. The all-solar homes are marketed to buyers who are willing to pay a premium on a home that more closely matches their personal ideals regarding energy use and the environment. Although some of these projects have had successful sales, it is speculative to assume that there are enough such buyers in the market to sustain an all-solar development the size of Rio del Oro, especially given the variety of residential unit types and densities that would be built as part of the project.

The commenter suggests that an all-solar home would increase the cost of each of the project's residential units by \$23,000.

As noted above in response to comment Kopper-R-32, installing photovoltaic rooftop energy systems is one of the measures that could be imposed under new Mitigation Measure 3.15-7b to achieve an overall reduction in residential energy consumption under the GreenPoint rating program or equivalent program. A mitigation measure requiring solar panels for each unit in Rio del Oro would be infeasible, however, because of the additional cost of \$23,000 per home. Premier Homes received financial contributions from SMUD in the amount of \$7,000 per home, which largely funded the cost of solar-panel systems for its developments, including Bay Drive Estates, and made the homes more affordable. The Premier Homes development incorporated solar systems ranging in size from 30–70 units, however. Because of the much larger size of the Rio del Oro project, it is speculative at best to assume that SMUD would provide the same financial benefit if the project were to incorporate solar systems on all 11,601 units that would vary in product type and density. Given the existing fee burden in Rancho Cordova, the existing housing market, and the availability of similar homes at similar or lower prices throughout the region, an additional cost of \$23,000 would put the houses in the project at such a competitive disadvantage that the project would not be considered feasible. Based on the increased cost, and for the reasons set forth in response to comment Kopper-R-34, requiring solar panels for each housing unit is infeasible at this time.

Kopper-R-36

The commenter suggests that the project applicant(s) purchase offsets to finance windmill production to mitigate GHGs.

The commenter does not provide any examples of programs that would allow the project developers to purchase such offsets or finance windmill production, nor is any evidence provided that such a measure would be feasible. The project applicant(s) have researched the availability of such programs. Based on this information, the City has determined that purchasing offsets would be infeasible because such purchases have not yet been established as a reliable way to effectively reduce GHGs. Several nongovernmental organizations (e.g., Carbonfund.org, TerraPass, Native Energy) provide several types of offsets, such as tree planting, development of renewable energy sources (such as wind power), and energy efficiency projects. For several reasons, however, these types of carbon offsets may not actually be effective in reducing GHG emissions. The consumer carbon-offset business is almost entirely unregulated, so money supposedly funding reforestation and alternative energy may not always be well spent. The City is simply not equipped to regulate these entities and assure that the money spent on offsets for Rio del Oro is being spent wisely and in the manner promised. An investigation by the *Financial Times* (Harvey and Fidler 2007) found the following problems prevalent in the carbon-offset industry:

- ▶ widespread instances of people and organizations buying worthless credits that do not yield any reductions in carbon emissions;
- ▶ industrial companies profiting from doing very little, or from gaining carbon credits on the basis of efficiency gains from which they have already benefited substantially;
- ▶ brokers providing services of questionable or no value;
- ▶ a shortage of verification, making it difficult for buyers to assess the true value of carbon credits; and
- ▶ companies and individuals being overcharged for the private purchase of European Union carbon permits that have plummeted in value because they do not result in emissions cuts.

A *Washington Post* article (“Cost of Saving the Climate Meets Real-World Hurdles”) dated August 17, 2007, called into question the reliability of these various carbon offsets offered by nongovernmental organizations. The article specifically discussed credits sold by Carbonfund.org that were discontinued because their GHG reduction benefits could not be verified (Fahrenthold and Mufson 2007). On January 25, 2008, the California Office of the Attorney General cited concerns about fraud in the carbon offset market and called on the Federal Trade Commission to address this concern (Office of the Attorney General 2008; see also Burg and Zonana 2008). Although these sorts of carbon offset programs may eventually prove to be valuable means of mitigating GHG emissions, the market at present is not sufficiently developed to assure that carbon offsets purchased from them are effective. As regulatory schemes develop, this current state of affairs may change, but no such schemes are in place in California at this time.

Relying on nongovernmental organizations to oversee mitigation of project-related impacts creates several legal problems for the City because no accountability mechanism exists to assure that carbon offset programs would be in place and effectively mitigating GHG emissions by the time the project is operational. Moreover, delegating authority for overseeing and implementing mitigation measures to a nongovernmental organization, particularly in cases where mitigation programs may take place in foreign countries, creates potential transnational legal and liability problems for the City and the project applicant(s). The State of California, in implementing AB 32, may be developing a state-regulated carbon offset program. When such a program is in place, carbon-offset credits may become a more feasible means of mitigating GHG emissions.

Moreover, the development of renewable energy does not necessarily assure that less fossil fuel-based energy will be consumed because renewable sources of electricity (e.g., solar and wind) often lack the reliability to be used as “base-load” sources of power for most utilities. Base-load sources of power are critical because they must be constantly available to supply the basic needs of the electrical grid at all times. Most utilities in the United States use wind and solar as “spinning capacity”—nonessential sources of power that can augment base-load sources when needed. In other words, this is standby power and often is not used. Hence, a tremendous amount of uncertainty exists about the effectiveness of citing carbon offsets investing in the development of solar and wind power as mitigation for GHG emissions. For these reasons, at this time, carbon-offset programs are not considered feasible mitigation measures for the Rio del Oro project’s GHG emissions. If ARB adopts a cap-and-trade strategy for reducing GHG emissions, the City will consider that program in accordance with Mitigation Measure 3.15-7c (see response to comment Kopper-R-32). Such a program may include a requirement for developers of local projects to purchase energy offsets.

Kopper-R-37

The comment suggests implementing mitigation requiring all light bulbs in all houses to be energy-saving compact fluorescents.

The commenter provides no basis to indicate why such a measure would be feasible, and as such, it is difficult to respond to the commenter’s suggestion. The project is required to comply with Title 24 of the California Code of Regulations regarding energy efficiency. See response to comment Kopper-R-34.

Title 24 currently requires the use of compact fluorescent light bulbs in many areas of residential dwellings:

- ▶ permanently installed lighting in kitchens (Section 150[k]2);

- ▶ permanently installed lighting in bathrooms, garages, laundry rooms, and utility rooms (Section 150[k]3); and
- ▶ permanently installed lighting that is any of the following (Section 150[k]4):
 - located other than in kitchens, bathrooms, garages, laundry rooms, and utility rooms (except closets less than 70 square feet);
 - controlled by a dimmer switch; or
 - controlled by an occupant sensor that complies with Section 119(d) that does not turn on automatically or have an “always on” option.

Thus, to meet the requirements of Title 24, all of the permanent fixtures in the units would be fitted with either compact fluorescent light bulbs or incandescent bulbs with energy-reducing mechanisms such as dimmers or occupant sensors. Also, the use of energy-saving compact fluorescent light bulbs could be a measure implemented under “Building Performance” in new Mitigation Measure 3.15-7b (see response to comment Kopper-R-32) to achieve an overall reduction in residential energy consumption beyond the requirements of Title 24.

Kopper-R-38

The commenter suggests that the City should be required to purchase only hybrid service vehicles for the Rio del Oro area.

The commenter does not provide any facts or evidence detailing the extent to which requiring the purchase of hybrid service vehicles would reduce the project’s impact on global climate change. Rather, the commenter notes, in general terms, that requiring the City to purchase only hybrid service vehicles for the Rio del Oro area would reduce emissions of both carbon dioxide and other air pollutants.

The City believes that requiring the purchase of hybrid service vehicles is not an appropriate measure for a specific plan proposal, and that such a requirement would best be suited for the City’s general plan update or some similar legislative process dealing with the City’s own practices, as opposed to the regulation of private-sector activities. The specific plan is a private development application in the sense that the property owners are private individuals and companies. City action on a private development proposal for a small portion of the city is not an appropriate vehicle for adopting policies requiring the City to change its own practices, which presumably would be applicable citywide.

More importantly, there is no overall practical and cost-effective guide, including BMPs, for local governments to reduce GHGs emitted by public fleets. As described in Section 3.15 of the 2006 DEIR/DEIS, air quality is managed at a local level through land-use development planning practices that are implemented by the City and through the permitted source controls that are implemented by SMAQMD. SMAQMD attains and maintains air quality conditions in Sacramento County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean-air strategy of SMAQMD involves preparing plans for the attainment of ambient air quality standards, adopting and enforcing rules and regulations concerning sources of air pollution, and issuing permits for stationary sources of air pollution. SMAQMD is also the agency responsible for enforcing many federal and state air quality requirements, and for establishing air quality

rules and regulations. To date, SMAQMD has not been required to implement or enforce any air quality requirements related to GHG emissions.

Moreover, although the City does not currently have a policy relating to the purchase of hybrid service vehicles, Policy AQ.4.2 in the Air Quality Element of the City General Plan, which calls for supporting vehicle improvements and the use of clean vehicles that reduce emissions and improve air quality, sets forth Action AQ.4.2.1 regarding the City's fleet vehicles: "Replace the City's fleet vehicles with new vehicles that utilize the lowest emission technology available, whenever economically feasible." Because it is not known to what extent requiring hybrid service vehicles in the project area would reduce the project's impact beyond what is required, the City believes that the measure proposed by the commenter is not feasible.

Kopper-R-39

The commenter suggests that the City should adopt a ban on the use of gas-powered lawn mowers and gardening equipment as part of the CC&Rs in the project area.

CC&Rs are covenants, conditions, and restrictions applied to homeowners who live in areas that have a homeowners' association. There is no indication at this time that any of the residential developments in Rio del Oro would have a homeowners' association. Therefore, any mitigation that would require the project applicant(s) to add a restriction in CC&Rs may not even be applicable to the project area.

Moreover, the commenter does not provide facts to indicate why banning gas-powered mowers and gardening equipment in CC&Rs would be a feasible and/or effective mitigation measure for the project's impact on global climate change. For the same reasons discussed in responses to comments Kopper-R-34 and Kopper-R-38, a measure in CC&Rs banning the use of gas-powered lawn mowers and gardening equipment is infeasible. In addition, many homeowners are expected to hire private landscape maintenance companies to mow their lawns. Because such companies use their own equipment, and because neither state law nor local ordinance prohibits the use of gasoline-powered equipment, any measure requiring only electric lawn mowers would be unenforceable. However, as part of the operational air quality plan implemented under Mitigation Measure 3.15-2, "Implement Measures to Control Long-Term Operational (Regional) Emissions of ROG, NO_x, and PM₁₀," a complimentary cordless electric lawn mower will be provided to purchasers of single-family residential homes. (See page 32 of Appendix L in the 2006 DEIR/DEIS.) Therefore, the City has determined that the suggested mitigation measure is unnecessary and infeasible. However, to further encourage the use of electrically powered equipment and to make such usage feasible in the future, a new mitigation measure, Mitigation Measure 3.15-2b, has been added to the 2006 DEIR/DEIS as shown in Chapter 5 of this FEIR/FEIS (the existing Mitigation Measure 3.15-2 has been renumbered as Mitigation Measure 3.15-2a). See response to comment Kopper-R-32.

Kopper-R-40

The comment states that the DEIR/DEIS is deficient because it did not comply with the requirements of Appendix F of the State CEQA Guidelines, which require that EIRs discuss the potential energy impacts of proposed projects, "with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy."

This comment is based on information contained in the 2006 DEIR/DEIS, not the 2008 RDEIR/SDEIS. As such, the comment is outside the scope of the documents identified in the NOA of the 2008 RDEIR/SDEIS for which comments were invited, and no response is required (State CEQA Guidelines, CCR Section 15088.5[f][2]); see response to comment Kopper-R-9. Although not required under CEQA, the USACE is required under

NEPA to assess and consider comments individually and collectively and has determined that substantive comments received prior to the release of the Final EIR/EIS will be considered under NEPA. In addition, in the interest of clarity, the City as CEQA lead agency, has chosen to respond to this comment. See also Master Response 3, “Comments Outside the CEQA Public Review Period,” in Chapter 3 of this FEIR/FEIS.

The commenter claims that the DEIR/DEIS does not comply with the requirements of Appendix F of the State CEQA Guidelines, and is therefore deficient. The City disagrees because the commenter’s assertion is incorrectly premised on the assumption that Appendix F contains mandatory, rather than advisory, directives. Furthermore, as discussed below, the 2008 RDEIR/SDEIS includes numerous air quality mitigation measures that require reduced energy consumption, and includes discussions of energy issues in connection with the extension of electrical and natural gas services to the project area.

The commenter’s assumption that Appendix F to the State CEQA Guidelines is “mandatory” rather than advisory is not a correct reading of the purpose of this provision when such language is viewed in light of other provisions of the State CEQA Guidelines. The starting point for understanding the extent to which CEQA requires lead agencies to address energy conservation is the language in Section 21100(b)(3) of the Public Resources Code, which provides that EIRs must contain:

[m]itigation measures proposed to minimize the significant effects on the environment, including, but not limited to, measures to reduce the wasteful, inefficient, and unnecessary consumption of energy.

Although it might be argued that this language may seem to support the commenter’s position, the State of California Resources Agency (The Resources Agency) does not agree, and has not agreed for many years. In promulgating former Section 15126 (now Section 15126.4) of the State CEQA Guidelines, The Resources Agency interpreted the above-quoted statutory reference by requiring mitigation measures addressing energy conservation only “where relevant.” The pertinent language provides as follows (italics added):

(a) Mitigation Measures in General.

(1) An EIR shall describe feasible measures which could minimize significant adverse impacts, including *where relevant*, inefficient and unnecessary consumption of energy.

* * *

(C) Energy conservation measures, as well as other appropriate mitigation measures, shall be discussed *when relevant*. Examples of energy conservation measures are provided in Appendix F.

This interpretation has the force of law behind it. The courts in the recent case of *Tracy First v. City of Tracy*, Case No. C059227 (August 27, 2009), ruled that the “when relevant” language means that energy impact discussions are not always required under CEQA. Moreover, not all elements of the State CEQA Guidelines are “mandatory,” however; some are either “advisory” or “permissive” (State CEQA Guidelines, Section 15005).

In light of these long-established legal principles that defer to The Resources Agency in its interpretations of CEQA statutes, the City has followed The Resources Agency's interpretation of Public Resources Code Section 21100 and case law. As this statute is interpreted in Section 15126.4 of the State CEQA Guidelines, energy conservation measures must be addressed in EIRs only "where relevant" in light of significant energy-related impacts. The City also notes, in response to the commenter's reference to Appendix F, that it must be interpreted and applied in light of the unambiguous language of Section 15126.4. The City believes Appendix F to be an advisory section only. The environmental factors required to be studied in an EIR are listed in the initial study checklist (contained in Appendix G of the State CEQA Guidelines), from which the subject of energy impacts was deleted in late 1998.

Moreover, energy impacts are already addressed by state regulations. After the 1976 promulgation of Appendix F (at the height of the 1970s "energy crisis") the State of California adopted comprehensive energy efficiency and energy conservation standards for buildings, found in Title 24 of the California Code of Regulations, which are applicable to all building construction. These standards, like many other California regulations, are much more advanced and stringent than those found in most other states, and generally obviate the need for local governments to formulate their own standards to apply to individual projects. Absent the statewide standards found in Title 24, a patchwork of conflicting standards might result, should local agencies engage in their own standard making in connection with CEQA review for individual projects.

Because Appendix F is only an appendix to the State CEQA Guidelines and Section 15126.4 is a duly enacted regulation, the language of Section 15126.4 should be understood to govern in the event of any conflict between its language and that of Appendix F. The language quoted by the commenter—that CEQA "requires" EIRs to address energy issues—therefore cannot be taken literally. Notably, moreover, even Appendix F itself includes language suggesting its advisory character, including the following (emphasis added):

[p]otentially significant energy implications of a project *should* be considered in an EIR. The following list of energy impact possibilities and potential conservation measures is designed *to assist* in the preparation of an EIR . . . [a] Project Description may include . . . Environmental Setting may include . . . Environmental impacts may include . . . Mitigation Measures may include . . . Alternatives should be compared in terms of overall energy consumption . . .

This interpretation of Appendix F as not containing mandatory requirements is consistent with the court's ruling in *Tracy First*. *Tracy First* held that neither the language of Appendix F nor any other CEQA law requires an EIR to discuss every possible energy impact or conservation measure listed in Appendix F.

Whether or not Appendix F is purely advisory or contains any mandatory elements, the City did consider the potential energy impacts of the project when preparing the 2006 DEIR/DEIS and 2008 RDEIR/SDEIS. The project impact is considered less than significant because the project would not result in "a wasteful, inefficient and unnecessary consumption of energy," which is the significance standard under CEQA (Public Resources Code, Section 21100[b][3]). In light of the beneficial effects of Title 24 compliance and the existence of various specific plan policies, the City does not perceive that the project, even without mitigation imposed by the City, would result in "the inefficient and unnecessary consumption of energy" (State CEQA Guidelines,

Section 15126.4[a]); nor would the project's use of energy be "wasteful," to use a word found in Section 21100 of the California Public Resources Code. Consistent with the court ruling in *Tracy First*, compliance with the state building standards (Title 24) can be used to determine that a project's impact on energy would be less than significant because the Title 24 standards promote energy efficiency and compliance and would not result in wasteful, inefficient, and unnecessary consumption of energy.

Moreover, the items that Appendix F of the State CEQA Guidelines suggests may be discussed in the EIR have been discussed in the 2006 DEIR/DEIS. With respect to the environmental impacts section of an EIR, the items that may be discussed include:

- ▶ the project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project's life cycle including construction, operation, maintenance, and/or removal, and if appropriate, the energy intensiveness of materials;
- ▶ the effects of the project on local and regional energy supplies and on requirements for additional capacity;
- ▶ the effects of the project on peak and base-period demands for electricity and other forms of energy;
- ▶ the degree to which the project complies with existing energy standards;
- ▶ the effects of the project on energy resources; and
- ▶ the project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

The analysis of the energy considerations discussed in Appendix F of the State CEQA Guidelines is contained in the 2006 DEIR/DEIS in Section 3.5, "Utilities and Service Systems." One of the thresholds of significance identified was whether the project would "result in inefficient, wasteful, and unnecessary consumption of energy (based on Appendix F of the State CEQA Guidelines)" (2006 DEIR/DEIS, page 3.5-7). The impacts of project-related increases in demand for electricity and natural gas are analyzed in Impacts 3.5-8 and 3.5-9, respectively, of the 2006 DEIR/DEIS. The 2006 DEIR/DEIS concludes that the impacts on energy would be less than significant. The discussions of these impacts specifically address the first five items listed above. Moreover, the air quality analysis models the operational emissions for the project, which includes vehicle emissions, and which can give an indication of fuel requirements (2006 DEIR/DEIS, page 3.15-43).

As noted on page 3.5-6 of the 2006 DEIR/DEIS, the project would also be required to comply with the most recent version of Title 24 of the California Code of Regulations regarding energy efficiency. See response to comment Kopper-R-34. In addition, the *Rio del Oro Air Quality and Emissions Reduction Plan* includes measures for energy efficiency (see Appendix L of the 2006 DEIR/DEIS). Under the air quality and emissions reduction plan, the following measures to promote building and transportation energy efficiency would be incorporated into the project:

- ▶ energy efficient heating in all project buildings;

- ▶ pedestrian and bicycle paths and bikeway connections to existing Class I or Class II bike lanes located within one-half mile of the project area;
- ▶ additional 20% required Class I and Class II bicycle facilities within each commercial development in the project area;
- ▶ mixed uses, with at least three of the following land uses on-site and/or within one-quarter mile: Residential Development, Retail Development, Personal Services, Open Space, and Office;
- ▶ preferential parking for carpools and vanpools; and
- ▶ essential bus stop improvements for bus service, providing headways of 15 minutes or less for stops within one-quarter mile.

Furthermore, under new Mitigation Measure 3.15-7b, which has been added to the 2006 DEIR/DEIS (see response to comment Kopper-R-32), the project applicant(s) are committed to participating in the GreenPoint Rated New Home program or equivalent program, through which recommended green building measures would be implemented to exceed the requirements of the California's Building and Energy Codes. As evidenced by responses to comments Kopper-R-41 through Kopper-R-51 below, it is the City's opinion that the subject of energy conservation has been dealt with appropriately and thoroughly in the 2006 DEIR/DEIS to the extent that the subject matter is relevant.

Kopper-R-41

The commenter states that the DEIR/DEIS should provide some discussion of energy requirements associated with project-related vehicle trips.

This comment is based on information contained in the 2006 DEIR/DEIS, not the 2008 RDEIR/SDEIS. As such, the comment is outside the scope of the documents identified in the NOA of the 2008 RDEIR/SDEIS for which comments were invited, and no response is required (State CEQA Guidelines, CCR Section 15088.5[f][2]); see response to comment Kopper-R-9. Although not required under CEQA, the USACE is required under NEPA to assess and consider comments individually and collectively and has determined that substantive comments received prior to the release of the Final EIR/EIS will be considered under NEPA. In addition, in the interest of clarity, the City as CEQA lead agency, has chosen to respond to this comment. See also Master Response 3, "Comments Outside the CEQA Public Review Period," in Chapter 3 of this FEIR/FEIS.

The commenter's claim is based on an incorrect assumption that Appendix F of the State CEQA Guidelines contains mandatory directives. As discussed above under response to comment Kopper-R-40, Appendix F contains directives that are merely advisory. Regardless, the 2006 DEIR/DEIS acknowledges that vehicle trips within the project area are anticipated to increase with implementation of the project. Moreover, the air quality analysis models the operational emissions for the project, which include vehicle emissions, and which can give an indication of fuel requirements (2006 DEIR/DEIS, page 3.15-43). Because the project would provide housing, commercial uses, and employment within a close proximity, new Rio del Oro residents and some existing Rancho Cordova residents would need to travel a shorter distance to work and shopping destinations than they did previously. Thus, it is likely that the Rio del Oro project would cause transportation-related energy use to decrease. As noted in the *Rio del Oro Development Standards and Design Guidelines*, the project would be designed to reduce energy consumption and vehicle trips. See response to comment Kopper-R-32 for a list of

measures in the development standards and design guidelines intended to promote this goal.

In addition, as described in response to comment Kopper-R-40, the *Rio del Oro Air Quality and Emissions Reduction Plan* includes measures for energy efficiency, including measures directed at efficient transportation alternatives. (See Appendix L of the 2006 DEIR/DEIS.)

Kopper-R-42

The commenter claims that the DEIR/DEIS does not include information about the supply of energy to the project site and does not include possible energy conservation provisions.

This comment is based on information contained in the 2006 DEIR/DEIS, not the 2008 RDEIR/SDEIS. As such, the comment is outside the scope of the documents identified in the NOA of the 2008 RDEIR/SDEIS for which comments were invited, and no response is required (State CEQA Guidelines, CCR Section 15088.5[f][2]); see response to comment Kopper-R-9. Although not required under CEQA, the USACE is required under NEPA to assess and consider comments individually and collectively and has determined that substantive comments received prior to the release of the Final EIR/EIS will be considered under NEPA. In addition, in the interest of clarity, the City as CEQA lead agency has chosen to respond to this comment. See also Master Response 3, “Comments Outside the CEQA Public Review Period,” in Chapter 3 of this FEIR/FEIS.

The commenter suggests that, as mitigation, the City require residential consumption of energy to be reduced by 10–20% below the requirements of Title 24. The commenter, however, has not identified the significant impact for which this mitigation measure is suggested. Title 24 represents state policy on building efficiency, and the project applicant(s) are already complying with all relevant existing SMAQMD regulations and Title 24. The project’s impact on energy would be less than significant because it would not result in a “wasteful, inefficient, or unnecessary consumption of energy.” Therefore, the City need not require the project applicant(s) to reduce energy consumption below the requirements of Title 24. Further, as discussed above in response to comment Kopper-R-40, compliance with Title 24 energy efficiency standards can support a finding of a less-than-significant energy impact.

The commenter claims that the DEIR/DEIS does not comply with the requirements of CEQA because there is no discussion of energy conservation, except for compliance with Title 24.

The analysis of the energy considerations discussed in Appendix F of the State CEQA Guidelines is contained in the 2006 DEIR/DEIS in Section 3.5, “Utilities and Service Systems.” The 2006 DEIR/DEIS, page 3.5-6, states that:

The project would be required to comply with recently adopted changes to Title 24 of the California Code of Regulations regarding energy efficiency, which became effective on October 1, 2005. These new energy efficiency standards were developed in response to the state’s energy crisis as well as AB 970 (Chapter 329, Statutes of 2000), the California Energy and Reliability Act of 2000. The goals of the recent changes to Title 24 are to improve energy efficiency of residential and nonresidential buildings, minimize impacts during peak energy-usage periods, and reduce impacts on overall state energy needs.

Note that the project would be required to comply with the Title 24 standards in effect when the application for the building permit is submitted.

One of the thresholds of significance identified in Section 3.5, “Utilities and Service Systems,” of the 2006 DEIR/DEIS (on page 3.5-7) was whether the project would “result in inefficient, wasteful, and unnecessary consumption of energy (based on Appendix F of the State CEQA Guidelines).” Title 24 represents state policy on building efficiency. Thus, by meeting Title 24 requirements, the project would comply with the relevant regulation for energy conservation, and therefore complies with CEQA requirements.

The commenter states that the EIR fails to discuss “the Project’s energy requirements and energy use efficiencies by amount and type of fuel used for each stage of the Project’s lifecycle, including construction, operation, maintenance and/or removal.”

As discussed above, the impacts of project-related increases in demand for electricity and natural gas are analyzed in Impacts 3.5-8 and 3.5-9, respectively, of the 2006 DEIR/DEIS. In addition, Section 3.15 of the 2006 DEIR/DEIS discusses emissions of pollutants from construction vehicles and calls for implementation of Mitigation Measure 3.15-1 to control those emissions. Not only would implementing the measures identified in Mitigation Measure 3.15-1 reduce construction-related emissions of air pollutants, but many of the measures would result in improved operations and the use of more efficient construction vehicles (e.g., use of construction vehicles with late-model engines, low-emission diesel products, alternative fuels, engine retrofit technology).

As discussed in responses to comments Kopper-R-40 and Kopper-R-41, above, both the *Rio del Oro Air Quality and Emissions Reduction Plan* and the *Rio del Oro Development Standards and Design Guidelines* include energy efficiency measures and measures that call for the project to be designed to reduce energy consumption and vehicle trips. Furthermore, under new Mitigation Measure 3.15-7b, which has been added to the 2006 DEIR/DEIS (see response to comment Kopper-R-32), the project applicant(s) are committed to participating in the GreenPoint Rated New Home program or equivalent program, through which recommended green building measures would be implemented to exceed the requirements of California’s Building and Energy Codes.

Kopper-R-43

The commenter claims that the DEIR/DEIS contains no discussion of cumulative energy demand in conjunction with other East Sacramento County projects.

This comment is based on information contained in the 2006 DEIR/DEIS, not the 2008 RDEIR/SDEIS. As such, in accordance with Section 15088(f)(2) of the State CEQA Guidelines, the comment is outside the scope of the documents identified in the NOA of the 2008 RDEIR/SDEIS for which comments were invited, and no response is required. See response to comment Kopper-R-9. Although not required under CEQA, the USACE is required under NEPA to assess and consider comments individually and collectively and has determined that substantive comments received prior to the release of the Final EIR/EIS will be considered under NEPA. In addition, in the interest of clarity, the City as CEQA lead agency has chosen to respond to this comment. See also Master Response 3, “Comments Outside the CEQA Public Review Period,” in Chapter 3 of this FEIR/FEIS.

Cumulative energy demand and supply is discussed in Section 3.5, “Utilities and Service Systems,” of the 2006 DEIR/DEIS. With respect to electricity demand, as noted in the 2006 DEIR/DEIS, SMUD has stated that it has adequate electricity supplies to support the project without affecting service to existing customers. SMUD also has long-term contracts with other generators to provide an additional 1,189 MW per day of electricity

for distribution. Throughout the year, SMUD buys and sells energy and capacity on a short-term basis to meet load requirements and reduce costs. As shown in Chapter 5 of this FEIR/FEIS, the second paragraph on page 3.5-5 of the 2006 DEIR/DEIS is hereby revised as follows:

SMUD also has long-term contracts with other generators to provide an additional 1,189 MW of electricity for distribution per day. Throughout the year, SMUD buys and sells energy and capacity on a short-term basis to meet load requirements and reduce costs. ~~SMUD is currently in the process of permitting~~ received approval from the California Energy Commission to build the first phase of the 500-MW Cosumnes Power Plant (CPP), which is part of SMUD's long-range plan to meet the growing power needs of Sacramento County. ~~The CPP would be a~~ A natural gas-fired electrical generating facility ~~and is anticipated to be constructed in two phases (Phase 1 started in early 2004), the CPP, which came online in 2006, provides enough power to meet the annual needs of 450,000 single-family homes (SMUD 2009). The CPP would provide SMUD with a total of 1,000 MW additional capacity. Phase 1 of the CPP (500 MW) is scheduled to begin serving SMUD costumers in 2006 (SMUD 2004, n.d.).~~

In addition, as shown in Chapter 5 of this FEIR/FEIS, the last three sentences in the first paragraph under "Electricity" on page 3.5-45 of the 2006 DEIR/DEIS are hereby revised as follows:

~~SMUD is currently in the process of permitting~~ received approval from the California Energy Commission to build the first phase of the CPP, which is part of SMUD's long-range plan to meet the growing power needs of Sacramento County. ~~The CPP is anticipated to be constructed in two phases (Phase 1 started in early 2004) and would provide SMUD with a total of 1,000 MW. Phase 1 of the CPP is scheduled to begin serving SMUD costumers, which came online in 2006 (SMUD 2004, n.d.),~~ provides enough power to meet the annual needs of 450,000 single-family homes (SMUD 2009).

Further, because future development would be required to comply with all existing City and SMUD requirements as well as applicable Building Code requirements, it is anticipated that electricity supplies would be available. Therefore, cumulative electricity impacts are expected to be less than significant. The project would not result in a cumulatively considerable incremental contribution to this cumulatively significant impact from the Rio del Oro project and related projects. (See page 3.5-45 of the 2006 DEIR/DEIS.)

With respect to demand for natural gas, as noted in the 2006 DEIR/DEIS, PG&E has stated that it has adequate natural-gas supplies to support the project without affecting service to existing customers. The total amount of natural gas supplied by PG&E in its northern and central California service area was estimated to be 887 million cubic feet per day in 2000. Additional energy is expected to be available in the future. In addition, because future development would be required to comply with all existing City and PG&E requirements as well as applicable Building Code requirements, it is anticipated that natural-gas supplies would be available. Therefore, cumulative impacts related to availability of natural gas are expected to be less than significant. The project would not result in a cumulatively considerable incremental contribution to this cumulatively significant impact from the Rio del Oro project and related projects. (See page 3.5-45 of the 2006 DEIR/DEIS.)

Kopper-R-44

The commenter claims that the DEIR/DEIS does not contain “potential measures to reduce wasteful and inefficient and unnecessary consumption of energy during construction, operation, maintenance and/or removal.”

This comment is based on information contained in the 2006 DEIR/DEIS, not the 2008 RDEIR/SDEIS. As such, the comment is outside the scope of the documents identified in the NOA of the 2008 RDEIR/SDEIS for which comments were invited, and no response is required (State CEQA Guidelines, CCR Section 15088.5[f][2]); see response to comment Kopper-R-9. Although not required under CEQA, the USACE is required under NEPA to assess and consider comments individually and collectively and has determined that substantive comments received prior to the release of the Final EIR/EIS will be considered under NEPA. In addition, in the interest of clarity, the City as CEQA lead agency has chosen to respond to this comment. See also Master Response 3, “Comments Outside the CEQA Public Review Period,” in Chapter 3 of this FEIR/FEIS.

The commenter’s claim is based on an incorrect assumption that Appendix F of the State CEQA Guidelines contains mandatory directives. As discussed above under response to comment Kopper-R-41, Appendix F contains directives that are merely advisory. Regardless, the 2006 DEIR/DEIS does include measures that would reduce the unnecessary consumption of energy during construction. Section 3.15 discusses emissions of pollutants from construction vehicles and calls for implementation of Mitigation Measure 3.15-1 to control those emissions. Not only would implementing the measures identified in Mitigation Measure 3.15-1 reduce construction-related emissions of air pollutants, but many of the measures would result in improved operations and the use of more efficient construction vehicles (e.g., use of construction vehicles with late-model engines, low-emission diesel products, alternative fuels, engine retrofit technology).

In addition, as noted on page 3.5-6 of the 2006 DEIR/DEIS, the project would be required to comply with Title 24 of the California Code of Regulations to reduce energy consumption during operation and maintenance. By meeting Title 24 requirements, the project would comply with the relevant regulation for energy conservation, and additional measures are not required. See responses to comments Kopper-R-34 and Kopper-R-42.

Furthermore, as discussed above, under responses to comments Kopper-R-41 and Kopper-R-42, both the *Rio del Oro Air Quality and Emissions Reduction Plan* and the *Rio del Oro Development Standards and Design Guidelines* include energy efficiency measures and measures that call for the project to be designed to reduce energy consumption and vehicle trips.

Kopper-R-45

The commenter claims that the DEIR/DEIS does not contain “[t]he potential of siting, orientation and design to minimize energy consumption, including transportation energy.”

This comment is based on information contained in the 2006 DEIR/DEIS, not the 2008 RDEIR/SDEIS. As such, the comment is outside the scope of the documents identified in the NOA of the 2008 RDEIR/SDEIS for which comments were invited, and no response is required (State CEQA Guidelines, CCR Section 15088.5[f][2]); see response to comment Kopper-R-9. Although not required under CEQA, the USACE is required under NEPA to assess and consider comments individually and collectively and has determined that substantive comments received prior to the release of the Final EIR/EIS will be considered under NEPA. In addition, in the interest of clarity, the City as CEQA lead

agency has chosen to respond to this comment. See also Master Response 3, “Comments Outside the CEQA Public Review Period,” in Chapter 3 of this FEIR/FEIS.

The commenter’s claim is based on an incorrect assumption that Appendix F of the State CEQA Guidelines contains mandatory directives. As discussed above under response to comment Kopper-R-41, Appendix F contains directives that are merely advisory. Regardless, the 2006 DEIR/DEIS does discuss how the project would be sited and designed to provide transportation efficiency. As noted in the *Rio del Oro Air Quality and Emissions Reduction Plan* (see Appendix L of the 2006 DEIR/DEIS), the project would incorporate several design and siting measures to improve transportation efficiency:

- ▶ mixed uses, with at least three of the following land uses on-site and/or within one-quarter mile of each other: Residential Development, Retail Development, Personal Services, Open Space, and Office.
- ▶ pedestrian and bicycle paths and bikeway connections to existing bike lanes to reduce dependence on vehicle travel;
- ▶ 20% more than the required amount of Class I and Class II bicycle facilities within the commercial development in the project area; and
- ▶ essential bus stop improvements for bus service, providing headways of 15 minutes or less for stops within one-quarter mile, to encourage use of public transportation.

The *Rio del Oro Development Standards and Design Guidelines* also prescribe siting, orientation, and design measures for the project to reduce energy consumption. Please see the measures listed in response to comment Kopper-R-32.

Furthermore, as discussed above, under responses to comments Kopper-R-41 and Kopper-R-42, the *Rio del Oro Air Quality and Emissions Reduction Plan* includes measures that call for the project to be designed to reduce energy consumption and vehicle trips.

Kopper-R-46

The commenter claims that the DEIR/DEIS does not discuss the potential for reducing peak energy demand.

This comment is based on information contained in the 2006 DEIR/DEIS, not the RDEIR/SDEIS. As such, the comment is outside the scope of the documents identified in the NOA of the 2008 RDEIR/SDEIS for which comments were invited, and no response is required (State CEQA Guidelines, CCR Section 15088.5[f][2]); see response to comment Kopper-R-9. Although not required under CEQA, the USACE is required under NEPA to assess and consider comments individually and collectively and has determined that substantive comments received prior to the release of the Final EIR/EIS will be considered under NEPA. In addition, in the interest of clarity, the City as CEQA lead agency has chosen to respond to this comment. See also Master Response 3, “Comments Outside the CEQA Public Review Period,” in Chapter 3 of this FEIR/FEIS.

The commenter’s claim is based on an incorrect assumption that Appendix F of the State CEQA Guidelines contains mandatory directives. As discussed above under response to comment Kopper-R-41, Appendix F contains directives that are merely advisory. Regardless, the 2006 DEIR/DEIS does discuss how the project would reduce peak energy demand. As noted on page 3.5-6 of the 2006 DEIR/DEIS, the project would be required

to comply with Title 24 of the California Code of Regulations regarding energy efficiency. One of the goals of Title 24 is to minimize impacts during peak energy usage periods. Furthermore, as discussed in responses to comments Kopper-R-41 and Kopper-R-42, above, the *Rio del Oro Air Quality and Emissions Reduction Plan* includes energy efficiency measures. No additional measures are required.

Kopper-R-47

The commenter claims that the DEIR/DEIS does not discuss “[a]lternative fuels (particularly renewable ones or energy systems).”

This comment is based on information on information contained in the 2006 DEIR/DEIS, not the 2008 RDEIR/SDEIS. As such, the comment is outside the scope of the documents identified in the NOA of the 2008 RDEIR/SDEIS for which comments were invited, and no response is required (State CEQA Guidelines, Section CCR 15088.5[f][2]); see response to comment Kopper-R-9. Although not required under CEQA, the USACE is required under NEPA to assess and consider comments individually and collectively and has determined that substantive comments received prior to the release of the Final EIR/EIS will be considered under NEPA. In addition, in the interest of clarity, the City as CEQA lead agency has chosen to respond to this comment. See also Master Response 3, “Comments Outside the CEQA Public Review Period,” in Chapter 3 of this FEIR/FEIS.

The commenter’s claim is based on an incorrect assumption that Appendix F of the State CEQA Guidelines contains mandatory directives. As discussed above under response to comment Kopper-R-41, Appendix F contains directives that are merely advisory. Regardless, the 2006 DEIR/DEIS does discuss the potential for using alternative fuels during construction. Section 3.15 discusses air quality emissions from construction vehicles and calls for implementation of Mitigation Measure 3.15-1, which includes low-emission diesel products and alternative fuels as acceptable options for reducing emissions. Although alternative fuels for passenger vehicles are not discussed, it would be beyond the scope of the DEIR/DEIS and the authority of the City to require such a measure. The City has no authority to impose clean or energy-efficient engines on motorists who might live in or work on the project site. ARB has exclusive authority over tailpipe emissions in California (California Health and Safety Code, Sections 39002 and 40000).

Kopper-R-48

The commenter claims that the DEIR/DEIS does not contain a mitigation measure for energy conservation that could result from recycling efforts.

This comment is based on information contained in the 2006 DEIR/DEIS, not the 2008 RDEIR/SDEIS. As such, the comment is outside the scope of the documents identified in the NOA of the 2008 RDEIR/SDEIS for which comments were invited, and no response is required (State CEQA Guidelines, CCR Section 15088.5[f][2]); see response to comment Kopper-R-9. Although not required under CEQA, the USACE is required under NEPA to assess and consider comments individually and collectively and has determined that substantive comments received prior to the release of the Final EIR/EIS will be considered under NEPA. In addition, in the interest of clarity, the City as CEQA lead agency has chosen to respond to this comment. See also Master Response 3, “Comments Outside the CEQA Public Review Period,” in Chapter 3 of this FEIR/FEIS.

The commenter’s claim is based on an incorrect assumption that Appendix F of the State CEQA Guidelines contains mandatory directives. As discussed above in response to comment Kopper-R-41, Appendix F contains directives that are merely advisory. Regardless, the 2006 DEIR/DEIS discusses how development under the Proposed Project Alternative would also comply with all federal, state, and local statutes and regulations

related to solid-waste reduction and recycling (2006 DEIR/DEIS, pages 3.5-4 and 3.5-26). The California Integrated Waste Management Act of 1989, also commonly known as AB 939, requires local agencies to implement source reduction, recycling, and composting. The countywide Integrated Waste Management Plan requires recycling programs that are expected to result in a 50% diversion away from landfills, thereby extending the life of landfills. Sacramento County had a diversion rate of 55% in 2000 (CIWMB 2005). The County continues to make substantial progress in diverting waste from landfills. Licensed solid-waste authorities hauled approximately 292,000 tons of waste materials in the county in 2000. In 2002, approximately 90,000 tons of waste were diverted from local landfills and the waste stream, which equates to a 31% reduction in landfill waste (City of Rancho Cordova 2005). Because the project would participate in the Sacramento County recycling program, and the County currently has a diversion rate that exceeds the Integrated Waste Management Plan's requirement of 50%, no mitigation measures are required.

Kopper-R-49

The commenter claims that the alternatives discussion in the DEIR/DEIS does not consider overall energy consumption in terms of reducing wasteful, inefficient, and unnecessary consumption of energy.

This comment is based on information contained in the 2006 DEIR/DEIS, not the RDEIR/SDEIS. As such, the comment is outside the scope of the documents identified in the NOA of the 2008 RDEIR/SDEIS for which comments were invited, and no response is required (State CEQA Guidelines, CCR Section 15088.5[f][2]); see response to comment Kopper-R-9. Although not required under CEQA, the USACE is required under NEPA to assess and consider comments individually and collectively and has determined that substantive comments received prior to the release of the Final EIR/EIS will be considered under NEPA. In addition, in the interest of clarity, the City as CEQA lead agency has chosen to respond to this comment. See also Master Response 3, "Comments Outside the CEQA Public Review Period," in Chapter 3 of this FEIR/FEIS.

The commenter's claim is based on an incorrect assumption that Appendix F of the State CEQA Guidelines contains mandatory directives. As discussed above under responses to comments Kopper-R-40 through Kopper-R-42, Appendix F contains directives that are merely advisory, and the project's energy impacts would be less than significant. Thus, there is no requirement that the alternatives discussion in the DEIR/DEIS specifically consider overall energy consumption or provide energy consumption calculations, especially because the project would have a less-than-significant impact. Regardless, throughout the 2006 DEIR/DEIS the impacts under the other alternatives, including impacts related to energy consumption, are discussed along with the impacts of the Proposed Project Alternative. For instance, the electricity and natural gas consumption of the alternatives is discussed in Section 3.5, "Utilities and Services Systems," of the 2006 DEIR/DEIS. The same energy efficiency and energy reduction measures applicable to the Proposed Project Alternative would also apply to the other alternatives.

Kopper-R-50

The commenter claims that the alternatives discussion in the DEIR/DEIS does not contain a discussion about avoiding the "wasteful and inefficient and unnecessary consumption of energy during construction, operation, maintenance and/or removal."

This comment is based on information contained in the 2006 DEIR/DEIS, not the RDEIR/SDEIS. As such, the comment is outside the scope of the documents identified in the NOA for which comments were invited, and no response is required (State CEQA Guidelines, CCR Section 15088.5[f][2]); see response to comment Kopper-R-9. Although not required under CEQA, the USACE is required under NEPA to assess and consider

comments individually and collectively and has determined that substantive comments received prior to the release of the Final EIR/EIS will be considered under NEPA. In addition, in the interest of clarity, the City as CEQA lead agency has chosen to respond to this comment. See also Master Response 3, “Comments Outside the CEQA Public Review Period,” in Chapter 3 of this FEIR/FEIS.

The commenter’s claim is based on an incorrect assumption that Appendix F of the State CEQA Guidelines contains mandatory directives. As discussed above in response to comment Kopper-R-41, Appendix F contains directives that are merely advisory. Thus, there is no requirement that the alternatives discussion in the DEIR/DEIS specifically consider avoiding consumption of energy. Regardless, throughout the 2006 DEIR/DEIS the impacts under the other alternatives, including impacts related to energy consumption, are discussed along with the impacts of the Proposed Project Alternative. The 2006 DEIR/DEIS discusses measures that would reduce the unnecessary consumption of energy during construction. Section 3.15 of the 2006 DEIR/DEIS discusses air quality emissions from construction vehicles and calls for implementation of Mitigation Measure 3.15-1. Not only would implementation of the measures identified in Mitigation Measure 3.15-1 reduce construction-related air emissions, but many of the measures would result in improved operations and the use of more efficient construction vehicles (e.g., use of construction vehicles with late-model engines, low-emission diesel products, alternative fuels, engine retrofit technology).

In addition, as noted on page 3.5-6 of the 2006 DEIR/DEIS, the project would be required to comply with Title 24 of the California Code of Regulations to reduce energy consumption during operation and maintenance. By meeting Title 24 requirements, the project would comply with the relevant regulation for energy conservation, and additional measures are not required. See responses to comments Kopper-R-34 and Kopper-R-42.

Furthermore, as discussed above in responses to comments Kopper-R-41 and Kopper-R-42, both the *Rio del Oro Air Quality and Emissions Reduction Plan* and the *Rio del Oro Development Standards and Design Guidelines* include energy efficiency measures and measures that call for the project to be designed to reduce energy consumption and vehicle trips. The same energy efficiency and energy reduction measures applicable to the Proposed Project Alternative would also apply to the other alternatives.

Kopper-R-51 *The commenter claims that the EIR’s alternatives discussion in the DEIR/DEIS does not consider “the short term gains versus long term impacts that could be compared by calculating the energy costs over the lifetime of the project.”*

See response to comment Kopper-R-49.

Kopper-R-52 *The comment states that the City provided misleading public notice regarding the comment period for the 2008 RDEIR/SDEIS.*

The commenter has misstated the order and dates during which public notice was provided. The City published two revised NOAs, one on June 3, 2008 (which extended the comment period to June 20, 2008), and one on June 24, 2008 (which extended the public comment period into July 2008). These extensions were provided at the request of SCWA, which requested additional time to review and comment on the 2008 RDEIR/SDEIS. Therefore, the City does not believe that it provided misleading notice regarding the public comment period.

Kopper-R-53

The comment provides a summary of the reviewer's qualifications and notes that comments are provided only on the traffic and transportation section of the 2006 DEIR/DEIS.

The comment is noted.

The City provides the following standard response to all comments related to the 2006 DEIR/DEIS traffic analysis that are contained in comments Kopper-R-53 through Kopper-R-60: The public comment period on the 2006 DEIR/DEIS (which contained the traffic analysis) closed on February 5, 2007, and the 2008 RDEIR/SDEIS only included two sections: water supply and biological resources. Because the comments on the 2006 DEIR/DEIS traffic analysis scenario are 17 months late, by law, the City is not required to consider them. See also Master Response 3, "Comments Outside the CEQA Public Review Period," in Chapter 3 of this FEIR/FEIS.

Kopper-R-54

The comment states that the traffic and transportation analysis in the 2006 DEIR/DEIS is based on outdated existing conditions data, and that therefore the 2008 RDEIR/SDEIS should have included a new traffic analysis.

As a matter of policy, the CEQA lead agency notes that CEQA requires that the baseline for the environmental analysis contained in an EIR is set on the date when the notice of preparation (NOP) is published. Accordingly, the existing conditions data used in the traffic and transportation analysis properly consisted of data available to the City and USACE in 2004.

New counts were collected in the study area in 2007 to identify how traffic volumes have changed relative to those used in the baseline conditions for the Rio del Oro project. Specifically, Fehr & Peers compared year 2004–2005 counts collected in the study area to counts collected in year 2007 to verify that the existing setting had not changed (see Appendix U attached to this FEIR/FEIS). Those results identified that, in general, counts in the study area were lower than those collected from 2004–2005. In fact, the only facility that had any substantial growth was Grant Line Road, between White Rock Road and Douglas Road. Upon further inspection of the count data, the growth on Grant Line Road (approximately 36% greater than previous counts, or approximately 2,000 average daily trips) was found to be attributable to temporary construction activities on Sunrise Boulevard in 2007.

Since 2007, traffic conditions in the study area have not changed substantially primarily because of economic conditions and the lack of new development occurring in Rancho Cordova. Therefore, when compared to current conditions (2009), the traffic levels in the study area have not increased substantially.

Therefore, given that the project baseline was set in 2004, and given that 2007 traffic counts indicated that the traffic levels in the study area had not increased and that there has not been a substantial change in traffic conditions in the study area since 2007, the existing conditions data used in the 2006 DEIR/DEIS are appropriate. In light of these conclusions, any changes in traffic conditions since 2007 would not result in "a new significant environmental impact" or "a substantial increase in the severity of an environmental impact" as a result of the project. Therefore, no additional analysis is required and the information in the analysis by Fehr & Peers does not require recirculation of the DEIR. (State CEQA Guidelines, Section 15088.5[a][1] and 15088.5[a][2].) See also Master Response 3, "Comments Outside the CEQA Public Review Period," in Chapter 3 of this FEIR/FEIS.

Kopper-R-55

The comment states that the study area is cut off too close to the project site, and therefore the analysis in the 2006 DEIR/DEIS does not fully account for all the project-related traffic impacts.

The project's traffic study area was defined during extensive coordination conducted with the City, Caltrans, the County, the City of Folsom, and the City of Sacramento. Before the study area was finalized, any facilities that these responsible agencies requested to be included in the study were included and are reflected in the impact analysis. Therefore, the study area used in the 2006 DEIR/DEIS for the traffic analysis is appropriate. The commenter provides no technical evidence that the project would result in traffic impacts outside of the study area.

Kopper-R-56

The comment states that the 2006 DEIR/DEIS does not provide the technical data and calculations prepared as part of the traffic and transportation analysis, and therefore the public could not determine the completeness and reasonableness of the analysis and conclusions.

The commenter identifies that the technical appendix to the 2006 DEIR/DEIS does not contain the technical calculations for the project, but then goes on to state that the public was thereby denied an opportunity to provide meaningful review and comment. The commenter is incorrect. Please note that the second sentence of Section 3.14, "Traffic and Transportation," of the 2006 DEIR/DEIS states:

Because of the large volume of raw data generated during traffic counts and modeling analyses conducted in support of the traffic analysis, it is not feasible to provide these data as an appendix to this draft environmental impact report/environmental impact statement (DEIR/EIS/DEIS). However, the data are available for review at the City of Rancho Cordova, 2729 Prospect Park Drive, Rancho Cordova, CA 95670.

Thus, the data and analysis referred to by the commenter were available for review by the public at the City offices.

The comment further indicates that national trip generation data from the Institute of Transportation Engineers (ITE) publication Trip Generation, 7th Edition, should have been used instead of local trip generation data.

The ITE publication *Trip Generation, 7th Edition*, referred to by the commenter specifically identifies that locally valid trip generation data may be used in place of national data, if appropriate. For this project, use of the SACMET travel demand forecasting model, which consists of locally valid trip generation information for the region, was used as described in the 2006 DEIR/DEIS. That model estimates trip generation, distribution, and trip assignment as it is specifically calibrated to trip-making characteristics for the City of Rancho Cordova and the project's study area. The City and USACE believe that using a locally valid travel demand forecasting model is appropriate for a project of this size.

The commenter also expresses concerns that the land use designations of "village commercial," "local town center," and "regional town center" are too vague for calculation of appropriate trip generation numbers, and that the 2006 DEIR/DEIS project description is deficient because it is too vague regarding these three types of land uses.

As a matter of policy, the City notes that these three types of land use designations were required to be included as part of the project by the City and are defined in the City General Plan. Therefore, the comment that these types of land uses are “too vague” is properly directed to the land use definitions in the City General Plan, not to the Rio del Oro 2006 DEIR/DEIS.

Land use assumptions for trip generation data that were input into the SACMET model were determined in direct consultation with the City and are consistent with the City General Plan.

Kopper-R-57

The comment states that the traffic analysis improperly relies on the “Circular 212” method of computation, which the commenter states is both obsolete and incapable of being used to disclose the project’s actual traffic impacts.

The traffic analysis for the Rio del Oro project was conducted using an adaptation of the Circular 212 methodology, which was identified and required by the County and initially adopted by the City as part of the County’s transportation impact analysis guidelines. See also Master Response 3, “Comments Outside the CEQA Public Review Period,” in Chapter 3 of this FEIR/FEIS.

It should be noted that the Circular 212 methodology used in the Rio del Oro analysis was adapted by the County to include measured capacities and thresholds that were specifically calibrated to Sacramento County conditions and driver expectations. Therefore, although the methodology does not use delay as its primary indicator, the calibration of capacity does roughly correlate to delays that drivers experience in the study area.

The comment further states that using a change in volume-to-capacity ratio of 0.05 is unreasonable to identify impacts on facilities that are operating at an unacceptable level.

This threshold used in the 2006 DEIR/DEIS is consistent with the thresholds identified by the County and subsequently adopted by the City in its general plan. Given that traffic volumes can typically fluctuate by 10% from day to day, the recognition that a significant impact would occur when the volume-to-capacity (v/c) ratio increases by 5% (or 0.05) is not unreasonable because it would typically represent less than half of the normal daily (weekday) fluctuation in traffic volumes. It also represents a threshold that would be noticeable to the average driver. Therefore, the City believes that the analysis performed in the 2006 DEIR/DEIS is appropriate. See also Master Response 3, “Comments Outside the CEQA Public Review Period,” in Chapter 3 of this FEIR/FEIS.

Moreover, as noted by the preparers of the EIR’s traffic analysis, Fehr & Peers, application of the 0.05 increase to the v/c ratio actually results in an increasing sensitivity to increased traffic volumes as the LOS degrades (i.e., as the LOS conditions worsen, the 0.05 v/c threshold is triggered by smaller percentage increases in traffic volume). To illustrate this point, assume that the capacity at an intersection is 100 vehicles. If the project adds five vehicles, the v/c ratio would increase by 0.05 and meet the threshold. As the congestion level increases (i.e. as the number of vehicles through the intersection approaches or exceeds the intersection capacity), however, the same five vehicles equate to descending percentages (6.2% [for a v/c ratio of 0.81 increasing to 0.86] to 4.1% [for a v/c ratio of 1.21 increasing to 1.26]) of allowable increases in traffic volume before an impact is triggered. Thus, the same 5% (addition of 0.05 to the v/c ratio) criterion is appropriate for the full range of conditions exceeding the basic level of service criteria, because the 0.05 threshold does not equate to a fixed percentage increase in traffic

triggering an impact at each LOS condition. Rather, when the 0.05 increase in v/c ratio is applied to the v/c ratio at any LOS condition, the percentage of additional traffic necessary to trigger an impact decreases as congestion levels increase and LOS conditions degrade.

Kopper-R-58

The commenter asserts that the traffic analysis is deficient because it assumes development that may not be realized and roadway networks that reflect future actions by SACOG, the City, Caltrans, and the County.

As stated in Section 3.14, “Traffic and Transportation,” of the 2006 DEIR/DEIS, the assumed development was identified by City staff and reflects the staff’s estimate of “reasonably foreseeable” development in the area; the developments have applications on file with the City, County, and nearby jurisdictions and are consistent with projections in the City General Plan. Roadway networks assumed in the assessment are based on roadways identified to be fully funded. However, the commenter is correct that if the full pace of development were not realized, funding for some of these facilities would not be fully realized. However, if the development pace were to slow, it necessarily follows that the traffic projections would be overstated because too much demand would be assumed, and therefore the roadway improvements would not necessarily be needed. It should be noted that the traffic analysis was based on the worst-case scenario for existing conditions and on buildout of the project and land areas within the Rancho Cordova city limits for cumulative conditions.

Furthermore, as stated on page 3.14-18 of the 2006 DEIR/DEIS, the City has completed an improvement phasing study that identified the timing for potential roadway improvements (consistent with the City’s CIP) to prioritize improvements to accommodate development south of U.S. 50 and east of Sunrise Boulevard. The phasing study correlated development thresholds for all development south of U.S. 50 and east of Sunrise Boulevard to roadway improvement packages consistent with the roadway system in the City’s CIP. This phasing study reflects a variety of long-range planning horizons and identifies which facilities are required to serve development in each development area south of U.S. 50 and east of Sunrise Boulevard. The City’s phasing study essentially documents improvements required if development is not fully realized, as requested by the commenter.

The commenter also states that the traffic analysis should include a long-term scenario where implications of a slowed pace of development demand in the general area is considered.

The baseline pursuant to CEQA is set on the date when the NOP is published. Accordingly, the existing conditions data used in the traffic and transportation analysis properly consisted of data available to the City and USACE in 2004. Therefore, the City and USACE do not believe that a new, additional traffic scenario is required.

Kopper-R-59

The commenter states that the project should be conditioned to make fair-share contributions toward roadway improvements that are identified as significant and unavoidable within the 2006 DEIR/DEIS—specifically, toward Folsom Boulevard, Sunrise Boulevard, and a potential additional American River crossing.

This comment is noted and will be taken into consideration by the City when conditions of approval are developed.

It should also be noted that the City has already worked with the County to downgrade Folsom Boulevard to a four-lane facility because the City wants to promote bicycle, pedestrian, and transit use through the corridor (rather than vehicle use). During its general plan EIR process, the City made clear that local facilities with more than six lanes are not optimal. This is a key policy foundation of the City General Plan to balance the need for effective traffic movement against smart growth and the desire to increase pedestrian and bicycle use of Rancho Cordova streets.

Kopper-R-60

The comment states that the traffic analysis in the 2006 DEIR/DEIS is not adequate and should be revised and recirculated for all the reasons previously listed.

For the reasons provided in responses to comments Kopper-R-54 through Kopper-R-59, the City believes that the traffic analysis contained in the 2006 DEIS/DEIS is appropriate no revisions are necessary. See also the City's standard response to all traffic comments provided at the start of the traffic responses. See also Master Response 3, "Comments Outside the CEQA Public Review Period," in Chapter 3 of this FEIR/FEIS.

Kopper-R-61

The comment states that alternative means of meeting water needs, such as rainwater catchment and greywater reuse, are not addressed in the 2008 RDEIR/SDEIS. The comment also states that the question of energy required to operate the water treatment and conveyance facilities is not addressed; expresses concern about site drainage and resulting flooding issues; and states that the project's carbon footprint has not been determined and mitigation has not been considered.

This comment is a summary of the comments addressed in responses to comments EPA-R-18 and Kopper-R-62 through Kopper-R-76.

The use of reclaimed water and GET-remediated water for nonpotable uses is discussed in Impact 3.5-8 of the 2008 RDEIR/SDEIS. The City adopted a Citywide Recycled Water Distribution Ordinance (Resolution No. 11-2006) on February 6, 2006, stating that new development should install a "purple pipe" recycled-water distribution. Because of the City's commitment to the use of recycled water, SCWA and SRCSD are investigating the feasibility of providing recycled-water service. In the long term, it is assumed that future supplies of nonpotable water would be provided by SRCSD or by GET-remediated water facilities, when a sufficient supply of nonpotable water is available to meet project demands. At present, facilities do not exist to deliver wastewater generated at the SRCSD wastewater treatment plant in Freeport to Rancho Cordova, where the Rio del Oro site is located.

SRCSD has prepared a *Water Recycling Opportunities Study* (SRCSD 2007) to study the feasibility of meeting its goal to increase water recycling throughout the Sacramento region on the scale of 30–40 mgd over the next 20 years. A planned expansion of the SRCSD water recycling facility plant could serve new areas of planned and expected growth and areas of public open space, including Zone 40 and the city of Rancho Cordova. The expanded water-recycling facility and new water-recycling service areas will be called Phase II of the SRCSD Water Recycling Program. Phase II construction will be timed with the need for the higher capacity and is currently expected to be in service within 5–10 years. Off-site facilities (i.e., infrastructure, storage tanks, and booster pumps), including those that would serve the Rio del Oro project, would be constructed by SRCSD through Phase II of the SRCSD Water Recycling Program. Before a large-scale water recycling program could be implemented, the program's elements would be required to undergo a comprehensive CEQA review. The *Water*

Recycling Opportunities Study, however, provides technical information to support a programmatic-level EIR.

Therefore, the Rio del Oro project includes a component to implement a recycled-water-use program, although such a program may not occur for many years. All major landscaping and open space areas within the project site would be irrigated via a recycled-water system that could be easily converted from a potable-water supply to a nonpotable-water supply at some future date. The draft *Rio del Oro Specific Plan Non-Potable Water Study* (Wood Rodgers 2007a) addressed the viability of providing supplies of nonpotable water to the project site, identified needs for on- and off-site infrastructure, and evaluated designs for consistency with the existing Draft Rio del Oro WSMP (Wood Rodgers 2007b). The nonpotable-water system would serve areas with land uses designated as park, streetscape, landscape corridor, greenbelt, school, commercial, public/quasi-public, private recreation, and business park.

CEQA does not require an agency to adopt every mitigation scheme or alternative brought to its attention or proposed in an EIR (*San Franciscans for Reasonable Growth v. City and County of San Francisco* [1989] 209 Cal.App.3d 1502, 1519). A public agency's duty to condition a project's approval on incorporation of mitigation measures, however, arises only when such measures are feasible and would "substantially lessen" a significant environmental effect (California Public Resources Code, Section 21002). Because the 2008 RDEIR/SDEIS concludes that impacts on water supply would be less than significant with implementation of identified mitigation, the commenter's suggested mitigation is not necessary to "substantially lessen" a significant environmental effect.

Moreover, aside from the unsupported assertion that rainwater catchment can collect about 30,000 gallons of water per year, the commenter provides no evidence that such systems would be feasible for the project. Although rainwater capture is used in many water-short places, there are several limits to its functionality. It would not be practical for the average Rio del Oro property owner to store enough rainwater to adequately treat landscaping. In Sacramento County, the rainwater catchment receptacle would be filled only during the rainy season (November–March). As a practical matter, an average belowground water cistern would be limited in size to about 8 feet in diameter and 14 feet in depth, and would hold about 5,000 gallons when full. This quantity would fall short of the water requirements for most residential landscaping in Sacramento County—about 1,500 gallons of water per week to irrigate a typical home lawn/landscape with one-half inch of water, especially during the summer months when no additional precipitation occurs to replenish the cistern. The cistern water would then need to be pumped out and delivered to its desired location, thus causing increased energy use. The cost of the systems would also be prohibitive, ranging from \$1,500 to \$3,000 for the tank and pump systems, equating to a total of \$17.4 to \$34.8 million for the 11,601 planned homes in the project area. Considered together, the lack of a significant environmental effect to substantially lessen the impact and the high cost of such systems make rainwater catchment systems unnecessary and infeasible for the project.

Kopper-R-62

The comment states that the project's water demand is anticipated to be met through agreements that are not yet in place, and are contingent on a series of such agreements related to water replacement obligations.

The commenter states that the primary water sources for the project are surface water diverted from the Sacramento River and remediated groundwater from the site and that these supplies are contingent on a series of agreements, the Zone 40 WSMP, the Zone 41 UWSP, and other stakeholders. The commenter is incorrect. The water sources for the

project are up to 1,500 afy of the Zone 40 WSMP conjunctive-use water supply and up to 8,900 afy of GET remediated water, not surface water from the Sacramento River. The project site is wholly within Zone 40 and partially within the 2030 Study Area evaluated in the Zone 40 WSMP. The 1,500-afy WSMP conjunctive-use water supply was determined based on a portion of the project area lying within the 2030 Study Area, and the up to 8,900 afy of GET remediated water is water identified under the 2010 Agreement that would be pumped, treated, and discharged by Aerojet to the American River.

The reliability of these supplies is not contingent on agreements or the water planning documents. As noted on page 3.5-66 of the 2008 RDEIR/SDEIS, the 1,500 afy is considered a reliable long-term water supply available to serve Zone 40 through 2030 according to the Zone 40 WSMP, Zone 41 UWMP, and the City's WSA. SCWA has existing secured surface-water supplies, groundwater, and recycled water. (See 2008 RDEIR/SDEIS, pages 3.5-9 through 3.5-12.) Although the Rio del Oro applicants may have to compete, on a first-come, first-served basis, for existing firm supplies, such as the Fazio and SMUD CVP contract supplies and groundwater pumped at levels no greater than the negotiated sustainable yield for the Central Basin as determined under the Water Forum Agreement, such supplies are considered reliable and, moreover, are necessary to serve only a small portion of the demand for the project (1,500 afy).

The Rio del Oro project would receive the greater part of its water (at least 7,391 afy) from the more than 15,000 afy of GET remediated water identified in the 2008 RDEIR/SDEIS as being available to serve the project. Although the 2003 agreements between SCWA and Aerojet and the Boeing Company have been terminated, SCWA and Aerojet have entered into a new 2010 Agreement under which Aerojet is transferring 8,900 afy of GET water to SCWA. Under the 2010 Agreement, SCWA acknowledges that the 8,900 afy will provide SCWA with sufficient available water to supply the Project, and shall further confirm this fact in writing to the City. The 8,900 afy along with other available Zone 40 water (including 1,500 afy under the SCWA conjunctive use program) is sufficient to meet the Project demand of 8,891 afy. The amount of water available under the 2010 agreement – 8,900 afy – is sufficient for build-out for the entire project, even if the 1,500 afy expected through the SCWA conjunctive-use supplies, for whatever reason, does not become available as expected. Thus, the water supply for the Project is reasonably likely under the standards set forth in *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal.4th 412. (See Master Response 1, "Adequacy of Long-Term Water Supply," in Chapter 3 of this FEIR/FEIS.)

Kopper-R-63

The comment refers to the project's water supply plan as "something of a shell game."

Aerojet is extracting, treating, and discharging to the American River up to 15,000 afy of GET remediated water identified in the 2008 RDEIR/SDEIS. As explained in the response to Kopper-R-28, this pumping is within sustainable levels. Under the 2003 agreements, which have now expired, SCWA was to be granted this GET remediated water discharged to the American River. In exchange for this water, among other matters, SCWA had agreed to provide replacement water to GSWC and Cal-Am through a replacement water supply project and to provide water for development of the Aerojet properties (including Rio del Oro) in excess of the replacement water supply obligations. Only after these demands were met would the residual GET remediated water be available to serve other water supply needs in the Zone 40 area. SCWA's obligation to provide replacement water to GSWC and Cal-Am under its agreements, however, was

dependent on the approval of the RWSP and the determination of ultimate need by those water entities. The RWSP DEIR was circulated for public review in October 2006. It evaluated actions necessary for SCWA to receive 35,000 afy of GET-Remediated water discharged to the American River and to provide 10,000 afy of the water directly or through exchange to the Folsom South Canal. Although the RWSP EIR was certified, the RWSP was not approved. Therefore, these agreements have been terminated.

At this juncture, Aerojet continues to discharge up to 15,000 afy of GET remediated water to the American River. SCWA and Aerojet have entered into a new 2010 Agreement under which Aerojet is transferring 8,900 afy of GET water to SCWA. Under the 2010 Agreement, SCWA acknowledges that the 8,900 afy will provide SCWA with sufficient available water to supply the Project, and shall further confirm this fact in writing to the City. The 8,900 afy along with other available Zone 40 water (including 1,500 afy under the SCWA conjunctive use program) is sufficient to meet the Project demand of 8,891 afy. The amount of water available under the 2010 agreement – 8,900 afy – is sufficient for build-out for the entire project, even if the 1,500 afy expected through the SCWA conjunctive-use supplies, for whatever reason, does not become available as expected. Furthermore, the commenter is incorrect in stating that water obtained in excess of replacement water supply need and Aerojet development need might be “considered a surface water take.” The GET remediated water is groundwater that is managed through surface water treatment facilities that are operated under EPA oversight.

Kopper-R-64

The comment states that the exact source of the 8,888 afy of water demand for the project is unclear, and that the pieces of infrastructure required to meet the demand (the Freeport Regional Water Project intake and the Vineyard Water Treatment Plants) will not be completed until 2011. The comment further states that the North Service Area Pipeline Project, which would convey the potable water to the site, has not yet been approved, with its earliest completion date estimated at 2014.

The 1,500-afy portion of the long-term water supply for the project would be provided through SCWA conjunctive-use supplies, which include surface water entitlements and groundwater. The greater part of the project’s water (at least 7,391 afy) would come from the more than 15,000 afy of GET remediated water that Aerojet discharges to the American River. SCWA and Aerojet have entered into a new 2010 Agreement under which Aerojet is transferring 8,900 afy of GET water to SCWA. Under the 2010 Agreement, SCWA acknowledges that the 8,900 afy will provide SCWA with sufficient available water to supply the Project, and shall further confirm this fact in writing to the City. The 8,900 afy along with other available Zone 40 water (including 1,500 afy under the SCWA conjunctive use program) is sufficient to meet the total Project demand of 8,891 afy. The amount of water available under the 2010 agreement – 8,900 afy – is sufficient for build-out for the entire project, even if the 1,500 afy expected through the SCWA conjunctive-use supplies, for whatever reason, does not become available as expected.

As discussed on page 3.5-34 of the 2008 RDEIR/SDEIS, however, these permanent long-term water supplies cannot be delivered to the project site until the SCWA facilities (Vineyard Surface Water Treatment Plant, the Freeport Regional Water Project, and the North Service Area Pipeline Project) have been constructed and are online. Thus, although the long-term water supplies are reasonably likely to be available, a small degree of uncertainty regarding timing arises because of the need to build infrastructure to deliver water to the project site. Therefore, although no mitigation measures or

identification of alternative water supplies are required under *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal.4th 412, the 2008 RDEIR/SDEIS does identify and analyze alternate sources of long-term water and contingencies (including curtailment of development) for the project if the water supply does not become available. (See 2008 RDEIR/SDEIS, pages 3.5-64 to 3.5-66 and Impact 3.5-7 [analyzing the impacts of curtailment if the long-term water supply cannot be delivered].) Moreover, Mitigation Measure 3.5-3 requires proof of infrastructure water delivery systems before project-specific approvals. (See 2008 RDEIR/SDEIS, page 3.5-50.)

To help ensure water supply for the project before the long-term water supply is available, the 2008 RDEIR/SDEIS also identified and analyzed initial water supplies to supply the first phase of the project. (See Impact 3.5-1 and Impact 3.5-2, 2008 RDEIR/SDEIS pages 3.5-34 to 3.5-41.) Water from GSWC is a reasonably likely supply for Phase 1A of the project, and Option A and Option B were identified as potential supplies for the remaining Phase 1 development (as identified in the 2008 RDEIR/SDEIS). The 2008 RDEIR/SDEIS, however, also identifies potential alternative sources of initial water supply, briefly describes the potential impacts of such alternative sources and analyzes temporary curtailment of development, which could be implemented if the initial water supplies do not become available. (See 2008 RDEIR/SDEIS, pages 3.5-39 and 3.5-40 and Impact 3.5-2 [analyzing the impacts of curtailment of development after Phase 1A for the remaining development of Phase 1 until the long-term water supply is available].)

Kopper-R-65

The comment states that the remaining water demand is proposed to be met by remediated (GET) water via the Eastern County Replacement Water Supply Project. The agreement between the County, SCWA, and Aerojet for this GET remediated water is dependent on the certification by SCWA of the FEIR for that project by a specific date. The commenter states that this water supply is therefore not guaranteed because that date has now passed without certification of the FEIR.

The commenter is incorrect. The remaining 7,391 afy of water needed to supply the project is not proposed to be met through the RWSP. As discussed on page 3.5-7 of the 2008 RDEIR/SDEIS, the project would not rely on the RWSP for water supply. The RWSP was a project under which SCWA would receive essentially all of Aerojet's GET remediated water discharged to the American River and would have had certain obligations to provide water to the Folsom South Canal. It also would have had certain pipeline obligations to implement its project. Approval and implementation of the RWSP by SCWA as described in the RWSP DEIR are not required for GET remediated water to be available to SCWA to meet Rio del Oro's demand, in addition to existing and other projected future demands to be met by SCWA. Although the RWSP DEIR describes the 15,000 afy of GET remediated water that is available for diversion at the Freeport Regional Water Project, this water is already being discharged to the American River and is separate from any additional GET remediated water that would be developed under the RWSP. Therefore, the status of the RWSP does not affect the 15,000 afy of GET which is already being discharged to the American River. Moreover, SCWA and Aerojet have entered into a new 2010 Agreement under which Aerojet is transferring 8,900 afy of GET water to SCWA. Under the 2010 Agreement, SCWA acknowledges that the 8,900 afy will provide SCWA with sufficient available water to supply the Project, and shall further confirm this fact in writing to the City. The 8,900 afy along with other available Zone 40 water (including 1,500 afy under the SCWA conjunctive use program) is sufficient to meet the Project demand of 8,891 afy. The amount of water available under the 2010

agreement – 8,900 afy – is sufficient for build-out for the entire project, even if the 1,500 afy expected through the SCWA conjunctive-use supplies, for whatever reason, does not become available as expected. Thus, it is a reasonably likely supply under the standards set forth in *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal.4th 412. (See Master Response 1, “Adequacy of Long-Term Water Supply,” in Chapter 3 of this FEIR/FEIS.)

Kopper-R-66

The comment states that future increased water demands from global warming already under way require further evaluation.

The 2008 RDEIR/SDEIS (pages 3.5-25 to 3.5-30) provides a detailed discussion of linkages between global climate change and water supply. Based on several recent studies, the 2008 RDEIR/SDEIS concludes that, overall, climate change is expected to have a greater effect on Southern California and on agricultural users than on urban users in the Central Valley, which includes both the Sacramento and San Joaquin Valleys. For year-2020 conditions, where optimization is allowed (i.e., use of the California Value Integrated Network, a statewide economic-engineering optimization model of water supply management), scarcity is essentially zero in the Sacramento Valley for both urban and agricultural users. Based on the conclusions of current literature regarding California’s ability to adapt to global climate change, it is reasonably expected that, over time, the state’s water system will be modified to be able to handle the projected climate changes, even under dry and/or warm climate scenarios. (See page 3.5-29 of the 2008 RDEIR/SDEIS.)

Furthermore, no CEQA or NEPA thresholds of significance have been formally adopted for measuring the effects of global climate change on a project. The primary purpose of a climate change impact evaluation is to assess whether reasonably foreseeable consequences of global climate change would result in substantial adverse environmental effects on the project, based on both the certainty or uncertainty of modeling results and the physical nature of the effect. As described in detail in Impact 3.5-9 of the 2008 RDEIR/SDEIS, the project’s water demands would be met through the conjunctive use of surface-water, groundwater, and remediated-water supplies identified in the Zone 40 WSMP. Zone 40 is located within the Central Basin. Preliminary studies indicate that the Sacramento Valley would experience only a small decline in groundwater levels as a result of global climate change, which would likely have little to no effect on available groundwater supplies that can be pumped from the Central Basin (Vicuña 2006).

The project’s water supplies are unlikely to be affected by global climate change. As indicated by preliminary results from DWR (2006), impacts of climate change on water supply would be reflected largely in reduced exports south of the Sacramento–San Joaquin Delta (Delta), while existing Delta water-quality requirements would continue to be satisfied. It is therefore reasonable to consider that global climate change may have relatively little effect on the project’s water supply because the project’s supplies of surface water are based on existing water rights and contract entitlements for in-basin use above the Delta. Groundwater may be used to supplement surface-water supplies to meet the needs of all Zone 40 water users, including the project, during multiple dry years; however, such future groundwater pumping is not likely to exceed sustainable yield.

California could potentially experience an increased number of single dry, multiple dry, and critically dry years as a result of global climate change. A great deal of uncertainty exists, however, about impacts of climate change on future water availability in California, specifically whether and where effects will occur and what the timing and severity of any such potential effect will be. This uncertainty makes it impossible to draw

a meaningful conclusion about significance on water supply impacts on this specific project without substantial speculation. However, through its extensive planning efforts in implementing the Water Forum Agreement, preparing the Zone 40 WSMP and 2005 Zone 41 UWMP, and participating in the Central Sacramento County Groundwater Forum, SCWA has demonstrated that it has planned for both sufficient water supplies and the infrastructure necessary to meet Zone 40's buildout water demand through the year 2030. (See pages 3.5-85 to 3.5-88 of the 2008 RDEIR/SDEIS.)

Kopper-R-67

The commenter requests a statement explaining that the water supply is not yet secure for this project, along with an explanation and listing of the variety of agreements and construction requirements needed to provide water to the project. The commenter also requests a set of tables to explain the project's water supply issue and provides sample tables.

As explained in Master Response 1, "Adequacy of Long-Term Water Supply," in Chapter 3 of this FEIR/FEIS, the long-term water supply for this project is reasonably likely. (See *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* [2007] 40 Cal.4th 412, 432.) As noted on page 3.5-66 of the 2008 RDEIR/SDEIS, the 1,500 afy of water is considered a reliable long-term water supply, available to serve Zone 40 through 2030 according to the Zone 40 WSMP, Zone 41 UWMP, and the City's WSA. The 1,500 afy is a portion of SCWA's existing secured conjunctive-use water supply, which consists of surface-water supplies, groundwater, and recycled water. Although the Rio del Oro applicants may have to compete, on a first-come, first-served basis, for existing firm supplies, such as the Fazio and SMUD CVP contract supplies and groundwater pumped at levels no greater than the negotiated sustainable yield for the Central Basin as determined under the Water Forum Agreement, such supplies are considered reliable and, moreover, are necessary to serve only a small portion of the demand for the project (1,500 afy).

The Rio del Oro project would receive the greater part of its water (a least 7,391 afy) from the more than 15,000 afy of GET remediated water identified in the 2008 RDEIR/SDEIS as being available to serve the project. (In fact, the current design flow for GET remediated water discharging to the American River exceeds 20,000 afy.) Aerojet is already extracting and treating water underlying its property and discharging it to the American River at quantities sufficient to meet the project's demand. SCWA and Aerojet have entered into a new 2010 Agreement under which Aerojet is transferring 8,900 afy of GET water to SCWA. Under the 2010 Agreement, SCWA acknowledges that the 8,900 afy will provide SCWA with sufficient available water to supply the Project, and shall further confirm this fact in writing to the City. The 8,900 afy along with other available Zone 40 water (including 1,500 afy under the SCWA conjunctive use program) is sufficient to meet the Project demand of 8,891 afy. The amount of water available under the 2010 agreement – 8,900 afy – is sufficient for build-out for the entire project, even if the 1,500 afy expected through the SCWA conjunctive-use supplies, for whatever reason, does not become available as expected. Thus, the water supply for the Project is reasonably likely under the standards set forth in *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal.4th 412. (See Master Response 1, "Adequacy of Long-Term Water Supply," in Chapter 3 of this FEIR/FEIS.)

Although the actual water supplies are reasonably likely, because of the contingencies identified in Table 4-4, these long-term water supplies would not be available to serve the project until 2010 at the earliest. The infrastructure components necessary to deliver the

long-term water supply to the project area are described under Impact 3.5-6 of the 2008 RDEIR/SDEIS, and a summary is provided in Table 4-5.

Table 4-4 Water Supply Contingencies						
Long-Term Water Supply	Capacity (afy) (Max. Annual Average)	Project Demand (afy) (Max. Annual Average)	Existing Supply?	Availability Date	Percentage of Demand Met	Contingencies
SCWA Zone 40 conjunctive-use water ¹	78,648 (up to 1,500 afy available for Project)	8,891	Yes	Water is currently available but cannot be delivered until 2010 to 2014 (at the latest)	17%	Construction of water conveyance facilities identified in Zone 40 WSMP (i.e., Vineyard Surface Water Treatment Plant, the Freeport Regional Water Project, and the North Service Area Pipeline Project)
GET-remediated water	15,000 (up to 8,900 afy available for Project)		Yes	Water is currently available but cannot be delivered until 2010 to 2014 (at the latest)	83%	Construction of water conveyance facilities identified in Zone 40 WSMP (i.e., Vineyard Surface Water Treatment Plant, the Freeport Regional Water Project, and the North Service Area Pipeline Project); potential agreement with SCWA for diversion at Freeport Regional Water Project
<p>Notes:</p> <p>afy = acre-feet per year; Freeport Regional Water Project = Freeport Regional Water Project; SCWA = Sacramento County Water Agency; WSMP = Water Supply Master Plan.</p> <p>¹ Assumes normal water year and takes into consideration only those water supplies "reasonably likely" to be available to SCWA to supply Zone 40 demand other than Aerojet lands and replacement water demands (i.e., the Fazio and SMUD Central Valley Project contract supplies and groundwater pumped at levels no greater than the negotiated sustainable yield for the Central Basin as determined under the Water Forum Agreement).</p> <p>Source: Data compiled by AECOM in 2009</p>						

**Table 4-5
Infrastructure Components for Long-Term Water Supply**

Long-Term Water Supply Delivery Infrastructure Component	Status	Completion Date	Contingencies?	Reference Pages to 2008 RDEIR/SDEIS
Vineyard Surface Water Treatment Plant	In construction phase	2011	None	3.5-4 and 3.5-68
Freeport Regional Water Project	In construction phase	2010	None	3.5-3, 3.5-71, and 3.5-72
North Service Area Pipeline Project	In planning and design phase	2014	Funding and Project-level CEQA review	3.5-4 and 3.5-68

Source: Data compiled by AECOM in 2009

Thus, although the long-term water supplies are reasonably likely to be available, a small degree of uncertainty with respect to timing issues arises related to implementation of long-term water supply infrastructure to deliver water, not the actual availability of the water sources. Therefore, although no mitigation measures or identification of alternative water supplies is required under *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal.4th 412, the 2008 RDEIR/SDEIS identifies and analyzes alternative sources of long-term water and contingencies (including curtailment of development) for the project in case an adequate water supply does not become available. (See 2008 RDEIR/SDEIS, pages 3.5-64 to 3.5-66, and Impact 3.5-7 [analyzing the impacts of curtailment if long-term water supply cannot be delivered].)

To help ensure water supply for the project before the long-term water supply is available, the 2008 RDEIR/SDEIS also identified and analyzed initial water supplies (outlined in Table 4-6) to supply the first phase of the project. (See Impact 3.5-1 and Impact 3.5-2, 2008 RDEIR/SDEIS pages 3.5-34 to 3.5-41.) Furthermore, implementation of Mitigation Measure 3.5-3 would ensure that the infrastructure would be in place before recordation of any final small-lot subdivision map or before the City approves any similar subsequent (i.e., outside of Tier 1—see Chapter 2 of this FEIR/FEIS) project-specific, discretionary approval or entitlement required for nonresidential uses. (See 2008 RDEIR/SDEIS, pages 3.5-50 and 3.5-51.)

**Table 4-6
Initial Water Supplies (Phase 1A)**

Water Supply for Phase 1A	Capacity (afy) (Max. Annual Average)	Project Demand (afy) (Max. Annual Average)	Existing Supply?	Availability Date	Percentage of Demand Met	Contingencies
GSWC excess capacity	968	902.6	Yes	Water is available but cannot be delivered until contingencies are satisfied.	100	Agreements with GSWC and SCWA; construction of initial water supply conveyance facilities

Notes:

afy = acre-feet per year; GSWC = Golden State Water Company; SCWA = Sacramento County Water Agency.

Source: Data compiled by AECOM in 2009

Based on the information presented in Table 4-6, the 2008 RDEIR/SDEIS concluded that because GSWC has indicated that it would have a water supply adequate to serve Phase 1A and that this water would be available until the SCWA facilities (Vineyard Surface Water Treatment Plant, the Freeport Regional Water Project, and the North Service Area Pipeline Project) have been constructed and are online, this water supply is considered a reliable source of potable water. Therefore, there is a reasonable likelihood that initial water supplies needed to serve Phase 1A would be available, and this impact is considered less than significant, and no mitigation measures are required. In addition, under *Vineyard*, the identification and analysis of alternative sources of water and contingencies (including curtailment of development) for the project in case a sufficient water supply does not become available are not legally required (2008 RDEIR/SDEIS, page 3.5-35).

Because the water supply identified in Table 4-6 would be sufficient to serve Phase 1A only, the 2008 RDEIR/SDEIS identified other potential sources of initial water supply (outlined in Table 4-7) that could serve the remaining development of Phase 1. (See Impact 3.5-2, 2008 RDEIR/SDEIS pages 3.5-36 to 3.5-39.)

Table 4-7 Initial Water Supplies (Phases 1B–1D)						
Initial Water Supply Remaining for Phase 1 Development	Capacity (afy) (Max. Annual Average)	Project Demand (afy) (Max. Annual Average)	Existing Supply?	Availability Date	Percentage of Demand Met	Contingencies
Option A	1,500	4,783.2 ¹	No	Unknown	31	Agreements with GSWC and SCWA; DPH approval; construction of initial water supply conveyance facilities
Option B	6,300	4,783.2 ¹	No	Unknown	100	Agreements with GSWC and SCWA; DPH approval; construction of initial water supply conveyance facilities

Notes:
 afy = acre-feet per year; DPH = California Department of Public Health; GSWC = Golden State Water Company; SCWA = Sacramento County Water Agency.
 Phasing is based on description of project phasing as identified in the 2008 RDEIR/SEIS.
¹ The total demand has been revised from what was presented in Table 3.5-10. Initially, the system loss was inadvertently subtracted from the total, rather than added to the total to determine the total demand.
 Source: Data compiled by AECOM in 2009

Based on the information presented in Table 4-7, the 2008 RDEIR/SDEIS concluded that there is not reasonable certainty that one or both options would be available to serve the demands of the remaining Phase 1 development (2008 RDEIR/SDEIS, page 3.5-39).

Provision of the initial water supplies also would require construction of water conveyance facilities. The 2008 RDEIR/SDEIS identifies and analyzes the impacts of constructing such facilities. Furthermore, implementing Mitigation Measure 3.5-3 would ensure that the infrastructure would be in place before recordation of any final small-lot subdivision map or before the City approves any similar project-specific, discretionary approval or entitlement required for nonresidential uses. (See 2008 RDEIR/SDEIS, pages 3.5-50 and 3.5-51.)

The infrastructure components necessary to deliver the initial water supply to the project site are described in Impact 3.5-3, and a summary is presented in Table 4-8.

Table 4-8 Infrastructure Components for Initial Water Supplies				
Initial Water Supply Delivery Infrastructure Component	Status	Completion Date	Contingencies?	Reference Pages to 2008 RDEIR/SDEIS
16-inch water transmission main; inline booster pump	Subject to CEQA/NEPA compliance and analyzed in 2008 RDEIR/SDEIS	Before recordation of any final small-lot subdivision map or before the City approves any similar project-specific, discretionary approval or entitlement required for nonresidential uses	Project approval	3.5-42 to 3.5-51
Source: Data compiled by AECOM in 2009				

Furthermore, although not legally required because a reasonably likely long-term supply has been identified, the 2008 RDEIR/SDEIS also identifies potential alternative sources of initial water supply and analyzes temporary curtailment of development, which could be implemented if the initial water supplies do not become available. (See 2008 RDEIR/SDEIS, pages 3.5-39 and 3.5-40 and Impact 3.5-2 [analyzing the impacts of curtailment of development after Phase 1A for the remaining development of Phase 1 until the long-term water supply is available].)

Kopper-R-68

The comment states that the 2008 RDEIR/SDEIS does not support the claim that wet-year reliance on surface water from the Sacramento and American Rivers will allow groundwater supplies to be replenished to meet dry-weather demands without affecting surface water during dry years. The comment further states that missing from the argument is that even wet-weather surface water supplies for the project are met with groundwater pumping via the GET [East Sacramento County] Replacement Water Supply Project.

The commenter is correct that, even in wet years, SCWA would rely in part on groundwater pumping to provide an adequate water supply to the project. Consistent with the conjunctive-use concept, however, pumping would be decreased substantially to take advantage of surface-water supplies, thus allowing groundwater levels to increase, because the amount of water replenishing the groundwater basin would exceed the amount of water pumped.

The reliability of groundwater supplies, including increased pumping of GET remediated water, was analyzed in the Zone 40 WSMP. The Zone 40 WSMP evaluated a suite of options for the SCWA conjunctive-use water supply system, including surface-water entitlements, groundwater, and GET remediated water from the Aerojet and MDC/Boeing properties. Within the suite of groundwater and surface-water supplies contemplated in the Zone 40 WSMP EIR, SCWA evaluated the impacts of groundwater extraction that would occur as a result of remediation activities by Aerojet and MDC/Boeing. When the Zone 40 WSMP EIR was being prepared (2003–2004), groundwater extraction volumes at the Aerojet and MDC/Boeing properties totaled an estimated 18,664 afy. Based on existing agreements at that time, the Zone 40 WSMP EIR

projected that groundwater extraction rates would increase to an estimated 35,890 afy by 2030 (see Table 6.3 of Appendix F of the Zone 40 WSMP EIR), which is greater than the 35,000 afy anticipated under the RWSP.

These projected future groundwater-extraction volumes for the Aerojet and MDC/Boeing properties were evaluated to determine whether these volumes, when combined with other groundwater pumping in Zone 40 and in the Central Basin, would exceed the negotiated sustainable yield of the Central Basin (i.e., 273,000 afy), as determined through the Water Forum Agreement stakeholder process. (See Alternatives 2a, 2b, 2c, and 3 in Appendix F of the Zone 40 WSMP EIR.) The Zone 40 WSMP EIR concluded that under various scenarios contemplating different levels of reuse of the estimated 35,890 afy of remediated groundwater, groundwater extraction volumes within the Central Basin would be slightly less than the negotiated sustainable yield, and groundwater levels would be higher than the minimum levels determined by the Water Forum Agreement. When the Zone 40 WSMP EIR was prepared, remaining groundwater-pumping capacity within the Central Basin varied from 20,000 afy to 40,000 afy.

Based on this analysis, groundwater in Zone 40 was determined to be a reliable source of water, taking into account the expansion of the GET facilities under the RWSP, even during dry years. As discussed above, however, the RWSP was not approved; thus, there is no indication that the additional GET remediated water will be pumped. Moreover, the 7,391 afy of water required for the project is not proposed to be obtained through the RWSP. The 7,391 afy of water would come from the more than 15,000 afy of GET remediated water that Aerojet is already extracting, treating, and discharging to the American River. Aerojet has been discharging and will continue to discharge in excess of 15,000 afy with or without the approval of the RWSP.

Kopper-R-69

The comment states that one of the sources of interim (gap) water supply for the project, Aerojet replacement water, will not be available until 2011 or 2014, and that the resulting 5,000 afy should not be considered available until a later date and not included in the calculation of water available for the project. The comment further notes that water conveyance systems must be approved and constructed before the GSWC water can be considered a secure interim water supply.

GSWC has indicated that it currently has water supply adequate to serve the initial phases of development, up to 600 dwelling units. County Improvement Standards (2006) assume 1 gpm per dwelling unit; therefore, water for 600 dwelling units would be equal to a maximum water supply of 600 gpm (968 afy). This water is existing water that exceeds GSWC current projected maximum-day system demand. As shown in Table 3.5-9, the total demand for the 861 units in Phase 1A is 902.6 afy. Therefore, the 968-afy water supply available from GSWC is more than sufficient to satisfy the demand for Phase 1A. Aerojet recently entered into agreements for the drilling of an additional well (Well 22C) and for the design, construction, and operation and maintenance of perchlorate treatment on three wells that were assumed to have been shut down in the supplies listed under Table 3.5-6 (2008 RDEIR/SDEIS page 3.5-21). The combined capacity of the new well and the three wells that will have treatment is in excess of 12,000 afy.

The initial water supply conveyance systems are identified and analyzed as a part of the project. (See Impact 3.5-3, 2008 RDEIR/SDEIS, pages 3.5-42 to 3.5-51.) Furthermore, implementing Mitigation Measure 3.5-3 would ensure that the infrastructure would be in place before recordation of any final small-lot subdivision map or before the City approves any similar subsequent (i.e., outside of Tier 1—see Chapter 2 of this

FEIR/FEIS) project-specific, discretionary approval or entitlement required for nonresidential uses. (See 2008 RDEIR/SDEIS, pages 3.5-50 and 3.5-51.)

Kopper-R-70

The comment states that graywater reuse should be considered in all development projects in this area to reduce potable water requirements for residential and commercial applications.

See response to comment Kopper-R-61.

Kopper-R-71

The comment states that on-site wastewater treatment should be considered to reduce energy and infrastructure requirements.

This comment is based on information contained in the 2006 DEIR/DEIS, not the 2008 RDEIR/SDEIS. As such, the comment is outside the scope of the documents identified in the notice of availability of the 2008 RDEIR/SDEIS for which comments were invited, and no response is required (State CEQA Guidelines, CCR Section 15088.5[f][2]; see response to comment Kopper-R-9. Although not required under CEQA, the USACE is required under NEPA to assess and consider comments individually and collectively and has determined that substantive comments received prior to the release of the Final EIR/EIS will be considered under NEPA. In addition, in the interest of clarity, the City as CEQA lead agency has chosen to respond to this comment. See also Master Response 3, “Comments Outside the CEQA Public Review Period,” in Chapter 3 of this FEIR/FEIS.

As described in Impact 3.5-6, “Increased Demand for Wastewater Treatment Plant Facilities,” in Section 3.5, “Utilities and Service Systems,” of the 2006 DEIR/DEIS, collected wastewater flows from the project site would ultimately be transported to the SRWTP for treatment and disposal, and the SRWTP is expected to have sufficient capacity to accommodate project flows through 2020. Furthermore, implementing Mitigation Measure 3.5-6 would ensure that sufficient wastewater treatment capacity would be available to all project phases, because capacity would be documented before approval of improvement plans. This mitigation measure would reduce significant impacts under the Proposed Project, High Density, Impact Minimization, and No Federal Action Alternatives associated with the increased demand for wastewater treatment plant facilities to a less-than-significant level. Because no otherwise significant and unavoidable impact is identified, no additional mitigation is required (State CEQA Guidelines, CCR Section 15088[c]). Therefore, an on-site wastewater treatment facility is not required for mitigation.

Moreover, constructing the new wastewater treatment facility would itself result in construction-related and operational impacts that would not otherwise occur under the project as proposed. Requiring construction of an on-site wastewater treatment facility would not reduce the project’s impacts relating to on-site infrastructure requirements. Infrastructure would have to be constructed to convey wastewater to the on-site wastewater treatment facility, which would result in impacts from construction. Furthermore, eliminating the off-site wastewater conveyance facilities from the project would not reduce or eliminate the impacts related to these off-site facilities. The trunk and interceptor sewer lines that would be required to serve the project to convey wastewater to the SRWTP would also be necessary to serve regional development, and would be required regardless of whether the project was developed. Thus, the impacts relating to the construction of these facilities would occur without development of the project.

Furthermore, the commenter's suggestion is contrary to the trend in wastewater treatment policy in California, which generally favors a regional approach to wastewater management and allows multiple jurisdictions to benefit from investments made in large treatment facilities with complex technology.

Kopper-R-72

The commenter suggests that on-site rainwater catchment is a reliable water source to meet residential irrigation demands.

See response to comment Kopper-R-61.

Kopper-R-73

The comment states that the DEIR/DEIS does not discuss how increased energy demands would be met for the project in general, nor specifically for water supply.

This comment is based on information contained in the 2006 DEIR/DEIS, not the 2008 RDEIR/SDEIS. This comment is outside the scope of the document identified in the notice of availability for the 2008 RDEIR/SDEIS for which comments were invited, and no response is required (State CEQA Guidelines, CCR Section 15088.5[f][2]); see response to comment Kopper-R-9. Although not required under CEQA, the USACE is required under NEPA to assess and consider comments individually and collectively and has determined that substantive comments received prior to the release of the Final EIR/EIS will be considered under NEPA. In addition, in the interest of clarity, the City as CEQA lead agency has chosen to respond to this comment. See also Master Response 3, "Comments Outside the CEQA Public Review Period," in Chapter 3 of this FEIR/FEIS.

The discussion of the project's energy demands and how the demands would be met is contained in the 2006 DEIR/DEIS in Chapter 3.5, "Utilities and Service Systems." The impacts of increased demand for electricity and natural gas are analyzed in Impact 3.5-8 and Impact 3.5-9, respectively (2006 DEIR/DEIS, pages 3.5-28 to 3.5-30). As noted in Impact 3.5-8, buildout of the project would increase electrical demand in Rancho Cordova by approximately 76 megavolt amperes. However, SMUD generates approximately 1,197 MW of electricity per day. Thus the increase in demand for electricity created by the project would not be substantial in relation to the existing electricity consumption in SMUD's service area. Moreover, SMUD has stated that it has electrical supplies adequate to support the project without adversely affecting service to current users (2006 DEIR/DEIS, page 3.5-28).

As noted in Impact 3.5-9, implementation of the project would increase the demand for natural gas in Rancho Cordova. PG&E has indicated that it has adequate natural-gas supplies to support the project without adversely affecting service to current users. The energy demands created by implementing the project are not considered substantial in relation to the total amount of energy supplied by PG&E in its northern and central California service area (estimated in 2000 to be 887 million cubic feet per day of natural gas) and available energy expected in the future (2006 DEIR/DEIS, page 3.5-29).

Moreover, the energy requirements related to pumping and delivering the Zone 40 WSMP water and the GET remediated water do not need to be analyzed as part of the Rio del Oro project. The Zone 40 WSMP already assumes the delivery of the 1,500 afy to the project area as part of the water supply analyzed in the Zone 40 WSMP EIR. Therefore, for delivery of the 1,500 afy of water to the project area, there would be no energy demands beyond those assumed in the Zone 40 WSMP EIR and the EIRs for the water treatment and conveyance facilities identified in the Zone 40 WSMP (i.e., the Vineyard Surface Water Treatment Plant, Freeport Regional Water Project, North Service Area Pipeline Project).

With respect to the GET remediated water, Aerojet already pumps, treats, and discharges more than 15,000 afy. The quantity of GET water anticipated to be required for the project, up to 8,891 afy and even less with the up to 1,500 afy of Zone 40 WSMP water, would be satisfied by this water (from the up to 8,900 afy of GET remediated water transferred under the 2010 Agreement); thus, no energy demands for pumping GET remediated water would result for the project beyond those already included in the baseline conditions. Furthermore, as is the case with the Zone 40 water, the energy demands related to treating and conveying this water are already accounted for in the EIRs for the water treatment and conveyance facilities identified in the Zone 40 WSMP (i.e., the Vineyard Surface Water Treatment Plant, Freeport Regional Water Project, North Service Area Pipeline Project).

As noted on page 3.5-6 of the 2006 DEIR/DEIS, the project will also be required to comply with adopted changes to Title 24 of the California Code of Regulations regarding energy efficiency, which became effective in 2008. These new energy efficiency standards were developed in response to the state's energy crisis, as well as AB 970 (Chapter 329, Statutes of 2000), the California Energy and Reliability Act of 2000. The goals of the recent changes to Title 24 are to improve the energy efficiency of residential and nonresidential buildings, minimize impacts during peak energy-use periods, and reduce impacts on overall state energy needs. The City does not agree with the commenter that "[t]he Sacramento area experiences recurring brownouts during summer peak periods." Such brownouts are comparatively rare.

Kopper-R-74

The comment states that mitigation measures must be utilized in the DEIR/DEIS for impacts related to flooding conditions and water quality.

Impact 3.4-2 (2006 DEIR/DEIS pages 3.4-21 through 3.4-23), which relates to flooding, contains a thorough and well-reasoned analysis as to why this project-related impact would be less than significant. Therefore, no mitigation measure is required. Impacts 3.4-3 and 3.4-5 (2006 DEIR/DEIS pages 3.4-23 through 3.4-29) relating to water quality already contain mitigation measures that would reduce both impacts to a less-than-significant level.

Kopper-R-75

The comment states that the DEIR/DEIS does not specify in its mitigation measures what appropriate drainage plans or "measures" or BMPs must be submitted, and that these plans are not yet developed and may require environmental review.

Contrary to the commenter's statement, Mitigation Measure 3.4-3 contains, as performance standards, a list of the specific contents of the SWPPP and a list of potential BMPs (see 2006 DEIR/DEIS, pages 3.4-24 and 3.4-25). Furthermore, the long-term water quality impacts of project development have been studied as part of the Rio del Oro Master Drainage Study and were evaluated as part of the 2006 DEIR/DEIS (see pages 3.4-26 through 3.4-29), and the DEIR/DEIS recommends implementation of Measure 3.4-1. This mitigation measure is intended to recognize that although the draft master drainage study discusses the means to control site drainage and erosion and is therefore appropriate for evaluation at the CEQA/NEPA level, implementation of the final master drainage study requires ultimate review and approval by the City planning department. Therefore, the City does not believe that any additional environmental review is required or that details on exact BMPs are appropriate for project requests at the specific plan level of detail.

Kopper-R-76

The comment states that the 2008 RDEIR/SDEIS lacks a discussion of the project's carbon footprint or offset options.

This comment is based on information contained in the 2006 DEIR/DEIS, not the 2008 RDEIR/SDEIS. As such, the comment is outside the scope of the document identified in the notice of availability of the 2008 RDEIR/SDEIS for which comments were invited, and no response is required (State CEQA Guidelines, Section 15088.5[f][2]; see response to comment Kopper-R-9. Although not required under CEQA, the USACE is required under NEPA to assess and consider comments individually and collectively and has determined that substantive comments received prior to the release of the Final EIR/EIS will be considered under NEPA. In addition, in the interest of clarity, the City as CEQA lead agency has chosen to respond to this comment.

The discussion of global climate change in the 2006 DEIR/DEIS discusses the project's "carbon footprint" by quantifying the project's estimated GHG emissions (see page 3.15-37 of the 2006 DEIR/DEIS). The project would incorporate several mitigation measures into the project design to reduce and offset GHG emissions during both project construction and operation. (See Mitigation Measures 3.15-1 and 3.15-2 in the 2006 DEIR/DEIS, and see response to comment Kopper-R-32, above.) The City believes that these mitigation measures proposed by the 2006 DEIR/DEIS, as revised and augmented in this Final EIR/EIS would be feasible and effective, although no feasible mitigation measures are available to reduce the impact to a less-than-significant level.

Kopper-R-77

The comment provides a summary of the experience of Shawn Smallwood, wildlife biologist.

The comment is noted.

Kopper-R-78

The comment describes the date, time, and conditions of three site visits conducted by K. Shawn Smallwood to observe and record wildlife from the project site perimeter, and states that 39 wildlife species were detected. A table of species observed or detected audibly during those site visits is provided.

The comment is noted.

Kopper-R-79

The commenter states that his assessment of the 2008 RDEIR/SDEIS considers omissions, errors, logical fallacies, and bias, which bears on the sufficiency of the 2008 RDEIR/SDEIS.

The City and USACE disagree with the commenter's assertions and believe that the 2008 RDEIR/SDEIS contains a fully complete and appropriate analysis of impacts to biological resources related to the project. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-80

The comment states that EDAW biologists visited the site on December 13, 2004, and January 12 and 13, 2005; that insufficient detail is provided about surveys for wildlife and other biological resources; and that many more wildlife surveys should be conducted.

As stated on page 3.10-1 of the 2008 RDEIR/SDEIS, surveys conducted on December 13, 2004, and January 12 and 13, 2005, were reconnaissance-level surveys conducted to characterize habitat on the project site and aid in developing the Impact Minimization Alternative, not protocol-level surveys to determine presence or absence of special-status or other wildlife species. An additional site reconnaissance survey was conducted by EDAW biologists on January 24, 2005. Numerous protocol-level biological resources surveys were conducted on the project site by various biological consultants before

preparation of the 2006 DEIR/DEIS; the results of these surveys were used to inform the analysis in the 2008 RDEIR/SDEIS. Protocol-level survey reports used during preparation of the biological resources analysis are listed on page 3.10-1 of the 2008 RDEIR/SDEIS and include a wetland delineation, elderberry surveys, vernal pool branchiopod surveys, and special-status plant surveys. The 2008 RDEIR/SDEIS is not required to include the detailed methodology of biological resources surveys used as sources of information for the impact analyses. Full references for background information sources are provided in Chapter 5, "References," of the 2006 DEIR/DEIS and the 2008 RDEIR/RDEIS. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Results of surveys conducted on December 13, 2004, and January 12 and 13, 2005, were documented in the habitat assessment report (EDAW 2005) provided as Appendix E of the 2006 DEIR/DEIS. This report includes a full description of the methods used for the habitat assessment and the following list of objectives for the assessment:

- ▶ Assess baseline conditions for upland habitats at the Rio del Oro project site.
- ▶ Prepare a habitat map encompassing the entire project site.
- ▶ Supplement biological resources data collected during wetland delineation and focused special-status species surveys at the site.
- ▶ Serve as the basis for determining potential impacts on biological resources resulting from construction of the proposed Rio del Oro development project.
- ▶ Determine habitat value provided by different plant communities present on-site.
- ▶ Support CEQA and NEPA analyses of the project.
- ▶ Document common and sensitive biological communities on-site in sufficient detail to allow for a determination of habitat quality throughout the site to aid in the development of a "low density alternative" to the project for CEQA and NEPA analyses.
- ▶ Provide background information for use in the 404(b)(1) alternatives analysis prepared for the project as part of an application for an individual permit from USACE under Section 404 of the CWA.

Kopper-R-81

The comment states that visiting the site only three times in December and January would guarantee missing species that would (1) occur during other portions of the year, (2) emerge from burrows at other times of the year, and (3) require establishment of special survey techniques to detect the species. The comment includes examples of species that would be missed during December/January surveys: western spadefoot, Swainson's hawk, and flowering plants.

As referenced on page 3.10-12 of the 2008 RDEIR/SDEIS, protocol-level special-status plant surveys of the project site were conducted in 2003 and 2006, during appropriate periods. These surveys were conducted in accordance with USFWS's *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants*, as well as the guidelines contained in CNPS's *Inventory of Rare and Endangered Plants of California, Sixth Edition*.

As referenced on pages 3.10-12 and 3.10-13 of the 2008 RDEIR/SDEIS, protocol-level surveys for listed vernal pool branchiopods were conducted in 2000 and 2001. These surveys were conducted in accordance with USFWS's *Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for Listed Vernal Pool Branchiopods*. Presence of vernal pool branchiopods has been assumed for all vernal pools not included in sampling during these surveys.

As referenced on page 3.10-13 of the 2008 RDEIR/SDEIS, protocol-level elderberry surveys were conducted in 2000. These surveys were conducted in accordance with USFWS's *Conservation Guidelines for the Valley Elderberry Longhorn Beetle (VELB Conservation Guidelines)*. In 2007, ECORP conducted a subsample survey of the project site to determine whether conditions for VELB (e.g., number of living elderberry shrubs, sizes of elderberry stems, number of exit holes observed) differed substantially from the results of the 2000 surveys. The number of elderberry shrubs and number of stems in 2007 did not differ substantially from the numbers in 2000, but the stem sizes were substantially larger in 2007. Compensatory mitigation ratios were determined based on size data collected in 2007.

Surveys have not been conducted for western spadefoot; however, the impact analysis and mitigation measure assume that the species is present and would be affected by project implementation because suitable habitat is abundant and numerous occurrences have been documented in the vicinity. If presence/absence surveys had been conducted but not found western spadefoot, these survey results would not necessarily have provided conclusive evidence that the species does not inhabit the site or would not be present at the time of construction. If western spadefoot had been found during surveys, the discovery would not have changed the impact conclusion or mitigation measures because the species is assumed to be present. Therefore, conducting protocol-level surveys for western spadefoot would not have added valuable information to the impact analysis or changed the significance conclusion or mitigation. See the impact discussion for western spadefoot on page 3.10-57 of the 2008 RDEIR/SDEIS.

Protocol-level surveys for Swainson's hawk, burrowing owl, or other raptors have not been conducted on the project site; however, the impact analysis and mitigation assume that Swainson's hawk and other raptors nest and forage on the project site and would be affected by project implementation. (See the impact discussion on pages 3.10-56 and 3.10-57 of the 2008 RDEIR/SDEIS.) If protocol-level surveys for Swainson's hawk had been conducted before preparation of the 2008 RDEIR/SDEIS but not found the species on the project site, these survey results would not have been evidence that the species would not occupy the site by the time of project implementation. The survey results also would not have changed the requirement to conduct preconstruction surveys for Swainson's hawk and other raptors and identify active nests on and within 0.5 mile of the project site and active burrows on the project site, as specified in Mitigation Measure 3.10-4c on page 3.10-63 of the 2008 RDEIR/SDEIS. Further, the survey results would not have eliminated the need to mitigate loss of Swainson's hawk foraging habitat, as outlined in Mitigation Measure 3.10-4d on page 3.10-64 of the 2008 RDEIR/SDEIS. Therefore, conducting protocol-level surveys for Swainson's hawk or other raptors before preparation of the 2008 RDEIR/SDEIS would not have contributed valuable information to the impact analysis or changed the significance conclusion or required mitigation measures. Moreover, the project site is outside the known range of California tiger salamander according to USFWS's *Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the California Tiger Salamander; and Special*

Rule. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-82

The comment states that visiting the site only during daylight hours would lead to missing species that are active mostly at night, such as California tiger salamander, short-eared owl, and bat species. The comment states that conducting nighttime surveys following appropriate methods would have enabled biologists to detect many more wildlife species.

See responses to comments Kopper-R-80 and Kopper-R-81. It is assumed that the comment refers again to the reconnaissance-level surveys conducted by EDAW to characterize habitat, although it cites methods in an unidentified ECORP attachment. Short-eared owl and other raptors are considered likely to occur on the project site and potential impacts on raptors are addressed in Mitigation Measure 3.10-4c on page 3.10-63 of the 2008 RDEIR/SDEIS. The project site is outside the known range of California tiger salamander according to USFWS’s *Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the California Tiger Salamander; and Special Rule*. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-83

The comment states that biologists searched for resources within 100 feet of 35 sites, which represents 0.019% of the project site. It states that the 2008 RDEIR/SDEIS does not explain how or why the sites were chosen and that the survey methods were grossly deficient, and suggests that the 2008 RDEIR/SDEIS be revised to include results of many more surveys over a larger percentage of the project site.

See responses to comments Kopper-R-80 and Kopper-R-81. As listed on page 3.10-1 of the 2008 RDEIR/SDEIS, many more biological resources surveys were conducted on the project site; the results of these surveys were used as information sources in developing the Biological Resources section of the 2008 RDEIR/SDEIS. The habitat assessment to which the comment refers supplements existing information provided by the protocol-level surveys, providing a more detailed characterization of habitat types than is normally provided in the setting section of an EIR/EIS. Background surveys—special-status plant surveys, a wetland delineation, elderberry surveys, tree surveys, and vernal pool branchiopod surveys—were completed for the entire project site. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

The habitat assessment was used to create a habitat map and provide information about the composition and structural diversity of plant species, as well as general observations such as incidental wildlife sightings or signs, disturbances, and soil texture. Data including dominant plant species in each stratum, total cover in each stratum, tree and shrub height, and diameter at breast height were recorded at the 35 sampling points. These sampling points were chosen randomly, but included at least one sampling point within each habitat type as identified from aerial photographs (except wetlands, because these were mapped and described in the wetland delineation). The vegetation data described above were collected within a 100-foot radius of each randomly selected sampling point. This information was requested by USACE in support of the NEPA analysis and the methodology was reviewed and approved by USACE.

This habitat assessment is not a standard assessment required for establishing baseline data for CEQA documentation and actually provides a greater level of detail about the habitat types and vegetation communities on the project site than is normally found in CEQA documents. Generally, habitat types and vegetation communities are mapped and

described qualitatively without these additional data, and that lesser level of analysis is considered adequate for CEQA documents.

Habitat types were determined based on *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986) and cross-referenced to *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer 2005). However, vegetation communities observed at the project site did not necessarily fit into the classification categories established by Holland or habitat type categories established by Mayer and Laudenslayer. Therefore, names and descriptions of habitat types were adapted specifically for this project.

Kopper-R-84

The comment states that the 2008 RDEIR/SDEIS does not indicate that any methods for detecting wildlife species were used other than visual scans within a 100-foot radius of 35 sampling points, and that this methodology was unsuitable for detecting many plant and wildlife species. The comment also states that transects should be walked for long distances over the project site to detect species.

See responses to comments Kopper-R-80 and Kopper-R-81. Surveys were conducted according to established protocols for special-status plant species, listed vernal pool branchiopods, and VELB. (See page 3.10-1 of the 2008 RDEIR/SDEIS.) The wetland delineation was conducted according to USACE's established methods. Both the special-status plant surveys and wetland delineation provide floristic inventories of the project site. An inventory of all trees on the site was also conducted.

The comment erroneously suggests that the habitat assessment was meant as a presence/absence survey for wildlife species. As indicated on pages 3.10-8, 3.10-12, and 3.10-13 of the 2008 RDEIR/SDEIS, the list of known or potentially occurring special-status plant and wildlife species is based on previously prepared biological resources reports for the project site; occurrence records for the site documented in the California Natural Diversity Database (CNDDDB) and CNPS inventory; and habitat types present based on the habitat assessment. It is not based on species observed during the reconnaissance-level survey or habitat assessment. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Biologists walked for long distances over the project site to get from one sample point to the next. The sample points were spread over the entire project site, with the exception of the proposed wetland preserve area (because this area had already been thoroughly characterized during other biological resources inventories, including the wetland delineation). Wildlife species observed during the habitat assessment are recorded on the data sheets provided in Appendix E of the 2006 DEIR/DEIS.

Kopper-R-85

The comment states that just because a species is not detected during surveys conducted at a given point in time, that does not mean that species could not occupy the site at some time in the future, because animal species exhibit dynamic distribution. The comment states that the 2008 RDEIR/SDEIS is better than most at concluding presence/absence for those species discussed, but that too many potentially occurring species were not addressed and some were dismissed based on flawed arguments.

The list of known or potentially occurring special-status plant and wildlife species is based on previously prepared biological resources reports for the project site and occurrence records documented in the CNDDDB and CNPS inventory for the Carmichael and Buffalo Creek U.S. Geological Survey 7.5-minute quadrangles, which contain the

project site, and the 10 surrounding quadrangles. In addition, a list of endangered and threatened species that occur in or may be affected by projects within the Buffalo Creek, Carmichael, Citrus Heights, and Folsom U.S. Geological Survey 7.5-minute quadrangles was obtained from USFWS. The lists of species generated by these sources was compared against the species' known ranges and distributions and the habitat and elevation range of the project site to compile the species listed in Tables 3.10-1 and 3.10-2 of the 2008 RDEIR/SDEIS. These are standard, accepted methods for creating a list of special-status species that could potentially be affected by a project. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-86

The comment states that the 2008 RDEIR/SDEIS presents a very cursory list of known and potentially occurring special-status species for a site of such large size and diversity of habitats. The comment states that a query of DFG's California Wildlife Habitat Relationships (CWHR) revealed potential use of the site by 270 vertebrates, including 194 bird species, 47 species of mammals, 19 species of reptiles, and 10 species of amphibians. The comment states that the environmental setting section of the 2008 RDEIR/SDEIS is inadequately described.

See response to comment Kopper-R-85 explaining how the list of potentially occurring special-status species was developed. See response to comment Kopper-R-84 regarding common wildlife species. Page 3.10-6 of the "Affected Environment" discussion in the for the Biological Resources section of the 2008 RDEIR/SDEIS states:

The project site supports an abundant and diverse fauna. This large and mostly contiguous block of open space, dominated by natural plant communities, is particularly important to native grassland wildlife species. The project site provides habitat for both resident breeding and migratory raptors that prefer large tracks of open grassland for foraging. The fragmented and disturbed scrub and woodland communities are attractive to many of the common wildlife species in Sacramento County.

A few of the many common wildlife species that are expected to use the site are listed on that page, but a list of all common wildlife species expected or observed is not provided because (1) any list generated would not necessarily be all-inclusive, and (2) trying to provide an all-inclusive list would add several pages to an already cumbersome document without adding anything particularly meaningful to the description of the analysis of impacts. It is therefore sufficient and adequate to simply state that the site supports an abundant and diverse fauna and that many of the common wildlife species of Sacramento County are expected to use the site. This summarizes the point that the comment is making about common wildlife use without filling multiple pages with tables of names of common wildlife species. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

The CWHR was not used to identify potentially occurring special-status species because it is a very coarse-scale tool that generates lists of all species, common and otherwise, that could use a particular habitat type in a particular region. The CNDDDB and CNPS inventory provide specific information about special-status species that have been documented in a specified search area. USFWS provides a list of special-status species that could be affected by projects in a specified area. The USFWS list provides a much more focused species list and is the standard procedure for developing a target list of potentially occurring special-status species and for supporting CEQA and NEPA analyses of proposed projects.

Kopper-R-87

The comment states that Table 3.10-2 of the 2008 RDEIR/SDEIS contains 17 special-status vertebrate species, including 12 bird species, one mammal, two reptiles, and two amphibians compared with 46 special-status vertebrate species (30 birds, nine mammals, three reptiles, and four amphibians) identified in the CWHR query. The comment asks why the CWHR query turned up so many more species of special-status vertebrates than included in the 2008 RDEIR/SDEIS and states that the 2008 RDEIR/SDEIS is deficient at describing the environmental setting of the project and therefore deficient in its estimates of project impacts.

See response to comment Kopper-R-85 explaining how the list of potentially occurring special-status species was developed for the 2008 RDEIR/SDEIS. Many of the species identified in the CWHR query were not identified in the CNDDDB, CNPS, and USFWS inventories for the project area and therefore were not included in Table 3.10-2 of the 2008 RDEIR/SDEIS. The area searched included the quadrangles containing the project site as well as the nine surrounding quadrangles. If these species have never been documented in the search area, then they are unlikely to occur in the area, regardless of whether the CWHR lists them as being associated with the particular habitat types that are present on the site and occurring in the region. California tiger salamander, for example, uses vernal pool habitat and is known from the region; however, it is not expected on the project site because, despite extensive surveys between Butte County and the Cosumnes River, the species has been found only on the southern edge of Sacramento County, south of the Cosumnes River (CNDDDB 2007; 69 *Federal Register* [FR] 47212–47248, August 4, 2004).

It is accurate to state that numerous species of birds, including special-status bird species, use the project site in some capacity. However, for many of these species, project impacts would be significant only if these impacts would adversely affect nesting by the species. Therefore, if the species is unlikely to nest on the site because no suitable nesting habitat exists or the site is outside of its nesting range, then the species was not included in the list of species with potential to occur on the project site because it would not be a part of the impact analysis. The list of potentially occurring special-status species is focused on species that could be adversely affected by the project; it does not include every bird species that might forage, roost, or fly over the project site at some point in time. For example, yellow warbler may pass through the project site, but the project site is not within the species' current breeding range and no breeding records exist for this species in Sacramento County (Shuford and Gardali 2008:334). Yellow warbler is a California species of special concern, but only when breeding. Because the project site is outside the species' breeding range, the project would not be expected to affect breeding yellow warblers.

Species once listed as federal species of concern and having no other sensitive status, such as Lawrence's goldfinch and Lewis' woodpecker, were not included in the 2008 RDEIR/SDEIS because USFWS's Sacramento office no longer maintains a list of species of concern. Most of the species generated by the CWHR query (Table 2, pages 7–16 of the comment letter) do not meet the definition of special-status species under CEQA, as outlined on page 3.10-7 of the 2008 RDEIR/SDEIS. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-88

The comment quotes the 2008 RDEIR/SDEIS, stating that most of the wetland depressions and other wetlands on the project site could support vernal pool crustaceans that were not identified during surveys and that protocol-level branchiopod surveys did

not cover the entire site. The comment asks how much of the project site has not been properly surveyed for crustaceans.

Protocol-level branchiopod surveys were conducted by Gibson and Skordal in 2000 and 2001. During these surveys, 112 depressional wetlands and vernal pools were sampled over approximately 1,800 acres (47%) of the project site. The 2008 RDEIR/SDEIS assumes that listed vernal pool branchiopods are present in all suitable habitats present on the project site, including wetlands that were not sampled and wetlands that were sampled but in which branchiopods were not found. Therefore, the 2008 RDEIR/SDEIS takes the most conservative approach possible for analyzing project impacts on vernal pool branchiopods. It is current standard procedure for USFWS to assume presence of listed vernal pool branchiopods in all suitable habitats rather than to request presence/absence surveys. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-89

The comment states that the 2008 RDEIR/SDEIS does not address coast horned lizard. The commenter states that he observed coast horned lizards just a few miles away from the project site as a child and therefore would expect them to occur on the project site. The comment further states that the reconnaissance surveys conducted by EDAW were at the wrong time of year to detect coast horned lizard.

See responses to comments Kopper-R-80 and Kopper-R-81 regarding the purpose of the reconnaissance-level surveys conducted by EDAW. See response to comment Kopper-R-85 explaining how the list of potentially occurring special-status species was developed for the 2008 RDEIR/SDEIS. Coast horned lizard, a California species of special concern, is not considered in the *South Sacramento County Habitat Conservation Plan* (which includes the project area) because it is not expected to occur in the draft SSCHCP study area because the study area is outside of its known range. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-90

The comment states that the 2008 RDEIR/SDEIS is probably correct that giant garter snakes are unlikely to be found on the project site, but if they are not looked for, they are certain not to be detected. The comment further states that the reconnaissance surveys conducted by EDAW were at the wrong time of year to detect giant garter snake.

Suitable habitat for giant garter snake consists of waterways that support adequate water during the species’ active season (early spring through late fall) and marsh vegetation (e.g., cattails and tule), which are not present on the Rio del Oro project site. Therefore, this species is unlikely to occur on the project site. Because suitable habitat is absent, there is no reason to conduct surveys for this species. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-91

This comment responds to the statement in the 2008 RDEIR/SDEIS that “there is no suitable aquatic habitat within the project boundary and pond turtles are unlikely to nest there.” The comment states that pond turtles nest in upland areas, including annual grasslands, not in aquatic environments. The comment further states that pond turtles often travel far from water to nest and need the juxtaposition of upland and wetland environments for populations to persist. The comment asserts that because pond turtles are known to occur near the project site, it is reasonable to assume that these pond turtles travel into the project site to nest, but that the reconnaissance surveys conducted by EDAW were not adequate to detect this species.

The nearest documented occurrence of western pond turtle is approximately 3 miles from the project site at Lake Natoma. Western pond turtles typically nest within 0.8 mile of their aquatic habitat (CNDDDB 2007), and substantial urban development, including U.S. Highway 50, is present between the project site and this documented occurrence; therefore, it is highly unlikely that these individuals would travel to the project site to nest. The nearest suitable aquatic habitat for western pond turtle is Mather Lake, which is approximately 0.5 mile from the project site. Western pond turtle has never been documented at Mather Lake, and even if the species did occur there, it would be unlikely to nest on the project site because it would have to cross Sunrise Boulevard, Douglas Road, and the Folsom South Canal to get to the project site. Further, ample nesting habitat exists in areas that are closer to Mather Lake and more easily accessible. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-92

The comment states that according to the 2008 RDEIR/SDEIS, few crevices or burrows have been identified on the project site that would provide suitable habitat for California tiger salamander. The comment states that this is inconsistent with the statement in the 2008 RDEIR/SDEIS that there is suitable habitat for American badger because badger forage on fossorial mammals that construct burrows. The commenter states that he observed ground squirrel burrows during his site visits and that without surveying for California tiger salamander, it is deficient of the 2008 RDEIR/SDEIS to conclude that this species is not expected to occur.

See response to comment Kopper-R-87; the project site is outside the known range of California tiger salamander. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-93

The comment states agreement with the conclusion of the 2008 RDEIR/SDEIS that the project site likely supports western spadefoot. However, the comment states that it would be helpful if appropriate searches for western spadefoot were made before changes to the environment on the project site.

No protocol-level surveys are necessary because the 2008 RDEIR/SDEIS assumes the presence of western spadefoot on the project site. If presence/absence surveys were to be conducted and western spadefoot were not found, this would not provide conclusive evidence that they do not inhabit the site or that they would not be present at the time of construction. If western spadefoot were to be found during surveys, the 2008 RDEIR/SDEIS contains mitigation measures sufficient to address the occurrence. Therefore, conducting protocol-level surveys for western spadefoot would not add valuable information to the impact analysis or change the mitigation measures. See the impact discussion for western spadefoot on page 3.10-57 of the 2008 RDEIR/SDEIS. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-94

The comment states that the 2008 RDEIR/SDEIS does not address the possibility of California red-legged frog occurring on the project site, and that although it is unlikely the species would be found on the project site, one cannot be certain unless protocol-level surveys are performed.

Based on preliminary review of the CNDDDB for California red-legged frog, the species was unlikely to be found on or within the species range of the project site; therefore, protocol-level surveys were not required. The nearest documented occurrence of California red-legged frog is from a drainage channel on the southeast side of Folsom

Lake in El Dorado County (CNDDDB 2008), approximately 12–13 miles east of the project site. This occurrence was found at an elevation of 485 feet. California red-legged frogs require dense, shrubby, or emergent riparian vegetation within 100 feet of deep (greater than 0.7 meter [approximately 2.3 feet]), still, or slow-moving water (61 FR 25814, May 23, 1996). The appropriate combination of dense riparian vegetation and deep water do not occur on the project site. California red-legged frogs are believed to have been extirpated from the Central Valley floor before 1960 (61 FR 25815, May 23, 1996); therefore, the project site is not within this species' current known range. This species is not included for consideration in the draft SSCHCP because the draft SSCHCP study area (which includes the project area) is considered outside the species' range. For these specific reasons, the species was not addressed as a potentially occurring species at the project site in the 2008 RDEIR/SDEIS. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-95

The comment states that the 2008 RDEIR/SDEIS does not address the possibility of foothill yellow-legged frog occurring on the project site. It is doubtful that the species occurs on the project site because the habitat on Morrison Creek does not appear consistent with streams where typically detected, but without looking for the species, it will not be detected.

Based on preliminary review of the CNDDDB for foothill yellow-legged frog, the species was unlikely to be found on or within the species range of the project site; therefore, protocol-level surveys were not required. No CNDDDB occurrences of foothill yellow-legged frog have been documented in the 12 quadrangles containing and surrounding the project site (CNDDDB 2005). This species is also not included for consideration in the draft SSCHCP because the draft SSCHCP study area is considered outside the species' current known range. The known range for the foothill yellow-legged frog extends from the Sierra-Cascade crest to the north coast and along the North Coast Ranges south to the Transverse Ranges and along the Sierra Nevada foothills south to Fresno County (Jennings and Hayes 1994:66–67, Zeiner et al. 1988:86–87). Although isolated populations were historically reported in San Joaquin and Sutter Counties, these populations appear to be extirpated and there are no other known occurrences on the Central Valley floor (Jennings and Hayes 1994:66–67). Suitable habitat conditions for foothill yellow-legged frog do not occur on the project site; Morrison Creek is generally completely dry before the end of summer, and this species is associated with perennial streams, or intermittent and ephemeral streams that retain pooled water through the end of summer. For these reasons, foothill yellow-legged frog was not addressed as a potentially occurring species in the 2008 RDEIR/SDEIS. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-96

The comment states that the 2008 RDEIR/SDEIS does not consider the likelihood of white-faced ibis occurring on the project site even though the site appears to provide suitable habitat during winter.

There are no occurrence records of this species in Sacramento County and the project site is not within the species' known nesting range. The nearest nesting colony is located north of the Yolo Bypass Wildlife Area, and the species is not known to winter in the project area, preferring large managed wetlands near agricultural fields such as the Butte Sink Area, Yolo Bypass, and Mendota Wildlife Refuge (Sacramento County 2008a). For these reasons, the species was not addressed in the 2008 RDEIR/SDEIS as a potentially occurring species at the project site. Furthermore, white-faced ibis is no longer listed as a

California species of special concern (DFG 2008:36), although the species is protected under the Migratory Bird Treaty Act. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-97

The comment states that the 2008 RDEIR/SDEIS does not address the likelihood of occurrence of golden eagle and that the project site appears suitable for golden eagle foraging.

The City and USACE note that the golden eagle is not a state-listed or federally listed species, and that therefore, the only impacts that would be significant would be mortality of individuals or disturbance of nesting success, not removal of foraging habitat. Nevertheless, a response to this comment is provided below.

The site does provide suitable foraging habitat for golden eagle (although the loss of such habitat is not an impact under CEQA); however, suitable nest sites, such as cliff ledges, rock outcrops, and suitable large trees, are lacking from the project site. There are no CNDDDB records of this species in the 12 quadrangles containing and surrounding the project site. Although golden eagles migrate through and winter in the Central Valley, the valley floor is not within the species’ core breeding range. Only one documented nesting occurrence has been documented in Sacramento County, and it is from the southeast corner of the county near the Amador County line (Sacramento County 2008b). Therefore, golden eagle is unlikely to nest on the project site and unlikely to be affected by the project. Furthermore, in the unlikely event that golden eagles were nesting on the project site, this fact would be discovered during preconstruction surveys that are required as mitigation for potential impacts on nesting raptors. Measures would be implemented to avoid impacts on the nest, among them establishing a no-construction buffer around the nest site until the eaglets have fledged (Mitigation Measure 3.10-4c on page 3.10-63 of the 2008 RDEIR/SDEIS). See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-98

The comment states that the 2008 RDEIR/SDEIS concludes that Cooper’s hawks likely use the project site, but not for nesting, without explaining such a conclusion. The comment states that Cooper’s hawk was observed on the project site during the nesting season and there is no reason that Cooper’s hawk would not nest on the site. The comment asks whether it matters if Cooper’s hawk never nested on the site.

The City and USACE note that the Cooper’s hawk is not a state-listed or federally listed species, and that therefore, the only impacts that would be significant would be mortality of individuals or disturbance of nesting success, not removal of foraging habitat. Nevertheless, a response to this comment is provided below.

The 2008 RDEIR/SDEIS correctly concludes that Cooper’s hawk is unlikely to nest on the project site. In the unlikely event that were to occur, the potential to affect nesting Cooper’s hawks is addressed by the impact that discusses Swainson’s hawk and other nesting raptors. If Cooper’s hawks were nesting on the project site, they would be discovered during preconstruction surveys for nesting raptors required by Mitigation Measure 3.10-4c on page 3.10-63 of the 2008 RDEIR/SDEIS. If nesting Cooper’s hawks were discovered, measures would be implemented to avoid the nests, among them establishing a no-construction buffer around nest sites until the nestlings have fledged. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-99

The comment states that the 2008 RDEIR/SDEIS concludes that sharp-shinned hawks likely use the project site, but not for nesting, without explaining such a conclusion. The comment states that there is no reason that sharp-shinned hawk would not nest on the site. The comment asks whether it matters if sharp-shinned hawk never nested on the site.

The City and USACE note that the sharp-shinned hawk is not a state-listed or federally listed species, and that therefore, the only impacts considered significant would be mortality of individuals or disturbance of nesting success, not removal of foraging habitat. However, a response to this comment is provided below.

The 2008 RDEIR/SDEIS correctly concludes that sharp-shinned hawk is unlikely to nest on the project site. In the unlikely event that such nesting were to occur, the potential to affect nesting sharp-shinned hawks is covered by the impact that addresses Swainson's hawk and other nesting raptors. If sharp-shinned hawks were to nest on the project site, they would be discovered during preconstruction surveys for nesting raptors required under Mitigation Measure 3.10-4c, page 3.10-63 of the 2008 RDEIR/SDEIS. If discovered, measures to avoid sharp-shinned hawk nests, including establishment of a no-construction buffer around nest sites until the nestlings have fledged, would be implemented. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-100

The comment states that it makes perfect sense that consultants observed ferruginous hawk on the project site because it supports ideal wintering habitat and consultants were visiting the project site at the right time of year to see this species.

The comment is noted.

Kopper-R-101

The comment states agreement with the conclusion in the 2008 RDEIR/SDEIS that the project site likely supports Swainson's hawks, but would characterize the likelihood as probable because the project site includes all the habitat elements needed by Swainson's hawks.

There are no defined categories of probability associated with the terms *likely* and *probable*. Calling the potential for Swainson's hawk to occur on the project site *probable* rather than *likely* would not indicate any higher or lower probability of finding the species on the project site and would not change the impact conclusion. Regardless, the 2008 RDEIR/SDEIS sets forth mitigation that would apply if Swainson's hawk were to be discovered on the project site. (See Mitigation Measures 3.10-4c and 3.10-4d, pages 3.10-63 to 3.10-65 of the 2008 RDEIR/SDEIS.) See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-102

The comment states that the 2008 RDEIR/SDEIS reports that a white-tailed kite was seen during the consultant's winter visit and that the commenter observed two white-tailed kites foraging over the site during the nesting season, so the species appears to use the project site for winter foraging as well as nesting.

The 2008 RDEIR/SDEIS states that white-tailed kite is known to use the site year round (Table 3.10-2 on page 3.10-10) and is expected to nest on the project site (page 3.10-56). Preconstruction surveys for nesting raptors are required under Mitigation Measure 3.10-4c, page 3.10-63 of the 2008 RDEIR/SDEIS. If white-tailed kite nests are discovered, measures to avoid the nests, including establishment of a no-construction buffer around nest sites until the nestlings have fledged, would be implemented. See also Master

Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-103

The comment states that the 2008 RDEIR/SDEIS concludes that northern harriers are likely to occur on the project site and that the commenter observed northern harrier foraging on the project site.

The 2008 RDEIR/SDEIS states that northern harrier is expected to nest on the project site (page 3.10-56). Preconstruction surveys for nesting raptors are required under Mitigation Measure 3.10-4c, page 3.10-63 of the 2008 RDEIR/SDEIS. If northern harrier nests are discovered, measures to avoid the nests, including establishment of a no-construction buffer around nest sites until the nestlings have fledged, would be implemented. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-104

The comment states agreement that the project site likely supports merlins, but would characterize the likelihood as probable.

See response to comment Kopper-R-101 above, which also applies to merlins. Regardless, the 2008 RDEIR/SDEIS sets forth mitigation that would apply if raptors, such as merlins, were to be discovered on the project site. (See Mitigation Measure 3.10-4c, page 3.10-63 of the 2008 RDEIR/SDEIS.) See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-105

The comment states that the 2008 RDEIR/SDEIS does not address the potential for peregrine falcon to use the project site, and that there is no reason why peregrine falcon would not use the site at least sometimes because it is within the species’ range and it supports suitable habitat.

Peregrine falcon was not included on the list of potentially occurring special-status species (Table 3.10-2 on page 3.10-10 of the 2008 RDEIR/SDEIS) because there are no CNDDDB records of this species within the 12 quadrangles containing and surrounding the project site. In fact, the CNDDDB contains no occurrence records of peregrine falcon in the Central Valley, although the species is regularly observed in the Central Valley during fall migration and winter. Peregrine falcon would not be expected to nest on the project site because the site is outside the core nesting range of this species, which nests almost exclusively on protected ledges of high cliffs (Sacramento County 2008c), which do not exist on the project site. However, in the unlikely event that a peregrine falcon was nesting on the project site, this fact would be discovered during preconstruction surveys that are required as mitigation for potential impacts on nesting raptors. Measures would be implemented to avoid impacts on the nest, among them establishing a no-construction buffer around the nest site until the nestlings have fledged (Mitigation Measure 3.10-4c on page 3.10-63 of the 2008 RDEIR/SDEIS). See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-106

The comment states that it is not surprising that consultants observed a prairie falcon on the project site because it provides habitat typically used by this species.

The comment is noted.

Kopper-R-107

The comment expresses agreement with the conclusion in the 2008 RDEIR/SDEIS that short-eared owls are likely to occur on the project site, but would characterize the likelihood as probable because the site includes all of the habitat elements needed by this species. The commenter further expresses his beliefs that the short-eared owl should be listed as threatened or endangered and that very few locations remain that can support this species.

See responses to comments Kopper-R-101 and Kopper-R-104 regarding the terms *likely* and *probable*. The 2008 RDEIR/SDEIS addresses species in terms of their current listing status and the associated analysis requirements under CEQA and NEPA regarding species and their habitat. As of the February 2008 publication date of *California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California*, the short-eared owl species status was still listed as a “California species of special concern,” and only where breeding (Shuford and Gardali 2008:243). The project site is outside of the species’ core breeding range (Shuford and Gardali 2008:242–243); therefore, short-eared owl would not be expected to nest on the site. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-108

The comment notes that the 2008 RDEIR/SDEIS concludes that the project site likely supports burrowing owls. The commenter further states that the project site almost certainly supports burrowing owls, at least periodically, because the habitat appears ideal for this species, and that ground squirrels are present supplying burrows that burrowing owls often use for nesting.

The comment is noted. The 2008 RDEIR/SDEIS sets forth mitigation that would apply in the event burrowing owls are discovered on the project site. (See Mitigation Measure 3.10-4c, page 3.10-63 of the 2008 RDEIR/SDEIS.)

Kopper-R-109

The comment states that the 2008 RDEIR/SDEIS did not address the likelihood of greater sandhill crane occurrence and states that the project site appears suitable for sandhill crane during winter months.

Use of areas in the Central Valley by greater sandhill crane is well studied. The closest use area to the project site is the Cosumnes River floodplain, most of which is west of State Route 99 (Sacramento County 2008d). The project site is outside the species’ breeding range. No occurrences of greater sandhill crane have been documented in the CNDDDB within the 12 quadrangles containing and surrounding the project site. According to the draft SSCHCP, suitable habitat cover types north of Elk Grove Boulevard are not considered habitat for greater sandhill crane because no evidence exists that this species roosts or forages in these areas. Therefore, greater sandhill cranes are not expected to use the project site. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-110

The comment states that the 2008 RDEIR/SDEIS did not address California horned lark, and that according to CWHR, vegetation cover types on the project site are suitable for this species.

California horned lark is not addressed in the 2008 RDEIR/SDEIS because no occurrences of this species have been documented in the CNDDDB in the 12 quadrangles containing and surrounding the project site, and because it was not identified on the USFWS list of species that could be affected by projects in the area. This species is no

longer listed as a California species of special concern (DFG 2008:41). It is also not included for consideration in the draft SSCHCP. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-111

The comment states that the 2008 RDEIR/SDEIS did not address the likelihood of long-billed curlew occurrence, and states that the project site appears suitable to long-billed curlew during winter months.

No CNDDDB occurrence records for long-billed curlew exist in the 12 quadrangles containing and surrounding the project site. This species is of concern only when nesting and the site is outside of the species’ nesting range. This species is no longer listed as a California species of special concern (DFG 2008:41) and is not included for consideration in the draft SSCHCP because the draft SSCHCP study area is outside of its nesting range. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-112

The comment states that the 2008 RDEIR/SDEIS did not address purple martin, which is a California species of special concern, and vegetation cover types on the project site are suitable for this species.

The purple martin is only a species of concern where breeding, and the project site is outside the species’ breeding range (Shuford and Gardali 2008:294). Purple martin was extirpated from the Central Valley by competition from nonnative European starlings by the 1980s, except in the city of Sacramento, where they nest in hollow-box bridges (Shuford and Gardali 2008:295). This species is not included for consideration in the draft SSCHCP because the draft SSCHCP study area is outside of its breeding range. Because it is highly unlikely that this species nests on the project site, the impact on the species was not addressed in the RDEIR/SDEIS. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-113

The comment states that the 2008 RDEIR/SDEIS does not address yellow warbler or consider the role the project site might play as a stopover habitat during seasonal migrations between the Central Valley and Sierra Nevada.

The comment provides no evidence that the project site serves as a substantial stopover site along established migratory routes for this species. Moreover, the yellow warbler is only a species of concern when breeding (Shuford and Gardali 2008:333). No CNDDDB occurrence records for yellow warbler exist in the 12 quadrangles containing and surrounding the project site and the site is not within the species’ breeding range (Shuford and Gardali 2008:332–334). No breeding records exist for this species in Sacramento County, and it is largely extirpated as a breeder from the Central Valley floor (Shuford and Gardali 2008:334). This species is not included for consideration in the draft SSCHCP because the draft SSCHCP study area is outside of its breeding range. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-114

The comment expresses lack of understanding as to why the 2008 RDEIR/SDEIS does not consider the likelihood of occurrence of yellow-breasted chat.

No CNDDDB occurrence records for yellow-breasted chat exist in the 12 quadrangles containing and surrounding the project site, and yellow-breasted chat was not identified

on the USFWS list of species that could be affected by projects in the area. The species is of concern only where breeding, and it is not known to breed in Sacramento County (Shuford and Gardali 2008:354, Sacramento County 2008e). See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-115

The comment states that the 2008 RDEIR/SDEIS does not consider mountain lion to be a potentially occurring species on the project site even though appropriate habitat elements are present and contiguous with habitat to the east and north. The comment further states that mountain lions have been found on the outskirts of the city of Folsom and other sites in the project vicinity.

No CNDDDB occurrence records for mountain lion exist in the 12 quadrangles containing and surrounding the project site. Although it is possible for mountain lion to occasionally wander onto or pass through the site, there is no evidence that the site serves as an important movement corridor for mountain lion. Additionally, mountain lion would have to cross Sunrise Boulevard, Douglas Road, and the Folsom South Canal to get to/from the project site. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-116

The comment states that the 2008 RDEIR/SDEIS does not consider ringtail to be a potentially occurring species on the project site even though appropriate habitat elements are present and contiguous with habitat to the east and north.

No CNDDDB occurrence records for ringtail exist in the 12 quadrangles containing and surrounding the project site. In the Central Valley, ringtails are found almost exclusively in riparian forests along major waterways such as the Sacramento River, American River, Feather River, and Butte Creek (Sacramento County 2008f). Riparian forest vegetation is present on the project site; however, this vegetation is associated with tailings basins that pool water supplied by direct precipitation, runoff, and ephemeral drainage channels, and not with major rivers or streams. Therefore, the project site does not contain all the habitat elements that are present in areas where ringtails are typically found in the Central Valley, especially a continual supply of open water. In addition, the project site is outside the species’ core range and there is only one occurrence record of this species within the draft SSCHCP study area, which is from the American River near its confluence with the Sacramento River (Sacramento County 2008f). For these reasons, it is highly unlikely that ringtail occur on the project site, and therefore, no impact analysis was required. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-117

The comment states that the 2008 RDEIR/SDEIS does not address the potential for bats to occur on the project site even though multiple special-status species of bat can occur there and considerable bat habitat is available. The comment further states that no bat surveys were performed, that there are certainly numerous bats using the site, and that not addressing bats is a significant shortfall in the 2008 RDEIR/SDEIS.

Although it is true that bats may use the project site, only one special-status bat species, pallid bat (a California species of special concern), has been documented in the CNDDDB in the 12 quadrangles containing and surrounding the project site. This is a 1941 record from 2 miles northwest of Folsom.

Water sources are a vital component of habitat for pallid bats because they drink immediately after emerging from their day roosts and because water sources attract high

concentrations of insects. Therefore, the project site does not provide suitable habitat during summer and fall when ponds, pools, and drainage channels are dry. For this reason, the project site is not expected to support maternity colonies of pallid bats. Pallid bats give birth in May or June and need a permanent water source near their nursery roost through summer.

In addition, of 111 CNDDDB records of pallid bat, only two are from the Central Valley (CNDDDB 2008) and only one from Sacramento County. See the species' distribution map in Appendix A of the draft SSCHCP (Sacramento County 2008g). For these reasons, the project site is unlikely to support important winter roosting or maternity colonies of pallid bats. Any other use of the site by pallid bats would not present a potential significant impact from the project because these bats could relocate to another site at the onset of project disturbance without direct mortality or abandonment of pups that cannot survive on their own.

The only other bat species documented in the CNDDDB in the 12 quadrangles containing and surrounding the project site is silver-haired bat. This species is categorized as medium priority by the Western Bat Working Group, but is not state listed or federally listed and is not a California species of special concern. Therefore, silver-haired bat does not meet the definition of special-status as applied under CEQA in the 2008 RDEIR/SDEIS. Also, this species is associated primarily with coastal and montane forest habitats and requires a permanent water source (CNDDDB 2008). Therefore, this species is unlikely to inhabit the project site, since neither of these habitats are present.

Other special-status bat species were identified on the USFWS list of species that could be affected by projects in the area: Townsend's big-eared bat, spotted bat, and greater western mastiff bat. However, no occurrences of any of these species have been documented within the 12 quadrangles containing and surrounding the project site, and the project site either does not contain suitable roosting habitat or is below the known elevation range of these species. For example, Townsend's big-eared bat has never been recorded at low elevations in Sacramento County and greater western mastiff bat is primarily a cliff-dwelling species and requires rock slabs or crevices in large boulders or buildings for roosting, which are not present at the project site (Western Bat Working Group 2005a). Spotted bats roost in cracks, crevices, and caves, usually high in fractured rock cliffs (Western Bat Working Group 2005b).

Other bats that are likely to use the project site are common species or species that are not considered special-status. A definition of special-status species is provided on page 3.10-7 of the 2008 RDEIR/SDEIS. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-118

The comment states that the 2008 RDEIR/SDEIS does not address the project's effects on the ability of wildlife to move across the project site. The comment further states that converting several thousand acres of wildlife habitat to houses at the proposed location would indeed interfere with the movement of wildlife between undeveloped areas to the east and north, and that the project would result in a 507-acre wetland preserve surrounded by residential and commercial development on three sides, providing no opportunity for wildlife to pass through the preserve to any other habitat. The comment also states that the project would cover a portion of Morrison Creek, thereby cutting off movements of species that routinely move along the creek (e.g., western pond turtle, river otters, various amphibians, garter snakes, and pocket gophers).

The comment provides no evidence that the project would interfere substantially with wildlife movement. There are no established migratory routes through the project site that are vital for the movement of any resident or migratory fish or wildlife species or population. There also are no established wildlife nursery sites on the project site.

The commenter is incorrect in stating that a portion of Morrison Creek would be “covered.” Morrison Creek would be maintained through the project site and bridges crossing over Morrison Creek would be sized to provide for wildlife movement and minimize habitat fragmentation. Bridge design would include a large enough span area to provide movement corridors for terrestrial wildlife even during high flows (see page 3.10-27 of the 2008 RDEIR/SDEIS). Therefore, Morrison Creek would provide a corridor for wildlife movement through the project’s wetland preserve to adjacent lands to the east and southwest, although there are existing impediments to movement southwest and south off the project site including Sunrise Boulevard, Douglas Road, and the Folsom South Canal.

As described on page 3.10-26 of the 2008 RDEIR/SDEIS, the proposed wetland preserve would connect to the agency-proposed conservation area identified in *A Conceptual-Level Strategy for Avoiding, Minimizing, & Preserving Aquatic Resource Habitat in the Sunrise-Douglas Community Plan Area* adjacent to the east of the project site. However, no other opportunities exist for connections to other planned or existing preserves. The conceptual-level strategy does not propose any preserves adjacent to the Rio del Oro project site other than the one to the east, nor does the City General Plan show other planned preserves in adjacent areas. Approved development plans for areas south of Douglas Road do not include preserve areas that could connect to the proposed Rio del Oro wetland preserve, and adjacent land to the west is already developed with urban uses. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-119

The comment states that habitat fragmentation is not considered adequately in the 2008 RDEIR/SDEIS, even though it is likely the greatest threat to biological species. The commenter suggests revising the 2008 RDEIR/SDEIS to include a more detailed discussion of habitat fragmentation caused by the project and directing the discussion to each special-status species potentially occurring in the area.

See response to comment Kopper-R-118 regarding project measures to minimize habitat fragmentation and opportunities for connecting to adjacent habitats. Contrary to the commenter’s assertion, habitat fragmentation is considered a substantial adverse effect on every special-status species addressed in the 2008 RDEIR/SDEIS (page 3.10-65). This topic is also discussed under impacts on wetlands and other waters of the United States and waters of the state (pages 3.10-26, 3.10-27, and 3.10-45), cumulative impacts (page 3.10-71 and 3.10-72), and residual significant impacts (page 3.10-72).

The 2008 RDEIR/SDEIS states that vernal pools and other wetlands would be confined to small geographic locations and would be more vulnerable to the effect of habitat fragmentation and other indirect impacts. The 2008 RDEIR/SDEIS acknowledges that the project would result in the net loss of approximately 3,300 acres of potential habitat for special-status species and would lead to habitat fragmentation. However, there is not sufficient undeveloped land in the project vicinity to offset the effects of habitat fragmentation on special-status species, and thus, to fully mitigate the impact. Adjacent lands to the west, as well as portions to the south, are already developed and remaining lands to the north, east, and south are planned for development. Some of these planned developments are already approved. Habitat fragmentation resulting from project

implementation is part of the reason that impacts on special-status wildlife would be significant and unavoidable even after mitigation implementation, as stated on page 3.10-65 of the 2008 RDEIR/SDEIS. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-120

The comment states that the 2008 RDEIR/SDEIS does not discuss or even mention use of the project site by migrating birds. The comment further states that habitat patches are often critical for the persistence of special-status species, including willow flycatcher, yellow warbler, white-faced ibis, and sandhill crane. The commenter suggests revising the 2008 RDEIR/SDEIS to estimate impacts on migrant birds that rely on the project site as stopover habitat.

It is true that many migratory birds, including special-status species, could use the project site during migration. However, the commenter provides no evidence that the project site provides critical stopover habitat for any migratory bird species or that project implementation would substantially alter migration patterns for these or any other bird species. See responses to comments Kopper-R-87, Kopper-R-96, Kopper-R-109, and Kopper-R-113. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-121

The comment states that the 2008 RDEIR/SDEIS provides no description of changed hydrology or reason for the change, which is reportedly leading to a loss of regeneration of riparian vegetation that is pervasive between rock (tailings) piles. The comment further states that the 2008 RDEIR/SDEIS provides no quantitative data, such as counts of young versus mature trees, to support the conclusion that all trees are old and dying, and should be revised to include counts within size classes of trees and shrubs that were inventoried.

The habitat assessment that was provided as Appendix E of the 2006 DEIR/DEIS provides data on tree and shrub size classes. During the habitat assessment, the observation was made at nearly every sample point that the majority of the trees and shrubs were reaching senescence and seedlings and saplings were lacking. These observations led to the conclusion in the 2008 RDEIR/SDEIS that the majority of riparian trees and shrubs are reaching senescence.

It is understood that the commenter advocates for full-scale scientific research studies to back up every conclusion contained in the 2008 RDEIR/SDEIS; however, neither CEQA/NEPA regulatory requirements nor case law require such an effort. See Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS. The City/USACE believe that observations made by a qualified botanist with many years of field experience are sufficient to conclude that the trees and shrubs are older and that there is a lack of recruitment. Such patterns can be observed without an analysis of quantitative data. The exceptions from the senescing trend are the willow woodland and cottonwood-willow riparian forest communities, which support varying sizes of trees and shrubs. Regeneration of cottonwood and willow species was directly observed in both of these communities.

The causes of the changes in surface hydrology at the site are not entirely understood; however, it has been suggested that wet periods on the site appear to correspond with El Niño years, the last of which occurred in the 1990s. The majority of overland watercourses that were once present on the project site were eliminated as a result of historical mining activities (Wood Rogers 2005). In addition, gold mining activities that occurred on the project site in the 1950s resulted in the creation of basins between

tailings piles. These basins filled with water because of their low-lying positions on the landscape and because of mining-related manipulation of the site's surface-water and groundwater supplies. The thick, impermeable material that resulted from dredging would likely have allowed pooled water to remain for quite some time. In many areas of the project site, the cobble in the tailings piles has been mined, thereby eliminating the basins that stored water and allowed generation of riparian vegetation. This is clearly evident even in aerial photographs where, in the northeast portion of the site, tailings piles were removed some time ago and numerous downed cottonwood trunks are visible between the widely scattered remaining large, mature cottonwood trees.

Further mining of the tailings piles has already been approved under separate and unrelated conditional use permits issued by the City. These proposed activities are not a part of the Rio del Oro project and are occurring with or without the Rio del Oro project. Eventually all of the tailings piles will be removed from the project site. Even without implementation of the Rio del Oro project, no basins will remain to capture and store rainfall and support the existing on-site riparian vegetation.

Whatever all of the compounding reasons may be, the historic quadrangle maps show a myriad of water features, including open water in the basins between tailings piles that are not currently present on the project site. The fact that they are not present on the project site today can be verified by examining a current aerial photograph of the site (available from Google Earth in 2009). See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-122

The comment states that the 2008 RDEIR/SDEIS describes the annual grassland on the project site as being composed of ripgut brome, soft chess, Italian thistle, yellow starthistle, dovefoot geranium, medusahead, rose clover, and vetch; that these are exotic species; and that most are considered serious pests. The comment further states that any biologist would conclude from this description that the site is degraded and of lower value to wildlife and native flora. The commenter did not observe a single plant of any of these species while walking the perimeter of the site, except for yellow starthistle on the dredge tailings and along some access roads, and suggests revising the 2008 RDEIR/SDEIS to more accurately portray the annual grassland across much of the project site.

The project site consists of 3,800 acres; therefore, the commenter could not have accurately determined what the on-site grassland habitat consists of by walking along the perimeter. The description of the annual grassland as provided in the 2008 RDEIR/SDEIS is accurate and consistent with every other description of the on-site annual grassland community provided in baseline survey reports, specifically the wetland delineation, special-status plant survey, and listed vernal pool branchiopod survey.

By definition, annual grassland communities in California are dominated by nonnative annual grasses and are also known as "nonnative grassland" (Holland 1986). Ripgut brome and soft chess are characteristic of the annual grassland community in California (refer to Holland 1986, Sawyer and Keeler-Wolf 1995, Mayer and Laudenslayer 2005). It is also typical for annual grasslands to contain invasive plant species. The description of this community in the 2008 RDEIR/SDEIS acknowledges that the annual grassland community outside of the tailings mound areas supports native forbs. However, the annual grassland community on the project site is dominated by nonnative plant species and that many of these are invasive. This does not mean that the on-site annual grassland habitat is of low value to wildlife species that use annual grasslands. The impact analysis in the 2008 RDEIR/SDEIS does not assert this conclusion. See also Master Response 2,

“Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-123

The comment states that the sentence in the 2008 RDEIR/SDEIS stating that the oak woodland community on the project site would not provide suitable nesting habitat for raptors because it lacks larger diameter trees is untrue and that the oaks on the site are large enough to support nesting by red-tailed hawk, Swainson’s hawk, white-tailed kite, and other species.

The statement quoted refers specifically to a 3-acre area mapped as oak woodland and does not suggest that no trees on the project site are large enough to support nesting raptors. The 2008 RDEIR/SDEIS acknowledges the likelihood that each of the raptor species listed in the comment, and others, nest on the project site. Potential impacts on nesting raptors are addressed in Impact 3.10-4 on pages 3.10-53, 3.10-56, and 3.10-57 of the 2008 RDEIR/SDEIS. Mitigation Measure 3.10-4c (page 3.10-63) provides mitigation for impacts on nesting raptors. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-124

The comment states that the methodology used to characterize and map biological resources present on the project site (i.e., the methodology used for the habitat assessment conducted by EDAW in 2005) suggests the effort was designed to turn up few observations of biological resources because of the exceedingly small area surveyed (35 sample sites composing <0.019% of the project area).

See responses to comments Kopper-R-80, Kopper-R-81, Kopper-R-83, and Kopper-R-84 regarding the habitat assessment and reconnaissance-level surveys. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-125

The comment states that searching 0.72 acre once in the middle of winter would not qualify in any scientific journal as a thorough characterization of any habitat type, and that there is no precedent in science or professional biology for the use of such cursory surveys.

See responses to comments Kopper-R-80, Kopper-R-81, Kopper-R-83, and Kopper-R-84 regarding the habitat assessment and reconnaissance-level surveys. The descriptions of vegetation communities contained in the 2008 RDEIR/SDEIS go far beyond what is typically conducted in support of a CEQA document in terms of providing percent cover estimates and qualitative descriptions of structural diversity within each community. Though not included in the descriptions in the 2008 RDEIR/SDEIS, the descriptions provided in the habitat assessment (Appendix E of the 2006 DEIR/DEIS) also provide average heights for trees and shrubs and measurements of diameter at breast height for each community. There is no requirement under CEQA regulations or case law to provide quantitative habitat data in the biological setting section; the habitat assessment was provided as additional baseline information as requested by USACE. This information is in addition to protocol-level species surveys and the wetland delineation conducted on the project site, as listed on page 3.10-1 of the 2008 RDEIR/SDEIS. Reconnaissance of the entire site was conducted in conjunction with data collection at the 35 sample points.

The commenter provides no evidence that the 2008 RDEIR/SDEIS has mischaracterized habitat conditions or vegetation communities present on the project site, or omitted important habitat information that would change the impact analyses. See also Master

Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-126

The comment states that the nature of surveys used by EDAW does not begin to characterize habitats because habitats are defined by species’ use of the environment, while the descriptions in the 2008 RDEIR/SDEIS are more technically consistent with classifications of vegetative cover. The comment provides the example that if one were truly interested in habitat quality for pocket gophers, one would classify and measure soils and types of vegetation within multiple gopher home ranges; and beyond that, one would provide some measure of habitat quality, such as a productivity metric (e.g., comparison of the number of young per some number of generations among pocket gophers over the range of habitat conditions measured).

The commenter’s opinion that the habitat assessment might more accurately be termed a vegetation assessment is duly noted. However, a species’ habitat is generally described in terms of the vegetation communities occupied by the species. Suitable habitat characteristics often include other features, such as soil texture, rock outcrops, snags, tree cavities, and surface water; however, vegetation communities are the foundation for characterizing wildlife habitats. For example, the DFG Web site that describes wildlife habitats in California (http://www.dfg.ca.gov/biogeodata/pdfs/ca_habitat.pdf) shows a map of vegetation communities. The CWHR system, referred to multiple times in the beginning of these comments, also defines wildlife habitats in terms of vegetation communities (http://www.dfg.ca.gov/biogeodata/cwhr/wildlife_habitats.asp).

The habitat characterization conducted in support of the Rio del Oro project goes far beyond the level of detail typically provided in a CEQA setting section by providing information about tree and shrub size classes, distribution patterns, and density, which are all relevant to habitat quality in terms of the numbers and types of wildlife species they might support. Other factors, such as soil texture, presence of tree snags and cavities, and the presence of surface water were all noted on the data sheets during the habitat assessment. The characterization of habitat on the project site is therefore considered by the City and USACE to be more than adequate for the purposes of an EIR/EIS. See also Master Response 3, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-127

The comment lists the factors from page 3 of Appendix E of the 2006 DEIR/DEIS that were evaluated to determine overall biological value during the habitat assessment, then states that no explanation is provided on how these factors were weighted or used to determine biological value. The comment further states that the 2008 RDEIR/SDEIS is insufficient as an informative document for public review and the reader cannot possibly understand EDAW’s basis for formulating the Impact Minimization Alternative.

The information provided in Appendix E of the 2006 DEIR/DEIS is intended to provide additional information to describe the affected environment and exceeds information that is typically provided in a CEQA- and NEPA-compliant EIR/EIS biological resources chapter to describe the affected environment. This assessment was provided in addition to protocol-level species surveys, tree surveys, wetland delineation and CRAM analysis. This information is used to support the determination of impacts to biological resources and as discussed in response to comment Kopper-R-126, the City and USACE believe that the document is sufficient as an informative document about the biological resources that would be affected by the project. The commenter did not provide an alternative method for habitat analysis and did not provide additional details on the opinion that the 2008 RDEIR/SDEIS is “insufficient as an informative document for public review.” See

also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS. See responses to comments Kopper-R-128-140 for issues relating to factors used in habitat assessment. See response to comment Kopper-R-131 for rationale for determining the Impact Minimization Alternative’s proposed habitat preservation area boundaries.

Kopper-R-128

The comment addresses the Presence/Absence of Sensitive Habitats factor as listed in Appendix E of the 2006 DEIR/DEIS. The commenter states that examination of Exhibit 1 of Appendix E reveals that 31 of the 35 sample sites were within rows of dredge tailings, none within the vernal pool grassland complexes or within valley oak savanna outside the dredge tailings. The comment states further that this loading of survey sites was neither random nor systematic, is rarely acceptable in the biology profession, and is inappropriate for this situation, and that sensitive habitats were inadequately sampled.

The portions of the project site outside of the tailings piles and characterized by vernal pool grassland complexes had already been mapped and characterized during multiple protocol-level surveys and wetland delineation by the time USACE requested the habitat assessment performed by EDAW. Furthermore, the Proposed Project Alternative already included a 507-acre wetland preserve in the southern portion of the project site, containing Morrison Creek and the largest contiguous patch of vernal pool grassland. Therefore, the purpose of the habitat assessment described in Appendix E of the 2006 DEIR/DEIS was to characterize upland habitats on the rest of the site. Specifically, the purpose was to assess areas characterized by rows of tailings piles interspersed with basins that support riparian vegetation, and to determine what habitats besides the vernal pool grassland complexes would be valuable to preserve under the Impact Minimization Alternative.

Sensitive habitats are defined on page 3.10-14 of the 2008 RDEIR/SDEIS. Such habitats include those that are of special concern to resource agencies or are afforded specific consideration under CEQA, Section 1602 of the California Fish and Game Code, Section 404 of the federal Clean Water Act, and the Porter-Cologne Act. These habitats were identified through the wetland delineation. Sensitive habitats also include terrestrial natural communities identified as sensitive in the CNDDDB because of their locally or regionally declining status, or because they provide important habitat to common and special-status species. Riparian vegetation communities tend to fit this second definition, even if they do not meet the definition of wetlands under the CWA or the Porter-Cologne Act, or do not fall under DFG jurisdiction under Section 1602.

The riparian vegetation on the project site is associated exclusively with areas that support, or previously supported, tailings piles; that is why it was deemed important to sample vegetation in those areas. No vegetation community present on the project site could accurately be described as valley oak savanna. As verified in the tree inventory conducted by Sierra Nevada Arborists (2003), no valley oak trees are present on the project site. An area in the northeast corner of the project site has a savanna-like appearance, but Fremont cottonwood is the sole dominant in the tree layer. This area was included in sampling during the habitat assessment described in Appendix E of the 2006 DEIR/DEIS (sample point 33) and was classified as cottonwood woodland. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-129

The comment addresses the Presence/Absence of Special-Status Species factor as listed in Appendix E of the 2006 DEIR/DEIS, stating that the reconnaissance surveys had from zero to low chance of detecting the 62 species identified in the commenter’s query of the

CWHR (discussed in comments Kopper-R-86 and Kopper-R-87 and provided as Table 2 of the comments).

See responses to comments Kopper-R-80 through Kopper-R-117. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-130

The comment states that the fact that EDAW biologists detected ferruginous hawk, prairie falcon, white-tailed kite, and Greene’s legenera suggests that the methods described in Appendix E of the 2006 DEIR/DEIS were not followed and that these species were detected outside of the 100-foot radius sample areas.

The comment is correct that ferruginous hawk, white-tailed kite, and prairie falcon were detected outside of the 100-foot radii of the sample points, and this fact is noted on the data sheets. A general site reconnaissance was conducted during the habitat assessment and EDAW biologists conducted an additional site reconnaissance visit on January 24, 2005, which is when the ferruginous hawk and prairie falcon were observed. Greene’s legenera was detected during special-status plant surveys conducted by ECORP in 2003, as noted in Table 1 of Appendix A of the 2006 DEIR/DEIS and in Table 3.10-1 on page 3.10-9 and on page 3.10-12 of the 2008 RDEIR/SDEIS. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-131

The comment asks what EDAW considered disturbance. The comment further states that the 2008 RDEIR/SDEIS does not explain what is meant by relative level of disturbance, and is therefore insufficient as an informative document because it provides no basis for estimating impacts for formulating mitigation measures and no basis for formulating the Impact Minimization Alternative.

The information provided in the habitat assessment (Appendix E of the 2006 DEIR/DEIS) is supplemental information used to aid in developing the Impact Minimization Alternative and is not the only source of information considered in the Biological Resources section of the 2008 RDEIR/SDEIS (see pages 3.10-1, 3.10-8, 3.10-12, 3.10-13, and 3.10-22 for other information sources consulted). The relative level of disturbance noted in the habitat assessment is a qualitative description of the type and degree of disturbances observed in the sample areas; this information was not relied upon to determine the extent of potential project impacts on any biological resource. As noted on page 3.10-25 of the 2008 RDEIR/SDEIS, project impacts were assessed by comparing the postimplementation scenario of the project (and alternatives under consideration) with the existing conditions on-site, as documented during various baseline studies and summarized on page 3.10-22. There is no guideline suggesting that a measurement of relative level of disturbance needs to be established to adequately assess project impacts and formulate appropriate mitigation measures; therefore, the correlation that this comment draws between the lack of definition for relative level of disturbance and the sufficiency of the 2008 RDEIR/SDEIS is unfounded. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

The rationale for selecting the specific cottonwood-willow riparian forest and vernal pool grassland acreage for incorporation into the Impact Minimization Alternative is summarized on page 3.10-48 and detailed on page 25 of Appendix E of the 2006 DEIR/DEIS. This rationale includes continuity with other natural habitats (in the proposed 507-acre preserve); size of habitat area; opportunities for nesting, roosting, and

foraging; hydrologic connectivity; health and vigor of existing vegetation; and reducing the perimeter-to-area ratio of habitat preserved.

Kopper-R-132

The comment states that another problem with the level of disturbance factor is that it assumes disturbances are adverse to biological resources while in fact, many if not all biological resources rely on disturbances of some type. The comment states that the 2008 RDEIR/SDEIS is misleading in implying that disturbance is adverse and is vague in how disturbance is used to determine biological values of portions of the project site.

The comment is correct in noting that many species are disturbance-adapted and may rely heavily on particular types of disturbances. The habitat assessment does not define disturbance as good or bad, but notes observed disturbances, including ongoing disturbances such as cattle grazing and historic disturbances such as evidence of gold mining activities (dredge tailings). It is acknowledged that a particular kind of disturbance can be detrimental or beneficial depending on the resource affected and type of disturbance experienced, and that often it is not only the type of disturbance, but also the intensity of disturbance that is important. That is why the data sheets also note the degree of disturbance. For example, it is widely believed that cattle grazing is an essential component of vernal pool grassland management; however, the timing and intensity of grazing needs to be monitored and adapted to maximize the benefits of grazing and minimize potential adverse effects.

It is important to note that the 2008 RDEIR/SDEIS does not state that disturbance is adverse. It is noted on page 3.10-51 of the 2008 RDEIR/SDEIS that most of the riparian habitat on the project site developed because of human alteration (i.e., disturbance) of the natural landscape; however, this certainly cannot be interpreted as an implication that disturbance has had an adverse effect on riparian vegetation. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-133

The comment states that the 2008 RDEIR/SDEIS provides no metric or measurements of the health of trees and shrubs and refers to lack of regeneration without providing numbers of seedling and sapling trees and shrubs. The comment further states that there is no quantitative or scientific support for the conclusion in the 2008 RDEIR/SDEIS that regeneration on the site suddenly and recently stopped, nor any support for how regeneration was purportedly used to determine biological values of vegetation cover types visited on the project site. The comment also states that the cumulative area sampled was too small of a percentage within which to compare regeneration of trees and shrubs.

The factors evaluated, including health and regeneration of trees and shrubs, as listed under the heading "Determining Overall Biological Value" on page 3 of the habitat assessment (Appendix E of the 2006 DEIR/DEIS), were evaluated qualitatively. It is not stated or implied anywhere that these factors were based on quantitative data. See also response to comment Kopper-R-121.

The field surveys are described as reconnaissance-level surveys. Quantitative data collected are listed and described under the heading "Field Survey Methods" on page 3 of the habitat assessment. These data include percent cover estimates and estimated average height and diameter at breast height of trees and shrubs. The conclusion that there is a general lack of riparian tree and shrub regeneration on the project site is based on observations made during the habitat assessment and general site reconnaissance surveys. Very few seedlings or saplings were observed and most of the cottonwoods and willows

on the site were reaching senescence at the time of the surveys in 2005. This observation was repeatedly made throughout the project site, except in the areas mapped as willow woodland and cottonwood-willow riparian forest where trees and shrubs of various sizes/ages were observed. Lack of regeneration is relevant to biological value because it indicates that the vegetation community may not persist even without project implementation, and that there would be less value to preserving habitat characterized by a dying vegetation community. In addition, tree and shrub communities that are not regenerating generally have lower structural diversity and therefore provide habitat for fewer species.

The 2008 RDEIR/SDEIS does not conclude that “trees are suddenly dying off” but notes they are reaching the end of their life spans. Regeneration has not occurred over most of the site for some time, so new recruits have not grown up to replace old and dying trees. The riparian vegetation on the project site is associated exclusively with areas that support or previously supported tailings piles. This riparian vegetation has existed only since the mining activities that created the tailings piles and basins and altered site hydrology in the 1950s and earlier. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-134

The comment states that no effort to estimate wildlife abundance is summarized in the 2008 RDEIR/SDEIS or supporting documents. The comment further states that estimating abundance requires census, sight-resight, mark-resight, capture-recapture, or scientific sampling for animals or their sign and that none of these methods were used. The comment also states that it is scientifically unacceptable to imply that wildlife abundance was estimated or even indicated by reconnaissance-level surveys covering less than 0.019% of the project site.

The EIR/EIS must provide a reasonable level of detail to enable an assessment of the effects of the project on the resources present on the project site. Wildlife abundance and diversity is based on the wildlife species, or their sign, observed during reconnaissance surveys and protocol-level species surveys conducted on the project site.

The City and USACE believe that the level of effort of the biological resources assessments performed on the project site appropriately supports this objective, and that the analysis contained in the 2008 RDEIR/SDEIS is fully complete and adequate for CEQA/NEPA purposes. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-135

The comment states that without being able to indicate or measure abundance, it was also impossible to have characterized diversity, which has a technical definition rooted in information theory and measured or indexed. The comment further states that no diversity index or measure is described in the 2008 RDEIR/SDEIS.

See response to comment Kopper-R-134. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-136

The comment provides a table demonstrating the number of hours spent per observation of raptor species in a scientific survey conducted at Altamont Pass, California. The comment states that this table demonstrates that the level of effort implemented by EDAW was much too low to detect wildlife species at meaningful levels.

The commenter’s preference for the Altamont Pass survey is noted; however, the way in which that survey was conducted does not undermine the propriety and sufficiency of

surveys conducted on the project site. See responses to comments to Kopper-R-80 through Kopper-R-84. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-137

The comment states that the table demonstrating the number of hours spent per observation of raptor species within 100 feet in a scientific survey conducted at Altamont Pass, California, shows that relying on a 100-foot survey radius doomed the EDAW habitat assessment to detect almost no raptor species, and this conclusion is based solely on survey radius. Considering a single visit per site and the single season surveyed, there was no hope the EDAW surveys would tally sufficient numbers of raptors for use in any kind of habitat evaluation or comparison among vegetation cover types. The comment further states that the same problems limited detection of all other bird species to levels that could not possibly be useful for habitat assessment or formulation of project alternatives, impact estimates, or mitigation measures.

The commenter’s preference for the Altamont Pass survey is noted; however, the way in which that survey was conducted does not undermine the propriety and sufficiency of surveys conducted on the project site. See responses to comments to Kopper-R-80 through Kopper-R-84. The impact analysis assumes that nesting raptors may be on-site. As such, Mitigation Measure 3.10-4c on page 3.10-63 of the 2008 RDEIR/SDEIS requires preconstruction surveys for nesting raptors. The impact analysis assumes that Swainson’s hawk may be present on the project site. Therefore, Mitigation Measure 3.10-4d of the 2008 RDEIR/SDEIS requires that a Swainson’s hawk mitigation plan be developed and that an assessment of habitat quality, availability, and use within the City’s planning area be conducted to determine habitat mitigation ratios. If specific data for Rancho Cordova’s Swainson’s hawk habitat are not available at the time that this mitigation measure is being implemented, the mitigation ratio shall be consistent with the 1994 DFG Swainson’s hawk guidelines included in the *Staff Report Regarding Mitigation for Impacts to Swainson’s Hawks (Buteo swainsoni) in the Central Valley of California*. Because the 2008 RDEIR/SDEIS assumes their possible presence on the project site, spending hundreds of hours counting raptor species observed at the project site would not change the impact assessment, significance conclusions, or mitigation measures required for Swainson’s hawks or other raptors. See also response to comment Kopper-R-134 and Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-138

The comment states that the 2008 RDEIR/SDEIS and supporting documents do not explain how nonnative species were factored into the determination of biological values among vegetation cover types. The commenter is not aware of any scientific basis for assigning lower biological value to environments occupied by nonnative species, and points out that there is probably not a grassland or woodland in California that does not support some nonnative species.

This comment appears inconsistent with comment Kopper-R-122, which states “...any biologist would conclude from this description that the site is degraded and of lower value to wildlife and native flora...” because grasslands are dominated by nonnative species. See response to comment Kopper-R-122.

Presence/absence of nonnative species was noted because the prevalence of nonnative vegetation can indicate a stressed environment and can lower habitat values for some plant and wildlife species. This is particularly true if nonnative species that are known to be invasive in California make up a high percentage of the vegetative cover. Although it is acknowledged in response to comment Kopper-R-122 that annual grasslands are by

definition dominated by nonnative species, most natural communities in California would not be expected to support a prevalence of nonnative vegetation, especially invasive species, if they are in good functional condition. Even among annual grasslands, those that support high percent cover of invasive species, such as medusahead, would typically be considered lower value than annual grasslands that support low cover of invasive species and higher cover of native forbs. As stated by the National Wildlife Federation (1996-2009), and by Restoration Resources (2007-2008) (which is specific to California), native plants support 10–50 times as many wildlife species as nonnative plants. Many habitat assessment methods include a metric for nonnative and/or invasive plant species cover (see *California Rapid Assessment Method for Wetlands—User’s Manual, version 5.0.2* [Collins et al. 2008], for example).

Invasive plant species are thought to lower habitat value for many reasons. They can alter ecosystem processes (e.g., fire, hydrologic, and nutrient cycles); alter soil chemistry; affect native plant community composition, structure, and interactions; affect higher trophic levels, including vertebrates and invertebrates; disrupt native plant-animal relationships such as pollination, seed dispersal, and host plant relationships; affect the genetic integrity of native species through hybridization; and reduce or eliminate habitat and food sources for wildlife (Cal-IPC 2006:2, Vitousek et al. 1996). Ultimately, however, the value of the habitat depends on the species in question. For these reasons, many factors were considered in determining the biological value of on-site habitat. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-139

The comment states that the 2008 RDEIR/SDEIS and supporting documents do not explain how presence/absence of permanent or temporary surface water was used to assess biological value, nor provide a scientific basis for doing so. The comment further states that it makes no sense to include this as a factor for determining biological value. For example, why would one assign lower biological value to oak woodland that lacked surface water when oak woodlands are not supposed to include surface water and are of no inherently lesser value than wetlands? According to the commenter, EDAW is being arbitrary and unscientific in assigning values to vegetation cover types in this manner.

The presence or absence of permanent or temporary surface water was of interest for several reasons. Primarily, it was of interest to determine whether the hydrology to support riparian vegetation was still present. In many areas that currently support riparian vegetation, water features that once existed are no longer present and the riparian vegetation is not regenerating (see response to comment Kopper-R-121 regarding changes in hydrology). A riparian vegetation community that is not sustainable is less valuable than one that has the supporting hydrology to sustain it. The purpose of the Impact Minimization Alternative is to preserve a greater proportion of on-site habitat to benefit wildlife species. Preserving a vegetation community that might not be sustained over the long term would provide less value to wildlife. The riparian habitat that was selected for addition to the preserve area under the Impact Minimization Alternative is fed by three ephemeral drainages and supports seasonally inundated wetlands. Riparian vegetation is regenerating in this area; therefore, it appears to have the hydrological support needed to sustain the riparian vegetation.

Also, the presence of surface water at particular times of year is a crucial habitat element for some special-status species (e.g., northwestern pond turtle, western spadefoot, bats). Therefore, it was important to note whether water sources were present and whether they

appeared to be seasonal or permanent. The lack of permanent surface waters on the project site lowers the site's value as habitat for some species.

The 2008 RDEIR/SDEIS and supporting documents do not suggest that oak woodlands should support surface water, or that oak woodlands have inherently lower habitat value than wetlands. The value of the habitat depends on the specific needs of the species in question. That is why many factors were considered in determining the biological value of on-site habitat.

Furthermore, the methods used to assess impacts on wildlife follow professionally accepted methodologies. The assertion that EDAW is being "arbitrary and unscientific" is unfounded. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-140

The comment states that the habitat assessment performed by EDAW was unscientific and flawed in many ways, invalid as a scientific tool for determining biological values or characterizing habitat types, and inappropriate for formulating mitigation measures or the Impact Minimization Alternative.

The habitat assessment was not used to formulate mitigation measures. The commenter provides no evidence that the habitat selected for the Impact Minimization Alternative is less biologically valuable than other habitats on the project site; nor does the commenter provide any reasoning to suggest that some other habitat should have been selected for this alternative. As stated previously, the habitat characterizations provided in the 2008 RDEIR/SDEIS provide greater detail than is typically provided in a CEQA/NEPA document. The City and USACE believe that the biological resources assessment is scientifically sound, fully complete, and adequate for the purposes of evaluating project-related impacts in a CEQA/NEPA document. See also response to comment Kopper-R-139. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-141

The comment refers to Impact 3.10-1 and states that according to the 2008 RDEIR/SDEIS, the project would destroy nearly 41 acres (or 59%) of the existing wetlands (Table 4). The comment states that these losses cannot be replaced, unless these types of wetlands were to be restored at locations where they used to exist but were destroyed by other human activities. The commenter asserts that attempting to restore these wetlands at other locations would be inappropriate because of unsuitable soil and hydrologic conditions, or because other existing vegetation cover types would be destroyed in the process.

It is unclear what table the comment refers to as "Table 4." Table 3.10-3 of the 2008 RDEIR/SDEIS lists the total project impacts on existing wetlands and waters of the United States as 43.028 acres (approximately 62%). The commenter's opinion is noted. Both USACE and City policy allow compensatory mitigation of filled wetlands and other waters of the United States as a means of achieving "no net loss" of wetlands and other waters of the United States. Restoration is one form of compensatory mitigation, as is creation of wetlands.

Compensatory mitigation proposed in the 2008 RDEIR/SDEIS includes both creation and restoration of approximately 17.9 acres of wetlands within the proposed on-site wetland preserve in the footprints of historic vernal pools that were filled between 1961 and 1971 as a result of land uses associated with the Kappa/Gamma Test Complexes. In addition, mitigation credits have been purchased at the Clay Station Mitigation Bank, and the

project applicant(s) would preserve an additional 22 acres of wetland habitat at an off-site location known as the Cook Property. As noted in the most recent version of the draft MMP, updated in 2009 (attached as Appendix Q to this FEIR/FEIS), based on agency comments, the design of the vernal pool and seasonal wetland swales was shifted so that the MMP would focus on restoring historic features that were eliminated or degraded by past land practices. The location of historic wetland features was determined by examining wetland signatures on historic aerial photographs, conducting field visits, and conducting soil surveys on-site. The secondary focus became creating vernal pools in the most appropriate areas within the wetland preserve. As a result, 13.449 acres of vernal pools and 0.752 acre of seasonal wetland swale habitat are proposed in the current 2009 draft MMP.

However, as noted on page 3.10-72 of the 2008 RDEIR/SDEIS, the value of the region as it relates to the long-term viability of these resources would be substantially diminished even with implementation of the proposed mitigation and regional enforcement of the USACE “no-net-loss” standard. As noted on page 3.10-45, the RDEIR/SDEIS indicates that the extent of habitat loss and degradation is extensive and contributes significantly to the loss of this habitat type in the region. Indirect impacts also are identified as remaining significant and unavoidable. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-142

The comment states that the 507-acre wetland preserve would be considered mitigation for project impacts, but that it consists of grassland and wetlands that already exist and would not in any way be improved or enhanced by the project. The comment further states that the project would cause indirect impacts that would degrade the environmental conditions within the preserve. The comment provides the following examples of indirect impacts that would occur: habitat fragmentation leading to diminished value to animal and plant populations, prevention of natural disturbance cycles, intrusion of people and pets from urban areas, and intolerance of nuisance wildlife such as coyotes, mountain lions, and raccoons.

On-site preservation is one element of the proposed mitigation. However, the project applicant(s) are required to provide compensatory mitigation for the unavoidable impacts to wetlands and other waters of the United States and waters of the state that would be lost. See response to comment Kopper-R-141 above. Indirect impacts on the preserved habitat are considered in the analyses of impacts on wetlands and other waters of the United States and waters of the state, federally listed vernal pool invertebrates, VELB, Swainson’s hawk, western spadefoot, Greene’s legenera, and in the cumulative impacts analysis. Mitigation measures to reduce indirect impacts on the preserved habitat include low-impact development features, preservation of microwatersheds, installation of fencing around the preserve, construction of Con-Span® bridge systems, bioswales, and management of invasive plants. However, as noted on page 3.10-65 of the 2008 RDEIR/SDEIS, indirect impacts would remain significant and unavoidable because of the removal of approximately 3,300 acres of potential habitat for special-status wildlife, and because the associated fragmentation of surrounding potentially suitable habitat cannot be fully mitigated. As stated in the 2008 RDEIR/SDEIS, the amount of habitat lost and the resulting fragmentation of habitat preserved could potentially contribute to the decline of vernal branchiopods, VELB, Swainson’s hawk, and western spadefoot populations in the region. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

The comment states that the 2008 RDEIR/SDEIS implies that the project and its proposed preserve would benefit wetlands conservation in the region because it is the only remaining hope to achieve connectivity with the agency-proposed conservation area identified in A Conceptual-Level Strategy for Avoiding, Minimizing, & Preserving Aquatic Resource Habitat in the Sunrise-Douglas Community Plan Area (June 2004). The comment states that the conceptual-level strategy was not provided as an appendix, and it is unknown what agencies proposed the plan or what chance it has of coming to fruition; therefore, it is inappropriate for the 2008 RDEIR/SDEIS to imply that the project's impacts would be offset by achieving connectivity between the proposed wetland preserve and land protected by unstated means, and to unstated levels, in a conceptual plan consisting of nothing more than a map.

The discussion regarding the *Conceptual Level Strategy for Avoiding, Minimizing, & Preserving Aquatic Resource Habitat in the Sunrise Douglas Community Plan Area* was added in response to comments from USFWS. A *Conceptual Level Strategy for Avoiding, Minimizing, and Preserving Aquatic Resource Habitat in the Sunrise-Douglas Community Plan Area* was developed in 2004 by representatives of EPA, USACE, and USFWS to address concerns regarding the impact of development in the Sunrise Douglas Community Plan area, which includes the project site. The agencies mapped areas for preservation that they deemed "... the smallest that would be acceptable to the Agencies and are predicated on ten principles and standards that would be followed by developers and planners as each element of the overall development proceeds" (EPA, USACE, and USFWS 2004). These areas were selected based on the "best professional judgment" of the agency representatives and information regarding "site-specific biology and hydro-geomorphology." Particular emphasis was given to preserving vernal pool complexes and corridors of Morrison Creek and Laguna Creek. Preservation objectives included maintaining natural (existing) watershed integrity and flows to downstream reaches, and maintaining corridors and large areas for wildlife and the propagation of flora and, specifically, preserving "vernal pool hydrology and integrity to benefit listed plants and invertebrates" (EPA, USACE, and USFWS 2004).

Contrary to the commenter's assertion, the 2008 RDEIR/SDEIS does not claim that the proposed on-site wetland preserve would benefit wetlands conservation in the region because of its connectivity with the agency-proposed conservation area identified in the conceptual-level strategy, or that it is the last remaining hope of achieving such connectivity. The 2008 RDEIR/SDEIS also does not state or imply that project impacts would be offset by achieving connectivity with the conservation area identified in the conceptual-level strategy. Rather, the 2008 RDEIR/SDEIS discussion provides geographic and ecosystem context to the analysis of wetland impacts and states that project design provides an opportunity to connect with a preserve area that is identified both in the conceptual-level strategy and in the City General Plan, thereby providing an opportunity for a larger, contiguous habitat patch. This proposed preserve area is the only proposed preserve adjacent to the project site; all other adjacent habitat is either already developed, approved for development, or planned for development. Habitat connectivity is considered a benefit of habitat preserves for many reasons, including increased opportunities for dispersal and genetic exchange, so it is important to provide opportunities for off-site connectivity where they exist and are feasible. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

The comment states that the discussion in the 2008 RDEIR/SDEIS on the likely postconstruction performance of the wetland preserve relies on hydrologic modeling,

assumptions, and data on which the modeling was based. The commenter believes that it would be unscientific folly to assume that the model's predictions are correct before they are tested by reality. The comment further states that any claims that construction designs of bridges and stormwater retention basins would minimize interference with wetland processes and wildlife movement should be regarded as speculative until proven otherwise. The commenter calls for a monitoring plan to measure performance, with the results linked to thresholds tied to a performance bond.

Mitigation Measure 3.10-1a of the 2008 RDEIR/SDEIS requires that the project develop and implement a wetland MMP approved by USACE, the Central Valley RWQCB, and the City. The wetland MMP for jurisdictional wetland features must be consistent with USACE's December 30, 2004, *Habitat Mitigation and Monitoring Proposal Guidelines*. The MMP must include the following:

- ▶ intensive, early monitoring of hydrology (this can be phased out as created wetlands are achieving target standards);
- ▶ a CRAM analysis conducted annually for 5 years after any construction adjacent to assessment areas, to determine whether these areas are retaining functions ;
- ▶ analysis of CRAM data, including assessment of potential stressors, to determine whether any remedial activities may be necessary;
- ▶ corrective measures if performance standards are not met;
- ▶ monitoring of vegetation communities and targeted special-status species as success criteria for hydrologic functions have become established and the creation site “matures” over time;
- ▶ reference locations for comparison to compensatory vernal pools to document success;
- ▶ adaptive management measures to be applied if performance standards are not being met;
- ▶ parties responsible for monitoring and preparing reports; and
- ▶ parties responsible for receiving and reviewing reports and for verifying success or prescribing implementation or corrective actions.

Additional monitoring of preserved and created vernal pools would continue for 10 years, beginning with the first rainy season after construction.

The final wetland MMP would require that remedial action be taken if final success criteria are not met, with maintenance and monitoring to continue until success criteria are met and USACE gives final project confirmation. As noted in the most recent version of the draft MMP, updated in 2009 (attached as Appendix Q to this FEIR/FEIS), CRAM analysis would be conducted to track changes in wetland function and values and to help identify any sources of adverse impacts. The results would help determine the most appropriate course of action to ensure that the vernal pools meet the established success criteria. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

- Kopper-R-145 *This comment relates to Impact 3.10-2 (Loss and Degradation of Sensitive Natural Communities) in the 2008 RDEIR/SDEIS and indicates agreement that this impact would be significant, but disagrees that conclusive evidence was provided that riparian vegetation is senescing and will not persist much longer. The comment states that it is suspect that after many decades—perhaps more than a century—thousands of trees and shrubs suddenly begin dying off right when a corporation wants to construct residential units on the site.*
- The conclusion that there is a general lack of riparian tree and shrub regeneration on the project site is based on observations made during the habitat assessment and general site reconnaissance surveys. See responses to comments Kopper-R-121 and Kopper-R-133. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.
- Kopper-R-146 *This comment relates to Impact 3.10-3 (Loss of Oak Trees and Oak Woodland) in the 2008 RDEIR/SDEIS and indicates agreement that this impact would be significant.*
- The comment is noted.
- Kopper-R-147 *This comment relates to Impact 3.10-4 (Loss and Degradation of Special-Status Wildlife Species Habitat) in the 2008 RDEIR/SDEIS. The commenter states that the document does not consider all the special-status species that could or actually do use the site, so the impact assessment is deficient. The comment lists several species already listed in comments Kopper-R-86, Kopper-R-87, Kopper-R-96, Kopper-R-97, and Kopper-R-109 through Kopper-R-117 that the commenter believes should have been addressed. The comment further states that most species discussed in the 2008 RDEIR/SDEIS are minimized in estimated impacts and that the document should be revised to address the species listed and reevaluate the impact assessments of others.*
- Regarding the determination of species analyzed in the 2008 RDEIR/SDEIS, see responses to comments Kopper-R-86, Kopper-R-87, Kopper-R-96, Kopper-R-97, and Kopper-R-109 through Kopper-R-117. Furthermore, the commenter provides no specifics about which species’ impacts he believes were minimized or how that was done. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.
- Kopper-R-148 *The comment states that the 2008 RDEIR/SDEIS is incorrect in concluding that Swainson’s hawk is the only listed species to use the site because the commenter expects peregrine falcon to use the site. The comment further states that he has proved the 2008 RDEIR/SDEIS wrong in concluding that Cooper’s hawk is unlikely to nest on the site because the commenter saw Cooper’s hawk on the site during the breeding season.*
- The 2008 RDEIR/SDEIS correctly concludes that peregrine falcon and Cooper’s hawk are unlikely to nest on the project site. In the unlikely event this does occur, they would be discovered during preconstruction surveys for nesting raptors required under Mitigation Measure 3.10-4c, page 3.10-63 of the 2008 RDEIR/SDEIS. See responses to comments Kopper-R-98 and Kopper-R-105. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.
- Kopper-R-149 *The comment states that it is misleading for the 2008 RDEIR/SDEIS to state that western spadefoot has not been documented on the site when no surveys for this species have been conducted on the site.*

The 2008 RDEIR/SDEIS assumes presence of western spadefoot on the project site. See responses to comments Kopper-R-81 and Kopper-R-93. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-150

The comment states that it is misleading of the 2008 RDEIR/SDEIS to refer to habitat on the site as “potential” habitat for western spadefoot because it has been documented all around the project site. The comment states that such habitat is almost certain to occur on the site, so the project site’s vernal pools should be regarded as “habitat” rather than “potential habitat.”

The 2008 RDEIR/SDEIS assumes that western spadefoot are present on the project site. See response to comments Kopper-R-81 and Kopper-R-93. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-151

The comment expresses agreement with the conclusions in the 2008 RDEIR/SDEIS that project impacts on valley elderberry longhorn beetle, nesting and foraging raptors, and western spadefoot would be significant.

The comment is noted. The comment states agreement with the impact conclusions of the 2008 RDEIR/SDEIS regarding certain special-status species.

Kopper-R-152

The comment expresses agreement with the conclusion in the 2008 RDEIR/SDEIS that the project would significantly and adversely affect populations of Greene’s legener.

The comment is noted.

Kopper-R-153

The comment states that the 2008 RDEIR/SDEIS does not discuss the environmental impacts of losing so much annual grassland. The comment refers to such a loss as a serious impact because annual grasslands support some of the most diverse assemblies of plant and wildlife species in California, many of which are threatened and endangered. The comment further states that grasslands are widely known among biologists to be very important as foraging, nesting, and breeding habitat for a wide variety of wildlife species, and have been shown to support high bird species richness compared to other vegetation types. The commenter states that grasslands have been reduced in California from their original extent by about 90 percent, representing a tremendous loss of plant and wildlife habitat. The comment states that CNPS believes grasslands are rare locally, regionally, and statewide, especially considering cumulative losses that have occurred over the past 150 years, and that the decline of grasslands across the United States has resulted in an emerging conservation crisis of declining distribution and abundance of grassland birds. The comment states that loss of grassland on the project site should be considered a significant impact.

The 2008 RDEIR/SDEIS addresses the substantial loss of annual grassland habitat with regard to foraging habitat for Swainson’s hawk and other raptors, and in the cumulative impacts analysis. The loss of Swainson’s hawk foraging habitat is considered a significant impact and Mitigation Measure 3.10-4d of the 2008 RDEIR/SDEIS commits the project applicant(s) to preserve suitable foraging habitat acreage in Sacramento County to ensure 1:1 compensatory mitigation of habitat value for Swainson’s hawk foraging habitat lost as a result of the project. The cumulative impacts discussion acknowledges that the project would contribute significantly to the regional loss of this biological resource (2008 RDEIR/SDEIS, page 3.10-71).

There is no CEQA (or NEPA) regulatory threshold or case law that requires an evaluation of impacts on annual grassland beyond the degree to which it is already addressed in the 2008 RDEIR/SDEIS. Annual grassland is not a sensitive natural community and remains regionally abundant despite the high rate of conversion.

The grasslands referred to by the commenter that have been reduced by 90% in California and are recognized as sensitive or rare natural communities are native grasslands. Native grasslands are dominated by perennial native grass species; by contrast, annual grassland, including that present on the project site, is dominated by nonnative species and is the result of a massive biological invasion that has nearly wiped out California's native grasslands. Although annual grassland provides important habitat for many species, it is not generally considered a sensitive plant community or a high priority for conservation. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-154

The comment states that the cumulative impacts discussion in the 2008 RDEIR/SDEIS begins with an inappropriate premise in establishing its scope as the City's planning area, which is an arbitrary area that has no basis in biology.

The portion of the cumulative impacts discussion that addresses past, present, and reasonably foreseeable future projects is based on existing, proposed, planned, and approved projects within the City's planning area for two reasons: (1) those are the development projects in the project area for which details regarding biological resources impacts are available, and (2) these projects encompass the planning area over which the City has influence. The cumulative impacts area is consistent with CCR Section 15130(b)(1) of the State CEQA Guidelines, which states that an analysis of cumulative impacts can use a summary of projections contained in a general plan or related planning document (in this case, the City General Plan).

The geographic extent of cumulative impacts on vernal pools and biological resources associated with wetlands and other waters of the United States includes the planning area for the City General Plan, as well as other surrounding areas that support biological resources values and functions similar to those of the project site (page 3.10-68 of the 2008 RDEIR/SDEIS). The 2008 RDEIR/SDEIS also states that the project would result in degradation of wildlife habitat by developing new facilities that, when combined with other habitat impacts occurring from development within the *region* [emphasis added], would result in significant cumulative impacts. Cumulative impacts are considered over the whole region, as the following paragraph taken from page 3.10-71 of the 2008 RDEIR/SDEIS indicates:

The project would result in the loss of nearly 1,500 acres of annual grassland habitat, which serves as foraging habitat for raptors, including Swainson's hawk. This loss would contribute significantly to the *regional* loss of this biological resource. Removal of large expanses (867 acres) of woodland and riparian habitat from the project site would contribute substantially to the *regional* loss of these habitat types that provide important functions to special-status plant and animal species. Woodland and riparian habitat within the *region* is rapidly declining and a large portion has already been lost to development and other land use modifications. [Emphasis added.]

The 2008 RDEIR/SDEIS concludes that the project would result in a cumulatively considerable incremental contribution to several significant cumulative biological resources impacts: the loss and degradation of sensitive habitats, habitat for special-status

wildlife, and habitat for special-status plants, and the loss/displacement of special-status wildlife; and that these impacts are significant and unavoidable. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-155

The comment states that the discussion of cumulative impacts in the 2008 RDEIR/SDEIS appeared grossly simplistic and narrow, focusing on wetland acreages and Swainson’s hawk foraging habitat as if they are the only cumulative impacts that matter, while in fact many complex cumulative impacts should be addressed.

Cumulative impacts are considered for all habitat types on the project site, including annual grassland, woodland and riparian habitats, and wetlands and other waters. Please see response to comment Kopper-R-154. Table 3.10-5 in the 2008 RDEIR/SDEIS lists the acreage of five habitat types, and the listed plant and wildlife species they support, that could be affected by implementation of the City General Plan and to which the Rio del Oro project could contribute a cumulatively considerable incremental effect to significant cumulative biological resources impacts. Therefore, the commenter is incorrect in stating that the 2008 RDEIR/SDEIS considers only Swainson’s hawk and wetlands in the cumulative impact analysis. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-156

The comment states that according to the National Research Council (1986), cumulative environmental effects can be defined as (1) time-crowded perturbations (perturbations are so frequent that the effects of one have not dissipated before the next perturbation); (2) space-crowded perturbations (effects overlap spatially); (3) synergisms (reactions between different types of perturbations cause qualitatively and quantitatively different ecological responses); and (4) incremental and decremental effects in which the functional integrity of the species or resource is eroded. The comment states that the 2008 RDEIR/SDEIS addresses only space-crowded perturbations and only for wetlands and Swainson’s hawks, and only within an arbitrarily defined political boundary.

See responses to comments Kopper-R-154 and Kopper-R-155 regarding the cumulative impact areas and other biological resources addressed in addition to wetlands and Swainson’s hawk. The comment on establishing an appropriate definition for cumulative impacts is noted. However, the 2008 RDEIR/SDEIS appropriately follows the State CEQA Guidelines, which state that the discussion of cumulative impacts shall reflect the severity of impacts and their likelihood of occurrence, but need not provide as great detail as provided for effects attributable to the project alone and shall be guided by standards of practicality and reasonableness (CCR Section 15130[b]). The analysis performed was practical and reasonable; thus, identifying and evaluating cumulative environmental effects at the level of detail suggested by the commenter is unnecessary. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-157

The comment states that to perform a quantitative assessment of cumulative impacts for each species, the thresholds of significance need to be established along with margins of safety around these significance thresholds. The comment further states the need to identify the temporal (set by the recovery time of the environmental resource at issue) and spatial scales of the assessment and suggests that the cumulative effects analysis should extend over the amortized life of the project or permit duration. The comment further suggests that because housing developments are permanent, the cumulative effects analysis should extend until all land in the region has been converted to houses, and the spatial scale should be set by estimating the size of the adult male’s home range

for the largest carnivore, the size of the area normally occupied by a species' population, or the watershed area.

See responses to comments Kopper-R-154 and Kopper-R-156. It should also be noted that the cumulative impacts analysis area in the 2006 DEIR/DEIS focused on projects proposed within the Laguna Formation. This was revised in the 2008 RDEIR/SDEIS to be more encompassing, by including the City's entire planning area and surrounding areas that support similar biological resources functions. Restricting the cumulative impacts analysis to either the Laguna Formation or the Morrison Creek watershed would have excluded several of the past, present, and future planned projects listed in Table 3.10-4 of the 2008 RDEIR/SDEIS, which would each affect some of the same biological resources as the Rio del Oro project. The 2008 RDEIR/SDEIS appropriately follows the State CEQA Guidelines, which state that the discussion of cumulative impacts shall reflect the severity of impacts and their likelihood of occurrence, but need not provide as great detail as provided for effects attributable to the project alone and shall be guided by standards of practicality and reasonableness (Section 15130[b]).

Some of the commenter's suggested concepts for determining the cumulative impacts area would exceed what is reasonable or practical for a cumulative impacts analysis; yet they would not necessarily result in a more inclusive list of existing, proposed, planned, and approved projects that would contribute to the cumulative impacts of similar biological resources. For example, it can be difficult to determine individuals that constitute a population, let alone the size of the area a population normally occupies. Even if this information were carefully investigated and determined with a reasonable degree of confidence, there is no guarantee that this would lead to a more appropriate or more inclusive cumulative impacts area than that considered in the 2008 RDEIR/SDEIS. One reason is that there is probably no single species that relies on the whole suite of biological resources that would be affected by the project. Therefore, the area normally occupied by any species' population, or a top carnivore's normal home range, would probably be smaller than the total of the City's planning area plus surrounding areas supporting similar biological resources functions—that is, the area that is already evaluated in the 2008 RDEIR/SDEIS. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-158

The comment states that Bedford and Preston (1988) maintains that the ecological system, rather than the project footprint, should set the bounds of the cumulative impacts analysis and all projects affecting the resource at issue should be considered within the watershed, landscape, or region in which the resource's formation, distribution, and biogeochemistry are meaningful. The comment further states that, according to MacDonald (2000), the cumulative impacts analysis should identify options for modification, mitigation, planning, and restoration within the plan area and identify key data gaps and monitoring needs. The comment states that the DEIR performed some of these steps, but not to levels described by Bedford and Preston or MacDonald.

The cumulative analysis performed is consistent with the State CEQA Guidelines. See responses to comments Kopper-R-154, Kopper-R-156, and Kopper-R-157. No guidelines under CEQA or NEPA and none of the local, state, and federal agencies charged with overseeing the biological resources at issue suggest that cumulative impacts need to follow the suggestions of Bedford and Preston (1988) or MacDonald (2000) suggested by the commenter. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-159

The comment suggests that the 2008 RDEIR/SDEIS should address the project's contribution to cumulative impacts on animal movement, but that no attempt was made to evaluate the ability of wildlife and plants to move or disperse between wetlands remaining after buildout of all projects in the region, between the isolated elderberry shrub preserves, or along the disrupted streams such as Morrison Creek.

See response to comment Kopper-R-118. Morrison Creek would not be disrupted by the project and would be maintained throughout the project site, mostly as is, but with some alteration to the southwest portion outside the proposed wetland preserve area. This portion would be reconfigured to connect hydrologically with the constructed drainages and to allow gravity flows away from the project (no pumps). The improved channel would slope westerly at approximately 1% from elevation 175 feet to elevation 142 feet over a length of 2,000 feet. The downstream end of the improved channel would include erosion control materials (e.g., riprap) to reduce the velocity of erosive runoff, but would otherwise retain a natural substrate, meandering channel. Peak flows in Morrison Creek would not increase with project implementation (pages 3.10-27 and 3.10-28 of the 2008 RDEIR/SDEIS). The off-site connections to Morrison Creek to the southwest and east of the project site would be maintained. In addition, Con-Span[®] bridge systems would be used over Morrison Creek so that the creek would provide a movement corridor through the site for terrestrial wildlife even during peak flows.

The 2008 RDEIR/SDEIS acknowledges (on page 3.10-56) that relocating elderberry shrubs to land designated as Open Space/Preserve would not be expected to result in any measurable benefit to the species because the conservation areas would eventually be surrounded by development and isolated from larger areas of potential habitat. This is part of the reason that cumulative impacts would be significant and unavoidable even after the application of mitigation.

In addition, the 2008 RDEIR/SDEIS acknowledges (on page 3.10-55) that even with establishment of the 507-acre wetland preserve, indirect impacts on potential habitat for federally listed vernal pool invertebrates are expected because of increased urbanization on surrounding land. This is part of the reason that cumulative impacts would be significant and unavoidable even after the application of mitigation.

See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-160

The comment states that no consideration was given to changes in water and other resources moving downstream along Morrison Creek into known occupied giant garter snake habitat. The comment asks what changes resulting from the project filling a portion of Morrison Creek would do to water levels and water quality in habitat known to be occupied by giant garter snake. The comment states that there needs to be an assessment of water flow, nutrient loads, and animal movements that giant garter snake relies on and potential contaminants introduced by the project.

As explained on pages 3.10-27 and 3.10-28 of the 2008 RDEIR/SDEIS, the project is designed to direct flows to the drainage corridors that would be created throughout the project site. These drainage corridors include water quality treatment swales and basins to treat stormwater and nuisance flows before they are released into Morrison Creek. The project would include constructed detention basins to attenuate runoff flows to predevelopment levels so that peak flow rates would not change. Urban runoff would be treated as required by state and local stormwater quality standards in the detention basins and drainage channels proposed to be constructed within the project site. Incorporating

low-impact development features, along with the required water quality features, would aid in reducing flows to near natural conditions.

Water quality is addressed in detail in Section 3.4 of the 2006 DEIR/DEIS. The project is required to apply BMPs as described in Mitigation Measure 3.4-3 of the 2006 DEIR/DEIS. Because the project incorporates measures to maintain water quality and flow conditions, project implementation would not result in downstream changes in water quality, flow regime, or water levels that would significantly affect habitat known to be occupied by giant garter snake.

Contrary to the commenter's assertion, the portion of Morrison Creek on the project site is currently a seasonal feature, and no potential habitat for the giant garter snake is present. Even so, the project would not fill any portion of Morrison Creek, so habitat known to be occupied by giant garter snake would not be affected by fill. Implementation of BMPs and other requirements of the project's Section 401 permit would help ensure that downstream water quality is not compromised. Further, according to the CNDDDB, the closest recorded occurrence of the giant garter snake is located in the vicinity of Elk Grove, almost 13 miles southwest of the project area. No adverse impacts on giant garter snake habitat are expected. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-161

The comment states that the 2008 RDEIR/SDEIS should address the potential impacts of facilitating the downstream spread of southern watersnake, a species that can compete with and consume local amphibian and reptile species, including giant garter snake. The comment suggests that the project could cause southern watersnake to spread from Lake Natoma to habitat known to be occupied by giant garter snake downstream of the project site, citing a statement by ECORP Consulting that says developments in dredge tailings tend to transform ephemeral water channels into perennial water channels, which are favorable to southern watersnake.

An introduced population of Florida watersnake (*Nerodia fasciata pictiventris*) has been documented and studied within both Humbug Creek and Willow Creek (in Folsom) including Willow Creek's confluence with Lake Natoma (Balfour et al. 2007, Stitt et al. 2005). The potential for this species to adversely affect the giant garter snake (e.g., through competition, parasites) has been recognized by both USFWS and DFG. At present the lands that lie between the project site and the Lake Natoma area are relatively arid, dominated by seasonal wetlands, and do not provide suitable habitat for this species. Assessing project-related impacts on downstream giant garter snake populations in Elk Grove is too speculative for analysis. Moreover, with implementation of the Rio del Oro project, the ephemeral drainage channels that currently exist in the areas of dredge tailings would be filled, not converted to perennial drainage channels. Drainage parkways would be constructed throughout the project site to convey urban runoff from the site, but these drainage parkways would have no connection to Lake Natoma. Therefore, there is no reason to expect the project to facilitate the spread of southern watersnake into habitat known to be occupied by giant garter snake. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-162

The comment states that the 2008 RDEIR/SDEIS should address cumulative impacts on wildlife resulting from project needs for water and electric power. The comment calls the cumulative impacts discussion inadequate because it is only seven paragraphs long and addresses infrastructure only in terms of roadways referenced in other EIRs. The comment states that water and electric power impacts, for example, should have been addressed in cumulative impacts.

There is no requisite length for a cumulative impacts analysis under CEQA or NEPA, so the fact that this analysis is seven paragraphs long is not evidence of inadequacy. The only off-site water infrastructure that would be developed specifically for the Rio del Oro project would be constructed in the rights-of-way of existing roads and other developed areas and would therefore result in less-than-significant impacts. This infrastructure is addressed in Section 3.5, “Utilities and Service Systems—Water Supply,” of the 2008 RDEIR/SDEIS and in Section 3.6, “Public Services,” of the 2006 DEIR/SDEIS. No power infrastructure would be developed specifically and solely for this project, and separate environmental review processes would be required for any power distribution facilities that would be added in the region.

Kopper-R-163

The comment states that the project’s water demand would be 8,891 afy at buildout. Using the assumption that all of this demand would come from surface water that could ultimately be used for crop irrigation, the commenter states that the project would use enough water to remove about 2,223 acres of farmland that could provide prime foraging habitat to Swainson’s hawk, which would contribute to the cumulative impact of water demand on Swainson’s hawk.

The information in this comment is inaccurate. Water supply for the project is from GET water and conjunctive-use water in Zone 40 (see Section 3.5, “Utilities and Service Systems—Water Supply,” of the 2008 RDEIR/DSEIS). The GET water is not used to grow crops. There is no way to determine that the Zone 40 conjunctive-use water used by the project would otherwise be used to grow crops that would provide foraging habitat for Swainson’s hawk, although that is unlikely. Trying to make such a determination is not practical or reasonable for the cumulative impacts analysis for this project. An analysis of impacts too speculative for meaningful consideration is not required under CEQA (CCR Section 15145) or NEPA.

Kopper-R-164

The comment expresses the concern that an estimated 446 acres of Swainson’s hawk foraging habitat would be degraded if electricity for Rio del Oro were to come from natural gas-fired power plants. The estimate is based on calculations presented in this comment (which assume that at buildout Rio del Oro would demand 63.8 MW per year for dwelling units alone) and the assumption that water used to irrigate farmland (foraging habitat) would be diverted to the future power plant. Water is used as part of the cooling process for gas-fired power plants.

The potential impact suggested in this comment is highly speculative and cannot be substantiated. The City is not required to evaluate such impacts. (See State CEQA Guidelines, Section 15145.) There is no way to verify that water used for cooling at gas-fired power plants as a result of project energy demands would otherwise be used to grow crops that would provide habitat for Swainson’s hawk. There is also no way to substantiate a direct loss of wetlands attributable to energy demands resulting from project implementation. Attempting to make such determinations is speculative and is not practical or reasonable for the cumulative impacts analysis for this project. An analysis of impacts too speculative for meaningful consideration is not required under CEQA (CCR Section 15145) or NEPA.

Kopper-R-165

The comment requests that the 2008 RDEIR/SDEIS be revised to address potential impacts on raptors and other birds to reflect the assumption that wind turbines could be used to provide a portion of the project’s electricity demands. Annual mortality estimates are provided in the comment based on the assumption that the project would require 63.8 MW of electric power and that 20% of that would come from wind energy.

The potential impact suggested in this comment is highly speculative and cannot be substantiated. The City is not required to evaluate such impacts. (See State CEQA Guidelines, Section 15145.) It cannot be determined at this time how much, if any, of the project's energy demands would be met by wind generation. In addition, any impacts on birds resulting from wind generation would be addressed in the environmental impact assessments for specific wind energy projects. This type of impact assessment is beyond the scope of what is practical or reasonable for the cumulative impacts analysis for this project. An analysis of impacts too speculative for meaningful consideration is not required under CEQA (CCR Section 15145) or NEPA.

Kopper-R-166

The comment states that it is unclear what residual significant impacts are or how extensive project impacts would be because the impacts assessment of the 2008 RDEIR/SDEIS (page 3.10-72) relied largely on unscientific methods to determine habitat values and wildlife species occurrences and abundance. However, the commenter agrees with the conclusion that impacts would be significant and unavoidable.

Residual significant impacts are those project impacts that remain significant even after the application of mitigation (i.e., those impacts that could not be fully mitigated to a less-than-significant level). This definition, along with definitions of other terms used in the DEIR/DEIS, is provided on page 3-5 of the 2006 DEIR/DEIS. The mitigation measures presented in the 2008 RDEIR/SDEIS would reduce the magnitude of impacts on biological resources; however, the 2008 RDEIR/SDEIS acknowledges that project impacts on wetlands and other waters of the United States and waters of the state, riparian habitat, vernal pool invertebrates, VELB, Swainson's hawk, and western spadefoot would remain significant and unavoidable after application of mitigation (see pages 3.10-45 and 3.10-65 of the 2008 RDEIR/SDEIS). These are residual significant impacts. See responses to comments Kopper-R-80 through Kopper-R-140, which address the adequacy of impact assessments for wildlife species and habitats. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-167

The comment states that it is premature of the 2008 RDEIR/SDEIS to claim that the project complies with Policy N.R.1.1 of the City General Plan (calling for protection of rare, threatened, and endangered species and their habitats in accordance with state and federal law) because take permits have yet to be issued and mitigation plans have yet to be finalized and circulated. The comment further states that the 2008 RDEIR/SDEIS did not address the Migratory Bird Treaty Act, although many protected species would be adversely affected by the project.

Appendix P of the 2008 RDEIR/SDEIS provides an extensive analysis and evidence of how the Rio del Oro project is consistent with City General Plan Policy NR.1. The commenter provides no countering analysis that this consistency determination is not supportable (see 2008 RDEIR/SDEIS Appendix P pages P-1 through P-4). As identified in Appendix P, the 2008 RDEIR/SDEIS provides mitigation measures (see Mitigation Measures 3.10-1a and b, 3.10-2a and b, 3.10-3a through d, and 3.10-5) to protect rare, threatened, and endangered species and their habitat associated with project site development, consistent with the intent of Policy NR.1.1. The draft mitigation plans for the project's impacts on wetlands and other waters of the United States and waters of the state and VELB were included in the 2008 RDEIR/SDEIS as Appendices Q and R, respectively. These mitigation plans must be approved by the applicable regulatory agencies (see 2008 RDEIR/SDEIS Mitigation Measures 3.10-1a and 3.10-4b). It should also be noted that the project applicant(s)' wetland MMP has been refined, but not

substantially changed, since the release of the 2008 RDEIR/SDEIS as a result of consultation with USACE and EPA. The revised mitigation plans are attached to this FEIR/FEIS as Appendices Q and R, respectively.

Consistent with Policy NR.1.1, the project is required to comply with the state and federal regulatory requirements and obtain required permits (see 2008 RDEIR/SDEIS Mitigation Measures 3.10-1a, 3.10-2a, 3.10-2b, 3.10-4a, 3.10-4b, 3.10-4d, and 3.10-5). The fact that the project would result in certain significant and unavoidable impacts on biological resources under CEQA does not mean that it is inconsistent with Policy NR.1.1. This policy requires compliance with state and federal law. The City may approve a project with significant and unavoidable biological impacts under CEQA in compliance with state and federal laws.

USFWS has issued a draft biological opinion on the project (April 25, 2006, USFWS File Number 1-1-06-1108), which was revised on August 11, 2009 (USFWS File Number 1-1-04-F-0006) The project is required to obtain a final biological opinion in compliance with the federal ESA and as part of its federal CWA 404 permitting process.

The Migratory Bird Treaty Act (MBTA) is specifically identified on page 3.10-18 of the 2008 RDEIR/SDEIS and impacts associated with raptors that would be subject to this Act are addressed on 2008 RDEIR/SDEIS pages 3.10-58 through -68. The MBTA states it is unlawful, to pursue, take, or kill any migratory bird, or any part, nest, or egg of any such bird. However, the MBTA does not make it unlawful to convert suitable habitat for migratory birds and loss of such habitat is not considered a significant impact under CEQA or a substantial adverse effect under NEPA. Loss of potential habitat for migratory birds that are not rare, threatened, or endangered species is not inconsistent with City General Plan Policy NR.1. See response to comment Kopper-R-120 for discussion of further discussion of migratory birds.

Kopper-R-168

The comment states that the connectivity of the project's wetland preserve to similar, or any, habitat would be restricted to the eastern boundary, and that what would be left after development would be a dead-end trap that would bring wildlife into conflict with people on three sides.

Despite physical constraints of the project area (i.e., existing adjacent roadways and developments), the project includes an on-site preserve that is a large area (507 acres) on the southern portion of the project site. Because the preserve is one nearly contiguous area, it provides on-site interconnections for invertebrate and other species. Although there would be two new roads constructed through the wetland preserve, which are consistent with the City General Plan circulation policies, the project would include a special bridge design ("con-span[®]") designed to provide for wildlife movement, including invertebrate species and minimize habitat fragmentation.

The project wetland preserve connects to the planned preserve area (as designated by the City General Plan) to the east. There is no possible physical interconnection from the proposed preserve area to preserve lands on adjacent properties to the west and south because no existing or proposed preserves are present to the south or west and because existing roadways (Sunrise Boulevard and Douglas Road) and development creates a barrier to connectivity. Given the disturbed conditions of the central and northern portions of the project site, no large habitat preservation areas (with the exception of the VELB preserve site) are proposed (consistent with the City General Plan). However, the proposed preserve design does include drainage parkways that would provide habitat and movement corridors for wildlife species.

Appendix P of the 2008 RDEIR/SDEIS provides an extensive analysis and evidence of how the proposed project is consistent with City General Plan Action NR.1.1.1. The commenter provides no countering analysis that this consistency determination is not supportable (see 2008 RDEIR/SDEIS Appendix P pages P-4 and P-5).

Kopper-R-169

The comment states that the elderberry shrub preserves would be tiny and completely disconnected from each other and from any other habitat areas.

The existing habitat on-site for VELB is isolated and not interconnected with other habitat areas for this species, so disconnection is an existing condition. There is no possible physical interconnection from the proposed preserve area to preserve lands on adjacent properties because no existing or proposed preserves containing elderberry shrubs are present. The project's restoration of the riparian habitat, maintenance of an existing elderberry grove on-site, transplantation of existing shrubs, establishment of 3,230 new elderberry seedlings and 4,170 associated native plantings, and purchasing credits at a USFWS-approved mitigation bank (consistent with implementation of Mitigation Measure 3.10-4b) are measures that would mitigate adverse project effects and address habitat and movement needs in a manner consistent with USFWS guidelines. (See Appendix R to this FEIR/FEIS.) The commenter provides no countering analysis that this consistency determination is not supportable.

Kopper-R-170

The comment states that the habitat analysis is flawed, sampling only 0.019% of the project area, and was designed to minimize detections of wildlife. The commenter states that he detected more wildlife species in 90 minutes than the consultants did over 3 days.

The 2008 RDEIR/SDEIS provides an extensive description and impact analysis of project site unique habitats (56.632 acres of waters of the United States, 12.946 acres of wetland habitats that are considered waters of the state, 16 acres of willow scrub, 190 acres of mixed riparian scrub, 16 acres of elderberry scrub, 4 acres of willow woodland, and 57 acres of cottonwood-willow riparian forest) consistent with Action NR.1.1.2 (see 2008 RDEIR/SDEIS, Section 3.10, "Biological Resources"). This description is based on field reconnaissance surveys and technical reports listed on 2008 RDEIR/SDEIS page 3.10-1. This level of analysis is adequate for the purposes of environmental review under CEQA and NEPA. See also responses to comments Kopper-R-80 through Kopper-R-84, which address the adequacy of consultant surveys.

Kopper-R-171

The commenter states that the interconnections between preserved habitat and other habitat areas would be inadequate to support multiple special-status species, no matter who decides on their design and size, because the elderberry shrub preserves would lack any connection except sky and the wetland preserve would be connected to other habitat only on one side.

See response to comments Kopper-R-167, -168 and -169 in regards to the coordination with the USFWS and EPA regarding the design of the project and mitigation to address impacts on habitat that support the special-status species. As specifically noted in the 2008 RDEIR/SDEIS Appendix P, page P-5, the conclusions of the adequacy of the proposed on-site preserve and its hydrology are based on the results of a GIS analysis of the watershed using LIDAR-derived topographic model and wetland delineation conducted for the wetland preserve. The watershed analysis concluded that the configuration of the preserve conserves almost 100% of the original watershed area and would not negatively impact the hydrologic function of the vernal pools that support special status species. The final preserved habitat mitigation would be developed in consultation with USFWS and DFG where required by federal and state law and

mitigation measures in the 2008 RDEIR/SDEIS. Mitigation Measures 3.10-1 and 3.10-4 and the project applicant(s)' MMPs (Appendices Q and R to this FEIR/EIS) establish success criteria and require monitoring to ensure successful implementation.

Although connectivity to off-site habitat is not required under the City General Plan Policy NR 1.1.3, the project's wetland preserve connects to the proposed preserve area (as designated by the City General Plan) to the east. There is no possible physical interconnection from the proposed preserve area to preserve lands on adjacent properties to the west and south because no existing or proposed preserves are present to the south or west and because existing roadways (Sunrise Boulevard and Douglas Road) and development create a barrier to connectivity. Given the disturbed conditions of the central and northern portions of the project site, no large habitat preservation areas (with the exception of the VELB preserve site) are proposed (consistent with the City General Plan). However, the preserve design does include drainage parkways that would provide habitat and movement corridors for wildlife species.

This consistency determination is consistent with the published court case *California Native Plant Society v. City of Rancho Cordova* (C057018). The commenter provides no countering analysis that this consistency determination is not supportable.

See also responses to comment ComDev-R-2 and Kopper-R-159 regarding the isolated elderberry preserve. See also response to comment Kopper-R-118 regarding connectivity of the wetland preserve

Kopper-R-172

The commenter states that he did not see a statement in the 2008 RDEIR/SDEIS that preconstruction surveys would be performed during the raptor nesting season, as called for by Action NR.1.1.4 of the City General Plan.

The commenter is mistaken. Mitigation Measure 3.10-4c in the 2008 RDEIR/SDEIS requires preconstruction surveys during the nesting season for raptors. If active nests are found, the measure requires that appropriate buffers be established to protect the nests. The mitigation measure also states that no project activity shall commence within the buffer area until a qualified biologist confirms that any young have fledged and the nest is no longer active.

Kopper-R-173

The commenter states that based on his reading of the 2008 RDEIR/SDEIS, the mitigation plan for Swainson's hawk has not been finalized, so it is premature of the document to claim that the project would comply with Policy NR.1.2 of the City General Plan, which calls for conservation of Swainson's hawk habitat.

Although a Swainson's hawk mitigation plan is to be based on specifics and will be developed in consultation with DFG, Mitigation Measure 3.10-4d in the 2008 RDEIR/SDEIS requires that the mitigation plan ensure 1:1 mitigation of foraging habitat and permanent protection of mitigation land. Because the City is bound to implement the mitigation measures in the 2008 RDEIR/SDEIS, it is not premature to claim that the project would comply with City General Plan Policy NR.1.2.

Kopper-R-174

The commenter questions the conclusion that "the DEIR" complies with Action NR.1.2.1 of the City General Plan, which calls for establishment of a Swainson's hawk ordinance in coordination with DFG. The commenter also states that the Biological Resources section of the 2008 RDEIR/SDEIS concludes that Swainson's hawk foraging habitat would not be protected at the same acreage as would be destroyed by the project; cites a lack of technical studies to estimate or compare habitat values; and claims that it is

premature to conclude that mitigation would meet the timing specified in Action NR.1.2.1 because the draft mitigation plan was incomplete when the 2008 RDEIR/SDEIS was circulated.

Action NR.1.2.1 implements Policy NR.1.2 of the City General Plan. It is an action proposed by the City to establish a citywide Swainson's hawk ordinance; this action does not require that an ordinance be adopted for specific projects. The determination of consistency set forth in Appendix P of the 2008 RDEIR/SDEIS is based on Mitigation Measures 3.10-4c and 3.10-4d, which address the substantive requirements of this action—mitigating the loss of Swainson's hawk foraging habitat based on habitat value lost and permanently protecting mitigation habitat. Mitigation Measure 3.10-4c requires that raptor surveys be completed before construction, and Mitigation Measure 3.10-4d requires preparation of a Swainson's hawk mitigation plan that ensures 1:1 mitigation of foraging habitat and permanent protection of mitigation land. The mitigation plan is to be based on specifics and will be developed in consultation with DFG. Because the City is bound to implement the mitigation measures in the 2008 RDEIR/SDEIS, including implementation of the Swainson's hawk mitigation plan, it is not premature to claim that the project would comply with City General Plan Action NR.1.2.1. See also response to comment Kopper-R-224 for information about the methodology for determining appropriate compensatory mitigation ratios for loss of Swainson's hawk foraging habitat.

Kopper-R-175

The comment states that Appendix P and the Biological Resources section of the 2008 RDEIR/SDEIS reach conflicting conclusions about whether invasive species would adversely affect the wetland preserve. The commenter concludes that establishing a sizable, private recreation area adjacent to the wetland preserve would expose the preserve to invasive species.

The 2008 RDEIR/SDEIS acknowledges that surrounding development could result in the introduction of invasive species in the proposed wetland preserve. Mitigation Measure 3.10-1a requires preparation of a wetland MMP that would include actions to reduce invasive species in the preserve. (See page 26 of the draft MMP in Appendix Q of the 2008 RDEIR/SDEIS. The most recent version of the draft MMP, updated in 2009, is attached as Appendix Q to this FEIR/FEIS.) The project is not inconsistent with a policy that requires the City to *discourage* the *planting* of invasive species.

Kopper-R-176

The commenter, referring to Action NR.1.7.1 of the City General Plan, claims that the 2008 RDEIR/SDEIS provided no basis from which to determine whether project impacts would affect species regionally. The commenter also claims that the project's MMPs, most incomplete at the time the 2008 RDEIR/SDEIS was circulated, included no means to assess the effectiveness of mitigation on special-status species.

The 2008 RDEIR/SDEIS describes in detail potential impacts on listed species and proposes mitigation measures that require "no net loss" of habitat values for these species (pages 3.10-53 to 3.10-68). A detailed draft MMP for wetland species was provided as Appendix Q in the 2008 RDEIR/SDEIS; this MMP was updated in June 2009 and is attached as Appendix Q to this FEIR/FEIS. To the extent that mitigation plans for other species have not been developed, the mitigation measures provide extensive detail and performance standards explaining how "no net loss" standards would be met.

With this analysis and the required mitigation, the City can conclude that the project would not "contribute to the decline of the affected species populations in the region to the extent that their decline would impact the viability of the regional population." Although the MMP for wetland species is in draft form, that does not render the MMP

invalid for purposes of analyzing the project's consistency with this requirement of Action NR.1.7.1 of the City General Plan. The MMP is necessarily draft at this point because USACE will not "approve" it until the NEPA process is complete (issuance of the ROD).

Hydrology and floristic characteristics are indicators of a vernal pool's quality as habitat for special-status species, and the methods set forth in the draft MMP are typical of those approved by USACE and USFWS. In drafting the June 2009 MMP, moreover, the City coordinated with both USACE and USFWS to design the mitigation plan. The City met with both USACE and USFWS on several occasions to receive their input on the MMP. The June 2009 draft MMP incorporates changes based on the comments from those agencies as well as from EPA.

In spring 2009 and at the request of USACE, a field investigation of Morrison Creek was conducted. This investigation showed that the portion of Morrison Creek within the wetland preserve was affected by historic mining and farming activities (realignment). Based on this investigation, several enhancement opportunities were identified. The revised wetland MMP includes plans to correct two head-cuts within the channel and naturalization (regrading/redistribution) of spoil piles left behind after Morrison Creek was realigned into its current position.

Based on agency comments, the design of the vernal pool and seasonal wetland swales was shifted so that the MMP would focus on restoring historic features that were eliminated or degraded by past land practices. The location of historic wetland features was determined by examining wetland signatures on historic aerial photographs, conducting field visits, and conducting soil surveys on-site. The secondary focus became creating vernal pools in the most appropriate areas within the wetland preserve. As a result, 13.449 acres of vernal pools and 0.752 acre of seasonal wetland swale habitat are proposed in the current 2009 draft MMP. This proposed level of compensatory mitigation increases the wetland-to-watershed ratio relative to the ratio proposed in the earlier 2007 plan by reducing the amount of wetlands being constructed. Additionally, because the 2009 draft MMP proposes the enhancement of degraded features, some compensatory mitigation work would occur in and adjacent to existing features. Any impacts on habitat resulting from the restoration or creation of habitat are considered temporary because the end result would be an improvement in habitat function. Additionally, a CRAM analysis would be conducted to track changes in wetland function and values and to help identify any sources of adverse impacts. The results would help determine the most appropriate course of action to ensure that the vernal pools meet the established success criteria.

The acreage of seasonal wetlands constructed within the 187-acre open space corridor has been reduced in the currently proposed wetland MMP. This acreage was reduced because the design of the 26-acre detention basin was changed, and because EPA and USACE were concerned about the long-term viability of seasonal wetlands in the basin. The 2009 draft MMP calls for the construction of 16.941 acres of seasonal wetlands within the open space corridor instead of 20.785 acres proposed in the 2007 draft MMP.

Kopper-R-177

The comment states that there is no real multispecies approach and no participation in an HCP. Although the 2008 RDEIR/SDEIS mentions the possibility of modifying mitigation plans to use the draft SSCHCP, the plans are incomplete and formulations deferred, thus not allowing meaningful participation by the commenter in environmental review.

The draft wetland MMP and VELB mitigation plan are both quite detailed, and because they are drafts, the commenter has an opportunity to comment on them before they are finalized. Both plans were recently updated—in June 2009 and July 2009, respectively—and the updated plans are attached to this FEIR/FEIS as Appendices Q and R, respectively. The draft wetland MMP takes a multispecies approach in that all species that use similar vernal pool and wetland habitats are covered in one plan (vernal pool fairy shrimp, vernal pool tadpole shrimp, and plant species). No HCP has been adopted that covers the area, but Mitigation Measure 3.10-4a in the 2008 RDEIR/SDEIS requires that the wetland MMP for vernal pool species be consistent with the draft SSCHCP if it is adopted.

Kopper-R-178

The comment states that the project’s mitigation plan does not comply with Policy NR.1.8 of the City General Plan, which calls for the City to encourage creation of habitat preserves immediately adjacent to each other. The commenter expresses uncertainty about the applicant’s claim that the 2008 RDEIR/SDEIS complies with this policy because doing so is not required.

City General Plan Policy NR.1.8 states that, “The City shall *encourage* (italics added) creation of habitat preserves that are immediately adjacent to each other in order to provide interconnected open space areas for animal movement.” The consistency analysis contained in 2008 RDEIR/SDEIS Appendix P is correct in that the policy *encourages*, but does not require, creation of adjacent habitat preserves. It should also be noted that the consistency analysis provided in Appendix P is the City’s determination and not the project applicant(s)’.

The project wetland preserve connects to the proposed preserve area (as designated by the City General Plan) to the east. There is no possible physical interconnection from the proposed preserve area to preserve lands on adjacent properties to the west and south because no existing or proposed preserves are present to the west or south and because existing roadways (Sunrise Boulevard and Douglas Road) and development create a barrier to connectivity. Given the disturbed conditions of the central and northern portions of the project site, no large habitat preservation areas (with the exception of a 12-acre VELB preserve site) are proposed (consistent with the City General Plan). However, the preserve design does include drainage parkways that would provide habitat and movement corridors for wildlife species.

Despite physical constraints of the project area (i.e., existing roadways and developments), the project includes an on-site preserve that is a large area (507-acres) on the southern portion of the project site. Because the preserve is one nearly contiguous area, it provides on-site interconnections for invertebrate and other species. Although there would be new roads constructed through the wetland preserve, which are consistent with City General Plan circulation policies, the project would include a special bridge design (“con-span[®]”) designed to provide for wildlife movement, including invertebrate species and minimize habitat fragmentation.

Kopper-R-179

The comment states that the response to Policy NR.1.9 of the City General Plan, requiring impacts on riparian habitats be mitigated at a no net loss of existing function and value, presented in Appendix P of the 2008 RDEIR/SDEIS contradicts the statements made in the Biological Resources section. The commenter cites statements in the Biological Resources section stating that the direct and indirect impacts of loss of riparian habitat under the Proposed Project and High Density Alternatives would remain significant and unavoidable.

Section 3.10 of the 2008 RDEIR/SDEIS includes mitigation measures that address the loss of riparian habitat consistent with this City General Plan Policy NR.1.9. Mitigation Measure 3.10-2b expressly requires that compensatory mitigation for impacts to riparian habitats meet the performance standard of “no net loss” of overall habitat values and functions through either on- or off-site efforts. The types of mitigation under this measure are consistent with the options identified in City General Plan Policy NR.1.9. As specifically identified in Section 3.10 of the 2008 RDEIR/SDEIS, approximately 597 acres of cottonwood woodland habitat (majority of the riparian habitat) is of poor quality and would be mitigated consistent with its current value (e.g., nesting and foraging habitat and not necessarily an acre-for-acre replacement). However, removal of this riparian habitat acreage is still considered a significant impact, regardless of how the habitat was formed based on consultations with DFG. The 2008 RDEIR/SDEIS conclusion that the impact of the project on certain riparian habitat is significant and unavoidable under CEQA despite the imposition of mitigation that complies with this City General Plan policy does not create an inconsistency with this policy. The CEQA significance determination is based on a “substantial adverse effect on any riparian habitat,” which is different than the standard under the City General Plan policy which is “no net loss of existing function and value.” The CEQA significance determination also considers the sheer magnitude of loss (807 acres) of riparian woodland vegetation in the region combined with historic and ongoing regional losses of this resource. Therefore, with implementation of compensatory mitigation measures resulting in no net loss of habitat functions in compliance with the City General Plan policy, the impact of this loss would be reduced, but not fully eliminated, and the abundance and availability of this resource in the region would be reduced, constituting a substantial adverse effect.

Kopper-R-180

The comment states that the applicant’s response to Policy NR.2.1 of the City General Plan, which requires mitigation providing no net loss of wetlands, as presented in Appendix P of the 2008 RDEIR/SDEIS is contradicted by the conclusion of a significant impact in the Biological Resources section. The commenter states that the project would destroy 59% of the existing wetlands and degrade the remaining wetlands, as acknowledged in the Biological Resources section but not in Appendix P.

The 2008 RDEIR/SDEIS conclusion regarding the loss of wetlands under Impact 3.10-1 is based on the “Thresholds of Significance” identified in Section 3.10. The specific threshold applied for this impact was:

Have a substantial adverse effect on federally protected waters of the United States, including wetlands, as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means.

This threshold of significance is not the same as City General Plan Policy NR.2.1, which requires mitigation that provides for no net loss of wetlands consistent with current state and federal policies. The mitigation measures in the 2008 RDEIR/SDEIS are consistent with this policy as discussed in Appendix P of the 2008 RDEIR/SDEIS.

Based on the analysis provided in 2008 RDEIR/SDEIS Section 3.10, the Proposed Project Alternative would result in a substantial loss of existing on-site wetlands and other waters of the United States and waters of the state (e.g., direct fill of 27.9 acres of waters of the United States and 12.9 acres of nonjurisdictional wetlands). Mitigation Measures 3.10-1a and 3.10-1b require “no net loss” of wetlands and other waters of the United States and waters of the state consistent with the requirements of state and federal law. With implementation of these mitigation measures, the 2008 RDEIR/SDEIS concludes that the direct impacts of the project would be reduced to a less-than-

significant level. However, indirect and cumulative biological impacts of the project are identified as significant and unavoidable. This significant and unavoidable impact is due to the project's cumulatively considerable contribution to impacts on certain biological resources in the region. The CEQA significance determination is based on a substantial adverse effect on protected waters (including wetlands), which is different than the standard under City General Plan Policy NR.2.1 which is "no net loss." The 2008 RDEIR/SDEIS states that its conclusion on a significant and unavoidable impact under CEQA is warranted "even with implementation of the proposed mitigation and regional enforcement of USACE 'no-net-loss' standard" (2008 RDEIR/SDEIS, p. 3.10-72). Therefore, mitigation in compliance with City General Plan Policy NR.2.1 still results in a significant and unavoidable determination under the CEQA standard of significance. Therefore, the determination of a significant and unavoidable impact under CEQA despite the imposition of mitigation that complies with this City General Plan policy does not create an inconsistency with this policy.

Kopper-R-181

The comment states that it is premature to conclude that the mitigation would achieve no net loss of wetlands because the MMP remains a draft.

The 2008 RDEIR/SDEIS reaches the conservative conclusion that impacts on wetlands and other waters of the United States and waters of the state would be significant and unavoidable because of the contribution to cumulative loss of habitat in the region and because of potential indirect impacts. This is not inconsistent with the conclusion that the project is consistent with a policy requiring "no net loss" of wetlands. Mitigation Measure 3.10-1a of the 2008 RDEIR/SDEIS specifically requires the project applicant(s) to "commit to replace, restore, or enhance on a 'no net loss' basis (in accordance with USACE, the Central Valley RWQCB, and the Natural Resources Element of the City General Plan) the acreage of all wetlands and other waters..." The draft wetland MMP, which was updated in June 2009 (see Appendix Q to this FEIR/FEIS), proposes mitigation in the form of preservation, restoration, and creation at ratios greater than 1:1 to ensure achievement of no net loss.

Kopper-R-182

The comment states that Appendix P of the 2008 RDEIR/SDEIS does not indicate that any local interest groups were consulted or that any coordination was done to enhance or preserve Morrison Creek, as called for by Policy NR.3.1 of the City General Plan.

The City and USACE have solicited public and interest group input and consultation on the project as part of the environmental review process. On December 12, 2003, the City issued an NOP to inform agencies and the general public that a joint EIR/EIS was being prepared, and invited comments on the scope and content of the document and participation at a public scoping meeting. The NOP was published in the State Clearinghouse and was mailed to approximately 15 state agencies. It was also posted on the City's Web site and a notice of the NOP and joint scoping meeting was published in the *Sacramento Bee*. The NOP was circulated for 30 days as mandated by CEQA. The public-comment period for the NOP closed on February 12, 2004.

On January 30, 2004, USACE issued an NOI to inform agencies and the general public that a joint EIR/EIS was being prepared and invited comments on the scope and content of the document. At that time, USACE announced that it had developed a public-involvement program allowing opportunities for public participation and involvement in the NEPA process. The NOI also provided information on the dates and times of public scoping meetings. The NOI was published in the *Federal Register*, Vol. 69, No. 24, on February 5, 2004. The NOI was also posted on the City's Web site. There is no mandated time limit to receive written comments in response to the NOI under NEPA.

The City and USACE jointly held two public scoping meetings to solicit input from the community and public agencies to be considered in project design, alternatives selection, and on the scope and content of the EIR/EIS. The meetings were held on February 26, 2004, at 2:00 p.m. at the Rancho Cordova City Hall, and at 6:00 p.m. at the Mills Station light rail station in Rancho Cordova, California. Fourteen people from both the public and private sectors attended the two meetings.

The City and USACE have also received comments regarding the project and the environmental review analysis during the public review period for the 2006 DEIR/DEIS (December 6, 2006 to February 5, 2007) and on the 2008 RDEIR/SDEIS (April 15, 2008 to July 7, 2008).

As identified in the 2008 RDEIR/SDEIS, Appendix P page P-13, Morrison Creek is to retain its natural contours and condition throughout the project's 507- acre preserve area. Morrison Creek would be channelized once it leaves the preserve area up to the point where it leaves the southwest corner of the site via a culvert. The existing condition of the corridor of this section of Morrison Creek is disturbed due to past mining practices and aerospace activities on the project site. Although channelization of a portion of Morrison creek is necessary to provide adequate drainage of the site and consistency with other City policies, the channelization would retain its existing alignment.

Kopper-R-183

The comment states that Appendix P of the 2008 RDEIR/SDEIS claims that the project would be consistent with Policy NR.4.1 of the City General Plan, which calls for conservation of native oak and landmark tree resources, but that the Biological Resources section indicates that all of the acreage supporting oaks and other trees are projected to be lost to the project. The commenter further notes that the mitigation plan is not presented in the 2008 RDEIR/SDEIS, so it is premature to claim that the project is consistent with Policy NR.4.1.

City General Plan Policy NR.4.1 states, "Conserve native oak and landmark tree resources for their historic, economic, aesthetic, and environmental value." The project is consistent with this policy with the implementation of 2008 RDEIR/SDEIS Mitigation Measure 3.10-3. As stated in Mitigation Measure 3.10-3, a determinate survey of tree species and size would be performed. It will be determined from the results of that survey which native trees can be avoided by construction and, if it is not feasible to avoid such trees, specific measures (i.e., performance standards listed in Mitigation Measure 3.10-3) would be implemented to mitigate for the loss of those trees on an inch-for-inch basis. Use of performance standards for implementation of mitigation measures is provided for under State CEQA Guidelines Section 15126.4(a)(1)(B). Compensation of potential loss of these trees set forth in this mitigation measure is consistent General Plan Action Item NR.4.1.3 and Policy 4.4.

Kopper-R-184

The comment indicates uncertainty about the conclusion in Appendix P of the 2008 RDEIR/SDEIS that the project is consistent with Action NR.4.1.1 of the City General Plan, which calls for implementation of the City's Tree Preservation and Protection Ordinance, and states that the document did not present sizes and ages of tree species inventories on the project site.

The City has not developed its own Tree Preservation and Protection Ordinance and therefore defers to the County Tree Ordinance (Sacramento County Code, Title 19, Chapter 19.12) when addressing impacts on trees within the City's sphere of influence. As stated in 2008 RDEIR/SDEIS Mitigation Measure 3.10-3, a determinate survey of tree species and size would be performed. It would be determined from the results of that

survey which native trees can be avoided by construction and, if it is not feasible to avoid such trees, specific measures (i.e., performance standards listed in Mitigation Measure 3.10-3) would be implemented to mitigate for the loss of those trees. Compensation of potential loss of these trees set forth in this mitigation measure is consistent with General Plan Action Item NR.4.1.3 and Policy 4.4.

Kopper-R-185

The comment states that the response to Action NR.4.1.2 of the City General Plan, regarding underground utility lines near oak and other landmark trees, in Appendix P of the 2008 RDEIR/SDEIS is misleading in stating that 47 native oak trees would likely be removed by the project, because the Biological Resources section states that all oak trees would be removed.

It is correct that oak woodland on the project site is restricted to a 3-acre area that includes a total of 47 oak trees greater than 6-inches diameter breast height (dbh). Under the Proposed Project Alternative, the High Density Alternative, or the Impact Minimization Alternative, the identified 3 acres of oak woodland and 47 native oak trees that qualify for protection or mitigation under the County Tree Ordinance (because they have a dbh of 6 inches or greater) would be removed from the project site. Removal of all 47 trees would mean there would be no oaks or other landmark trees on-site that would conflict with installation of underground utility lines, and implementation of Mitigation Measure 3.10-3 would require avoidance of trees that are preserved (including utility placement). Thus, the project would be consistent with City General Plan Action NR.4.1.2.

Kopper-R-186

The comment states that the response to Action NR.4.1.3 of the City General Plan, calling for development guidelines requiring avoidance of oak habitat or preservation of in-kind habitat, as stated in Appendix P of the 2008 RDEIR/SDEIS is misleading. Appendix P states that the project would result in the loss of 3 acres of oak woodland habitat and refers to a description of tree mitigation, but the Biological Resources section states that all 3 acres of the oaks are projected to be removed and there is no plan to replace these 3 acres.

According to City General Plan Policy NR.4.1.3, "...when avoidance [of oak habitat] is not possible, require mitigation efforts that result in preservation of in-kind habitat in the Planning Area." Three acres of oak woodland would be removed as a result of project implementation. The 2008 RDEIR/SDEIS Mitigation Measure 3.10-3 does provide adequate mitigation for this loss in that it requires inch-for-inch replacement, which provides for complete mitigation of the removal of trees.

Kopper-R-187

The comment notes that according to Appendix P, Mitigation Measure 3.10-3 presented in the 2008 RDEIR/SDEIS is consistent with the provisions set forth in Policy NR.4.4; however, the mitigation measures would not be formulated until after CEQA review, which the commenter says excludes meaningful public participation.

The 2008 RDEIR/SDEIS Mitigation Measure 3.10-3 includes the specific measures in City General Plan Policy NR.4.4 that would be implemented to mitigate for the loss of those trees on an inch-for-inch basis as a performance standard. Use of performance standards for implementation of mitigation measures is provided for under State CEQA Guidelines Section 15126.4(a)(1)(B) ("measures may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way"). (See also *Endangered Habitats League v. County of Orange* [2005] 131 Cal. App. 4th 777, 793–794 [deferral is permissible where the agency commits itself to mitigation and either (1) adopts a performance

standard and makes further approvals contingent on finding a way to meet the standard or (2) lists alternative means of mitigating the impact which must be considered, analyzed, and possibly adopted in the future]; *Riverwatch v. County of San Diego* [1999] 76 Cal. App. 4th 1428, 1147–1448 [“the fact the entire extent and precise detail of the mitigation that may be required is not known does not undermine the Final EIR’s conclusion that the impact can in fact be successfully mitigated.” It was appropriate to defer such analysis where there was “nothing in the record which suggests that the impact cannot be mitigated in the manner described in the Final EIR”].)

Kopper-R-188

The comment states the project is inconsistent with Proposed Revised Action NR.1.1.1 of the City General Plan because the project would include no wildlife corridors, and residential and commercial development would close in on the on-site preserves on three sides.

The City of Rancho Cordova is no longer pursuing policy amendments to the Natural Resources Element of the City General Plan identified in the Section 3.10 of the 2008 RDEIR/SDEIS. See response to comment Kopper-R-168 and -169 for discussion of consistency with existing policies.

Kopper-R-189

The comment notes the existence of additional proposed revised actions and policies from the “City of Rio Vista” and additional applicant responses in Appendix P of the 2008 RDEIR/SDEIS, but no changes in the Appendix P responses or in Mr. Kopper’s original comments.

Because the City of Rio Vista is not involved in the Rio del Oro project and has no jurisdiction over the project, it is assumed that the commenter is referring to the City of Rancho Cordova. See response to comments Kopper-R-167 through -188.

Kopper-R-190

The comment notes that the conclusions in Appendix P of the 2008 RDEIR/SDEIS contradict those in the Biological Resources section and that the Appendix P conclusions are misleading. The comment suggests revising the summary of project consistency with the “City of Rio Vista General Plan.” The comment also suggests that the 2008 RDEIR/SDEIS not conclude that the project is consistent with Rancho Cordova actions and policies unless the corresponding mitigation measures are formulated and circulated for public review and unless the conclusion is fully supportable.

Because the City of Rio Vista is not involved in the Rio del Oro project and has no jurisdiction over the project, it is assumed that the commenter is referring to the City of Rancho Cordova. The commenter’s opinion regarding the consistency analysis is noted. The comment does not provide examples of purported inconsistencies between the “Biological Resources” section of the 2008 RDEIR/SDEIS and Appendix P of the 2008 RDEIR/SDEIS.

Kopper-R-191

The comment states that the public would not be able to provide timely environmental review on any compensatory mitigation measures that would be formulated after the public review process and “phased in with project implementation” as stated on page 3.10-22 of the 2008 RDEIR/SDEIS. Examples are listed in subsequent comments.

The quoted statement is not appropriately considered deferred mitigation. The statement is from an introductory discussion summarizing the proposed mitigation plan. It summarizes the timing of compensatory mitigation. Full and complete mitigation measures are provided in the 2008 RDEIR/SDEIS and would not be formulated in phases. Creation of compensatory habitats would be phased consistent with project

phases that would affect the particular resources. For example, the project applicant(s) would be required to begin construction of the compensatory mitigation habitats, in accordance with the MMP (when a final version has been approved by the appropriate regulatory oversight agencies), before the start of ground-disturbing activities that would adversely affect wetlands and other waters of the United States and waters of the state (page 3.10-33 of the 2008 RDEIR/SDEIS). In other words, compensatory habitat would not necessarily be created until just before the start of the particular project phase that would affect the specific habitat being mitigated.

Regardless, Mitigation Measure 3.10-1a of the 2008 RDEIR/SDEIS details the requirements for compensating impacts on wetlands and other waters of the United States and waters of the state, and a detailed draft wetland MMP was circulated with the 2008 RDEIR/SDEIS for public comment. The wetland MMP was updated in June 2009 (see Appendix Q to this FEIR/FEIS). The currently proposed plan has altered the acreage of seasonal wetlands constructed within a portion of the open space corridor; see response to comment Kopper-R-176.

Kopper-R-192

The comment expresses concern that mitigation measures would be formulated at unspecified, later dates based on review of the MMP by federal and state agencies, and states that the public would not be able to meaningfully participate in the environmental review process of the final MMP.

Mitigation Measure 3.10-1a of the 2008 RDEIR/SDEIS is detailed and provides specific performance standards and requirements for mitigation of impacts on wetlands and other waters of the United States and waters of the state. Use of performance standards for implementation of mitigation measures is provided for under State CEQA Guidelines Section 15126.4(a)(1)(B) (“measures may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way”). (See also *Endangered Habitats League v. County of Orange* [2005] 131 Cal. App. 4th 777, 793–794 [deferral is permissible where the agency commits itself to mitigation and either (1) adopts a performance standard and makes further approvals contingent on finding a way to meet the standard or (2) lists alternative means of mitigating the impact which must be considered, analyzed, and possibly adopted in the future]; *Riverwatch v. County of San Diego* [1999] 76 Cal. App. 4th 1428, 1147–1448 (“the fact the entire extent and precise detail of the mitigation that may be required is not known does not undermine the Final EIR’s conclusion that the impact can in fact be successfully mitigated.” It was appropriate to defer such analysis where there was “nothing in the record which suggests that the impact cannot be mitigated in the manner described in the Final EIR”].)

The wetland MMP is by necessity a draft at this stage because the CEQA and NEPA processes must be completed before permits (and associated mitigation plans) can be approved. Providing a draft of the plan with the 2008 RDEIR/SDEIS allowed the public to comment on the proposed plan, whereas the public would not have been allowed to provide input on an already approved plan. The MMP is not expected to change substantially from the draft provided in Appendix Q of the 2008 RDEIR/SDEIS; however, certain measures identified in the 2008 RDEIR/SDEIS (pages 3.10-41 through 3.10-43) were not included in the draft MMP at the time the document went out for public review. The MMP was revised in June 2009 to include these measures, which include conducting a CRAM analysis to establish a baseline for future monitoring, creation or restoration of in-kind aquatic habitats at sufficient ratios above those already identified, and adjustment of compensatory mitigation ratios to provide an adequate

margin of safety to reflect anticipated success rates of created and restored aquatic habitats and to offset temporal loss of habitat functions. The CRAM monitoring will help determine the most appropriate course of action to ensure that the vernal pools meet the established success criteria. The June 2009 version of the draft MMP is attached as Appendix Q to this FEIR/FEIS.

The 2008 RDEIR/SDEIS follows standard CEQA/NEPA procedures in disclosing impacts on biological resources and providing mitigation measures that the project applicant(s) would be required to implement after certification of the EIR and issuance of the ROD. The wetland MMP (presented as Appendix Q of the 2008 RDEIR/SDEIS and updated in 2009, with the revised version presented as Appendix Q to this FEIR/FEIS) is the proposed plan of the project applicant(s) to compensate for unavoidable impacts on wetlands and other waters of the United States for the purpose of obtaining a Section 404 permit from USACE; the plan is subject to review and approval by USACE. The mitigation measures provided on pages 3.10-40 through 3.10-45 of the 2008 RDEIR/SDEIS are not subject to change under the discretion of USACE as a condition of the Section 404 permitting process. Rather, they are considered final and binding once the final EIR is certified and a ROD for the EIS is issued. The terms of the Section 404 permit are up to USACE, and the 2008 RDEIR/SDEIS necessarily cannot consider mitigation measures for impacts on waters of the United States to be “final” until all conditions requested by USACE have been incorporated into the MMP and approved by USACE.

In response to USACE comments and additional information obtained during the design process, a more refined MMP was prepared in June 2009 (attached as Appendix Q to this FEIR/FEIS). The revised MMP includes several changes to the overall mitigation design as follows:

- ▶ enhancement of Morrison Creek;
- ▶ a reduction in the acreage of vernal pools proposed to be constructed, which increases the wetland-to-watershed ratio;
- ▶ the construction of seasonal wetland swales within the 507-acre wetland preserve area;
- ▶ use of a CRAM analysis to track changes in wetland function and to help identify any sources of adverse impacts;
- ▶ reduction in the acreage of seasonal wetlands within the 187 acres of open space areas because of changes to the design of the 26-acre detention basin and agency concerns about the long-term viability of seasonal wetlands in the basin; and
- ▶ inclusion of a water quality monitoring plan for constructed wetlands within the open space corridors, to ensure that the project’s water quality components would function appropriately and that constructed wetlands would not be adversely affected by stormwater runoff.

The currently proposed plan has altered the acreage of seasonal wetlands constructed within a portion of the open space corridor; see response to comment Kopper-R-176.

Kopper-R-193

The comment states that Appendix Q of the 2008 RDEIR/SDEIS should have presented a specific funding mechanism rather than listing three potential funding entities, so that the

commenter could provide an opinion on the sufficiency of funds and the strengths and weaknesses of the funding mechanism.

Neither CEQA or NEPA require that the details of funding for mitigation measures be included in an EIR or EIS. Each of the three methods of funding the monitoring and maintenance of the compensatory mitigation in the 2008 RDEIR/SDEIS is adequate to provide the necessary funds. The project applicant(s) would be required to establish an endowment or some other source of financing that is sufficient to fund management of the preserve in perpetuity, as stated on page 3.10-35 of the 2008 RDEIR/SDEIS. The particular method of funding would be determined by the permitting agencies and the project applicant(s) in the permit approval process, which would not conclude until after completion of the CEQA and NEPA processes. According to the 2009 draft MMP, information about funding for long-term monitoring and maintenance and other long-term management will be included in the *Operations and Management Plan for the Rio del Oro Wetland Preserve* and the *Operations and Management Plan for the Rio del Oro Open Space Preserve*. Therefore, the project applicant(s) are obligated to provide this funding, regardless of whether the funding mechanism is specified in the 2008 RDEIR/SDEIS.

Kopper-R-194

The comment states that it is unclear which vernal pools in the preserve area need to be restored and why they need to be restored, given that Appendix Q of the 2008 RDEIR/SDEIS concludes that the preserve area was “relatively undisturbed.” The comment also expresses concern that unnecessary restoration could cause more harm than help.

Historic aerial photography of the project site shows vernal pools within the preserve area that are no longer visible and functioning as a result of past land uses on the site. Some of these pools were filled between 1961 and 1971 as a result of land uses associated with the Kappa/Gamma Test Complexes. Creation of compensatory vernal pools would occur within the footprints of these previously existing vernal pools; that is why the term “restoration” is applied in some places when this compensatory mitigation is described. No restoration of existing, functioning pools would occur. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-195

The comment states that the 2008 RDEIR/SDEIS does not address adverse impacts on grassland habitat as a result of vernal pool creation. The comment refers to the Wildlife Society’s five criteria for accepting wetland creation as a form of mitigation, stating that three of the five criteria related to research on other created wetlands in the region and long-term funding were not met in the 2008 RDEIR/SDEIS. The comment further states that monitoring at Clay Station does not substantiate the success of created vernal pools there because the 2008 RDEIR/SDEIS does not reference any peer-reviewed documents stemming from this monitoring.

See response to comment Kopper-R-153 regarding impacts on annual grassland. The Wildlife Society’s opinion regarding the standards for creating wetlands as mitigation is noted. The wetland habitat that would be purchased at the Clay Station Mitigation Bank has been monitored for several years and has met success criteria to be approved for sale by the Mitigation Banking Review Team. These created wetlands exhibit functions similar to those of the wetland habitat to be affected at the project site. In addition, these wetlands currently support vernal pool fairy shrimp and vernal pool tadpole shrimp. The City and USACE consider approval by the Mitigation Banking Review Team to be acceptable evidence that established success criteria have been met. Contrary to the

commenter's assertion, there is no policy or precedent for requiring verification through peer-reviewed publications. The project applicant(s) would be required to establish an endowment or some other financial mechanism that is sufficient to fund management of the preserve in perpetuity, as stated on page 3.10-35 of the 2008 RDEIR/SDEIS. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-196

The comment states that wetland creation should follow rigorous standards for mitigation to assure success, including a minimum of 15 years of monitoring. The comment also states that performance criteria should be guaranteed by a negotiable performance security large enough to complete mitigation and pursue alternative measures should objectives and performance criteria not be met. The comment also states that the 2008 RDEIR/SDEIS provides only two of the "details" identified in "this paragraph," but does not specify which paragraph, and states that 15 years of monitoring were not committed to in the 2008 RDEIR/SDEIS.

Success criteria are provided in the draft MMP; however, these success criteria have not yet been approved by USACE. Additional success criteria based on CRAM were developed and presented in the 2009 draft wetland MMP, as recommended by EPA and specified in Mitigation Measure 3.10-1a of the 2008 RDEIR/SDEIS. Final success criteria for wetland compensatory mitigation will be established through the Section 404 permitting process.

Monitoring would be conducted for a minimum of 10 years, but would continue beyond that time only for wetlands that are not meeting success criteria. There is no requirement or policy stating that created wetlands must be monitored for a minimum of 15 years. No policy requires a performance bond for wetland mitigation and it is not standard CEQA/NEPA procedure to require one.

Compensatory wetland mitigation design, implementation measures, reporting methods, and responsible parties are identified in the 2008 RDEIR/SDEIS and the draft MMP. Attachment A of the draft MMP (see Appendix Q to this FEIR/FEIS) shows the wetland preserve impact and compensation plan. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-197

The comment claims that the 2008 RDEIR/SDEIS does not analyze the adverse impacts from creating wetlands, and missing details about locations and configurations of the created pools resulted in deferring formulation of the mitigation measure to an unspecified later date, which excludes meaningful public participation. The comment suggests revising the 2008 RDEIR/SDEIS to identify the wetland locations and configurations, but recommends against the wetlands to avoid impacts on grassland and vernal pool species.

The approximate location and configurations of the proposed created wetlands have been determined and are depicted in the wetland preserve impact and compensation plan in Attachment A of the draft wetland MMP. The MMP was presented in Appendix Q of the 2008 RDEIR/SDEIS and has since been updated; see Appendix Q of this FEIR/FEIS for the most up-to-date version, which supercedes the earlier version. As with any restoration project, configurations may need to be refined pending more detailed site-specific conditions at those locations. It is true that some upland area would be converted to seasonal wetlands through planned creation/restoration of wetlands. However, the majority of upland area in the preserve would remain available to grassland-adapted species. The preserve's final wetland density (including vernal pools, ponds, seasonal

wetland swales, seasonal wetlands, and ephemeral drainages) would be 6.8%. This density occurs naturally in the area.

Neither CEQA nor NEPA require that detailed mitigation plans be circulated with the DEIR or DEIS; setting forth the performance standards for such plans in the DEIR or DEIS is sufficient. (See State CEQA Guidelines Section 15126.4[a][1][B] [“measures may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way”]; *Endangered Habitats League v. County of Orange* [2005] 131 Cal.App.4th 777, 793.) Mitigation Measure 3.10-1a in the 2008 RDEIR/SDEIS satisfies this requirement and details the requirements for mitigation of impacts on wetlands and other waters of the United States and waters of the state. The detailed draft MMP was circulated with the 2008 RDEIR/SDEIS for public comment.

The wetland MMP was also recently revised in June 2009; the updated version is provided Appendix Q of this FEIR/FEIS. The vernal pool and seasonal wetland swale design shifted the focus of the mitigation plan to the restoration of historic features that were eliminated or degraded by past land practices. The location of historic wetland features was determined by examining wetland signatures on historic aerial photographs, conducting field visits, and conducting soil surveys on-site. The secondary focus became creating vernal pools in the most appropriate areas within the proposed wetland preserve. As a result, 13.449 acres of vernal pools and 0.752 acre of seasonal wetland swale habitat are now proposed in the 2009 draft MMP. This proposed compensatory mitigation amount increases the wetland-to-watershed ratio relative to the ratio proposed in the earlier 2007 draft MMP by reducing the amount of wetlands being constructed. Additionally, because the 2009 draft MMP proposes the enhancement of degraded features, some compensatory mitigation work would occur in and adjacent to existing features. Any impacts on habitat resulting from the restoration or creation of habitat are considered temporary because the end result would be an improvement in habitat function. Additionally, a CRAM analysis would be conducted to track changes in wetland function and values and to help identify any sources of adverse impacts. The results would help determine the most appropriate course of action to ensure that the vernal pools meet the established success criteria.

Potential impacts on preserved wetlands resulting from constructing vernal pools in the wetland preserve were analyzed through the watershed analysis, as discussed on pages 3.10-27, 3.10-28, 3.10-35, and 3.10-36 of the 2008 RDEIR/SDEIS. The hydrologic modeling analysis shows that creating compensatory wetlands would not adversely affect existing wetlands and other waters of the United States and waters of the state. Also see response to comment CNPS-R-2.

Kopper-R-198

The comment notes that Table 4 of Appendix Q in the 2008 RDEIR/SDEIS lists success criteria that appear “arbitrary and only vaguely related” to the special-status species that are central to the creation of vernal pools. The comment states that it would be meaningless to restore habitat that did not contain the species for which it was restored. The comment suggests revising the 2008 RDEIR/SDEIS to include definitive success criteria for wetlands creation that focus on the species for which the mitigation is targeted.

The vegetation criteria collectively assess whether a hydrologic regime appropriate for the establishment of vernal pool species is present. A pool that supports a dominance of vernal pool plants would support a hydrologic regime conducive to survival of aquatic invertebrates. The plant species expected to occur in the vernal pools include American

pillwort (*Pilularia americana*), coyote thistle (*Eryngium castrense*), white navarretia (*Navarretia leucocephala*), vernal pool goldfields (*Lasthenia fremontii*), rayless goldfields (*L. glaberrima*), horned downingia (*Downingia bicornuta* var. *picta*), and slender popcorn flower (*Plagiobothrys stipitatus* var. *micranthus*), among others. These species are commonly found within the Mather Field Vernal Pool Preserve and are indicative of viable vernal pool habitat in the Southeastern Sacramento Valley Vernal Pool Region.

In addition, as noted in the draft MMP, recently updated in June 2009 (see Appendix Q of this FEIR/FEIS), in response to the request from EPA, the CRAM will now be used to track changes in wetland function and to help identify any sources of adverse impacts. During the 2008 growing season, the wetlands in the preserve were subjected to a CRAM analysis that established baseline conditions for the preserved wetlands and provides a basis for comparisons with constructed and/or restored wetlands. In accordance with the revised 2009 wetland MMP, CRAM assessments are to be conducted on the wetlands within the on-site wetland preserve to track changes in wetland function and values, and to help identify the source of any adverse conditions within the wetland preserve. The results will help determine the most appropriate course of action to ensure that the vernal pools meet the established success criteria.

Kopper-R-199

The comment notes that the information in Table 5 of Appendix Q of the 2008 RDEIR/SDEIS is not clear.

Table 5 in Appendix Q is the proposed monitoring schedule for constructed vernal pools. The “yes” designation in Table 5 indicates that monitoring will occur during that year. No revisions to Appendix Q of the 2008 RDEIR/SDEIS are required on this basis. Moreover, according to the 2009 draft MMP (see Appendix Q of this FEIR/FEIS), monitoring of constructed wetlands will begin with the first rainy season after completion of adjacent and upstream construction activities. The wetlands will be monitored for the period specified in the MMP years or until success criteria have been met. At the end of the monitoring period, the constructed seasonal wetlands and low-flow channel must meet the success criteria set forth in Tables 4 and 5 of the 2009 draft MMP. Once the established criteria have been met, no further monitoring of the compensatory mitigation wetlands is required. See also response to comment CNPS-7.

Kopper-R-200

The comment questions the point of the wildlife surveys on pages 34 and 37 of Appendix Q of the 2008 RDEIR/SDEIS and of the surveys of the other resources that would be monitored as described in the MMP. The comment suggests that the 2008 RDEIR/SDEIS be revised to include “a scientifically sound monitoring program.”

The commenter’s opinion is noted. The monitoring plan was prepared by well-qualified biologists and developed in coordination with USFWS, and is scientifically sound. Information about observations of wildlife during monitoring surveys provides additional qualitative data regarding wildlife use of the preserve. Wildlife observation records are not intended to represent quantitative data. As such, power analyses like those requested by the commenter do not apply.

Kopper-R-201

The comment states that the MMP is also deficient by not establishing baselines against which to compare monitoring data. The comment states that baseline data are needed on distribution and abundance of multiple target species, including threatened and endangered and other special-status species. The comment also states that the pools in the wetlands preserve apparently were not surveyed for special-status species, and that

sampling of other plants and wildlife species in the surrounding grasslands has not occurred.

The wetlands in the preserve were subjected to a CRAM analysis during the 2008 growing season. The analysis established baseline conditions for the preserved wetlands and provides a basis for comparisons with constructed and/or restored wetlands. In accordance with the revised 2009 draft wetland MMP (see Appendix Q of this FEIR/FEIS), CRAM assessments are to be conducted on the wetlands within the on-site wetland preserve to track changes in wetland function and values, and to help identify the source of any adverse conditions within the wetland preserve.

The comment is incorrect in its assertion that special-status species surveys have not been conducted. A list of protocol-level species surveys conducted on the project site is provided on page 3.10-1 of the 2008 RDEIR/SDEIS. See also response to comment Kopper-R-80.

Kopper-R-202

The comment states that under “Contingency Measures,” Appendix Q of the 2008 RDEIR/SDEIS is deficient because the performance criteria do not include the status of any special-status species. The comment states that even if the performance criteria are considered achieved, there will be no verification that the special-status species actually occur in the ponds. The comment also states that possible remediation measures are not identified, thereby deferring the formulation of these measures until after the CEQA review.

Performance criteria for special-status species, presumably for listed aquatic invertebrates, were not specifically developed because the vegetation criteria represent a measure of the vernal pool ecosystem. In general, listed vernal pool invertebrates are not found in every aquatic feature over a landscape, whereas plant distribution can be relatively uniform throughout. A pool that supports a dominance of vernal pool plants would support a hydrologic regime conducive to aquatic invertebrate survival. The plant species expected to occur in the vernal pools include American pillwort (*Pilularia americana*), coyote thistle (*Eryngium castrense*), white navarretia (*Navarretia leucocephala*), vernal pool goldfields (*Lasthenia fremontii*), rayless goldfields (*L. glaberrima*), horned downingia (*Downingia bicornuta* var. *picta*), and slender popcorn flower (*Plagiobothrys stipitatus* var. *micranthus*), among others. These species are commonly found within the Mather Field Vernal Pool Preserve and are indicative of viable vernal pool habitat in the Southeastern Sacramento Valley Vernal Pool Region.

Specific remediation measures have not been identified at this time. If a problem or an issue is identified during the monitoring program, a specific remediation measure or measures, will be identified in consultation with USACE and implemented.

Kopper-R-203

The comment states that because the 2008 RDEIR/SDEIS (under “Contingency Measures” of Appendix Q) defers the formulation of contingency mitigation to an unspecified later date, the commenter cannot provide meaningful comments on the mitigation plan. The comment suggests specifying where the alternative sites would be located and detailing the funding amounts and funding mechanisms.

Neither CEQA or NEPA require that contingency measures be developed at the time the DEIR or DEIS is circulated; setting forth the performance standards for such plans in the DEIR or DEIS is sufficient. (See State CEQA Guidelines Section 15126.4[a][1][B] [“measures may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way”];

Endangered Habitats League v. County of Orange [2005] 131 Cal.App.4th 777, 793.) The requirement to develop contingency measures simply adds another layer of certainty assuring that impacts on wetlands and other waters of the United States and waters of the state will be adequately mitigated. The details of the requirements for mitigation of impacts on wetlands and other waters of the United States and waters of the state are included in the draft MMP and have been circulated with the 2008 RDEIR/SDEIS for public comment. Moreover, the draft wetland MMP, which was revised in June 2009 (see Appendix Q of this FEIR/FEIS), notes that a feasibility study will be done before the construction of the on-site seasonal wetlands and low-flow channel. If results of this study indicate that the proposed locations will not support the desired habitat, then another USACE-approved site and/or a USACE-approved mitigation bank or off-site mitigation facility will be used for the remaining compensatory mitigation requirements.

Kopper-R-204

The comment suggests revising the 2008 RDEIR/SDEIS to explain why wetlands constructed at the Clay Station Mitigation Bank in 1994 should be regarded as mitigation for this project's impacts, and to explain what is meant by "fully functioning" wetlands. The comment also asks whether special-status species that occur at the project site are present at the Clay Station Mitigation Bank and whether any other measure of functionality exists besides the presence of special-status species.

As defined by the National Mitigation Banking Association (NMBA), mitigation banking is wetland restoration, creation, enhancement, and in exceptional circumstances preservation, undertaken expressly for the purpose of compensating for unavoidable wetland losses in advance of development actions. It typically involves consolidating small, fragmented wetland mitigation projects into one large contiguous site. Units of restored, created, enhanced, or preserved wetlands are expressed as "credits" that may subsequently be withdrawn to offset "debits" incurred at a project development site (NMBA 2008).

Before a mitigation bank can be permitted and approved to sell wetland credits, federal and state government regulatory agencies form a mitigation banking review team that must approve plans for building the bank, from the hydrological and planting design to maintenance and monitoring arrangements. The mitigation banking review team also approves the number of mitigation credits that may be earned by the banker.

"Fully functioning" means that the created or restored wetlands have met the success criteria established by the mitigation banking review team to indicate they are providing the functions intended for that particular wetland type. Wetlands are created at a mitigation banking site, then are made available for sale once they have met the success criteria and have been approved for sale by the mitigation banking review team.

The created wetlands established at Clay Station in 1994 have been subjected to the monitoring protocol and determined to have met the success criteria and been approved for sale as compensatory mitigation for projects occurring in a specified service area, which includes Rancho Cordova. At the time of the development of this mitigation bank, the approving resource agencies allowed for construction of wetlands that were to be used as compensatory mitigation for future impacts within a given service area. There was no limitation or restriction as to when that future impact was to occur. The date when these credits are sold, in relationship to their establishment, is not regulated within a certain time frame. The wetlands at Clay Station currently support vernal pool fairy shrimp and vernal pool tadpole shrimp. Wetlands created many years ago provide an advantage over wetlands that would be newly created as compensatory mitigation for project impacts; the established wetlands already function, so no temporal loss of wetland

functions would occur during the interim period before newly created wetlands achieve functional success. Mitigation banks also provide larger, more interconnected preserves than project site preserves, thereby helping to reduce indirect effects of habitat fragmentation.

Multiple methodologies have been developed for assessing wetland functional conditions; however, these methodologies typically do not include metrics for the presence/absence of special-status species (e.g., CRAM, Wetland Evaluation Technique, Environmental Monitoring Assessment Program–Wetlands, Hydrogeomorphic Approach). Wetland functions are defined as processes or services that take place in a wetland. These functions fall into three broad categories: habitat, hydrologic, and water quality (Novitzki, Smith, and Fretwell 1997). In other words, habitat for special-status species is not the only function of a wetland, and other wetland attributes can be used to assess a wetland’s ability to function as wildlife habitat (e.g., hydrology, physical structure, plant community composition and structure).

For instance, based on a body of scientific studies, specific habitat requirements of particular special-status species are known, such as the period of time needed for a vernal pool tadpole shrimp to complete the water-dependent phase of its life cycle. Based on that information, a vernal pool would have to be inundated for a certain length of time to be suitable for vernal pool tadpole shrimp. Therefore, vernal pools that do not typically remain inundated for that specific length of time are not suitable for vernal pool tadpole shrimp, and it is not necessary to survey for the species to know that it would not be present in those pools. On the other hand, wetlands that do meet the habitat requirements of a particular species can be assumed to provide suitable habitat. It is not typically required that the presence of these species be established for the compensatory mitigation to be complete, only that suitable habitat exists. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-205

The comment states that a scientific basis for using the Cook Property to mitigate impacts on the project site could be established, but has not, and asserts that the project applicant(s) have to establish that special-status species occur on the Cook Property in order to establish a quantitative basis for the mitigation ratio, as called for by the City by policies such as Action NR 1.2.1 of the City General Plan.

Neither USACE, USFWS, nor the City require protocol-level surveys for compensatory mitigation land. As stated above, compensatory mitigation ratios are typically determined based on suitable habitat. USFWS requires compensatory mitigation for all suitable habitat that would be lost on the project site, occupied or not, and compensation in the form of suitable habitat (not necessarily occupied habitat) is typically considered appropriate compensatory mitigation. The *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (Vernal Pool Recovery Plan) expressly provides that habitat to be protected includes both occupied and unoccupied suitable habitat that serves as corridors for dispersal, opportunities for metapopulation dynamics, reintroduction/introduction sites, and protection of undiscovered populations. (2008 RDEIR/SDEIS, page 3.10-38.) The specific acreage ultimately required would be determined as part of Section 7 consultation between the federal agencies. Action NR 1.2.1 refers to the directive in the City General Plan to establish a Swainson’s hawk ordinance in coordination with DFG. The City has not adopted a Swainson’s hawk ordinance as of the time of this response. The Cook Property would be provided as

compensatory mitigation for impacts on wetlands and other waters of the United States and waters of the state, not Swainson's hawk impacts.

As explained in the draft MMP, updated in June 2009 (see Appendix Q of this FEIR/FEIS), the conclusion that the Cook Property is likely to support vernal pool species is well-supported. The site is situated in an area of Sacramento County that is known to support several branchiopod species, including those that are federally listed as threatened or endangered. Surveys conducted by ECORP and other investigators in the immediate vicinity have identified vernal pool fairy shrimp, mid-valley fairy shrimp, vernal pool tadpole shrimp, and California fairy shrimp. Furthermore, according to the CNDDDB, vernal pool fairy shrimp and vernal pool tadpole shrimp have been documented 800 feet to the west of the property.

The Cook Property has been included in the Mather Core Area of the Vernal Pool Recovery Plan, thereby reflecting USFWS's opinion that the area is suitable for preservation mitigation. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-206

The comment states that the possibility of modifying the MMP for consistency with the draft SSCHCP, if the plan were to be adopted before mitigation begins, pursuant to the MMP developed for the project, defers formulation of mitigation to a later date, thus excluding the public from review and comment.

The draft SSCHCP is beginning the environmental review process. An EIR/EIS will be prepared for the draft SSCHCP and will be available for public review prior to certification. Therefore, the public will have an opportunity to comment on the conservation strategies included in the draft SSCHCP before its adoption. Because the SSCHCP has yet to be adopted, the City and USACE cannot at this point require the project to be consistent with the document. As such, the 2008 RDEIR/SDEIS proposes that the project's mitigation requirement include consistency with the SSCHCP if it is adopted. The draft SSCHCP currently assumes that the proposed 507-acre on-site wetland preserve is established. It is expected that this project will receive its 404 permit approvals and associated biological opinion before the SSCHCP is adopted. Should the project applicant(s) and permitting agencies decide to pursue coverage under the draft SSCHCP rather than proceed with the mitigation as outlined in the 2008 RDEIR/SDEIS, the City and USACE would have to review the revised project to determine whether the scope of the project would change enough to warrant additional environmental analyses or whether any previously undisclosed significant impacts would result. Should additional analysis be deemed necessary, the public would have a chance to review any supplemental analysis circulated for review.

Kopper-R-207

The comment states that, regarding Mitigation Measure 3.10-1a, obtaining a required permit from a federal regulatory agency (e.g., a Section 404 permit) does not qualify as a mitigation measure and that the steps outlined in the 2008 RDEIR/SDEIS for obtaining wetlands take permits should have been completed in advance of public circulation of the document.

The comment correctly states that securing required permits does not, in and of itself, qualify as mitigation under CEQA. However, as a condition of obtaining necessary permits under Sections 401 and 404 of the CWA or California's Porter-Cologne Act, the project would be required to ensure no net loss of wetland functions, which would be satisfactory mitigation for wetland impacts under CEQA. Mitigation Measure 3.10-1a of the 2008 RDEIR/SDEIS outlines specific mitigation requirements beyond acquiring

regulatory permits, as listed in response to comment Kopper-R-144. Mitigation Measure 3.10-1a includes detailed requirements for mitigating impacts on wetlands and other waters of the United States and waters of the state. No requirement under CEQA or NEPA state that the mitigation steps outlined in Mitigation Measure 3.10-1a would need to be completed in advance of public circulation of the 2008 RDEIR/SDEIS. Mitigation is required in advance of the impact, not in advance of project approval. Furthermore, the NEPA process must be completed before issuance of a USACE permit, and therefore a permit could not be obtained before circulation of the 2008 RDEIR/SDEIS. In support of the application, a substantial amount of survey and study work have been performed, and are sufficient to demonstrate to the City and the USACE that impacts on wetlands and other waters of the United States and waters of the state can successfully be mitigated to the degree feasible. Issuance of a permit by a state agency such as DFG or the Central Valley RWQCB typically requires proof of a certified CEQA document and NEPA ROD. It would not be reasonable or justified to require a project applicant(s) to implement mitigation measures for a project that has not been approved. If the comment refers to the CRAM monitoring, this also would not be appropriate in advance of project approval because it is meant to compare the status of created and preserved wetlands with implementation of the project to the established baseline. If the project is never implemented, no wetland would be preserved and no future monitoring would be needed. CRAM baseline assessment was conducted on the project site in 2008.

Kopper-R-208

The comment states that translocation of elderberry shrubs, described under Impact 3.10-2 of the 2008 RDEIR/SDEIS, would not result in a less-than-significant impact unless the shrubs survive and unless any valley elderberry longhorn beetles they support also survive the translocation and continue to use the shrubs.

Elderberry shrubs are considered a sensitive biological resource because they are the host plant of the VELB, a federally listed species. Therefore, the mitigation contained in the 2008 RDEIR/SDEIS follows guidelines established by USFWS (1999), which state that elderberry shrubs that cannot be avoided must be transplanted to a conservation area. Also consistent with USFWS guidelines, 2,904 elderberry seedlings and associated native plants (equaling 290.4 mitigation credits) would be planted in the on-site elderberry preserve and 449.6 credits would be purchased at a USFWS-approved VELB mitigation bank. Planting of additional elderberry seedlings at ratios recommended by USFWS is meant to offset potential losses of transplanted shrubs. Presence of VELB is difficult to confirm as this species spends the majority of its life cycle within the stems of elderberry plants and exterior evidence of its presence is rarely evident. Therefore, determining presence and survival of VELB in transplanted shrubs is not a criterion of mitigation. The presence of exit holes is used in determining compensatory mitigation ratios (i.e., shrubs with exit holes are mitigated at a higher replacement ratio). Even though elderberry mitigation provided in the 2008 RDEIR/SDEIS follows USFWS guidelines, page 3.10-58 of the 2008 RDEIR/SDEIS acknowledges that relocating the shrubs to land designated as Open Space/Preserve would not be expected to result in any measurable benefit to VELB because the conservation areas would eventually be surrounded by development and isolated from larger areas of potential habitat. Furthermore, no assurances exist that the open space/preserve land would promote the long-term viability of the habitat (page 3.10-56).

A revised draft VELB mitigation plan was developed by ECORP in June 2009. This revised plan proposes to plant a total of 3,230 elderberry seedlings and 4,170 associated native plantings in a single 12-acre elderberry preserve on-site and purchase the remaining 449.6 credits needed from an off-site VELB mitigation bank. The 2009 draft

VELB mitigation plan is provided in Appendix R of this FEIR/FEIS. Ultimately, the project's requirements regarding federally listed species would be determined through issuance of the biological opinion by USFWS and any specific requirements stated in that biological opinion would have to be fulfilled by the project applicant(s) (see Mitigation Measure 3.10-4b). See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-209

The comment questions the conclusion in the 2008 RDEIR/SDEIS (Impact 3.10-2) that impacts on riparian habitat would be less than significant based on the premise that riparian trees are currently senescing and will not regenerate. The commenter expresses the opinion that a stronger case for this premise should be established in the 2008 RDEIR/SDEIS because it would be very unusual for trees that have been growing over many decades to suddenly and naturally run short of water.

Contrary to the commenter's assertion, the 2008 RDEIR/SDEIS concludes that there would be a direct and indirect significant impact on riparian habitat (page 3.10-47) and that this impact would remain significant and unavoidable even with application of mitigation (page 3.10-51). See also responses to comments Kopper-R-121 and Kopper-R-133 regarding regeneration of riparian vegetation. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-210

The comment reiterates that obtaining a required permit from a state agency (such as the Section 1602 streambed alteration agreement) does not qualify as a mitigation measure. The comment also states that the MMP for altering Morrison Creek, described in Mitigation Measure 3.10-2a of the 2008 RDEIR/SDEIS, should be prepared and included in the 2008 RDEIR/SDEIS in advance of the permit process so that the public can have a chance to review it and participate in the CEQA process.

The mitigation measure does not solely require a streambed alteration agreement as mitigation for impacts on Morrison Creek. Mitigation Measure 3.10-2a requires a habitat mitigation monitoring plan that includes certain performance standards and success criteria. In addition, mitigation measures that are acceptable to DFG would be established as a condition of the streambed alteration agreement. DFG, as a trustee agency charged with protection of the stream resource (Morrison Creek), would impose appropriate mitigation as a condition of the agreement. It is typical that streambed alteration agreements and other permits are not issued until after a project is approved and therefore this information is not available before circulation of a DEIR/DEIS. As stated above in response to Kopper-R-207, a certified CEQA or NEPA document is required to obtain a permit such as a streambed alteration agreement from a state agency such as DFG.

Modifications to Morrison Creek resulting from the project would be relatively minor and would occur only on the southwest end outside the proposed wetland preserve area associated with a portion of the creek that has already been disturbed from previous land use activities on the site. This portion would be reconfigured to connect hydrologically with the constructed project drainages and to allow for gravity flows away from the project site. The downstream end of the improved channel would include some riprap to reduce the velocity of erosive runoff, but would otherwise retain a natural substrate, meandering channel. Therefore, very little impact on Morrison Creek is expected.

In addition, as explained in the draft MMP updated in June 2009 (see Appendix Q of this FEIR/FEIS), in the spring of 2009 and at the request of USACE, a field investigation of Morrison Creek was conducted. This investigation showed that the portion of Morrison

Creek within the wetland preserve was affected by historic mining and farming activities (realignment). Based on this investigation, several enhancement opportunities were identified. The revised MMP includes plans to correct two head-cuts within the channel and naturalization (regrading/redistribution) of spoil piles left behind after Morrison Creek was realigned into its current position.

Kopper-R-211

The comment states that the 2008 RDEIR/SDEIS, regarding the MMP for the replacement of cottonwood willow riparian woodland (Mitigation Measure 3.10-2b), is not specific. The 2008 RDEIR/SDEIS says the MMP “may” address location of habitat replacement (on-site or off-site), specific mitigation ratios, and “enhancement” of habitat types, whereby enhancement is not well defined. The commenter states that the 2008 RDEIR/SDEIS defers the formulation of an important mitigation measure to an unspecified later date, excluding the public from meaningfully participating in the environmental review of the document.

Please see responses to comments Kopper-R-121 and Kopper-R-133 regarding riparian vegetation at the project site. The 2008 RDEIR/SDEIS calls this habitat type riparian because of its wildlife habitat functions and characteristic vegetation. However, it is not necessarily considered riparian habitat in a regulatory sense because it is not associated with streams. Riparian communities are considered sensitive natural communities by DFG, but DFG has no jurisdiction over this riparian habitat under Section 1602 because it is not associated with a river, stream, or lake. The formulation of the mitigation measure is not deferred to a later date; pages 3.10-50 and 3.10-51 contain performance standards that specify the contents of the required MMP and provide for consultation with the City and DFG. Neither CEQA nor NEPA requires that detailed mitigation plans be circulated with the DEIR or DEIS. Setting forth the performance standards for such plans in the document is adequate. (See State CEQA Guidelines Section 15126.4[a][1][B] [“measures may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way”]; *Endangered Habitats League v. County of Orange* [2005] 131 Cal.App.4th 777, 793.) Mitigation Measure 3.10-2b satisfies this requirement by establishing that the habitat MMP will include replacement of 57 acres of cottonwood willow riparian woodland and 4 acres of willow scrub at no-net-loss acreage to preserve the overall habitat functions .

Kopper-R-212

The comment states that the DEIR could be improved by providing results of the tree surveys (described in 3.10-3 of the DEIR) so that the reviewers can tell whether substantial changes to the project design would be needed. If survey results lead to the conclusion that mature oaks would need to be avoided, the commenter assumes the project design will be altered, thereby shifting the project’s impacts.

The tree survey indicates that 47 native oak trees on the project site have a dbh greater than or equal to 6 inches. All native oak trees meeting that size criterion are protected under the Sacramento County tree ordinance, which is the City’s interim tree policy until the City has developed and adopted one of its own. In addition, fewer than 50 oak trees measuring less than 6 inches dbh were documented during the tree survey. As reported in the tree inventory, “the (tree) vegetation is almost wholly comprised of Fremont cottonwood (*Populus fremontii*) with some Pacific willow (*Salix lasiandra*) being observed in the depressions between the tailings rows” (Sierra Nevada Arborists 2003). Cottonwood trees are excluded from the County tree ordinance. All but one of the oak trees identified on the project site are interior live oak (*Quercus wislizenii*), the other is a blue oak (*Q. douglasii*) located along White Rock Road. Most of the oak trees are located within the 3-acre area identified as oak woodland in Exhibit 3.10-1 of the 2008

RDEIR/SDEIS, but individuals are scattered throughout the project development footprint. As required in Mitigation Measure 3.10-3 of the 2008 RDEIR/SDEIS, all trees meeting the tree ordinance criteria would be avoided by the project, if feasible. If protected trees cannot be feasibly avoided, the mitigation measure sets forth requirements for replacement.

Kopper-R-213

The comment reiterates that the public would be excluded from environmental review of the draft VELB mitigation plan because Appendix R of the 2008 RDEIR/SDEIS states that the plan would be modified following consultation with USFWS, which would occur after the public can provide its review.

Consultation with USFWS has been ongoing throughout the EIR/EIS process and compensatory mitigation provided in the draft VELB mitigation plan provided as Appendix R of the 2008 RDEIR/SDEIS follows the compensation requirements outlined in the USFWS VELB Conservation Guidelines (USFWS 1999). These guidelines define the mitigation measures based on the number of stems by diameter class at ground level, the presence or absence of evidence of exit holes, and whether the elderberry shrubs occur in riparian habitats. Because the draft MMP was provided in the 2008 RDEIR/SDEIS, the public had an opportunity to comment on the proposed mitigation before it was finalized. As stated in Mitigation Measure 3.10-4b of the 2008 RDEIR/SDEIS, the final VELB mitigation plan requires relocation of existing elderberry shrubs and planting of new elderberry seedlings at appropriate ratios to achieve no net loss of VELB habitat. A revised VELB mitigation plan was prepared in 2009 (see Appendix R to this FEIR/FEIS). Based on the compensatory mitigation ratios set forth by USFWS, the 12-acre elderberry preserve will accommodate a total of 19 existing elderberry shrubs, 3,230 elderberry seedlings, and 4,170 associated native plantings. An additional 449.6 credits will be purchased at an off-site mitigation bank to accommodate the remaining credits. This mitigation plan cannot be considered final until a final biological opinion has been issued by USFWS and all conditions of the biological opinion have been incorporated into the mitigation plan. However, it is common for an EIR to be certified before USFWS has issued a final biological opinion for the project.

Kopper-R-214

The comment states the opinion that the two elderberry reserves of 10 and 12 acres (described on page 3.10-56) would be too small, too fragmented, and too degraded from exposure to edge effects to provide habitat for any of the special-status species at issue except as stopover habitat for migrating passerines.

See responses to comments Kopper-R-159 and Kopper-R-208. A revised VELB mitigation plan was completed in 2009 (see Appendix R to this FEIR/FEIS). This mitigation plan notes that only one 12-acre preserve will be created. Based on the compensatory mitigation ratios set forth by USFWS, the 12-acre elderberry preserve will accommodate a total of 19 existing elderberry shrubs, 3,230 elderberry seedlings, and 4,170 associated native plantings. An additional 449.6 credits will be purchased at an off-site mitigation bank to accommodate the remaining credits. The USFWS VELB Conservation Guidelines do not prescribe a minimum preserve size for VELB. The VELB Conservation Guidelines stipulate that 1,800 square feet be set aside to accommodate each transplanted elderberry shrub. Furthermore, page 3.10-58 of the 2008 RDEIR/SDEIS acknowledges that relocating the shrubs to land designated as Open Space/Preserve would not be expected to result in any measurable benefit to VELB because the conservation areas would eventually be surrounded by development and isolated from larger areas of potential habitat. There are no assurances that the open space/preserve land would promote the long-term viability of the habitat (page 3.10-56).

See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-215

The comment states that obtaining a required take permit for federally listed vernal pool invertebrates from USFWS does not qualify as a mitigation measure and should not be presented as such.

The comment is correct that securing a take authorization is not, in and of itself, mitigation. However, mitigation considered appropriate to USFWS, as the agency charged with enforcing the federal Endangered Species Act, would be developed as a condition of the take authorization. As Mitigation Measure 3.10-4a of the 2008 RDEIR/SDEIS states, the project applicant(s) shall secure take authorization and abide by all conditions set forth in the biological opinion from USFWS. To issue a permit, USFWS must find that the project is not likely to jeopardize the continued existence of the vernal pool tadpole shrimp, vernal pool fairy shrimp, Sacramento Orcutt grass, slender Orcutt grass, and VELB. Furthermore, the specific terms and standards to be included and achieved in the mitigation plan have been required as part of this mitigation measure. The mitigation measure also sets specific requirements and performance standards for compensatory mitigation through implementation of a wetland MMP that will result in no net loss of acreage, function, and value of affected vernal pool habitat. Many mitigation elements are identified in Mitigation Measures 3.10-4a and 3.10-1a of the 2008 RDEIR/SDEIS and the draft MMP (see Appendix Q of this FEIR/FEIS); however, USFWS has the discretion to require additional measures, changes to compensatory mitigation ratios, modifications to success criteria, and other modification as they see fit as the responsible agency for protecting federally listed species. The biological opinion is not subject to public review and comment and the 2008 RDEIR/SDEIS cannot consider mitigation measures for impacts on listed species to be final until a biological opinion has been issued and all conditions of the biological opinion have been incorporated into the mitigation plan. It is common for USFWS not to issue a final biological opinion for a project until after an EIR has been adopted.

Kopper-R-216

The comment states that because the draft MMP for impacts on federally listed vernal pool invertebrates is subject to change (pending USFWS review), including mitigation ratios, locations of on-site and off-site protections and wetland creations, the public is excluded from participating in the final review of the draft MMP. Also the commenter disagrees with the claim that mitigation in the draft MMP will result in no net loss in vernal pool or seasonal wetland habitat in lieu of a final draft MMP.

Neither CEQA nor NEPA requires that detailed mitigation plans be circulated with the DEIR or DEIS. Setting forth the performance standards for such plans in the MMP is adequate. (See State CEQA Guidelines Section 15126.4[a][1][B] [“measures may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way”]; *Endangered Habitats League v. County of Orange* [2005] 131 Cal.App.4th 777, 793.) See responses to comments Kopper-R-192, Kopper-R-207, and Kopper-R-215.

Kopper-R-217

The comment states that the 2008 RDEIR/SDEIS should accurately present ecological terms such as “ecosystem health,” which is used in the mitigation measure discussed on page 3.1-59. The commenter states that ecosystem health refers to ecosystem function and is usually associated with roles of contaminants or other intrusive forces in degrading ecosystem function. The commenter expresses the opinion that “ecosystem integrity” would not be a good word replacement for ecosystem health as the mitigation measure would not maintain or improve the ecosystem because the project would

fragment vegetation cover types, including vernal pools, and the proposed wetlands creation could further destroy existing elements of the ecosystem.

The commenter's opinion regarding the appropriate terminology is noted. There are many ways to determine or define ecosystem health. As applied in the 2008 RDEIR/SDEIS, "ecosystem health" refers to the condition of an ecosystem (i.e., the vernal pool grassland), its individual parts and their connections, and its ability to maintain the functions of the vernal pool system. This definition is used by the Ministry of Natural Resources (2008), among others.

The design of the on-site preserve incorporates measures to reduce and avoid indirect impacts on the preserved vernal pool grassland systems such as measures to reduce interference with the hydrology that sustains vernal pools, measures to maintain water quality in preserved wetlands and other waters, and maintenance of adjacent upland habitat to support species that use both vernal pool and upland habitats and provide ecological services to vernal pool species. As explained on page 3.10-27 of the 2008 RDEIR/SDEIS, the watershed analysis for the project indicates that the peak flows, runoff volumes, and runoff durations of the wetland preserve area would not be substantially altered because the project would modify only 3% of the 1,830-acre watershed and because low-impact development features, water quality ponds, and retention/detention ponds required by the local agencies would be incorporated into the project. The hydrologic analysis suggests that project implementation would not decrease the watershed ratios below levels necessary to sustain existing depressional wetlands or the proposed 13.5 acres of compensatory vernal pools.

The compensatory pools would be created in the footprints of previously existing pools, wherever possible. According to the modeling results summarized in the 2008 RDEIR/SDEIS, the proposed on-site wetland preserve could accommodate and support an additional 50 acres of vernal pool habitat without compromising the existing hydrology. The proposed configuration of the preserve conserves almost 100% of the original watershed area and would not negatively affect the hydrologic function of the vernal pools. However, despite the mitigation measures incorporated to minimize and avoid adverse effects on ecological health, as defined here, the 2008 RDEIR/SDEIS acknowledges that the impact on federally listed vernal pool branchiopods would remain significant and unavoidable (page 3.10-65) after application of mitigation. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-218

The comment states that obtaining a required take permit for VELB from USFWS does not qualify as a mitigation measure and should not be presented as such in the 2008 RDEIR/SDEIS.

The commenter is correct that securing an incidental take permit does not, in and of itself, constitute mitigation. In addition to requiring that a take permit be obtained, Mitigation Measure 3.10-4b also sets specific requirements and performance standards for compensatory mitigation through implementation of a wetland MMP that will result in no net loss of acreage, function, and value of affected vernal pool habitat. In addition, mitigation considered appropriate to USFWS, as the agency charged with enforcing the federal ESA, would be developed as a condition of the take authorization. To issue a permit, USFWS must find that the project is not likely to jeopardize the continued existence of the vernal pool tadpole shrimp, vernal pool fairy shrimp, Sacramento Orcutt grass, slender Orcutt grass, and VELB. Furthermore, the specific terms and standards to be included and achieved in the mitigation plan have been required as part of this

mitigation measure. As Mitigation Measure 3.10-4b of the 2008 RDEIR/SDEIS states, the project applicant(s) shall secure take authorization and abide by all conditions set forth in the biological opinion from USFWS, including relocation of existing elderberry shrubs and planting of new elderberry seedlings on a no-net-loss basis. A revised draft VELB mitigation plan is provided in Appendix R of this FEIR/FEIS. Please also refer to response to comment Kopper-R-213.

Kopper-R-219

The comment states that the 2008 RDEIR/SDEIS should be revised to include much more detail about the proposed VELB translocation, especially about success criteria, the likelihood of success, and the consequences of failure. The commenter also states that this detailed information on monitoring success of relocated and planted shrubs should be included in the 2008 RDEIR/SDEIS and not the biological opinion so that the commenter and other members of the public can participate meaningfully in the environmental review.

A Draft Valley Elderberry Longhorn Beetle Mitigation Plan was circulated with the 2008 RDEIR/SDEIS. The commenter's opinion regarding the likely success of transplanting elderberry shrubs is noted. Detailed information on the transplanting and success criteria is included in the draft plan, which was circulated for public review. See responses to comments Kopper-R-208 and Kopper-R-213. The public had the opportunity to comment on the draft VELB mitigation plan and mitigation measures provided in the 2008 RDEIR/SDEIS under Mitigation Measure 3.10-4d. The VELB mitigation plan was revised in 2009 to incorporate changes based on comments from the public and USFWS (see Appendix R of this FEIR/FEIS). These measures, however, are all subject to review and approval by USFWS and could be modified based on the terms of the final biological opinion. The 2008 RDEIR/SDEIS cannot consider mitigation measures for impacts on listed species to be final until a biological opinion has been issued and all conditions of the biological opinion have been incorporated into the mitigation plan. It is common for an EIR to be certified before USFWS issues a final biological opinion for the project. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-220

The comment states that according to the 2008 RDEIR/SDEIS (page 3.10-62), a compensatory mitigation plan for take of VELB will be submitted to DFG and the City before any grading. The commenter states that this step defers the formulation of an important mitigation measure to an unspecified, later date, ensuring that the commenter and public cannot meaningfully participate in the environmental review. Therefore, the 2008 RDEIR/SDEIS should be revised to include a detailed compensatory VELB mitigation plan.

Contrary to the commenter's assertion, the 2008 RDEIR/SDEIS does not state that a compensatory mitigation plan for take of VELB will be submitted to DFG and the City before grading. It states that if VELB is delisted before the project is implemented, a mitigation plan that would compensate for the removal of elderberry savanna, a sensitive habitat as identified by DFG, shall be submitted to and approved by DFG and the City before the approval of any grading or improvement plans or any ground-disturbing activities that would affect elderberry savanna. Because VELB has not been delisted and there is no way to know whether delisting would occur before project implementation, there is no reason to provide an alternate mitigation plan in the 2008 RDEIR/SDEIS. The current proposed compensatory mitigation for VELB is provided in Appendix R of this FEIR/FEIS and Mitigation Measure 3.10-4d, which includes performance standards to be met.

Kopper-R-221

The comment states that the term “qualified,” as it relates to “qualified raptor biologist” on page 3.10-63 of the 2008 RDEIR/SDEIS, should be defined in the 2008 RDEIR/SDEIS because it appears the document preparers struggled with ecological terms such as “ecosystem health” and “habitat type,” and were themselves not qualified to perform the analysis. The comment also expresses general frustration with the scientific foundation of the 2008 RDEIR/SDEIS (as articulated in prior comments) and with the integrity of the biological surveys conducted, stating that the wildlife survey methodology and findings were grossly inadequate.

All preparers of the “Biological Resources” section of the 2008 RDEIR/SDEIS are qualified biologists with relevant degrees from accredited universities and extensive professional knowledge of and experience with the biological resources in the region. See Chapter 6, “List of Preparers,” of the 2006 DEIS/DEIR, 2008 RDEIR/SDEIS, and this FEIR/FEIS. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS. Although it would be inappropriate for the 2008 RDEIR/SDEIS to specify who the project applicant(s) must hire to conduct raptor surveys, they are required to hire individuals who have experience conducting nesting raptor surveys and knowledge and familiarity with the species in the region, including their status, life history, habitat requirements, and identifying characteristics. See responses to comments Kopper-R-80 through Kopper-R-87 regarding the purpose and methodology of the habitat assessment/reconnaissance surveys. See response to comment Kopper-R-126 regarding the term “habitat type” and response to comment Kopper-R-217 regarding the term “ecosystem health.” See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-222

The comment states that Mitigation Measure 3.10-4c of the 2008 RDEIR/SDEIS should be revised to read that DFG’s guidelines on Swainson’s hawk nest surveys will be followed “in full” as opposed to the “extent feasible.” The comment also says that the 2008 RDEIR/SDEIS should state that the surveys for nesting raptors be performed during the nesting season and expresses frustration that preparers of the 2008 RDEIR/SDEIS already performed surveys at the wrong time of year to detect multiple special-status species.

Surveys for nesting Swainson’s hawks and other raptors must be conducted during the nesting season and the minimum survey standards outlined in the *Recommended Timing and Methodology for Swainson’s Hawk Nesting Surveys in California’s Central Valley* (Swainson’s Hawk Technical Advisory Committee 2000) must be implemented as required by Mitigation Measure 3.10-4c of the 2008 RDEIR/SDEIS. For example, surveys must be conducted for at least the two survey periods immediately before initiation of any project phase that could affect Swainson’s hawk nesting habitat. Surveys must be conducted during nesting survey periods II, III, or V, as identified in the recommendations. However, surveys would not necessarily be conducted in all three of these periods. The DFG guidelines are a separate document from the Swainson’s Hawk Technical Advisory Committee document cited in Mitigation Measure 3.10-4c; thus, it is unclear to which document the comment actually refers. The DFG guidelines state that project applicant(s) and CEQA lead agency may need to conduct site-specific surveys by a qualified biologist at the appropriate time of year following approved protocols, but provides no more specific guidelines for conducting surveys.

All previous protocol-level surveys for special-status species were conducted at the appropriate time of year to identify the target species. The surveys to which the comment

refers were reconnaissance-level surveys, not special-status species surveys. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-223

The comment expresses the opinion that the mitigation guidelines for burrowing owl were described by the 2008 RDEIR/SDEIS in a very cursory manner, making no mention, for example of the compensation ratio for unavoidable impacts on burrows and timing of actions. The commenter believes that the 2008 RDEIR/SDEIS should be revised to explain in detail which measures in the burrowing owl guidelines would be implemented and which would not be implemented.

As stated in Mitigation Measure 3.10-4c of the 2008 RDEIR/SDEIS, if active burrows are found, a mitigation plan to exclude the burrowing owls shall be submitted to the City for review and approval before any ground-disturbing activities. The City shall consult with DFG about the best exclusion methods to rid the site of burrowing owls before beginning construction activities. These exclusion methods may consist of installation of one-way doors on all burrows to allow owls to exit, but not reenter, and construction of artificial burrows within the project vicinity, as needed. If active burrows contain eggs and/or young, no construction shall occur within 50 feet of the burrow until young have fledged. Once no owls are confirmed inside burrows, these burrows may be collapsed. These are standard, accepted mitigation measures for burrowing owls regardless of which specific exclusion methods would be used. No requirement exists to mitigate the loss of potential burrowing owl habitat, only to avoid take of individuals and their eggs or young. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-224

The comment states that the preparation of the Swainson’s hawk mitigation plan (described in Mitigation Measure 3.10-4d) should be completed and included in the 2008 RDEIR/SDEIS. The commenter states that because the MMP is not completed, the public is denied the opportunity to participate in its review.

As stated in Mitigation Measure 3.10-4d, page 3.10-64 of the 2008 RDEIR/SDEIS, the project applicant(s) shall be required to preserve suitable Swainson’s hawk foraging habitat to ensure 1:1 compensatory mitigation of habitat value for Swainson’s hawk foraging habitat lost as a result of the project. However, the preservation ratio must be determined in consultation between the City and DFG and would be based on the amount of suitable foraging habitat within 10 miles of an active nest (one that has been used at least once in the past 5 years) that would be adversely affected by the project. This is consistent with the 1994 DFG Swainson’s hawk guidelines included in the *Staff Report Regarding Mitigation for Impacts to Swainson’s Hawks (Buteo swainsoni) in the Central Valley of California*. If compensatory mitigation ratios were determined for inclusion in the public 2008 RDEIR/SDEIS, they would have to be based on any active nest sites identified before development of the 2008 RDEIR/SDEIS and therefore would not be representative of nesting at the time project phases that would affect nesting Swainson’s hawks are implemented. The number of active nests within 10 miles by the time the particular project phase is implemented could be very different from what it is currently. Therefore, the most appropriate method would be to determine the compensatory habitat mitigation ratio following the protocol-level nesting Swainson’s hawk surveys that would take place before construction begins for each phase of development. Contrary to the commenter’s assertion, the specific mitigation is not deferred; it is required to be 1:1 preservation of lost habitat value that meets certain specified standards, but the value shall be determined based on the locations of active nests at the time of project impact.

Kopper-R-225

The comment expresses disagreement with the conclusion in the 2008 RDEIR/SDEIS (as stated on page 3.10-65) that “The project by itself, however, would not be expected to cause a decline in numbers of any of these species [vernal pool branchiopods, VELB, Swainson’s hawk, and western spadefoot] to the point where their regional populations were no longer viable...” The commenter states that cumulative development in the region has resulted in insufficient space available near the project to offset the impacts from this project; therefore, any single project in the region would contribute to the incremental destruction of the remaining wildlife and plant habitats that support special-status species. The comment further states that there is no getting around the conclusion that the cumulative effects of this and surrounding projects would be significant.

The commenter is correct that the project would result in a cumulatively considerable incremental contribution to significant impacts on cumulative biological resources in the region, as acknowledged on page 3.10-72 of the 2008 RDEIR/SDEIS. However, when considering the project by itself and not in combination with all other projects in the region, the project would result in significant and unavoidable impacts on special-status species according to CEQA. However, the project by itself would not cause a decline in species such that their regional populations are no longer viable (see City General Plan Policy NR 1.7.1). On a cumulative level, the impacts on special-status species are significant and unavoidable under the CEQA threshold of significance, as acknowledged in the 2008 RDEIR/SDEIS. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-226

The commenter disagrees with the conclusion on page 3.10-66 that “the mitigation does include elements of habitat creation and enhancement that would increase the habitat value of preserved lands....” The commenter reiterates the opinion that to “create” new habitat or “enhance” existing habitat in the preserve would require destroying existing habitat, thereby decreasing the habitat value. In addition, the commenter believes that to “enhance” habitat would require a baseline of conditions against which improvements will be made, but no such conditions, such as counts per pool on special-status plants, vernal pool branchiopods, or western spadefoot larvae, have been documented in the 2008 RDEIR/SDEIS. The comment further states that no measurements of any kind, other than digital delineation of vernal pools and seasonal wetlands, have been made and the delineations are of suspect value because vernal pools do not have hard and fast boundaries. The comment concludes by saying that no credible scientific basis exists in the 2008 RDEIR/SDEIS for either habitat creation or enhancement on the project site.

Protocol-level surveys of special-status plants and vernal pool branchiopods were conducted as part of the project (see response to comment Kopper-R-81); therefore, the commenter is incorrect in stating that no per-pool count data exist for these resources. Please refer to response to comment Kopper-R-194 regarding creation of vernal pools in the footprints of historic pools that were filled by past land use activities. The vernal pools and seasonal wetlands, as well as all other water features on the project site, were delineated according to USACE’s three-parameter approach to determining the location and boundaries of jurisdictional wetlands. This approach requires that an area support positive indicators of hydrophytic vegetation, hydric soils, and wetland hydrology to be considered a federally jurisdictional wetland. Vegetation, soil, and hydrology were investigated in the field following the USACE methodology and findings were recorded on routine delineation data forms provided in the respective wetland delineation reports (Gibson and Skordal 1999, ECORP 2004). The wetland delineations were verified by USACE and no evidence supports the comment’s claim that the wetland delineations should be considered suspect. The inundation level and duration of a vernal pool varies

from year to year, but the overall footprint of the pool that supports hydrology and hydric soil indicators does not vary. See response to comments USFWS-1, EPA-R-12, EPA-R-13, EPA-R-14, CNPS-R-2, CNPS-R-3, CNPS-R-4, CNPS-R-5, and CNPS-R-6. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-227

The comment states that it is meaningless to say on page 3.10-67 of the 2008 RDEIR/SDEIS that “Direct impacts on the population of Greene’s legenera...will be avoided to the maximum extent feasible” because the project would completely destroy the other two of the three occurrences of Greene’s legenera on the project site. The commenter suggests that because the project, as proposed, would not avoid Greene’s legenera, the 2008 RDEIR/SDEIS ought to be revised by removing any promise that efforts would be made to avoid or offset impacts on Greene’s legenera occurrences.

Efforts to minimize and avoid impacts on Greene’s legenera have been incorporated into Mitigation Measure 3.10-5 of the 2008 RDEIR/SDEIS, including construction monitoring by a qualified botanist, fencing of the area containing individuals to be preserved during project construction, and maintenance of existing hydrology. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-228

The comment states that translocation of Greene’s legenera seeds could result in genetic contamination of existing plants in the receiving pools, as well as new competition with existing plant species. The commenter also states that the seeds could fail to propagate new populations because of differences in environmental conditions. The commenter suggests that if this approach is going to be taken, the CNPS guidelines should be followed.

Greene’s legenera seeds would not be translocated to pools already containing Greene’s legenera but would be used to inoculate existing pools of similar size, depth, hydration period, and similar associated species as the pools that currently support Greene’s legenera. Also, genetic contamination would not be an issue because it is likely that seeds from one occupied pool already disperse naturally to other on site pools through flowing water and by animals, including water fowl and grazing cattle. Interbreeding also is likely to occur among individual plants across the site; however, whether outcrossing occurs in this species or whether it reproduces exclusively through self pollination is uncertain. The CNPS guidelines regarding translocation of affected special-status plants would be followed.

The comment is correct that collecting seeds and inoculating pools with similar characteristics as the pools the seeds come from does not guarantee that germination would be successful; however, according to CNPS guidelines, efforts to salvage portions of the population that would be lost should be made. Every effort would therefore be made to achieve successful translocation of the affected colonies of Greene’s legenera. The mitigation measure requires monitoring of existing and seeded populations. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-229

The comment states that by preparing an MMP for mitigating impacts on Greene’s legenera at an unspecified later date, the 2008 RDEIR/SDEIS defers the formulation of an important mitigation measure, thereby excluding the public from meaningfully participating with the environmental review.

The principal elements of the mitigation plan (e.g., performance standards) are provided in Mitigation Measure 3.10-5 of the 2008 RDEIR/SDEIS. Performance standards do not constitute deferral of mitigation. (*Endangered Habitats League v. County of Orange* [2005] 131 Cal.App.4th 777, 793.) Because Greene's legenera, a CNPS List 1B species, has no formal protection under state or federal law, it is up to the City and USACE, as the lead agencies, to determine appropriate mitigation for impacts on this species. The City and USACE have determined that the mitigation contained in the 2008 RDEIR/SDEIS is appropriate.

Kopper-R-230

The comment states that the measures outlined in Mitigation Measure 3.10-5 of the 2008 RDEIR/SDEIS would not reduce the significance of the project impacts on Greene's legenera to less than significant and that fencing off a population would not protect it from invasive plants and chemical pollutants. The commenter also states that inoculating vernal pools with Greene's legenera seeds may not result in new populations and could disturb existing conditions in the vernal pools. The commenter recommends that the 2008 RDEIR/SDEIS be revised with a new impacts conclusion, based on a more detailed MMP that is included in the 2008 RDEIR/SDEIS.

The commenter's opinion regarding the adequacy of the mitigation is noted. See responses to comments Kopper-R-228 and Kopper-R-229. Greene's legenera was found in three vernal pools on the project site. Two of these pools would be filled, but seeds from Greene's legenera would be collected from these pools and used to inoculate pools that would be preserved within the project's wetland preserve. Several measures have been incorporated into preserve design and into Mitigation Measures 3.10-1 and 3.10-4a of the 2008 RDEIR/SDEIS to ensure maintenance of existing hydrology in preserved vernal pools and water quality protection. All preserved pools would have a minimum 250-foot buffer from development in addition to preservation of their micro watersheds. Control and monitoring of invasive plant species is a component of the O&M plan for the proposed preserve. The preserve would be fenced and signed to discourage human intrusion. Therefore, no indirect impacts on preserved or translocated populations of Greene's legenera are expected and no direct effects would take place on one of the three existing populations. Although no guarantees exist that seed translocation would be successful, every effort would be taken to ensure success, including required monitoring. Therefore, the mitigation contained in the 2008 RDEIR/SDEIS is sufficient and expected to reduce impacts on Greene's legenera to a less-than-significant level. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-231

The commenter states that although he agrees with the conclusions in the 2008 RDEIR/SDEIS that cumulative impacts would be significant and unavoidable, he disagrees that the mitigation measures provided in the 2008 RDEIR/SDEIS would address cumulative impacts. The commenter states that the 2008 RDEIR/SDEIS only cites measures directed at individual project impacts.

To the degree that the commenter would have this project mitigate the full cumulative impacts, the courts have consistently upheld the concept that CEQA does not require a lead agency to adopt mitigation measures that would apply to other projects in an attempt to offset those other projects' contribution to environmental impacts; rather, the City's authority to impose mitigation is limited to impacts associated with this project. (See State CEQA Guidelines, Section 15126.4[a][4][B], quoting *Dolan v. City of Tigard* [1994] 512 U.S. 374 [the mitigation measure must be "roughly proportional" to the impacts of the project].). Thus, measures to mitigate direct project impacts would

simultaneously reduce the project's incremental contribution to cumulative biological resources impacts. As stated on page 3.10-66 of the 2008 RDEIR/SDEIS, however, the removal of approximately 3,300 acres of potential habitat for special-status wildlife and the associated fragmentation of surrounding potentially suitable habitat cannot be fully mitigated. Therefore, the direct and indirect impacts on biological resources would remain significant and unavoidable even after implementation of all feasible mitigation measures.

Kopper-R-232

The comment states that CNPS's Mitigation Guidelines Regarding Impacts to Rare, Threatened, and Endangered Plants (CNPS 1998) should be considered by the project applicant(s) when revising their mitigation measures as previously recommended by the commenter. The comment summarizes the CNPS guidelines in comments Kopper-R-233 through Kopper-R-240 below.

The commenter recommends considering CNPS and DFG expectations regarding mitigation for impacts on rare, threatened, and endangered plants. The comment is noted. Specific recommendations are addressed below. Protocol-level surveys of special-status plants were conducted on the project site in 2003 and 2006. Only one special-status plant species, Greene's legenera, was found on the project site. This species has no formal protection under CESA or ESA, but is a CNPS List 1B species. The CNPS guidelines would be considered in development of the final MMP for Greene's legenera. See also responses to Kopper-R-227 through Kopper-R-230 and responses to comments from CNPS contained in this FEIR/FEIS. See also Master Response 2, "Disagreement Regarding the Conclusions Reached in the DEIR/DEIS," in Chapter 3 of this FEIR/FEIS.

Kopper-R-233

The commenter states that CNPS advocates only for mitigation involving avoidance of impacts. The commenter further states that to avoid impacts, CNPS recommends preproject planning and design, reconfiguration of an existing project, or adoption of the No Project Alternative, in addition to site protection such as fencing and transfer of development rights in easements or fee title.

Although the commenter does not so specifically state, the City interprets this comment as being directed at avoidance for special-status plant species. CNPS's opinions regarding mitigation are noted. The wildlife agencies with jurisdiction over these resources regard habitat restoration and translocation as acceptable means of mitigating impacts.

The only special-status plant species found on-site during protocol-level surveys was Greene's legenera. It was not feasible to avoid impacts on Greene's legenera through project design and still meet project objectives because other design constraints limited the siting of the drainage parkways. The drainage channel must be deeper and wider than the existing channel to carry the flows and keep the velocity of the flows down to reduce erosion. This requires excavating the existing channel bottom by 2–7 feet and widening the existing channel from 40 feet wide to 220 feet wide. The channel needs to remain in the existing alignment to utilize the existing culvert at Sunrise Boulevard. The existing channel alignment also reduces the amount of excavation required to construct and reduces the amount of fill required to raise the areas adjacent to the channel above the floodplain.

The proposed land use plan requires additional constraints on the channel alignment. The large retail commercial site north of the channel establishes the northerly limits of the channel. The retail commercial site and detention basin south of the channel are constraints on the southerly limits of the channel corridor alignment. The channel must be located adjacent to the stormwater detention basin parcel for the stormwater to spill from

the channel into the basin. Creating a relatively small open-space avoidance area in the area immediately adjacent to the Greene's legenera is not feasible. A lowered and realigned channel would remove the aquatic habitat necessary to sustain the Greene's legenera.

One of the three pools containing Greene's legenera would not be affected by implementation of the Proposed Project Alternative. As stated in 2008 RDEIR/SDEIS Mitigation Measure 3.10-5, the mitigation plan for Greene's legenera must maintain viable plant populations on-site and must include avoidance measures allowing the existing population to be retained, as well as mitigation measures for the populations to be directly affected. Possible avoidance measures include fencing of the population. This measure incorporates the recommendations of CNPS to the degree feasible. Mitigation measures for impacts on Greene's legenera occurring in the two pools that would be filled are provided in Mitigation Measure 3.10-6 of the 2008 RDEIR/SDEIS. See responses to comments Kopper-R-227 through Kopper-R-232 regarding impacts on and mitigation for loss of Greene's legenera; see also responses to comments from CNPS contained in this FEIR/FEIS.

The comment regarding adoption of the No Project Alternative is noted. The City and USACE would consider this comment when deciding whether or not to adopt the Proposed Project Alternative or one of the other alternatives considered in the EIR/EIS.

Kopper-R-234

The comment states that mitigation measures should involve consultation with the appropriate regulatory agencies and be developed on a site-specific basis to determine measures that are appropriate for the life history and ecological relationships of rare plant species occurring at a particular site. The commenter also states that when lead agencies decide to minimize, rectify, reduce, or compensate impacts, CNPS recommends certain standards (listed by the commenter). The commenter also states that CNPS regards habitat restoration and off-site introduction or translocation as unproven and usually unsuccessful, and states his belief that genetic contamination of an otherwise unaffected population is intolerable.

CNPS's opinions regarding mitigation are noted. The appropriate regulatory agencies would be consulted, as stated in the 2008 RDEIR/SDEIS. The wildlife agencies with jurisdiction over these resources regard habitat restoration and translocation as acceptable means of mitigating impacts. Although CNPS claims that off-site introduction or translocation is unproven and unsuccessful, it also recognizes that some unavoidable losses of rare plants do occur under CEQA. Under such conditions, CNPS supports other means of mitigation—off-site restoration, compensation, and transplantation or other salvage methods—to provide for partial survival of the sacrificed population. Proposed mitigation for the affected populations of Greene's legenera at Rio del Oro includes the collection of seed to be deposited within appropriate wetland habitat within the wetland preserve, thus maintaining genetic integrity. CNPS further recognizes that these measures will provide helpful information on a species' horticultural and ecological requirements. The impacts on two of the three populations of Greene's legenera at Rio del Oro are considered to be unavoidable, and as such, the collection of seed to be deposited in vernal pools within the preserve area is a viable way to retain some of the genetic diversity of the impacted populations. Furthermore, there are local examples of successful long-term relocation/transplantation attempts for vernal pool species, including the well-documented population of Sacramento Orcutt grass (*Orcuttia viscida*, federally listed as endangered, state listed as endangered) at the Phoenix Field Vernal Pool Preserve. Regardless, off-site restoration or translocations are not proposed for project impacts on

Greene's legenera. See response to comment Kopper-R-228 regarding genetic contamination. See also responses to comments from CNPS contained in this FEIR/FEIS.

Kopper-R-235

The comment states that when lead agencies allow reduction of impacts, the CNPS guidelines maintain that the project size should be reduced and the project site should be relocated to the least environmentally sensitive area and surrounded by buffer zones permanently protected in conservation easements. The commenter states that CNPS also insists that efforts be made to salvage portions of the population that will be lost.

Efforts would be made to salvage portions of the Greene's legenera population. See responses to comments Kopper-R-228 and Kopper-R-230. See also responses to comments from CNPS contained in this FEIR/FEIS.

Kopper-R-236

The comment lists the following restoration guidelines:

- *The restoration should be directed to mitigate impacts of projects approved prior to environmental regulations.*
- *The goals of the restoration and the actions required need to be established before implementation of the project.*
- *The restoration plan should list preimpact site conditions, including land contours, soil types, erosion patterns, and preimpact hydrologic conditions.*
- *Study of target species should be thorough to identify total distribution, habitat descriptions of the occupied site, and symbiotic relationships with other species.*
- *The restoration plan should consider propagation techniques, reintroduction strategies, invasive species controls, site protection, public access, and other factors.*
- *A monitoring program should be sufficiently rigorous to assess restoration success and to augment the knowledge base relevant to related restoration efforts.*

Goals and actions would be established before project implementation as required in Mitigation Measure 3.10-5 of the 2008 RDEIR/SDEIS. Land contours, soil types, erosion patterns, and preproject hydrologic conditions have been studied and documented for the project site. The CNPS guidelines would be considered during development of the final MMP for Greene's legenera and were considered in development of Mitigation Measure 3.10-5 (see response to comment Kopper-R-240). See also responses to comments from CNPS contained in this FEIR/FEIS.

Kopper-R-237

The comment states that when lead agencies allow reduction of impacts over time, CNPS recommends limiting public access to protected habitat areas through fencing or other means, monitoring species and habitat conditions to detect intrusion and subsequent impacts caused by construction and operation activities, and public education regarding the value of the protected resources.

The wetland preserve would be fenced and monitored pursuant to the protocols set forth in the wetland MMP, biological opinion, Section 404 permit, and the O&M plan. Pursuant to Mitigation Measure 3.10-5, the preserved and translocated populations of Greene's legenera would be contained within the proposed wetland preserve, which would be fenced and signed to discourage intrusion. Greene's legenera would be monitored for 5 years and the wetland preserve would be monitored for 10 years for

habitat conditions including signs of intrusion by humans and domestic animals, thatch accumulation, and invasive plant species, in addition to monitoring success criteria. Construction monitoring would be implemented during any project phase that could affect Greene's legenera and preserved and inoculated pools would be fenced during construction. See also responses to comments from CNPS contained in this FEIR/FEIS.

Kopper-R-238

The comment summarizes the CNPS guidelines regarding off-site mitigation.

These guidelines are not relevant to the project because no off-site mitigation is planned related to impacts on Greene's legenera.

Kopper-R-239

The comment summarizes additional CNPS guidelines regarding off-site mitigation.

These guidelines are not relevant to the project because no off-site mitigation is planned related to impacts on Greene's legenera.

Kopper-R-240

The comment states that CNPS and DFG insist that mitigation design, implementation measures, and reporting methods be clearly documented, along with who or which agencies are responsible for achieving clearly defined success criteria. The comment further states that assurances for achieving success must be provided in writing and guaranteed by a negotiable performance security large enough to complete the mitigation plan and pursue alternative mitigation measures should implementation not be completed or fail to meet objectives. Five years of success monitoring should be the minimum time period before returning the performance security.

The comment misstates the language used by CNPS and DFG; they provide recommendations and guidelines, not requirements. The CNPS guidelines do recommend that, before approval of a discretionary permit, the following be put in writing: implementation techniques and reporting procedures; responsibilities of the landowner/applicant, contractors, and agencies; and success criteria. Most of these have been included in the 2008 RDEIR/SDEIS in Mitigation Measure 3.10-5. The mitigation plan must be completed before the approval of grading or improvement plans or any ground-breaking activity within 250 feet of any Greene's legenera population, including grubbing and clearing, for any project development phase. Ongoing monitoring must occur for a minimum of 5 years following the completion of all construction activities. The project applicant(s) are responsible for developing the final mitigation plan and have selected ECORP to prepare the final mitigation plan. The project applicant(s) are responsible for funding the implementation of the mitigation and monitoring. The City Planning Department is responsible for approving the mitigation plan and ensuring that the project applicant(s) implement the plan as approved and achieve the specified success criteria. The CNPS guidelines state that mitigation commitments should be guaranteed by a performance security in cases where project construction would be completed before mitigation is implemented. In this case, the mitigation measures must be implemented before completion of project construction.

Kopper-R-241

The comment states that it has long been known that mitigation pursuant to CEQA has often failed or has not been implemented, but with no consequences to the holder of the take permit. The comment expresses the belief that consequences should exist for not achieving the mitigation objectives or performance standards and that the project proponents should be required to pay fines in amounts that are sufficient for an independent party to achieve the mitigation objectives promised. The comment further states that an efficient means of ensuring enforcement of the mitigation measures would

be to require the project applicant(s) to pay an up-front security bond tied to performance standards.

The comment is noted. Requiring a performance security bond is not a standard part of the CEQA/NEPA process, and the City does not believe it would ensure enforcement of mitigation. Enforcement would still be needed to ensure that the “independent party” would implement successful mitigation, and no guarantee exists that an independent party would be more likely to achieve success than consultants hired by the project applicant(s). The mitigation measures for biological resources in the FEIR/FEIS contain standards to ensure successful implementation and monitoring to show it is accomplished. However, performance bonds have been used by USACE in the past as part of compensatory mitigation requirements, and the USACE will make a final permit decision and determination of required compensatory mitigation for unavoidable impacts to waters of the United States within the ROD. All mitigation measures will be included as conditions of project approval. The City has enforcement authority for failure to comply with conditions of approval. See also Master Response 2, “Disagreement Regarding the Conclusions Reached in the DEIR/DEIS,” in Chapter 3 of this FEIR/FEIS.

Kopper-R-242

The comment states that the 2008 RDEIR/SDEIS should be revised to specifically discuss mitigation monitoring and that a fund to support named individuals or an organization to track mitigation implementation is needed. The comment further states that report deadlines should be listed and report recipients should be listed or nobody will keep track of them; and that for a project of this size and scope, a “dire need” exists for a well-designed mitigation monitoring plan.

Draft MMPs for impacts on wetlands and other waters of the United States and waters of the state and VELB have been developed; these documents were included in the 2008 RDEIR/SDEIS as Appendices Q and R, respectively. Both MMPs have been updated since the 2008 RDEIR/SDEIS was issued and are included as Appendix Q and R, respectively, to this FEIR/FEIS. These MMPs include reporting deadlines and recipients. The timing and parties responsible for enforcing mitigation are identified at the end of each mitigation measure contained in the 2008 RDEIR/SDEIS, as well as in the draft MMPs, and these are the parties who would review the monitoring reports. These agencies, which include the City Planning Department, USACE, USFWS, the Central Valley RWQCB, and DFG, have a responsibility to carry out their duties.

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July 7, 2008

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Re: COMMENT LETTER – RECIRCULATED DRAFT ENVIRONMENTAL
IMPACT REPORT/SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPAC
STATEMENT FOR RIO DEL ORO SPECIFIC PLAN

Dear Mr. Angell and Ms. Dadey:

Thank you for allowing Defenders of Wildlife the opportunity to comment on the Recirculated Draft EIR/Supplemental Draft EIS.

Defenders of Wildlife (“Defenders”) is a national, not-for-profit conservation organization with more than 522,000 members, including approximately 200,000 members and supporters who reside in California. Defenders is dedicated to the protection of all native wild animals and plants in their natural communities. Defenders has advocated for heightened protection of wetland habitats and species depending on those habitats, including the Giant Garter Snake. Defenders has been intricately involved in the development of state policies for the protection of wetland habitats.

The California Native Plant Society submitted comment letters concerning the Recirculated Draft EIR/Supplemental Draft EIS on February 1, 2007 and May 28, 2008. Those comments are hereby incorporated by reference into this comment letter.

In short, many significant environmental impacts would result from the Rio del Oro Specific Plan, most notably destruction of wetlands, vernal pools, riparian habitat, willow scrub, mixed riparian scrub, elderberry savanna, willow woodland, cottonwood woodland, and cottonwood–willow riparian forest. The proposed mitigation will not adequately render these impacts insignificant, as required by CEQA and NEPA. The shortcomings of the proposed

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mitigation are discussed extensively in the California Native Plant Society's comment letter of May 28, 2008.

Impacts to Vernal Pools and Other Wetland Habitat

Over 225 species of birds, mammals, reptiles, and amphibians depend upon California's riparian habitats alone.¹ Vernal pool habitat, of which over 90 percent has been lost in California, is home to 20 federally listed species, including 10 endangered plants, 5 threatened plants, 3 endangered animals, and 2 threatened animals.²

In order to protect the physical characteristics of stream and wetland systems, including their connectivity and natural hydrologic regimes, the project should focus on avoidance of wetland impacts rather than minimization or mitigation of impacts. With an estimated 10% or less of the state's original wetlands left intact, it is essential that avoidance of impacts be the City's first priority. Mitigation and minimization often result in highly fragmented "postage stamp" wetland preserves that are difficult to manage. Wetlands created pursuant to mitigation plans do not retain even a semblance of the hydrological features, vegetation types, and habitat values of original wetlands. Mitigation often also fails to consider watershed function, particularly the hydrological complexities and movement of pollutants through watersheds. Mitigation wetlands are often designed "too wet" and translocation of species to populate these wetlands often is ineffective.

Multiple special status species will be impacted by the project, including but not limited to Swainson's Hawk, Giant Garter Snake, California Tiger Salamander, Western Spadefoot Toad, Conservancy fairy shrimp, Vernal Pool Fairy Shrimp, Valley Elderberry Longhorn Beetle, and Vernal Pool Tadpole Shrimp. The City has not indicated how it intends to comply with the Federal and State Endangered Species Acts in constructing the proposed project. Take is prohibited for many of these species except in circumstances where a consultation has been initiated with USFWS and a take permit has been acquired pursuant to section 10 of the Federal Endangered Species Act.

Consideration of Cumulative Impacts

Cumulative impacts are the combined, incremental effects of various development projects. These impacts accumulate over time, from one or more sources, and can result in the degradation of wetland resources due to multiple development projects in an area. Cumulative impacts, if left unaddressed, could lead to wholesale appropriation of entire wetland systems in the state. The City has not considered the cumulative impacts from other developments in the area.

¹ Knopf, F. R., R. R. Johnson, T. Rich, F. B. Samson, and R.C. Szaro. 1988. Conservation of riparian ecosystems in the United States. *Wilson Bull.*, 100(2), 1988, pp. 272-284.

² Leong, J.M., and Thorp, R.W., 2005. Bee Diversity Associated with *Limnanthes* Floral Patches in California Vernal Pool Habitats. USDA Forest Service Gen. Tech. Rep. PSW-GTR-195. 2005, p. 267.

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*

Defenders appreciates the opportunity to submit these comments. We strongly encourage the City to develop a mixed use project that does not destroy important native habitat. We look forward to assisting in the development of this project and in seeing it successfully protect the Sacramento Valley's remaining wetlands.

Sincerely,

Joshua Basofin
California Representative
Defenders of Wildlife

DOW-R-1

The commenter incorporates by record the comments submitted by CNPS on February 1, 2007, and May 28, 2008. The comment further states that the shortcomings of proposed mitigation are discussed extensively in the CNPS May 28, 2008, letter.

See responses to comments CNPS-1 through CNPS-13 (February 1, 2007) and CNPS-R-1 through CNPS-R-7 (May 28, 2008).

DOW-R-2

The comment states that many significant environmental impacts would result from the project, most notably destruction of wetlands, vernal pools, riparian habitat, willow scrub, mixed riparian scrub, elderberry savanna, willow woodland, and cottonwood-willow riparian forest.

The commenter is correct that certain significant environmental impacts would result from implementation of the project; the impacts related to biological resources are evaluated in detail in Section 3.10, "Biological Resources," of the 2008 RDEIR/SDEIS and are elaborated below.

Mitigation Measure 3.10-1a of the 2008 RDEIR/SDEIS commits the project applicant(s) to replace, restore, or enhance on a "no net loss" basis all wetlands and other waters of the United States and waters of the state that would be lost or degraded as a result of project implementation. Wetland habitat, other waters of the United States, and waters of the state must be restored, enhanced, and/or replaced at an acreage and location and by methods agreeable to USACE, the Central Valley RWQCB, and the Natural Resources Element of the City General Plan, as appropriate. The mitigation for federally listed vernal pool invertebrates also requires no net loss of habitat (acreage, value, and function) (Mitigation Measure 3.10-4a). If approved by the regulatory agencies, the proposed wetland mitigation plan (Appendix Q of the 2008 RDEIR/SDEIS, as revised in 2009 and shown in Appendix Q of this FEIR/FEIS) would result in a compensatory mitigation ratio of 1.3:1 of acres created or restored to acres filled and would ensure no net loss in the amount of wetland habitat and other waters of the United States in the region. Even if not approved as currently proposed, the final MMP approved for the project by USACE would include proposed wetland restoration, enhancement, and/or replacement activities that would ensure no net loss of aquatic functions in the project vicinity, as required by Mitigation Measure 3.10-4a, USACE, the Central Valley RWQCB, and the Natural Resources Element of the City General Plan. The final wetland MMP must also be consistent with the goals of the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (USFWS 2005) and the draft SSCHCP (if adopted), or must provide an alternative approach that is acceptable to the City, USACE, and USFWS and accomplishes no net loss of habitat.

Ratios for compensatory mitigation of VELB habitat (elderberry shrubs) would ultimately be determined through the federal ESA Section 7 consultation process with USFWS, but must be a minimum of no net loss as required by USFWS and Mitigation Measure 3.10-4b. The proposed mitigation plan for impacts on VELB (Appendix R of the 2008 RDEIR/SDEIS) was revised in 2009 in coordination with USFWS and is attached as Appendix R to this FEIR/FEIS. As shown in the 2009 update, the mitigation plan includes 3,230 elderberry plantings plus 4,170 associated native plantings, totaling 7,400 plantings required for compensatory mitigation, as determined according to the USFWS

conservation guidelines for VELB (USFWS 1999). One mitigation credit is equivalent to 10 plants (five elderberry seedlings and five associated native plants), so 740 mitigation credits are needed to compensate for the loss of elderberry shrubs on the project site. The 2009 draft VELB mitigation plan proposes to satisfy 290.4 mitigation credits through plantings within a 12-acre on-site preserve and purchase 449.6 credits at an off-site mitigation bank approved by USFWS.

As specified in Mitigation Measure 3.10-2b of the 2008 RDEIR/SDEIS, a wetland MMP must be developed and implemented to replace the 57 acres of cottonwood willow riparian woodland and 4 acres of willow scrub at no net loss of acreage to preserve the overall habitat functions. Elements of the wetland MMP may include habitat preservation on-site, enhancement of on-site riparian habitat types, or enhancement or protection of habitat off-site. The specific ratios of habitat lost to habitat created shall be determined by the City, in consultation with DFG as a trustee agency protecting the wildlife resources of the state. The ratios shall be consistent with the City's policy and shall be adequate to protect and preserve the diverse resources in the City.

The riparian vegetation on the project site is associated exclusively with areas that support or previously supported tailings piles. In many areas that currently support riparian vegetation, water features that once existed are no longer present and the riparian vegetation is not regenerating. Gold-mining activities that occurred on the project site in the 1950s resulted in the creation of basins between tailings piles. These basins filled with water because of their low-lying positions on the landscape and because of mining-related manipulation of the site's surface water and groundwater supplies. The thick, impermeable material that resulted from dredging would likely have allowed pooled water to remain for quite some time. In many areas of the project site, mining of the cobble in the tailings piles has occurred, thereby eliminating the basins that stored water and allowed generation of riparian vegetation. Eventually all of the tailings piles would be removed, as approved under separate projects related to mining applications, and no more basins would capture and store rainfall and support the existing on-site riparian vegetation, even without project implementation. Therefore, riparian habitat on the project site, with the exception of the 57 acres of cottonwood-willow riparian forest and 4 acres of willow woodland, would not be expected to persist on the site once the tailings piles are removed. Because the majority of riparian habitat on the project site is not self-sustaining, it is considered to be of relatively low value. The 2008 RDEIR/SDEIS identifies this habitat type as riparian habitat because of its wildlife habitat functions and characteristic vegetation. However, it is not truly riparian habitat in a regulatory sense because it is not associated with streams. For this reason, no regulatory requirement or ratio exists to mitigate the loss of this habitat. Moreover, cottonwood trees, which make up the vast majority of trees on the project site, are not subject to the County's tree ordinance. Because of the poor quality of the majority of the riparian habitat on the project site, the project-related mitigation for this riparian habitat is limited to the replacement and/or restoration of its current function and value (which consists of nesting and foraging habitat for raptors and other birds, as well as foraging habitat and shelter for numerous common wildlife species), as determined acceptable to the City in consultation with DFG as a trustee agency. Based on the status of this habitat, this is considered adequate mitigation under CEQA and NEPA.

Although the mitigation measures presented in the 2008 RDEIR/SDEIS would reduce the magnitude of impacts on biological resources, project impacts on wetlands and other waters of the United States and waters of the state, riparian habitat, vernal pool invertebrates, VELB, Swainson's hawk, and western spadefoot would remain significant

and unavoidable with application of mitigation (see pages 3.10-45 and 3.10-65 of the 2008 RDEIR/SDEIS). There are no mitigation measures to fully reduce impacts to less-than-significant levels.

DOW-R-3

The comment states that proposed mitigation would not adequately render these impacts insignificant, as required by CEQA and NEPA.

CEQA and NEPA do not require that all significant project-related impacts be mitigated to a less-than-significant level. Rather, CEQA and NEPA require that all *feasible* project-related mitigation measures be implemented, or that the project be modified *where feasible*, to reduce significant impacts. (See CCR Sections 15126.4, 15091[a], and 15091[b] of the State CEQA Guidelines and 40 CFR 1502.14[f], 40 CFR 1502.16[h] and 40 CFR 1515.2[c] of the NEPA regulations.) For the purposes of CEQA, feasible means “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social and technological factors” (California Public Resources Code, Section 21061.1). In cases where significant impacts are not at least “avoided or substantially lessened,” the lead agency may nevertheless approve the project if it first adopts a “statement of overriding considerations” setting forth the specific reasons why the agency found that the project’s “benefits” rendered “acceptable” its “unavoidable adverse environmental impacts” (State CEQA Guidelines, CCR Sections 15043[b] and 15093). For the purposes of NEPA, the agency must include “appropriate mitigation measures” and identify the “means to mitigate adverse environmental impacts.” In addition, NEPA requires that the agency identifies within the ROD whether “all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why they were not.”

The California Supreme Court states, “. . .[t]he wisdom of approving . . .any development project, a delicate task which requires a balancing of interests, is necessarily left to the sound discretion of the local officials and their constituents who are responsible for such decisions. The law as we interpret and apply it simply requires that those decisions be informed, and therefore balanced.” *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 576 [276 Cal.Rptr. 410].

The mitigation measures presented in the 2008 RDEIR/SDEIS would reduce the magnitude of impacts on biological resources; however, project impacts on wetlands and other waters of the United States and waters of the state, riparian habitat, vernal pool invertebrates, VELB, Swainson’s hawk, and western spadefoot would remain significant and unavoidable with the application of mitigation, as discussed on pages 3.10-45 and 3.10-65 of the 2008 RDEIR/SDEIS.

DOW-R-4

The comment states that more than 225 species of birds, mammals, reptiles, and amphibians depend on California’s riparian habitats alone and that vernal pool habitat is home to 20 federally listed species including 10 endangered plants, five threatened plants, three endangered animals, and two threatened animals. The comment also states that more than 90% of California’s vernal pool habitat has already been lost.

The commenter provides no specific information about the species he is referring to or those that would be expected to use riparian habitat on the project site or how they should be addressed differently in the 2008 RDEIR/SDEIS. The 2008 RDEIR/SDEIS acknowledges that the fragmented and disturbed scrub and woodland communities present are attractive to many of the common wildlife species in Sacramento County and that the site supports an abundant and diverse fauna (page 3.10-6). However, removal of the existing riparian vegetation from the project site would not be expected to reduce the

numbers of any regional wildlife population below self-sustaining levels. See response to DOW-R-2 regarding riparian habitat on the project site.

As stated in response to comment DOW-R-2, mitigation measures to ensure no net loss of aquatic functions would be implemented as a condition of project approval, and the riparian habitat that is functional and self-sustaining would also be replaced or preserved on a no-net-loss basis. Protocol-level special-status plant surveys were conducted on the project site in 2003 and 2006 and no federally listed plant species were found. Vernal pool tadpole shrimp and vernal pool fairy shrimp are known to occur on-site and Conservancy fairy shrimp and VELB are assumed to occur. (See Tables 3.10-2 and 3.10-3 in the 2008 RDEIR/SDEIS.) Mitigation measures for impacts on these federally listed species are included in the 2008 RDEIR/SDEIS and consultation with USFWS is ongoing.

DOW-R-5

The comment states that to protect the physical characteristics of stream and wetland systems, including their connectivity and natural hydrologic regimes, the project should focus on avoiding wetland impacts rather than minimizing or mitigating impacts. The comment states further that it is essential that avoidance of impacts be the City's first priority because only an estimated 10% or less of the state's original wetlands remain intact.

The No Federal Action Alternative analyzed in the 2008 RDEIR/SDEIS would avoid placement of fill in waters of the United States, including wetlands, but would not eliminate potential indirect impacts. It is not possible to completely avoid all impacts on wetlands and other waters of the United States and waters of the state and still achieve the project purpose and need, as determined by the City under CEQA.

See also responses to comment EPA-1 and EPA-2.

As the CEQA lead agency, the City understands that the project attempts to protect the functions of the wetlands and other waters to be retained on the project site by maintaining the micro watersheds of preserved wetlands, providing 250-foot buffers around preserved vernal pools, preserving a large contiguous patch of vernal pool grassland, and preserving the majority of Morrison Creek on the project site. As explained on pages 3.10-27 and 3.10-28 of the 2008 RDEIR/SDEIS, the project is also designed to direct flows to the drainage corridors that would be created throughout the project site. These drainage corridors include water quality treatment swales and basins to treat stormwater and nuisance flows before they are released into Morrison Creek, thus improving hydrological function over existing conditions.

As the CEQA lead agency, the City understands that the project also provides the opportunity to connect to the only other existing, planned, or proposed preserve adjacent to the project site. This proposed preserve is adjacent to the east of the project site and is part of the agency-proposed conservation area identified in *A Conceptual-Level Strategy for Avoiding, Minimizing, & Preserving Aquatic Resource Habitat in the Sunrise-Douglas Community Plan Area* (June 2004) and is a planned conservation area in the City General Plan. Lack of connectivity between habitat on the project site and adjacent habitats is an existing condition because White Rock Road, Douglas Road, and Sunrise Boulevard bound the project site on its north, south, and west sides respectively and existing, planned, or approved development is on all sides. The connections to Morrison Creek upstream and downstream of the project site would be maintained.

The USACE is evaluating the proposed project and other alternatives identified in the 2006 DEIR/DEIS and 2008 RDEIR/SDEIS to ensure that they comply with the 404(b)(1) Guidelines and no alternative will be permitted unless it is determined to be the least environmentally damaging practicable alternative and not contrary to the public interest.

DOW-R-6

The comment states that mitigation and minimization often result in highly fragmented “postage stamp” wetland preserves that are difficult to manage.

The project includes a large, contiguous on-site preserve area, which at 510 acres is one of the largest in the region. Also, the GIS-based hydrologic analysis of the LIDAR-derived topographic model indicates that hydrology of vernal pools and other wetland habitats within the proposed on-site preserve would not be adversely affected by fragmentation (see Impact 3.10-1 in the 2008 RDEIR/SDEIS). The 2008 RDEIR/SDEIS acknowledges, however, that the amount of habitat lost and the resulting fragmentation of habitat preserved could potentially contribute to the decline of vernal branchiopods, VELB, Swainson’s hawk, and western spadefoot populations in the region (page 3.10-65). These impacts could be fully mitigated only through a combination of habitat preservation and restoration near the project site, but nearby parcels of similar habitat value would be of lesser value and subject to the effects of habitat fragmentation with completion of the project and other planned and approved projects. Therefore, fully compensating for the impact by preserving and restoring existing habitat in the project vicinity is infeasible. ECORP has prepared a draft O&M plan for the wetland preserve. See pages 3.10-35 and 3.10-36 of the 2008 RDEIR/SDEIS and Appendix Q to this FEIR/FEIS for additional details regarding preserve management.

DOW-R-7

The comment states that wetlands created pursuant to mitigation plans do not retain even a semblance of the hydrological features, vegetation types, and habitat values of original wetlands.

Where possible, on-site compensatory wetlands would be created within the footprints of historic vernal pools that were eliminated during past land use activities. The hydrologic analysis included in Appendix Q of the 2008 RDEIR/SDEIS and Appendix Q to this FEIR/FEIS suggests that project implementation would not decrease the watershed ratios below levels necessary to sustain existing wetlands or the proposed 17.9 acres of compensatory vernal pools. According to the model, the proposed on-site wetland preserve could accommodate and support an additional 50 acres of vernal pool habitat without compromising the existing hydrology. In addition, soil analyses conducted by Davis² Consulting Earth Scientists indicate that soils on the site are still conducive to formation of vernal pools. Further GIS analysis of LIDAR-derived topography, review of historic aerial topography, and results of the soil analyses would be used to refine the configuration of the compensatory wetlands and maximize the potential for successful compensation.

The final wetland mitigation and monitoring plan, once approved by the regulatory agencies, would include performance standards and corrective measures to be implemented if performance criteria are not met. The draft wetland MMP was revised in June 2009 in coordination with USACE. To obtain USACE approval, the project applicant(s) would need to revise their mitigation proposal to (1) include the creation or restoration of in-kind aquatic habitats at a sufficient ratio of created to affected aquatic habitat to offset the functions of the aquatic environment that would be lost initially and over time and (2) contain an adequate margin of safety to reflect anticipated success rates of created and restored aquatic habitats and offset temporal loss of habitat functions.

In addition, proposed compensatory mitigation in the 2008 RDEIR/SDEIS includes purchasing 16.67 acres of created vernal pool habitat at the Clay Station Mitigation Bank. These created vernal pools have been monitored for approximately 10 years and have already met success criteria. These wetlands exhibit functions similar to those of the wetland habitat to be affected at the project site and currently support both vernal pool fairy shrimp and vernal pool tadpole shrimp. See Impact 3.10-1 and Mitigation Measures 3.10-1a and 3.10-1b in the 2008 RDEIR/SDEIS for a detailed discussion of this issue.

DOW-R-8

The comment states that mitigation often fails to consider watershed function, particularly hydrological complexities and movement of pollutants.

Based on the hydrologic analysis, micro watersheds would be maintained and hydrology within the preserve would not be substantially altered. The watershed analysis also indicates that the peak flows, runoff volumes, and runoff durations of the wetland preserve area would not be substantially altered for several reasons: the residential area is relatively small in relationship to this watershed; the project would modify only 3% of the 1,830-acre watershed; and low-impact development features, water quality ponds, and retention/detention ponds required by the local agencies would be incorporated into the project. See Impact 3.10-1 and Mitigation Measures 3.10-1a and 3.10-1b in the 2008 RDEIR/SDEIS for a detailed discussion of this issue. The commenter provides no technical evidence countering the conclusions of the EIR/EIS.

DOW-R-9

The comment states that mitigation wetlands are often too wet and translocation of species to populate these wetlands is often ineffective.

See response to comment DOW-R-8. Because the peak flows, runoff volumes, and runoff durations of the wetland preserve area would not be substantially altered and success criteria for compensatory wetlands includes maximum inundation and depth metrics, the created wetlands are not expected to be too wet, but are expected to resemble the wetlands currently present on the project site. Corrective measures would need to be implemented if inundation criteria were not met. Mitigation Measure 3.10-1a in the 2008 RDEIR/SDEIS includes application of CRAM to establish baseline conditions for future monitoring. CRAM includes metrics for assessing hydrology. CRAM data were collected in the wetland preserve in early summer of 2008 to provide a baseline to which later data may be compared. Success monitoring of the wetland preserve will be conducted to determine whether the overall goal of wetland construction is being accomplished and to develop and implement corrective measures, if necessary. CRAM assessments are to be conducted on the wetlands within the on-site wetland preserve to track changes in wetland function and values, and to help identify the source of any adverse conditions within the wetland preserve.

DOW-R-10

The comment states that multiple special-status species would be affected by the project, including Swainson's hawk, giant garter snake, California tiger salamander, western spadefoot, Conservancy fairy shrimp, vernal pool fairy shrimp, VELB, and vernal pool tadpole shrimp. The comment suggests that the City has not indicated how it intends to comply with ESA and CESA in constructing the project, and states that take of many of these species is prohibited except where consultation has been initiated with USFWS and a take permit has been acquired pursuant to Section 10 of ESA.

Please note that all of the issues raised by the commenter in this comment have been thoroughly evaluated, and mitigation measures are included, throughout Section 3.10, "Biological Resources," of the 2008 RDEIR/SDEIS and in multiple responses to

comments in this FEIR/FEIS. (See, in particular, responses to comments Kopper-R-81, 82, 84, 87, 90, 92, 93, 101, 123, 137, 139, 142, 149–151, 153–156, 160, 161, 163, 164, 166–169, 171, 173, 174, 177, 178, 195, 204, 205, 208, 213–215, 218–220, 222, 224–226, and 242.) A brief summary is provided below.

Giant garter snake is unlikely to occur on the project site because no suitable habitat for this species is present. California tiger salamander is unlikely to occur because the project site is outside this species' range. Western spadefoot is not listed under ESA or CESA. Because this is a NEPA project with a federal lead agency (USACE), the project is subject to Section 7 interagency consultation, not Section 10. Section 7 consultation for impacts on VELB, vernal pool fairy shrimp, vernal pool tadpole shrimp, and Conservancy fairy shrimp was initiated upon USACE's receipt of a complete project application and continues to occur on an ongoing basis.

As required in Mitigation Measure 3.10-4a, the project applicant(s) must secure take authorization for vernal pool invertebrates and implement all conditions of the take permit. As part of the consultation process, USFWS would issue a biological opinion and the project applicant(s) must abide by all conditions outlined in the biological opinion before beginning any project construction in areas supporting potential habitat for federally listed vernal pool invertebrates or within adequate buffer areas (250 feet or lesser distance deemed sufficiently protective by a qualified biologist with approval from USFWS).

As stated in Mitigation Measure 3.10-4b, no project construction may proceed in areas containing VELB habitat (i.e., elderberry shrubs) until a biological opinion has been issued by USFWS and until the project applicant(s) for all project phases have abided by all pertinent conditions in the biological opinion and mitigation measure relating to the proposed construction, including conservation and minimization measures, that are intended to be completed before on-site construction.

As required in Mitigation Measure 3.10-4c, to avoid take of Swainson's hawk, preconstruction nesting surveys must be conducted following guidelines provided in *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in the Central Valley* (Swainson's Hawk Technical Advisory Committee 2000). If no nesting Swainson's hawks are found, then compensating loss of foraging habitat would be the only necessary mitigation (required in Mitigation Measure 3.4-10d). If active nests are found, impacts on nesting Swainson's hawks would be avoided by establishing appropriate buffers around the nests. No project activity may commence within the buffer area until a qualified biologist confirms that any young have fledged and the nest is no longer active.

DOW-R-11

The comment states that cumulative impacts are the combined, incremental effects of various development projects and accumulate over time, from one or more sources, and can result in the degradation of wetland resources by multiple development projects in an area. The comment claims that the City has not considered cumulative impacts from other projects in the area.

Impact 3.10-6, beginning on page 3.10-68 of the 2008 RDEIR/SDEIS, thoroughly addresses the cumulative impacts resulting from the project. Table 3.10-4 provides a list of all past, present, and reasonably foreseeable future projects in the area and the acreage of waters of the United States affected by those projects. Table 3.10-5 lists the acreage of each habitat type for special-status species that could be affected by implementation of the City General Plan. All of these projects and their impacts on biological resources

were considered in the cumulative impacts analysis. The 2008 RDEIR/SDEIS concludes that on a cumulative level, the direct and indirect impacts on biological resources would be significant and unavoidable even with the application of all feasible mitigation.

To the degree that the commenter would have this project mitigate the full cumulative impacts, the courts have consistently upheld the concept that CEQA does not require a lead agency to adopt mitigation measures that would apply to other projects in an attempt to offset those other projects' contribution to environmental impacts; rather, the City's authority to impose mitigation is limited to impacts associated with this project. (See State CEQA Guidelines, Section 15126.4[a][4][B], quoting *Dolan v. City of Tigard* [1994] 512 U.S. 374 [the mitigation measure must be "roughly proportional" to the impacts of the project].). Thus, measures to mitigate direct project impacts would simultaneously reduce the project's incremental contribution to cumulative biological resources impacts. As stated on page 3.10-66 of the 2008 RDEIR/SDEIS, however, the removal of approximately 3,300 acres of potential habitat for special-status wildlife and the associated fragmentation of surrounding potentially suitable habitat cannot be fully mitigated. Therefore, the direct and indirect impacts on biological resources would remain significant and unavoidable even after implementation of all feasible mitigation measures.

DOW-R-12

The comment states that Defenders of Wildlife appreciates the opportunity to submit these comments and strongly encourages the City to develop a mixed-use project that does not destroy important native habitat. The comment further expresses the desire to assist in the development of this project to see it successfully protect the Sacramento Valley's remaining wetlands.

The comment is noted. The City will consider the commenter's concerns when deciding whether or not to approve the Proposed Project Alternative or one of the other action alternatives evaluated in the 2006 DEIR/DEIS and 2008 RDEIR/SDEIS. Opportunities for public, stakeholder, and agency input to the project and environmental analysis were provided multiple times during the development and refinement of the project, including preproject public workshops, during the NOP/NOI comment period and associated public hearing, and during the comment period and public hearings conducted for the 2006 DEIR/DEIS and the 2008 RDEIR/SDEIS.

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SECTION E

Commenters at the Public Hearing

THE CITY OF RANCHO CORDOVA

PLANNING COMMISSION

PUBLIC HEARING

RIO DEL ORO SPECIFIC PLAN

PROJECT NO. RC-03-014

COUNCIL CHAMBERS

RANCHO CORDOVA, CALIFORNIA

THURSDAY, MAY 22, 2008

6:00 P.M.

ORIGINAL

REPORTED BY:

ESTHER SCHWARTZ
CSR NO. 1564

CAPITOL REPORTERS (916) 923-5447

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ATTENDEES

COMMISSIONERS:

- TOM MOE, CHAIR
- RAY SAVORN
- THERESE BURKE
- MATTHEW CUMMINGS
- TROY L. KONARSKI
- ROSS JOHNSON
- ERNEST VANCE

STAFF:

- PAUL JUNKER, PLANNING DIRECTOR
- CHARLENE FORTUNKA, CLERK
- PATRICK ANGELL, EIR/EIS MANAGER

INTERESTED PERSONS:

- KIM WILHELM

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RANCHO CORDOVA, CALIFORNIA

THURSDAY, MAY 22, 2008, 6:00 P.M.

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CHAIRMAN MOE: Item 3A, Rio del Oro
Specific Plan, RC-03-014.

MR. JUNKER: Chairman Moe and Members of
the Commission, this evening Patrick Angell, senior
advisor on our environmental team is going to take
us through a brief overview of the Rio del Oro
environmental document. And as Pat will explain,
this is a required step within the process. It is
an opportunity for public comment.

I would like to just let Pat get started on
this.

MR. ANGELL: Thank you, Paul.

The purpose of tonight's meeting is to give an
opportunity to provide an overview of the
information in the -- this is going to be a long
kind of tongue-twister -- the Rio del Oro
Recirculated Draft EIR/Supplemental Draft EIS. From
this point forward, I am just going to say "the
document."

Again, the purpose is to provide this
information and give the public an opportunity to
provide input and the adequacy of the document. We

1 are not looking for any action or recommendations
2 tonight. This is simply a point of process to
3 receive input. What I'm going to do today is give a
4 very brief summary of the Rio del Oro Specific Plan.
5 I know this project has been before the Commission
6 already. But for those in the public and for a
7 refresher course:

8 Rio del Oro Specific Plan is a designated
9 planning area under the general of plan known as Rio
10 del Oro. It consists of a mix of land uses,
11 primarily residential with some commercial,
12 industrial, office uses, parks, et cetera. It's
13 proposed to be built over a series of phases. In
14 the end we end up with 11,601 units, as well as some
15 key roadway improvements, such as the extension of
16 Rancho Cordova Parkway.

17 The environmental process and the entitlements
18 include the consideration of project level
19 entitlements, tentative maps, et cetera, for Phase I
20 of the development project.

21 This is a site map location where Rio is in
22 relation to the city limits. As you can tell, it is
23 a rather substantial piece of land. This is a
24 recent aerial of the site to kind of give you some
25 perspective of what the property looks like today.

1 The is a site plan as it currently stands right
2 now.

3 This is an overview for requested entitlements
4 for the project which include adoption of a specific
5 plan, adoption of a financing plan, infrastructure,
6 Phase I entitlements, as well as development of a
7 development agreement.

8 In addition to the City's action, we have been
9 processing this with the Army Corps of Engineers.
10 This requires a wetlands field permit for a little
11 over 30 acres of wetland fill associated with
12 development of the site.

13 A little history of the environmental review
14 process. We have been at this since incorporation
15 of the City. This was one of our first
16 applications. We have been meeting with the Corps
17 and jointly working on this environmental document.
18 The Notice of Preparation, which is the California
19 Environmental Quality Act notice that lets the
20 public and agencies know that we are releasing an
21 environmental document or preparing one, was done in
22 December of 2003. The federal counterpart of that,
23 the Notice of Intent for an Environmental Impact
24 Statement was released in January 2004.

25 Jointly we got the Draft EIR/EIS out in

1 December 2006. Now we are back before you with the
2 document, again the revised document, right here in
3 April 2008.

4 And the comment periods are slightly staggered
5 because of issues associated with the way the
6 noticing works with the Army Corps of Engineers.
7 They have to put a notice through the Federal
8 Register, and it is a process that is a little
9 difficult to ascertain exactly where you are going
10 to fall on a schedule. So, unfortunately, their
11 notice didn't get out until May 7th, where ours got
12 out on April 15th. Thus our comment period ends on
13 the 30th, but the federal review process -- actually
14 their review process ends on July 7th.

15 MR. JUNKER: Anybody confused with what Pat
16 just described?

17 As we go through this process, you are
18 consistent going to hear this two different state
19 and federal processes, these two different actions.
20 So we want you to understand as we go forward
21 exactly what has happened and why this is legally
22 necessary.

23 MR. ANGELL: Just to further add to Paul's
24 comments, the state process requires a 45-day review
25 period, and the federal process requires a 60-day

1 review period. The federal process is a little
2 longer. Ideally, you would like to have them happen
3 at the same time, but, again, getting the issues we
4 have with noticing that just wasn't possible.

5 To carry on. What this document does is it
6 addresses two topics that we have been doing some
7 new work on since the release of the Draft EIR/EIS
8 back in 2006. Water supply and biological
9 resources. The water supply discussion updates the
10 information on the expected water supply sources,
11 the short-term water sources that we are expecting
12 to come on line as part of the initial development,
13 as well as the long-term water supply sources
14 expected for ultimate service of the project. It
15 also provides updates to the analysis to be
16 consistent with the Vineyard's court case that was
17 issued last year regarding Sunrise Douglas.

18 The other piece of the document addresses
19 biological resources. That analysis again is
20 largely an update based on new technical material
21 that the project applicants provided, some
22 refinement on their mitigation plan as well as some
23 further consultation we had with federal agencies,
24 USEPA, U.S. Fish and Wildlife, to get a better
25 understanding of their desires in regards to

1 mitigation and to better address it and associated
2 with comments we received from them on the draft
3 environmental document.

4 Other than that, in regards to the rest of the
5 document, there are no other changes that would
6 require us to have to go back and relook at the
7 original EIR/EIS. Things like traffic and air
8 quality and noise. We didn't need to relook at
9 again. The previous document adequately addresses
10 those issues.

11 So the next step is we receive comments
12 tonight, and we will continue to receive comments in
13 writing through the review period. That material
14 will be collected and we will prepare the final
15 environmental document that will respond to the
16 comments received. And in that document the
17 Specific Plan will start its process and
18 consideration before you and ultimately be before
19 the City Council.

20 So, again, tonight we are looking to provide
21 an opportunity for the public to provide comments on
22 the document. Close the meeting. And, again, there
23 is no action to be taken in regard to environmental
24 document or the Specific Plan. If you have any
25 questions regarding the property I will be more than

1 happy to answer them. Other than that, I would love
2 to hear from the public.

3 MR. JUNKER: The purpose of this meeting
4 is, in fact, as a hearing for the public, but I know
5 at least with Commissioner Cummings tonight we have
6 some discussions of the document. This is as much
7 for the public as an opportunity for you to become
8 more familiar with this process. This project will
9 be becoming forward to you for review in coming
10 months towards the end of the year. At some point
11 we want you up to speed, prepared for that action.
12 This is a chance for the Commission as well as the
13 public.

14 CHAIRMAN MOE: That being the case, do we
15 have questions from the Commissioners?

16 COMMISSIONER SAVORN: The timelines. The
17 state noticed on time. The feds didn't. Are there
18 any penalties that these people have to face because
19 -- I know there are penalties for the proponents if
20 they are late somewhere. Besides just losing their
21 money as the clock is ticking, because for whatever
22 reasons that the two jurisdictions or two agencies
23 didn't file when they were supposed to, do they
24 suffer any penalties?

25 MR. ANGELL: No. There is no penalty

1 regards to federal process for having their notices
2 match our notice time periods.

3 MR. JUNKER: In my experience, the delay we
4 experienced actually wasn't a bad delay. The
5 Federal Register notices can be difficult to get
6 published properly.

7 COMMISSIONER SAVORN: Say this goes down
8 the road and they are just not timely, whether state
9 or federal, and we not are talking, say, days, but
10 literally months on end, there is money out there by
11 the proponent on this. Timelines, obligations,
12 interest on money. And if it is just sitting there,
13 burning money because they can't move because
14 someone is not doing what they are supposed to do
15 fiduciarly in a timely manner, that is just tough
16 luck and your money is just down the tube?

17 MR. JUNKER: It's not a matter of tough
18 luck so much as each of you fulfills their
19 obligation and their responsibilities. They will do
20 that in as timely a manner as possible. If we, as
21 the local agency, feel like performance is not
22 appropriate, we point out that. In times we've had
23 to bring that to the attention of some of the higher
24 up folks in the agency. But our hope is that we
25 work collaboratively, as quickly as possible.

1 Honestly, in a project this size there are
2 frustrating delays, and it is frustrating at the
3 applicant's level as well as City's level. That
4 unfortunately seems to be part of the process for a
5 project that is as big as Rio del Oro.

6 CHAIRMAN MOE: Any other questions?

7 COMMISSIONER VANCE: I have one other
8 question -- I have several. One, on our draft here,
9 on Page 2 of 4, it says that the Army Corps of
10 Engineers is to place dredge or fill into the waters
11 of the United States at 30.3 acres. While in our
12 other, on page -- on Section 1, Page 26, it says
13 33.9 acres.

14 Am I reading something wrong here, as far as
15 the -- what is the difference here?

16 MR. ANGELL: I believe that was me just
17 rounding numbers incorrectly in the staff report.
18 The environmental document will be the correct
19 source in regard to the exact number.

20 COMMISSIONER VANCE: It would be the 33.9?

21 MR. ANGELL: Yes.

22 CHAIRMAN MOE: Other questions?

23 COMMISSIONER JOHNSON: I haven't been
24 privileged to be involved from the beginning so I do
25 have a couple concerns. When they actually bring up

1 something and they state it is significant and
2 unavoidable, does that mean that somebody has to
3 decide they are going to move forward with this
4 thing? Or, like, you have issues with potable water
5 in Phase I and they don't have remediated water, no
6 connectivity with natural resources area? They are
7 very strong statements in there about the major
8 impacts.

9 MR. ANGELL: Well, in regards to the term
10 "significant and unavoidable," that is a term that
11 is used in environmental documents to determine --
12 first, you required by law to determine the
13 environmental effects of a project. And the
14 environmental effects are no impact, less than
15 significant, a significant impact; and then once you
16 determine significant, you are looking at ways to
17 minimize or rectify the issue.

18 If it is determined by the experts that
19 prepare the document that there is just nothing you
20 can do in the circumstance to guarantee mitigation.
21 In fact, you have to come to the conclusion of an a
22 unavoidable effect. That material is in turn,
23 preparing the draft, provided in the final. As
24 decision-makers, you have to weigh that information
25 against the benefits of the project and determine

1 whether or not the environmental effects of the
2 project are acceptable, given the benefits you are
3 going to get from the project.

4 I hope I'm making this clear. That is the
5 disclosure process. Nothing in the environmental
6 document disclosing what is determined a fact by the
7 experts on the impact in question.

8 MR. JUNKER: It is common, in fact, to have
9 significant and unavailable impacts. That is the
10 reason we go to the more complex document, the more
11 complex form, the environmental impact report. If
12 you were able to reduce all impacts to less than
13 significant, there is a more streamlined document
14 that is called a negative declaration. And so
15 understand, that significant and unavoidable impacts
16 are, in fact, not uncommon for a project this size.
17 Not that they are unavoidable; they are significant
18 impacts. You have to weigh the benefits of the
19 project against the impacts.

20 COMMISSIONER JOHNSON: They are going to
21 have to be addressed when it comes back, which way
22 do we go.

23 CHAIRMAN MOE: Other questions?

24 COMMISSIONER JOHNSON: Information. Mather
25 Lake is usually remediated water now. That is why

1 it has water. It doesn't have a natural resource
2 other than rainwater. It's getting water out of the
3 wells.

4 COMMISSIONER CUMMINGS: I have some
5 concerns that Ross had regarding significant and
6 unavoidable. It seems a very common phrase that's
7 echoed throughout this document. I want to take a
8 step back and thank Paul for giving me some time on
9 Monday. This is a difficult document to wrap your
10 head around, especially when you get it a week
11 before. You are trying to understand the nuances of
12 what you are reading.

13 I want to make sure I understand, Paul. When
14 you talk about the table that Ernie referenced
15 before, you mentioned that the phases don't
16 necessarily go in this order. They can go in any
17 order, right, so long as previous ones are
18 satisfied? Is that what you were talking about?

19 MR. JUNKER: Commissioner Cummings is
20 talking about a discussion we had about the phasing
21 of the project, which is not so much an issue of the
22 environmental document as it will be an issue with
23 the Specific Plan. The Rio del Oro Project has
24 identified phases and various facilities that need
25 to serve any of those phases that have been

1 identified. It is possible and probably
2 economically likely that the project will develop in
3 Phase I, II, III and IV. But it is also possible
4 for some unforeseen reason at this point that one of
5 those phases would either wait or one of those
6 phases would want to go earlier. The document, the
7 specific plan includes phasing information about how
8 that could be accomplished, while providing
9 infrastructure needed to serve that development.
10 That was the discussion we had two nights ago.

11 COMMISSIONER CUMMINGS: Thank you.

12 I was curious to know if you received comments
13 from the public.

14 MR. ANGELL: As of this meeting, we have
15 only received two comment letters. One was from the
16 Sacramento County Department of Transportation, and
17 one was from Sacramento County Wastewater District.
18 Both were just echoing previous comments they made
19 on the original EIR.

20 COMMISSIONER CUMMINGS: But in general they
21 were supportive of what we see?

22 MR. ANGELL: They didn't comment negatively
23 towards the document that was released.

24 COMMISSIONER CUMMINGS: I know we are not
25 talking about the site plan tonight, but I do see it

1 in front of us, Pat. I do want to make comments not
2 only for the benefit of the developers who are out
3 there in the audience tonight and in talking about
4 this with Paul, I think it's very, very important
5 that we look at this site plan and analyze where we
6 are going in the City to make sure that if a site
7 plan of this size is best used for changes we are
8 seeing in the economy.

9 Paul was, again, very helpful the other night
10 in identifying, for example, single family area and
11 high density area and the parks and making sure that
12 this area is walkable, making sure that with the
13 changing economy and with gas prices being what they
14 are, I don't think that we can anymore look at
15 projects in the same vanilla fashion that we have.

16 I have the great pleasure of living in a
17 neighborhood just outside called Capital Village, it
18 has changed my thought on the way development should
19 be built. If we go into an area like this and we
20 build our single family areas and we build our
21 apartments and we build our parks kind of in the way
22 that things have been done before, I don't think we
23 are going to do the City any service in doing that.
24 More importantly, I think you are going to create
25 congestion where there doesn't need to be. And I

1 hope that we have an opportunity in the future to
2 specifically go through each of those sections
3 making sure that, for example, this wetland preserve
4 is the best use and this area is the best use.

5 I understand there are connectivity
6 enhancements that are not readily seen on this map.
7 But I do want to make sure that everybody sits down
8 and makes sure that it is the absolute best that we
9 can get. I will give you an opportunity to comment
10 on that one, if you like.

11 MR. JUNKER: Only that it is not really
12 possible for you as Commissioners, looking at this
13 map to have an understanding of what has gone into
14 it. This map has been analyzed and scrutinized from
15 many different perspectives. We will share all of
16 that with you as we get closer to the hearings on
17 the specific plan. You can understand all of the
18 underlying reasons. I think that will answer many
19 of the questions as we go forward. Tonight is about
20 the environmental document. It is -- of course, you
21 are interested in the project. I understand that.
22 We have already been speaking with the applicant
23 about holding study sessions prior to the hearing so
24 you are well versed to why things are presented in
25 the way they are. We will make sure you have that

1 opportunity for rich discussion.

2 COMMISSIONER CUMMINGS: The only other
3 comment I have, and I know it is not part of our
4 discussion tonight, necessarily, but it would seem
5 to me that in order for this project to be
6 successful, other pieces to the puzzle in the
7 surrounding neighborhood need to be finished or at
8 least started. And I am referencing the commercial
9 area south of here, Anatole, which has yet to be
10 built. I don't think there's any ground been
11 broken. I understand the economics of the
12 situation.

13 If we begin building homes in this area,
14 promising these people commercial that doesn't exist
15 already, we are going to be in big trouble
16 politically, and I think economically, if we can't
17 provide these people places to go without having to
18 drive 20 minutes to get to a grocery store or
19 someplace else.

20 Those were my main comments. I appreciate
21 Planning and audience's time.

22 CHAIRMAN MOE: You're up.

23 COMMISSIONER JOHNSON: I want workshops or
24 study period because this water with the South
25 County Water Agency, what is happening down in the

1 surface water and Florin, it kind of makes the whole
2 southeast part of the county -- will we have a
3 chance to look at that whole thing? That is a big
4 part of the success of this project.

5 MR. JUNKER: I don't believe we'll spend
6 much time talking about how the water will be
7 delivered to the project. That is really -- that is
8 a county water agency discussion more than Rio del
9 Oro discussion. We need assurance that the water
10 will be delivered. The water agency has to provide
11 that assurance before various levels of project
12 approval can occur.

13 We are not really going to delve deeply into
14 how the water agency provides that water. We just
15 understand it must be provided. So, for instance,
16 the Freeport water takeout, it's interesting, but
17 that's not really -- and it's critical to this
18 project, but it is not the subject of what we will
19 be discussing.

20 COMMISSIONER JOHNSON: Just as long as they
21 are on board. I don't know the specifics, but that
22 is a lot of development going on in this part and
23 the whole water issue and issues that could impact
24 the timing of the project. That is what I'm
25 concerned about.

1 MR. ANGELL: Yes. And just to note, the
2 preparation of the water analysis in here was done
3 in very close consultation with Sacramento County
4 Water Agency.

5 COMMISSIONER SAVORN: I was quite surprised
6 to hear that you had only two letters or two
7 comments from two agencies. Based on the fact that
8 whenever we have any kind of review projects with
9 EIRs, they always have wildlife experts coming
10 before you or we have vernal pool people or those
11 concerned about the clock issue.

12 Now absent these people from this process
13 right now, we go through this today, everybody's
14 copasetically satisfied as we go and everything is
15 more on a positive thing. Can they jump in at a
16 later date and stir up or either create something
17 that should be handled now at this stage of the
18 process as opposed to jumping in down the road?

19 MR. JUNKER: No, they have to speak tonight
20 or else they can't ever speak on the project. The
21 reality is we have these nice neat comment periods,
22 but comments can be received actually after the
23 comment period is closed, and we still, to some
24 extent, have to respond to them. This is a
25 midstream obligation here, not the close of the

1 comment period.

2 So we fully expect we are going to get long,
3 detailed comment letters from all types of special
4 interests that are affected by the project. That is
5 yet to come. We will respond to those. We will
6 have comment. I expect significant public comments
7 as the project moves through the actual approval
8 process. But this is -- this is really a bit of a
9 procedural step tonight that is not generally the
10 focus of the various interest groups that will come
11 later in the process.

12 Pat, anything to add?

13 MR. ANGELL: I think he hit it on the head.
14 You won't see -- the bulk of the comments usually
15 come in on the very last day, about 4:00 in the
16 afternoon.

17 COMMISSIONER SAVORN: I just don't think
18 that it's right for they the proponent to be ready
19 to move and we've done our due diligence and to all
20 of a sudden someone says I have a comment.
21 Everything stops, and you do what you need to do,
22 and the proponent is sitting here waiting to go. I
23 have a problem with that.

24 COMMISSIONER CUMMINGS: I have a request.
25 Could you let us know as you start getting these

1 things who's commenting, in general terms what are
2 they are commenting on, whether they're in support
3 or they have concerns? Are you allowed to that?

4 MR. JUNKER: What will happen, we will
5 receive the comments, and Pat really wasn't joking
6 when he said the timing of the comments. They
7 really do come in at the last one or two days.

8 We'll assimilate those. And the first step we
9 get a comment letter, ten, a hundred.

10 Pat, how many letters have you gotten on a big
11 project?

12 MR. ANGELL: I think the last go-around
13 with Rio with the draft we got somewhere in the
14 order of maybe shy 20 comment letters.

15 MR. JUNKER: Then those comment letters
16 will be raising numerous issues. We will dissect
17 them so we can identify all of the various different
18 comments that are embedded within those letters.
19 Then we prepare responses. That collection of
20 comment letters and responses constitutes the final
21 EIR/EIS, and will that come back to you.

22 We probably won't be checking in with you as
23 that process goes forward. We will actually be
24 working very hard to respond to those comments and
25 prepare that document and get it complete so that we

1 can proceed with the project.

2 COMMISSIONER CUMMINGS: When we do see it
3 in the final, we will see the actual letter?

4 MR. JUNKER: The actual letter with
5 response to specific comments.

6 COMMISSIONER CUMMINGS: The only concern I
7 have is if you start getting them trickling in, it
8 might be easier for us to digest them as well if we
9 can at least have them available for us to come in
10 and take a look at rather than sending it forward to
11 us so we have access to those so we are not slammed
12 with 40, 30, whatever.

13 MR. JUNKER: We really can most effectively
14 go through this process in its natural order. Let
15 the comments come in. Let us put the response
16 together. We get the documents out to you, and then
17 we'll begin walking you through that process to
18 touch it and touch it over and over, would probably
19 not actually make the process any more effective.
20 We're experienced in how to take you through this
21 and give you the opportunity to understand all of
22 the comments. There will be some obligation on your
23 part, of course, to review the documents, which will
24 be significant.

25 CHAIRMAN MOE: Any more questions or

1 comments from Commissioners?

2 CHAIRMAN MOE: If not, I open the public
3 hearing as well. A Kim Wilhelm would like to speak
4 on the project, on the EIR.

5 MR. WILHELM: Good evening. I am Kim
6 Wilhelm. I am with the California Department of
7 Public Health, the public drinking water program.
8 And I want to start by commenting to staff by saying
9 that you guys have done just an incredible amount of
10 work in summarizing all of the various water
11 projects and plans and agreements and issues that
12 surround the availability of water. It is an
13 extremely complex situation out there because of
14 water rights, because of contamination, because of
15 growth. And they all have to fit together.

16 We have one concern, as our agency, public
17 drinking water and that is the availability of good,
18 wholesome drinking water for the entire development.
19 Our concern is that, and it is discussed in the EIR,
20 that all of the water plans have some contingencies
21 on the use of the get waters, the well water
22 extractions, the treated water.

23 At this point those agreements are not
24 finalized. And so this is a huge investment for
25 everyone. The water portion of it, which is

1 absolutely critical, has not been nailed down and
2 finalized. That is our concern. We are going to be
3 trying to meet with the county water people and make
4 sure our understanding is the same as theirs. This
5 week get you some final comments in writing.

6 We wanted to be on record as expressing our
7 concern, but also recognizing staff has done a very
8 good job in trying to summarize a very, very complex
9 and contentious issue.

10 Thank you.

11 CHAIRMAN MOE: Thank you.

12 With that, any other speakers?

13 I guess not. I don't have any cards. There
14 is no actual action?

15 MR. ANGELL: No. I guess we need to close
16 the item.

17 MR. JUNKER: Close the hearing.

18 CHAIRMAN MOE: Without any more comments
19 from the Commissioners, I will close the hearing.

20 (Public comment period closed at 6:30 p.m.)

21 ---oOo---

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T-DHS-1

The comment states that all of the water supply options have contingencies on the use of the water, and those contracts are not executed yet.

The 2003 agreements between SCWA and Aerojet and the Boeing Company, noted by the commenter, have been terminated. SCWA and Aerojet have entered into a new 2010 Agreement under which Aerojet is transferring 8,900 afy of GET water to SCWA. Under the 2010 Agreement, SCWA acknowledges that the 8,900 afy will provide SCWA with sufficient available water to supply the Project, and shall further confirm this fact in writing to the City. The 8,900 afy along with other available Zone 40 water (including 1,500 afy under the SCWA conjunctive use program) is sufficient to meet the Project demand of 8,891 afy. Thus, the GET remediated water remains a reasonably likely supply under the standards set forth in *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal.4th 412. (See Master Response 1, “Adequacy of Long-Term Water Supply,” in Chapter 3 of this FEIR/FEIS.)

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5 CORRECTIONS AND REVISIONS TO THE 2006 DEIR/DEIS AND 2008 RDEIR/SDEIS

5.1 INTRODUCTION

This chapter includes revisions to the text in the 2006 DEIR/DEIS and the 2008 RDEIR/SDEIS subsequent to their publication and public review. The changes are presented in the order in which they appear in the 2006 DEIR/DEIS and 2008 RDEIR/SDEIS and are identified by page number in the respective documents. Revisions are shown as excerpts from the 2006 DEIR/DEIS or 2008 RDEIR/SDEIS text, with strikethrough (~~strikethrough~~) text for deletions and underlined (underlined) text for additions.

5.2 CORRECTIONS AND REVISIONS TO THE 2006 DEIR/DEIS

EXECUTIVE SUMMARY

Section ES.4, “Requested Entitlements,” on pages ES-1 and ES-2 of the 2006 DEIR/DEIS is hereby revised as follows:

Elliott Homes and GenCorp (hereinafter referred to as “the project applicant[s]”) are seeking approval of various discretionary approvals in support of the Rio del Oro Specific Plan. The current proposal is to process the specific plan in two separate phases, or tiers, of development approvals for each of the two property owners (see the detailed description of entitlements sought and the entitlement process in Chapter 2 of this FEIR/FEIS). The following separate but concurrent Tier 1 entitlements for each of the property owners ~~The following entitlements~~ are requested from the City for the project:

- ▶ adoption and implementation of the specific plan,
- ▶ ~~adoption of a public facilities financing plan,~~
- ▶ ~~adoption of a public facilities infrastructure/phasing plan,~~
- ▶ ~~approval of the Phase 1 tentative subdivision map, and~~
- ▶ amendment to the Aerojet Special Planning Area.

- ▶ approval of ~~a separate Tier 1 development agreements~~ between the City and ~~the each~~ project applicant(s)-, and

- ▶ certification of the EIR.

As part of the Tier 1 entitlements, the following approvals are also being requested from USACE:

- ▶ approval of the FEIS and

- ▶ approval of a USACE permit under Section 404 of the Clean Water Act for discharges into waters of the United States.

The City is not required to process the Tier 2 development agreements for GenCorp and Elliott Homes simultaneously. The project applicant that requests approval of its Tier 2 development agreement first would work with the City to prepare a single financing plan, phasing master plan, and set of master large-lot maps for the entire specific plan area. That applicant’s development agreement would be approved at the same time as the plans and master large-lot maps. before any Tier 2 entitlements are approved and before physical development would be allowed, including development under the Tier 2 development agreements, all of the developers within the Rio del Oro Specific Plan area would agree to the financing plan, phasing master plan, and overall project conditions of approval.

In addition to the authorizations and approvals requested from the City and USACE, permits and other approval actions from the following federal, state, regional, and local agencies may be required:

- ▶ U.S. Environmental Protection Agency
- ▶ U.S. Fish and Wildlife Service
- ▶ California Department of Education
- ▶ California Department of Fish and Game
- ▶ California Department of Transportation
- ▶ Central Valley Regional Water Quality Control Board (Region 5)
- ▶ Sacramento County Local Agency Formation Commission
- ▶ Sacramento Metropolitan Air Quality Management District

CHAPTER 1, “INTRODUCTION”

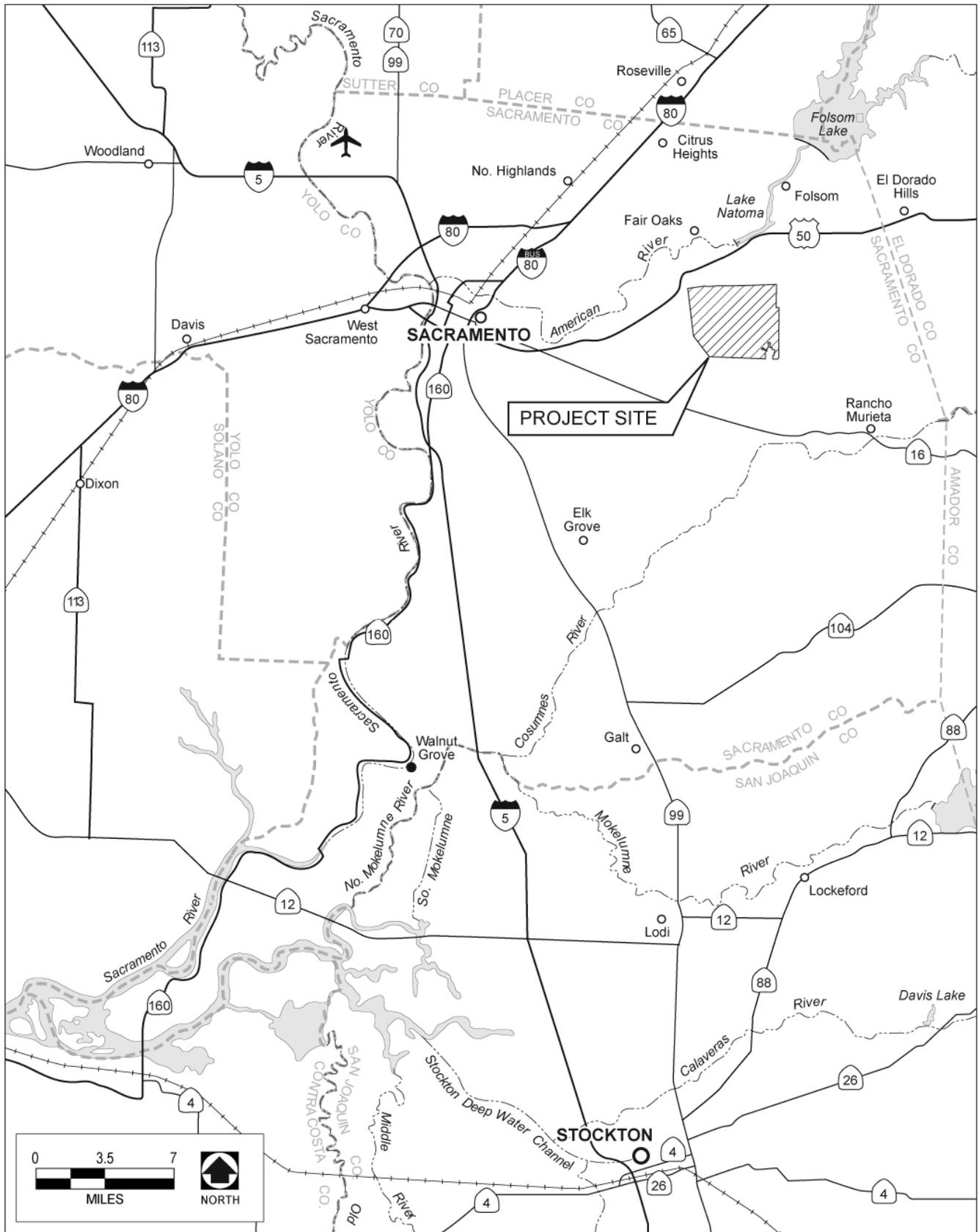
The third paragraph on page 1-4 of the 2006 DEIR/DEIS is hereby revised as follows:

PROJECT PURPOSE AND NEED: U.S. ARMY CORPS OF ENGINEERS

USACE has determined that the overall project purpose and need is to construct a master-planned mixed-use development to serve the growing population of southeastern Sacramento County ~~are to provide a large-scale mixed-use community within Sacramento County. The applicant has indicated that there is a need for additional residential and commercial development within the City of Rancho Cordova.~~

CHAPTER 2, “ALTERNATIVES”

Exhibit 2-1, “Regional Location,” on page 2-5 of the 2006 DEIR/DEIS was incorrectly labeled. The corrected version is shown on the following page.



Source: California State Automobile Association, Bay and Mountain Section 1999

Regional Location

EXHIBIT 2-1

Rio del Oro Specific Plan Project Administrative FEIR/FEIS
 City of Rancho Cordova and USACE
 P 03110089.01 02/07



The text in the “Rancho Cordova” subsection under “Requested Entitlements,” on page 2-8, 2-13, and 2-14 of the 2006 DEIR/DEIS is hereby revised as follows:

City of Rancho Cordova

Adoption of the proposed project, as well as alternatives under consideration, including development Phase 1, requires approval of the following City entitlements:

- ▶ ~~Adoption of the *Rio del Oro Specific Plan*,~~
- ▶ ~~Adoption of a Public Facilities Financing Plan,~~
- ▶ ~~Adoption of a Public Facilities Infrastructure/Phasing Plan,~~
- ▶ ~~Approval of a Tentative subdivision maps (Phase 1 only), and~~
- ▶ ~~Approval of a Development agreement between the City and project applicant(s).~~

Future City entitlement approvals for development Phases 2–5 may include, but are not limited to, the following:

- ▶ ~~use permits,~~
- ▶ ~~tentative subdivision maps,~~
- ▶ ~~lot line adjustments,~~
- ▶ ~~Engineering Improvement Plans,~~
- ▶ ~~infrastructure and roadway improvement projects,~~
- ▶ ~~design review, and~~
- ▶ ~~Development Agreement between the City and future project applicant(s).~~

Each of these required entitlements and approvals is described in turn below.

- ▶ ~~**Rio del Oro Specific Plan Adoption.** The specific plan is intended to provide a comprehensive land use, policy, and regulatory document to govern all future development in the 3,828-acre plan area, which contains the same boundary as the project site and is hereinafter referred to as the “project site.” The goal of the specific plan is to establish a development framework for land use, resource protection, circulation, public utilities and services, design, and implementation. Development of the specific plan (i.e., the proposed project under the CEQA process) and the subsequent entitlement process provides for a sequence of community input and government review to ensure that development occurs in a logical, consistent, and timely manner.~~

~~Specific plans are an implementation mechanism for new growth areas authorized, but not mandated, by California statute (California Government Code Section 65451 et seq.). The content of a specific plan is defined in Government Code Section 64541(a), which specifies the following in detail:~~

- ~~the distribution, location, and extent of the uses of the land, including open space, within the area covered by the plan;~~
- ~~the proposed distribution, location, extent, and intensity of major components of public and private transportation, sewage, water drainage, solid waste disposal, energy, and other essential facilities proposed to be located within the area covered by the plan and needed to support the land uses described in the plan;~~
- ~~standards and criteria by which development would proceed, and standards for the conservation, development, and utilization of natural resources, where applicable; and~~
- ~~a program of implementation measures including regulations, programs, public works projects, and financing measures necessary to carry out the above-listed criteria.~~

~~Under state law, the specific plan implements and must be consistent with the goals, policies, and objectives of the approving local agency's general plan. Here, the project is intended to be consistent with the *Rancho Cordova General Plan* (City General Plan), as adopted on June 26, 2006. All subsequent entitlements and approvals relating to land or infrastructure in the plan area (i.e., project site), including but not limited to subdivisions, public works projects, rezones, and conditional use permits, are required to be consistent with the specific plan if the specific plan is to be used as the entitling document. Once the specific plan is adopted, the maximum extent of development at the project site will have been determined and cannot be exceeded. However, development intensity and residential density within individual communities in the specific plan area may be transferred from one development to another, with City approval, provided that the maximum limits set forth in the specific plan are not exceeded.~~

- ~~► **Public Facilities Financing Plan.** A Public Facilities Financing Plan would be prepared and included as part of the Rio del Oro Specific Plan, and would be adopted by the City Council before the approval of any tentative map within the specific plan area, including development Phase 1. The Financing Plan would define the specific mechanisms required to fund capital costs of all infrastructure necessary as a result of specific plan buildout. The Financing Plan would define funding for the maintenance of new infrastructure and public services needed by the future residents and business locating within the Rio del Oro project site.~~
- ~~► **Public Facilities Infrastructure/Phasing Plan.** A Public Facilities Infrastructure/Phasing Plan would be adopted by the City Council before approval of any tentative map within the specific plan area, including development Phase 1. The plan would provide specific details regarding the phasing, sizing, alignment and location, cost estimates, and construction timing requirements for each phase of the Rio del Oro project site.~~
- ~~► **Development Agreement.** The project applicant(s) intend to enter into a Development Agreement with the City pursuant to Government Code Section 65864 et seq. at the time of specific plan adoption. The agreement would set forth many, if not all, of the applicants' obligations to the City and other public agencies with regard to the project, including but not limited to construction, maintenance, and financial responsibilities. The agreement would also set forth the City's other project obligations, including but not limited to processing of subsequent entitlement applications, formation of financing mechanisms (including Mello Roos districts), and the vesting of development entitlements. Pursuant to applicable Government Code provisions, public hearings at both the City Planning Commission and City Council would be held on the proposed Development Agreement before the City Council takes any action.~~

The applicant team and the City have agreed to pursue the concept of phasing project by first considering what is now referred to as the "limited entitlement" for Rio del Oro. The goal is to limit the initial approvals to the adoption of the Rio del Oro Specific Plan (Specific Plan) (with corresponding environmental analysis and development agreement) and to consider maps and details of financing, phasing, and overall map conditions in a subsequent entitlement process. Details of the limited entitlement are described below.

Limited Entitlement

California law allows cities and developers considerable flexibility to decide how to "package" the long list of development approvals that are needed for most major planned developments. One method of processing development approvals is to combine all or almost all of the plans and permits required to plan, analyze, subdivide, and start building a project into a single large set of approvals that a city council considers at one time. However, with proper environmental analysis and following the required procedures, several other communities around the state have at times found it useful to allow major

developments to be packaged into two or more sequential rounds of development approvals. This multiphase or multitier approach has been followed in this region (e.g., in Sutter County, for the Sutter Pointe Specific Plan) and in other areas of the state.

The current proposal is to process the Rio del Oro Specific Plan in two separate phases or “tiers” of development approvals for each of the two property owners (i.e., Elliott Homes and GenCorp). Separate but concurrent Tier 1 entitlements for each of the property owners would include the Specific Plan (and corresponding amendment to Aerojet Special Planning Area [SPA]), a Tier 1 development agreement, and certification of the EIR for the project. The Tier 1 development agreements would vest, to some extent, the Specific Plan and commit the City to consider future approval of project entitlements consistent with the land uses and other details in the specific plan.

Tier 1 entitlements would establish the zoning of the property, but would not allow for physical development of the site. The primary intent of the tiered entitlement process set forth in the GenCorp Tier 1 development agreement is to ensure, to the City’s satisfaction, that the provisions of the Specific Plan, the project’s financing plan, and the phasing master plan are uniformly applied in the entire Specific Plan area, to both the GenCorp and Elliott Homes properties. Critical to the Tier 2 entitlements is that the financing, phasing, and overall project conditions of approval would be determined and memorialized in the form of development agreements before or in conjunction with the maps and other entitlements associated with physical development of the site.

City staff and the applicant team have identified the following benefits to the limited-entitlement approach:

- ▶ The Specific Plan would establish a zoning and land use plan that would reflect and implement the vision of the *City of Rancho Cordova General Plan* for this area.
- ▶ The Specific Plan would advance the City’s circulation system.
- ▶ The Tier 1 entitlements would create a framework for future planning and construction of several improvements important to the City (e.g., a high school, a regional park, transportation improvements, and a library).
- ▶ The 404 permit being requested from USACE would establish certainty about the land use plan and infrastructure.
- ▶ The EIR would create the foundation for and expedite all future environmental review.
- ▶ The action on the project would protect the integrity of the already substantial investment in the technical project site studies and project analysis.

Tier 1 Entitlements for the Rio del Oro Specific Plan Project

Tier 1 project entitlements being sought separately but concurrently by the two property owners consist of adoption of the Specific Plan, an amendment to the existing Aerojet SPA, Tier 1 development agreements for the entire project, and certification of the EIR. Each entitlement is described in more detail below.

Adoption of the Rio del Oro Specific Plan

The Specific Plan establishes the land plan (zoning map) and zoning regulations for development within the 3,828-acre project site. Consistent with state law, a specific plan can establish zoning regulations that are different and unique to the project site. The Specific Plan includes information about the project’s objectives, its relationship to other City documents, setting and surroundings, land use and circulation.

environmental resources, public utilities, public services, and implementation. Related plans in the appendices to the Specific Plan include the *Rio del Oro Development Standards and Design Guidelines* and the *On-Site Infrastructure Master Plan*.

Adoption of the Specific Plan with the first tier of approvals would establish and vest (through the development agreements) the zoning of the property, including the land plan and corresponding development standards, circulation system, plan for services and utilities, preliminary on-site phasing, and plan for implementation and financing. Subsequent development would be subject to compliance with all provisions of the adopted Specific Plan. As described above, determination of additional project details (finance plan, phasing master plan, and overall project conditions of approval) would be required before formal subdivision and any physical development of the site may occur.

Amendment to the Aerojet Special Planning Area

In 1995, Sacramento County adopted the Aerojet SPA Ordinance, which included surface mining and use regulations for much of the Aerojet land holdings, including the Rio del Oro project site. Adoption of the Specific Plan requires a corresponding amendment to the Aerojet SPA to remove the 3,828-acre project site.

Development Agreement

As stated above, the current proposal is to process the Rio del Oro project in two separate phases, or tiers, of development approvals for each of the two property owners. The Tier 1 entitlements include the Specific Plan and a Tier 1 development agreement for each of the two property owners. The terms of the Tier 1 development agreements would be nearly identical; one agreement would apply to Elliott Homes' property and the other would apply to GenCorp's property. GenCorp would have the vested right to proceed with development of its property in accordance with the Tier 1 entitlements. The Tier 1 entitlements would also commit the City to consider future approval or denial of Tier 2 and subsequent project entitlements consistent with the land uses and other standards and requirements set forth in the Tier 1 entitlements, including the Specific Plan. The GenCorp Tier 1 development agreement would not guarantee approval of the Tier 2 entitlements or subsequent entitlements. In the Tier 1 development agreements, the City would agree that the Specific Plan is essentially the blueprint for the development and that the City and developers would both work toward the development it describes. The City would acknowledge that the Rio del Oro Specific Plan includes the land uses and approximate acreages for the project as shown and described in the Specific Plan. In the Tier 1 development agreements, both parties agree that the City would not firmly promise to approve development as described in the Specific Plan until all of the developers within the Specific Plan area agree to the financing plan, phasing master plan, and overall project conditions of approval.

Tier 2 Entitlements for the Rio del Oro Specific Plan Project

The City is not required to process the Tier 2 development agreements for GenCorp and Elliott Homes simultaneously. The project applicant that requests approval of its Tier 2 development agreement first would work with the City to prepare a single financing plan, phasing master plan, and set of master large-lot maps for the entire specific plan area. That applicant's development agreement would be approved at the same time as the plans and master large-lot maps. The City and property owners agree that before any Tier 2 entitlements are approved and before physical development would be allowed, including development under the Tier 2 development agreements, all of the developers within the Specific Plan area would agree to the financing plan, phasing master plan, and overall project conditions of approval. If Elliott Homes requests approval of its Tier 2 development agreement first, then the City may deny approval of the GenCorp Tier 2 development agreement and other Tier 2 entitlements for areas subject to the GenCorp Tier 1 development agreement unless GenCorp agrees to comply with the terms of the

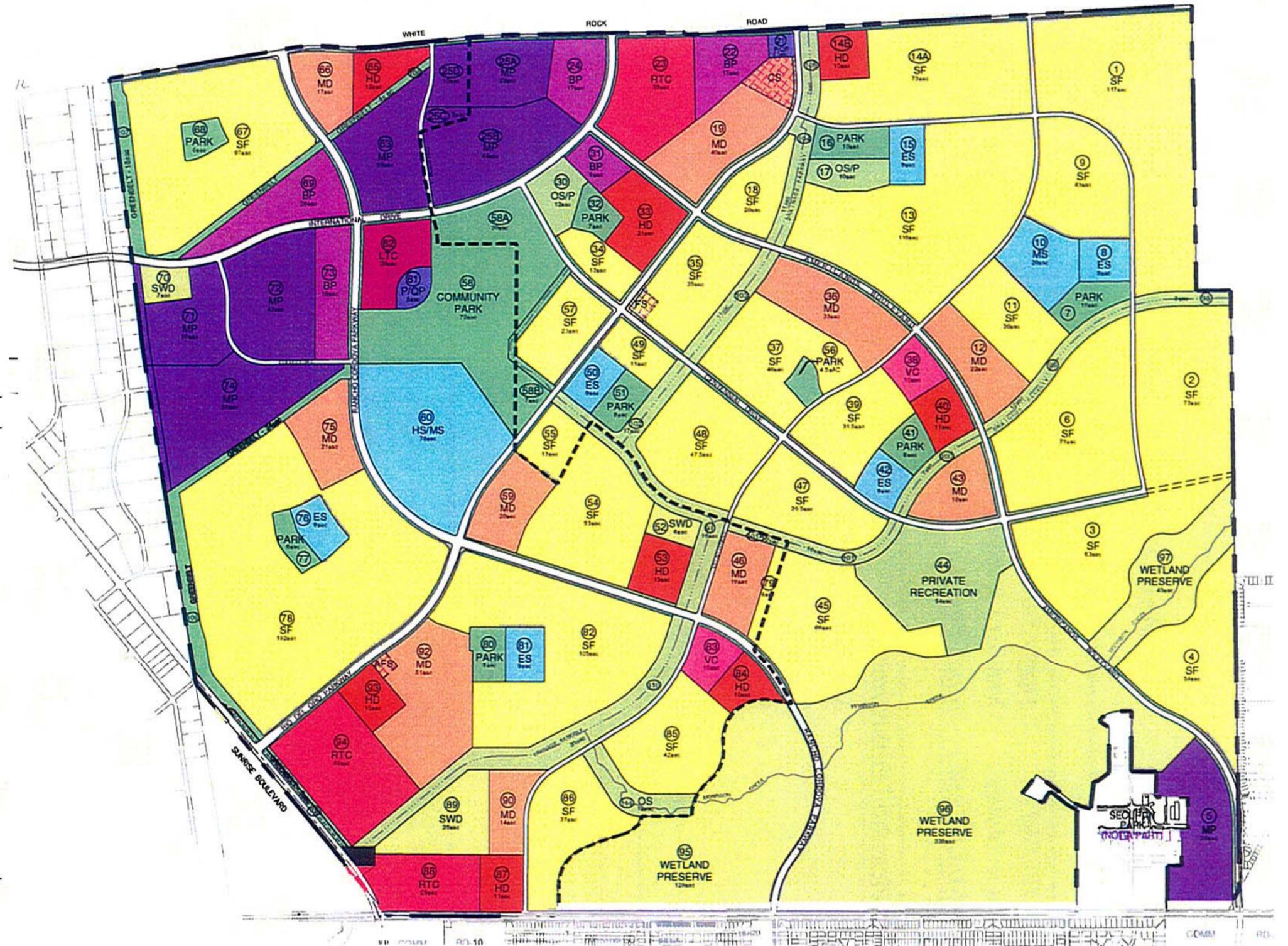
financing plan, phasing master plan, and master large-lot tentative map conditions of approval, as established by the City and Elliott Homes. The GenCorp Tier 2 development agreement would be approved at the same time as, but not before, the City approves the financing plan and phasing master plan for the entire Rio del Oro Specific Plan area, and a large-lot tentative map for the GenCorp property (which would include the master conditions of approval to implement the Specific Plan, the financing plan, and the phasing master plan).

Exhibit 2-4, “Proposed Project Alternative Land Use Plan,” on page 2-9 of the 2006 DEIR/DEIS is hereby revised as shown below.

LAND USE SUMMARY

LAND USE	ACRES	DENSITY RANGE	FIXED COUNT	UNITS	UNIT %	% OF RESIDENTIAL ACRES
SF	1,518.5	2.1 - 6.0	5 DU/AC	7,503	65%	61.0%
MD	256	6.1 - 16.0	8 DU/AC	2,048	18%	13.8%
HD	98	18.1 - 40.0	20 DU/AC	1,960	17%	5.2%
VC	20					
LT	20					
RT	113					
BP	86					
IP	283					
PQ	7.5					
FS	*					
AFS	*					
CS	*					
SC	76					
MS	20					
ES	54					
CP	107					
NP	67.5					
SWD	30					
WP	510					
DP	138					
PR	54					
OS	12					
OSP	22					
LSC	82					
GB	51					
MR	192					
TOTALS:	3828.5			11,601	100%	

*UNDERLYING ZONING SHALL REMAIN



Source: Andrea Mayer Consulting 2009

Proposed Project Alternative Land Use Plan

Rio del Oro Specific Plan Project Administrative FEIR/FEIS
 City of Rancho Cordova and USACE
 P 03110089.01 11/09

EXHIBIT 2-4

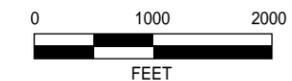


Table 2-1 on page 2-14 of the 2006 DEIR/DEIS is hereby revised as follows:

Table 2-1 Acres of Proposed Rio del Oro Project Land Uses by Specific Plan Development Phase						
Land Use	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Total
Single Family Residential	290	252	324	386	345	1,597
Medium Density Residential	113	56	26	22	20	237
High Density Residential	32	22	21	-	11	86
Village Commercial	-	-	10	-	10	20
Shopping Center (LTC-RTC)	98	35	-	-	-	133
Business Park	41	45	-	-	-	86
Industrial Park	188	55	-	-	39	282
Public/Quasi Public	5	4.5	-	-	-	9.5
High School/Middle School	78	-	-	-	-	78
Middle School	-	-	-	20	-	20
Elementary Schools	9	9	9	18	9	54
Community Parks	71	36	-	-	-	107
Neighborhood Parks	12	15	8	20	8	63
Stormwater Detention	33	-	6	-	-	39
Wetland Preserve	-	-	129	-	378	507
Drainage Parkway	17	60	41	18	19	155
Private Recreation	-	-	-	-	54	54
Open Space Preserve	-	14	-	10	-	24
Greenbelts	50	-	-	-	-	50
Major Roads with Landscaping	78	36	37	27	49	227
Total	1,115	639.5	611	521	942	3,828.5

Source: G. C. Wallace 2005

Table 2-1 Proposed Rio del Oro Project Land Uses				
Land Use	Acres	% of Total Acres	% of Total Units	Units
Residential				
Single Family	<u>1,518.5</u>	<u>39.7%</u>	<u>65%</u>	<u>7,593</u>
Medium Density	<u>256.0</u>	<u>6.7%</u>	<u>18%</u>	<u>2,048</u>
High Density	<u>98.0</u>	<u>2.6%</u>	<u>17%</u>	<u>1,960</u>
Subtotal	<u>1,872.5</u>	<u>49.0%</u>	100%	11,601
Village Services and Employment				
Village Commercial	20.0	0.5%		
Local Town Center	<u>20.0</u>	0.5%		
Regional Town Center	<u>113.0</u>	3.0%		
Business Professional	86.0	2.2%		
Industrial Park (MP)	<u>283.0</u>	7.4%		

**Table 2-1
Proposed Rio del Oro Project Land Uses**

Land Use	Acres	% of Total Acres	% of Total Units	Units
Subtotal	<u>522.0</u>	<u>13.6%</u>		
Education				
High/Middle School	78	2.0%		
Middle School	20	0.5%		
Elementary School	54	1.4%		
Subtotal	152	3.9%		
Open Space & Public				
Community Park	107	2.8%		
Public/Quasi Public	<u>7.5</u>	<u>0.2%</u>		
Park	<u>67.5</u>	<u>1.8%</u>		
Storm Water Detention	39.0	1.0%		
Wetland Preserve	<u>510.0</u>	<u>13.3%</u>		
Drainage Parkway	<u>138.0</u>	<u>3.6%</u>		
Private Recreation	54.0	1.4%		
Open Space	12.0	0.3%		
Open Space/Preserve	<u>22.0</u>	0.6%		
Landscape Corridor	<u>82.0</u>	<u>2.1%</u>		
Greenbelt	<u>51.0</u>	1.3%		
Major Roads	<u>192.0</u>	<u>5.0%</u>		
Subtotal	<u>1,282.0</u>	<u>33.4%</u>		
Total	3,828.5	100%	--	11,601
Source: Data compiled by City of Rancho Cordova in 2009				

The fourth full paragraph on page 2-21 of the 2006 DEIR/DEIS is hereby revised as follows:

Three detention and water quality basins are proposed in the northwest, central, and southwest portions of development Phase 1. The 26-acre basin proposed for the southwest corner of the site would act as a large overflow basin for flows exceeding the bank-full capacity of Morrison Creek where it exits the project site. This basin would have a storage capacity of nearly 500 acre-feet. The other two basins would consist of 7 acres and 6 acres each, with storage capacities of 100 acre-feet and 70 acre-feet, respectively. All detention basins have been designed according to the criteria contained in the Sacramento City/County Drainage Manual Volume 2: Hydrology Standards. Storm drainage pipes would all be 72 inches in diameter or less, with the majority less than 48 inches in diameter.

The last paragraph on page 2-21 (continuing onto page 2-22) of the 2006 DEIR/DEIS is hereby revised as follows:

The proposed project includes a 507-acre wetland preserve that would contain 18.234 acres of vernal pools and 8.006 acres of seasonal wetland habitats. An easement would be established over the wetland

~~preserve~~ ~~The wetland preserve would likely be established during development Phase 1, with construction of the features within the preserve proposed to take place during Phases 3 and 5 (see Table 2-1) although it would be expanded and continue to be improved as later development phases come on line.~~ The exact timing of events within the wetland preserve would be determined by USACE's Clean Water Act Section 404 permit requirements. The wetland preserve would not function as a mitigation bank.

The fifth paragraph under "Sewer" on page 2-34 of the 2006 DEIR/DEIS is hereby revised as follows:

Planned off-site improvements and sewer shed boundaries are shown in Exhibit 2-10b. The Aerojet and Laguna Creek Interceptors, as designated in the *SRCSD Interceptor System Master Plan 2000*, would service the proposed development under the specific plan. The Aerojet Interceptor (Section 2) would run along the western side of the project site, then south along Sunrise Boulevard to a connection point with the Laguna Creek Interceptor. Discharge from the entire Rio del Oro project site would ultimately flow into the Laguna Creek Interceptor, which is not scheduled for completion until after 2024. Interim facilities for portions of the area to be served would flow into the Bradshaw Interceptor upon its completion. Total interim flows into the Bradshaw Interceptor from all projects is on a first come, first served basis ~~may not exceed 39 mgd in the year 2020~~. It is assumed that up to 10 mgd of flows generated by the Rio del Oro project would need to be serviced on an interim basis. Initial development (development Phase 1) of the proposed project would require construction of on-site facilities to a common point near the intersection of Sunrise Boulevard and Douglas Road, where off-site facilities would then be required to convey flows to existing facilities.

The sixth paragraph under "Sewer" on page 2-34 of the 2006 DEIR/DEIS is hereby revised as follows:

Interim facilities are shown in Exhibit 2-10c. These interim facilities may be necessary if the Mather Interceptor is not online by 2010. The following features would likely be constructed:

Exhibit 2.10-a on page 2-35 of the 2006 DEIR/DEIS is hereby revised as shown below, with the following revisions to Notes 2 and 3:

Note 2: Alignment of interceptors adjacent to Sunrise Blvd, Jaeger Road & Rio del Oro Parkway will be addressed in the upcoming SRCSD Interceptor Master Plan 2007. ~~To be constructed outside of right of way to the extent possible.~~

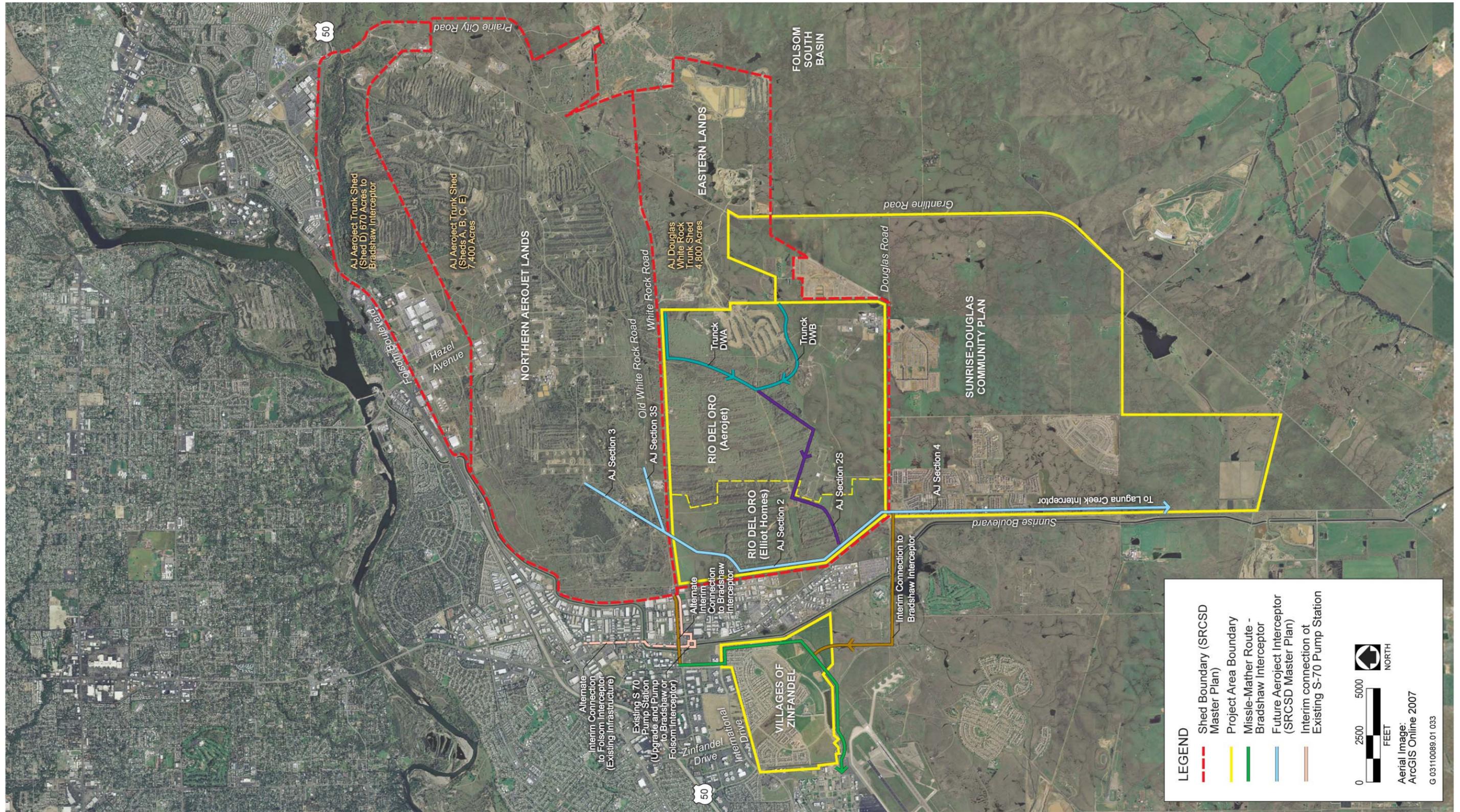
Note 3: ~~SRCSD has identified a need for a staging area for future tunneling of the Laguna Interceptor. This would require temporary use of a portion of the storm water detention facility.~~ During the design of the basin stormwater detention facility, placement of wetland mitigation areas should be coordinated with SRCSD to provide for potential interceptor easement requirements.

As shown below, Exhibit 2.10-b on page 2-37 of the 2006 DEIR/DEIS is hereby revised to change all references of the "Laguna Interceptor" to the "Laguna Creek Interceptor."

Exhibit 2-12, "Roadway Circulation Plan," on page 2-45 of the 2006 DEIR/DEIS is hereby revised as shown below.

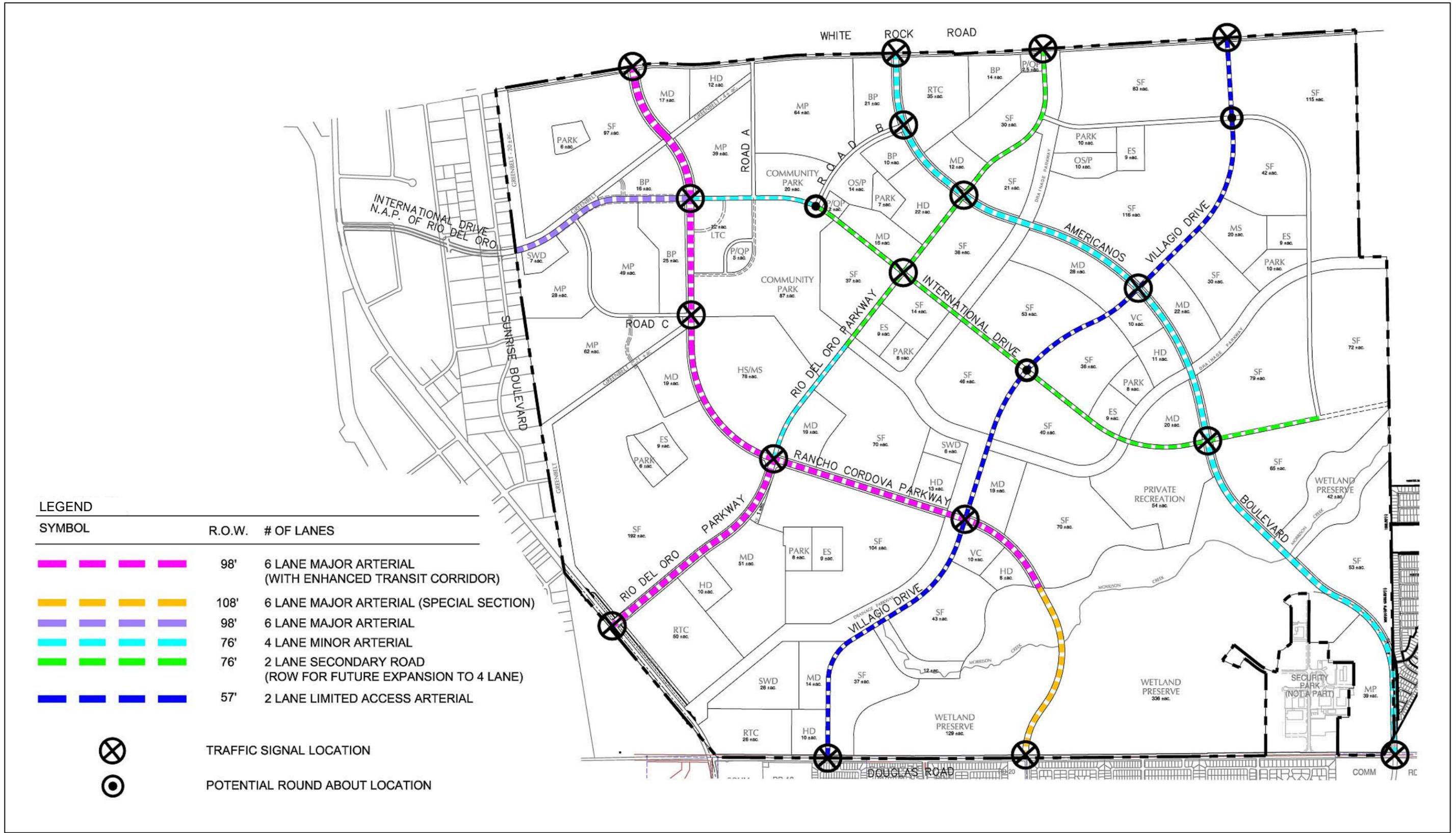
Exhibit 2-13, "Bikeway and Trails Plan," on page 2-47 of the 2006 DEIR/DEIS is hereby revised as shown below.

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Source: Wood Rogers 2006, Adapted by EDAW 2008

Existing Sewersheds and Off-Site Sewer Facilities

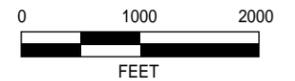


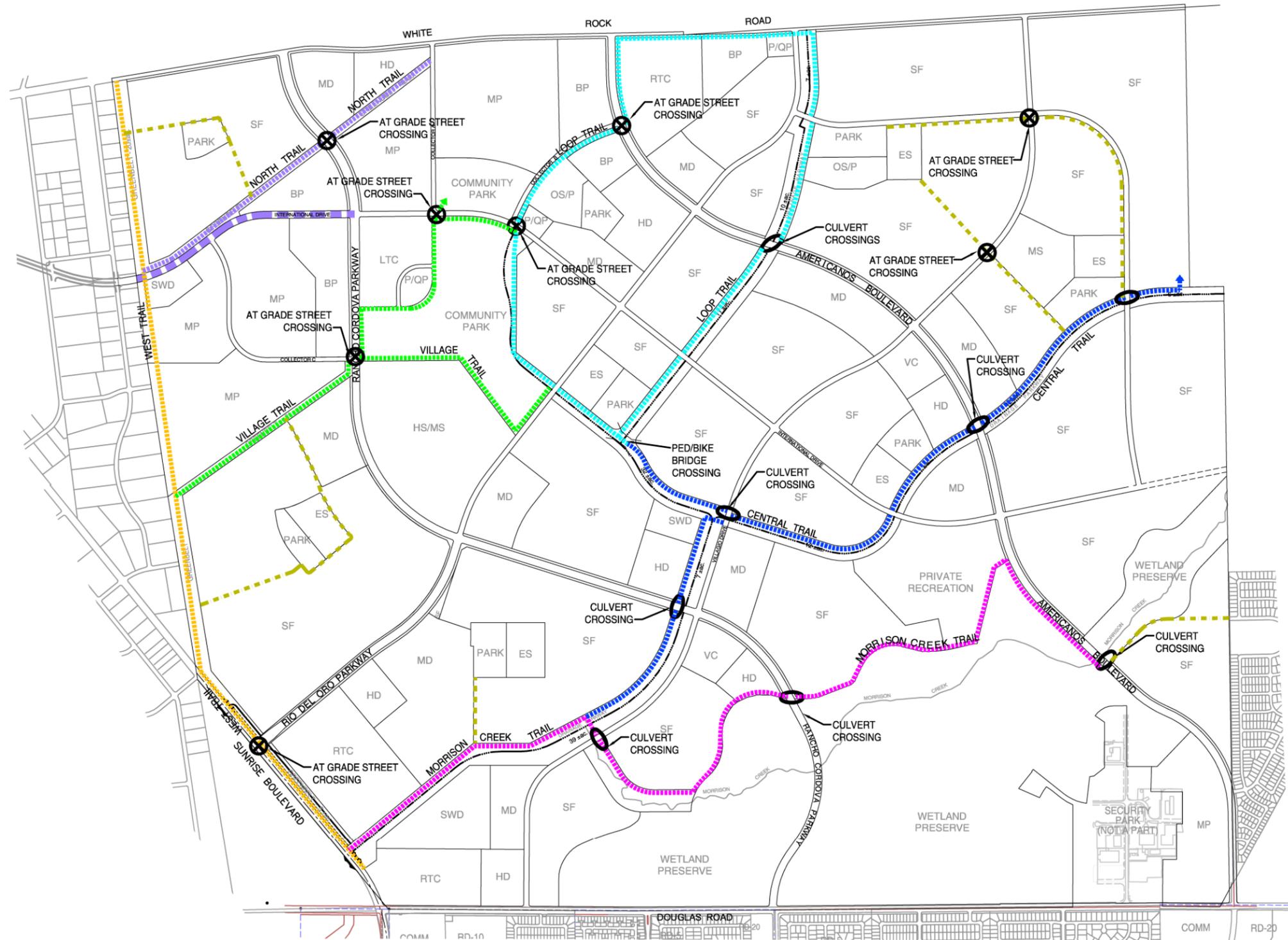
Source: Andrea Mayer Consulting 2009

Roadway Circulation Plan

Rio del Oro Specific Plan Project Administrative FEIR/FEIS
 City of Rancho Cordova and USACE
 P 03110089.01 11/09

EXHIBIT 2-12





LEGEND

- CLASS I 10' OFF-STREET TRAIL**
- WEST TRAIL - - - - -
- NORTH TRAIL - - - - -
- CENTRAL TRAIL - - - - -
- LOOP TRAIL - - - - -
- VILLAGE TRAIL - - - - -
- MORRISON CREEK TRAIL - - - - -

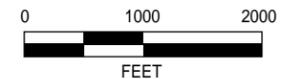
- CLASS II TRAIL**
- NEIGHBORHOOD TRAILS
(TO BE DETERMINED
BY TENTATIVE SUBDIVISION MAP) - - - - -

- CULVERT STREET CROSSING ○
- AT GRADE STREET CROSSING ⊗

Source: Andrea Mayer Consulting 2009

Bikeway and Trails Plan

Rio del Oro Specific Plan Project Administrative FEIR/FEIS
City of Rancho Cordova and USACE
P 03110089.01 11/09



SECTION 3.5, “UTILITIES AND SERVICE SYSTEMS”

The fifth sentence of the fourth paragraph under “Wastewater” on page 3.5-3 of the 2006 DEIR/DEIS is hereby revised as follows:

The AJ and Laguna Creek Interceptors, as designated in the 2000 SRCSD Interceptor System Master Plan, would be constructed by SRCSD and would serve the project site beginning in 2020.24; however, SRCSD is currently updating the Interceptor Master Plan and the interceptor project completion schedule is subject to change.

The last sentence of the first paragraph of 2006 DEIR/DEIS page 3.5-4 is hereby revised as follows:

Project-related facilities evaluated include the Bradshaw, AJ, Mather, and Laguna Creek Interceptors.

The second paragraph on page 3.5-5 of the 2006 DEIR/DEIS is hereby revised as follows:

SMUD also has long-term contracts with other generators to provide an additional 1,189 MW of electricity for distribution per day. Throughout the year, SMUD buys and sells energy and capacity on a short-term basis to meet load requirements and reduce costs. SMUD is currently in the process of permitting received approval from the California Energy Commission to build the first phase of the 500-MW Cosumnes Power Plant (CPP), which is part of SMUD’s long-range plan to meet the growing power needs of Sacramento County. The CPP would be a natural gas-fired electrical generating facility and is anticipated to be constructed in two phases (Phase 1 started in early 2004), the CPP, which came online in 2006, provides enough power to meet the annual needs of 450,000 single-family homes (SMUD 2009). The CPP would provide SMUD with a total of 1,000 MW additional capacity. Phase 1 of the CPP (500 MW) is scheduled to begin serving SMUD costumers in 2006 (SMUD 2004, n.d.).

The timing of Mitigation Measure 3.5-4, “Submit Proof of Adequate Wastewater and Implement On- and Off-Site Infrastructure Service System or Assure that Adequate Financing is Secured,” on page 3.5-19 of the 2006 DEIR/DEIS, is hereby revised as follows:

Timing: Before approval of small-lot final maps and building permits for all project phases.

The last three sentences in the first paragraph under “Electricity” on page 3.5-45 of the 2006 DEIR/DEIS are hereby revised as follows:

SMUD is currently in the process of permitting received approval from the California Energy Commission to build the first phase of the CPP, which is part of SMUD’s long-range plan to meet the growing power needs of Sacramento County. The CPP is anticipated to be constructed in two phases (Phase 1 started in early 2004) and would provide SMUD with a total of 1,000 MW. Phase 1 of the CPP is scheduled to begin serving SMUD costumers, which came online in 2006 (SMUD 2004, n.d.), provides enough power to meet the annual needs of 450,000 single-family homes (SMUD 2009).

SECTION 3.6, “PUBLIC SERVICES”

The following change is hereby made to the second paragraph under “Law Enforcement Services” on page 3.6-2 of the 2006 DEIR/DEIS:

The police department is located at 10361 Rockingham Drive (at Mather Field Road), approximately 3.5 miles southwest of the project site. The City’s goal is to provide ~~one~~ 1.1 police officer for every 1,000 citizens and one support staff member for every three officers, similar to the standard that was adopted for SCSD. The police department maintains an average response time for Priority One calls for service of 5

minutes or less. A Priority One call is a violent crime against a person or an emergency requiring an immediate response to save a life. Daily assessments are conducted on a call-by-call basis, with the goal of improving the department's response times. SCSD and the City have agreed that funding for the Rancho Cordova Police Department will occur using revenues from the City's General Fund, which is the primary source of revenue for law enforcement services (City of Rancho Cordova 2005).

The first full paragraph on page 3.6-3 of the 2006 DEIR/DEIS is hereby revised as follows:

The Folsom Cordova Unified School District (FCUSD) provides educational services to approximately 18,000 students in the cities of Folsom and Rancho Cordova. FCUSD schools currently include 19 elementary schools, four middle schools, and two high schools, plus continuing-education high schools and adult education. The teacher-student ratio is 1:~~19~~³² for K, 1:19 for grades 1–3, 1:31 for grades 4–6, 1:27 for grades 7–8, and 1:~~29~~²⁸ for grades 9–12. Special education classes generally have a teacher-student ratio of 1:12 or less, and continuation high schools have a ratio of 1:15 or less. On a district level, FCUSD is operating at or near capacity for its elementary and high schools. The school district has experienced considerable growth in the past few years. Table 3.6-1 identifies the 2003–2004 school year enrollment for FCUSD in September 2003.

Table 3.6-1 on page 3.6-3 of the 2006 DEIR/DEIS is hereby revised as follows:

School Name	Grade	Current Enrollment	Student Capacity	% of Capacity	Remaining Capacity
Blanche Sprentz Elementary	K–5	353	383	92	30
Carl Sundahl Elementary	K–6	435	534	81	99
Cordova Gardens Elementary	K–6	421	464	91	43
Cordova Lane Elementary	K–5	586	598	98	12
Cordova Meadows Elementary	K– 6 ⁵	414	459	90	45
Cordova Villa Elementary/Reymouth	K–5	507	483	105	-24
Empire Oaks Elementary	K–5	409	598	68	189
Folsom Hills Elementary	K–6	580	689	84	109
Gold Ridge Elementary	K–5	544	598	91	54
Mather Heights Elementary	K– 6 ⁵	369	422	87	53
Natoma Station Elementary	K–6	593	672	88	79
Oak Chan Elementary	K– 6 ⁵	596	641	93	45
PJ Shields Elementary	K– 6 ⁵	381	453	84	72
Rancho Cordova Elementary	K–6	441	566	78	125
Riverview Elementary	K–6	257	351	73	94
Sandra J. Gallardo Elementary	K– 6 ⁵	591	618	96	27
Theodore Judah Elementary	K–6	348	547	64	199
White Rock Elementary	K–6	593	642	92	49
Williamson Elementary	K–5	406	428	95	22
Folsom Middle	6–8	1,059	1,194	89	135

**Table 3.6-1
Folsom Cordova Unified School District Enrollment, 2003–2004^a**

School Name	Grade	Current Enrollment	Student Capacity	% of Capacity	Remaining Capacity
Mills Middle	6–8	1,112	1,170	95	58
Mitchell Middle	6–8	734	851	86	117
Sutter Middle	6–8	1,027	1,378	75	351
Cordova High	9–12	2,108	2,148	98	40
Folsom High	9–12	2,537	2,268	112	-269
Folsom Lake High (Continuation)	10 9–12	109	158	69	49
Kinney High (Continuation)	9–12	238	225	106	-13
Kitty Hawk (Alternative)/Mather Youth Academy Community Day	6–12	117	225	52	108
Walnutwood High (Alternative)	1–12	176	158	111	-18

^a Student enrollment in the district changes daily as more students enroll and others leave; therefore, Table 3.6-1 does not reflect exact current (2009) enrollment.

Sources: California Department of Education, Educational Demographics Unit 2004; FCUSD 2004

The second sentence of the first full paragraph on page 3.6-4 of the 2006 DEIR/DEIS is hereby revised as follows:

The district opened Sandra J. Gallardo Elementary School for K–~~6~~5 students in August 2004 to accommodate rapid growth in the Folsom area.

The fourth full paragraph on page 3.6-4 of the 2006 DEIR/DEIS is hereby revised as follows:

The school district is funded by 50% state and 50% local sources. State funding is based on a per-pupil grant. The district can receive local funding through developer impact fees, tax revenue from Mello-Roos districts, and General Obligation (GO) bonds. ~~The district can receive local funding through developer impact fees, tax revenue from Mello-Roos districts, and General Obligation (GO) bonds.~~ Developer impact fees are the major source of funding for the district and generally finances approximately one-third of school construction costs. In addition to developer impact fees, FCUSD can receive local funding through tax revenue from Mello-Roos districts and General Obligation (GO) bonds. Based on its Facility Needs Assessment, FCUSD demonstrated the need to levy Level II developer fees (described in Section 3.6.2, “Regulatory Framework”) in the Rancho Cordova SFID that are higher than the statutory fee. As of August 2005, Level II fees for residential development are \$4.57 per square foot and \$0.36 per square foot for commercial/industrial construction (FCUSD 2005). Developer fees may be used to finance construction of new schools and equipment, and to reconstruct existing facilities to maintain adequate housing for all the district’s students. Mello-Roos districts are defined tax areas usually associated with new residential subdivisions, which are often used for additional school taxes.

The timing of Mitigation Measure 3.6-1, “Prepare and Implement Traffic Control Plans,” on page 3.6-8 of the 2006 DEIR/DEIS is hereby revised as follows:

Timing: Before approval of grading, improvement, or construction plans and permits ~~Before the approval of all relevant plans and/or permits~~ and during construction for all project phases.

The following changes are made to the impact discussion below Impact 3.6-4 starting on page 3.6-11:

PP

The Rancho Cordova Police Department, which is located approximately 3.5 miles from the project site, would provide first-response service for the project site. Under the Proposed Project Alternative, the estimated residential population at project buildout is 31,671 persons. Using the City's ratio of ~~one~~1.1 officers to 1,000 residents, a minimum of ~~32~~36 new police officers would be needed to serve project development at buildout. Approximately ~~11~~12 new administrative staff members would also be required to support these patrol officers.

To maintain adequate levels of service, additional officers, facilities, and equipment would be required to serve project development at buildout. ~~City Ordinance No. 13-2003 levies a special tax on all taxable parcels in the project area. This tax would be included in new homeowners' property taxes and would be used to pay for new equipment and the startup costs incurred to hire and train each of the new police officers necessary to serve project development.~~ Pursuant to California Government Code section 53978, the City will levy a special tax on all taxable parcels in the project area to provide an adequate level of police services. As an alternative to the special tax mechanism identified in Government Code section 53978, the City may collect the amount of the special tax by an alternative special tax or assessment mechanism charged specifically to property owners of the project area. This special tax or assessment would be included in property owners' property taxes and would be used to pay for obtaining, furnishing, operating, and maintaining police protection equipment or apparatus, for paying the salaries and benefits of police protection personnel, and other such police protection services necessary to serve project development. Impacts related to increased demands for police protection facilities, services, and equipment would be **direct** and **less than significant**. **No indirect** impacts would occur.

HD

Under the High Density Alternative, the estimated residential population at project buildout is 42,282 persons. Using the City's ratio of ~~one~~1.1 officers to 1,000 residents, a minimum of ~~42~~47 new police officers would be needed to accommodate project development at buildout. Approximately 14 new administrative staff members would also be required to support these patrol officers. This would be approximately ~~10~~11 more new officers and three more new administrative staff members, respectively, than would be required under the Proposed Project Alternative.

To maintain adequate levels of service, additional officers, facilities, and equipment would be required to serve project development. ~~City Ordinance No. 13-2003 levies a special tax on all taxable parcels in the project area. This tax would be included in new homeowners' property taxes and would be used to pay for new equipment and the startup costs incurred to hire and train each of the new police officers necessary to serve project development.~~ Pursuant to California Government Code section 53978, the City will levy a special tax on all taxable parcels in the project area to provide an adequate level of police services. As an alternative to the special tax mechanism identified in Government Code section 53978, the City may collect the amount of the special tax by an alternative special tax or assessment mechanism charged specifically to property owners of the project area. This special tax or assessment would be included in property owners' property taxes and would be used to pay for obtaining, furnishing, operating, and maintaining police protection equipment or apparatus, for paying the salaries and benefits of police protection personnel, and other such police protection services necessary to serve project development. Impacts related to increased demands for police protection facilities, services, and equipment would be

direct and **less than significant** and would occur to a greater degree than under the Proposed Project Alternative because 10 additional police officers and three additional administrative staff members would be required. **No indirect** impacts would occur. *[Greater]*

IM

Under the Impact Minimization Alternative, the estimated residential population at project buildout is 28,828 persons. Using the City's ratio of ~~one~~ 1.1 officers to 1,000 residents, a minimum of ~~28-32~~ additional police officers would be needed to accommodate project development at buildout. Approximately nine administrative staff members would also be required to support these patrol officers. This would be approximately four fewer new officers and two fewer new administrative staff members, respectively, than would be required under the Proposed Project Alternative.

To maintain adequate levels of service, additional officers, facilities, and equipment would be required to serve project development. ~~City Ordinance No. 13-2003 levies a special tax on all taxable parcels in the project area. This tax would be included in new homeowners' property taxes and would be used to pay for new equipment and the startup costs incurred to hire and train each of the new police officers necessary to serve project development.~~ Pursuant to California Government Code section 53978, the City will levy a special tax on all taxable parcels in the project area to provide an adequate level of police services. As an alternative to the special tax mechanism identified in Government Code section 53978, the City may collect the amount of the special tax by an alternative special tax or assessment mechanism charged specifically to property owners of the project area. This special tax or assessment would be included in property owners' property taxes and would be used to pay for obtaining, furnishing, operating, and maintaining police protection equipment or apparatus, for paying the salaries and benefits of police protection personnel, and other such police protection services necessary to serve project development. Impacts related to increased demands for police protection facilities and services would be **direct** and **less than significant**, but would occur to a lesser degree than under the Proposed Project Alternative because fewer new police officers and administrative staff members would be required. **No indirect** impacts would occur. *[Lesser]*

NF

Under the No Federal Action Alternative, the estimated residential population at project buildout is 29,388 persons. Using the City's ratio of ~~one~~ 1.1 officers to 1,000 residents, a minimum of ~~29-32~~ additional police officers would be needed to accommodate project development at buildout. Approximately 10 administrative staff members would also be required to support these patrol officers. This would be approximately ~~three~~ four fewer new officers and one fewer new administrative staff members, respectively, than would be required under the Proposed Project Alternative.

To maintain adequate levels of service, additional officers, facilities, and equipment would be required to serve project development. ~~City Ordinance No. 13-2003 levies a special tax on all taxable parcels in the project area. This tax would be included in new homeowners' property taxes and would be used to pay for new equipment and the startup costs incurred to hire and train each of the new police officers necessary to serve project development.~~ Pursuant to California Government Code section 53978, the City will levy a special tax on all taxable parcels in the project area to provide an adequate level of police services. As an alternative to the special tax mechanism identified in Government Code section 53978, the City may collect the amount of the special tax by an alternative special tax or assessment mechanism charged specifically to property owners of the project area. This special tax or assessment would be

included in property owners' property taxes and would be used to pay for obtaining, furnishing, operating, and maintaining police protection equipment or apparatus, for paying the salaries and benefits of police protection personnel, and other such police protection services necessary to serve project development. Impacts related to increased demands for police protection facilities and services would be **direct** and **less than significant**, but would occur to a lesser degree than under the Proposed Project Alternative because fewer new police officers and administrative staff members would be required. **No indirect** impacts would occur. [*Lesser*]

The discussion of Impact 3.6-5 under the Proposed Project Alternative that appears in the first paragraph on page 3.6-14 of the 2006 DEIR/DEIS is hereby revised as follows:

As required by state law, the project applicant(s) would pay the state-mandated school impact fees to FCUSD. As of August 2005, the developer is charged Level II fees of \$4.57 per square foot for residential development and \$0.36 per square foot for commercial development in the FCUSD boundaries. The City would determine the assessable square footage that would be subject to the fee at the time of development (FCUSD 2005). ~~For FCUSD, this fee is typically an insufficient amount to fund 100% of new school facility construction.~~ Thus, other local funding sources (see discussion in "Affected Environment") would be needed to construct schools. However, the California Legislature has declared that the school impact fee is deemed to be full and adequate mitigation under CEQA. (Government Code Section 65996.) With payment of the state-mandated school impact fees, and assuming that all six proposed elementary schools are constructed, implementation of the Proposed Project Alternative would have a **less-than-significant, direct** impact on school services and facilities in the long term. **No indirect** impacts would occur.

The second paragraph of the discussion of Impact 3.6-5 under the High Density Alternative on page 3.6-14 of the 2006 DEIR/DEIS is hereby revised as follows:

The project applicant(s) would pay the state-mandated school impact fees to FCUSD. ~~For FCUSD, this fee is typically an insufficient amount to fund 100% of new school facility construction and operation;~~ however, the California Legislature has declared that the school impact fee is deemed to be full and adequate mitigation under CEQA. Therefore, implementation of the High Density Alternative would have a **less-than-significant, direct** impact on school services and facilities in the long term. **No indirect** impacts would occur. [*Greater*]

The second paragraph of the discussion of Impact 3.6-5 under the Impact Minimization Alternative on page 3.6-15 of the 2006 DEIR/DEIS is hereby revised as follows:

The project applicant(s) would pay the state-mandated school impact fees to FCUSD. ~~For FCUSD, this fee is typically an insufficient amount to fund 100% of new school facility construction and operation;~~ however, the California Legislature has declared that the school impact fee is deemed to be full and adequate mitigation under CEQA. Therefore, implementation of the Impact Minimization Alternative would have a **less-than-significant, direct** impact on school services and facilities in the long term. **No indirect** impacts would occur. [*Lesser*]

The discussion of Impact 3.6-5 under the No Federal Action Alternative that appears in the first paragraph on page 3.6-15 of the 2006 DEIR/DEIS is hereby revised as follows:

The project applicant(s) would pay the state-mandated school impact fees to FCUSD. ~~For FCUSD, this fee is typically an insufficient amount to fund 100% of new school facility construction and operation;~~ however, the California Legislature has declared that the school impact fee is deemed to be full and adequate mitigation under CEQA. Therefore, implementation of the No Federal Action Alternative would have a **less-than-significant, direct** impact on school services and facilities in the long term. **No indirect** impacts would occur. [*Lesser*]

The discussion of Impact 3.6-6 under the Proposed Project Alternative that appears in the first paragraph on page 3.6-16 of the 2006 DEIR/DEIS is hereby revised as follows:

As discussed above, the project applicant(s) would pay the state-mandated school impact fees to FCUSD. ~~For FCUSD, this fee is typically an insufficient amount to fund 100% of new school facility construction and operation;~~ however, the California Legislature has declared that the school impact fee is deemed to be full and adequate mitigation under CEQA. Therefore, implementation of the Proposed Project Alternative would have a **less-than-significant, direct** impact on school services and facilities in the long term. **No indirect** impacts would occur.

The second paragraph of the discussion of Impact 3.6-6 under the High Density Alternative on page 3.6-16 of the 2006 DEIR/DEIS is hereby revised as follows:

As discussed above, the project applicant(s) would pay the state-mandated school impact fees to FCUSD. ~~For FCUSD, this fee is typically an insufficient amount to fund 100% of new school facility construction and operation;~~ however, the California Legislature has declared that the school impact fee is deemed to be full and adequate mitigation under CEQA. Therefore, implementation of the High Density Alternative would have a **less-than-significant, direct** impact on school services and facilities in the long term. **No indirect** impacts would occur. *[Greater]*

The second paragraph of the discussion of Impact 3.6-6 under the Impact Minimization Alternative on page 3.6-17 of the 2006 DEIR/DEIS is hereby revised as follows:

As discussed above, the project applicant(s) would pay the state-mandated school impact fees to FCUSD. ~~For FCUSD, this fee is typically an insufficient amount to fund 100% of new school facility construction and operation;~~ however, the California Legislature has declared that the school impact fee is deemed to be full and adequate mitigation under CEQA. Therefore, implementation of the Impact Minimization Alternative would have a **less-than-significant, direct** impact on school services and facilities in the long term. **No indirect** impacts would occur. *[Lesser]*

The second paragraph of the discussion of Impact 3.6-6 under the No Federal Action Alternative on page 3.6-17 of the 2006 DEIR/DEIS is hereby revised as follows:

As discussed above, the project applicant(s) would pay the state-mandated school impact fees to FCUSD. ~~For FCUSD, this fee is typically an insufficient amount to fund 100% of new school facility construction and operation;~~ however, the California Legislature has declared that the school impact fee is deemed to be full and adequate mitigation under CEQA. Therefore, implementation of the No Federal Action Alternative would have a **less-than-significant, direct** impact on school services and facilities in the long term. **No indirect** impacts would occur. *[Lesser]*

The last paragraph of the discussion of Impact 3.6-11 under the Proposed Project Alternative on page 3.6-21 (continuing onto page 3.6-22) of the 2006 DEIR/DEIS is hereby revised as follows:

Because the Phase 1 elementary school would not have sufficient capacity for all 800 students generated during development Phase 1, approximately 188 students would not be accommodated by this school facility. Portable classrooms could be added to existing school sites to accommodate additional students, or students could be bused to nearby schools that have additional capacity (Washburn, pers. comm., 2005). However, as required by state law, the project applicant(s) would pay the state-mandated school impact fees to FCUSD to mitigate impacts on schools. As of August 2005, the developer is charged Level II fees of \$4.57 per square foot for residential development and \$0.36 per square foot for commercial development in the FCUSD boundaries. The City would determine the assessable square footage that would be subject to the fee at the time of development (FCUSD 2005). ~~For FCUSD, this fee is typically insufficient to fund 100% of new school facility construction.~~ Thus, other local funding sources (see

discussion in “Affected Environment”) would be needed to construct schools. However, the California Legislature has declared that the school impact fee is deemed to be full and adequate mitigation under CEQA. With payment of the state-mandated school impact fees, implementation of the Proposed Project Alternative would have a **less-than-significant, direct** impact on school services and facilities in the short term. **No indirect** impacts would occur.

The discussion of Impact 3.6-12 under the Proposed Project Alternative that appears in the first paragraph on page 3.6-24 of the 2006 DEIR/DEIS is revised as follows:

As required by state law, the project applicant(s) would pay the state-mandated school impact fees to FCUSD. As of August 2005, the developer is charged Level II fees of \$4.57 per square foot for residential development and \$0.36 per square foot for commercial development in the FCUSD boundaries. The City would determine the assessable square footage that would be subject to the fee at the time of development (FCUSD 2005). ~~For FCUSD, this fee is typically insufficient to fund 100% of new school facility construction.~~ Thus, other local funding sources (see discussion in “Affected Environment”) would be needed to construct schools. However, the California Legislature has declared that the school impact fee is deemed to be full and adequate mitigation under CEQA. Because the project applicant(s) would pay the state-mandated school impact fees, and because the Phase 1 combined middle school/high school would have sufficient capacity to accommodate students living at the project site, implementation of the Proposed Project Alternative would have a **less-than-significant, direct** impact on school services and facilities in the short term. **No indirect** impacts would occur.

SECTION 3.12, “PARKS AND RECREATION”

To reflect the project applicants’ modification to the Rio del Oro Specific Plan (see Chapter 2), the discussion of Impact 3.12-1 for the Proposed Project Alternative on pages 3.12-9 and 3.12-10 of the 2006 DEIR/DEIS is hereby revised as follows:

Community parks created as part of the project would be located near the village core and would be easily accessible via numerous greenways linking the entire project site. Facilities in the community parks would include ball fields, soccer fields, tennis courts, basketball courts, and picnic and playground areas, as well as community gathering facilities such as an amphitheater and plaza. The neighborhood parks at the project site would serve as a focal point for each neighborhood, providing a gathering place with smaller scale recreational facilities, such as tot lots, playgrounds, multiuse turf fields, and picnic and barbeque areas. The project may also include an outdoor sports facility/adult sports park. Uses at this facility could include a water slide park, softball complex, soccer fields, and/or a stadium/amphitheatre with capacity to accommodate approximately 3,000 people.

CRPD requires 5 acres of parks for every 1,000 residents. Residential development under the Proposed Project Alternative would generate a population of 31,672 persons at buildout, which would require 158 acres of parks to meet the standard. The Proposed Project Alternative would include development of ~~63~~ 67.5 acres of neighborhood parks and 107 acres of community parks for a total of ~~170~~ 174.5 acres of parks (Table 3.12-3). Because ~~170~~ 174.5 acres of neighborhood and community parks would be provided, implementation of this alternative would result in a ~~12~~ 16.5-acre surplus. Additionally, if the sports park is constructed, a ~~52~~ 56.5-acre surplus would result. Thus, the Proposed Project Alternative would provide sufficient park facilities to meet the demand generated by the project population at buildout, and there would be a **direct, beneficial** impact related to parkland acreage.

Table 3.12-3 Project Parkland and Open Space Acreage Calculations					
Alternative	Proposed community park (acres)	Proposed neighborhood park (acres)	Total of proposed parkland (acres) ^a	Parkland requirement per CRPD of 5 acres per 1,000 residents (acres)	Total surplus or deficit of parkland acreage compared with requirements ^b
Proposed Project	107	63 <u>67.5</u>	170 <u>174.5</u> 210 <u>214.5</u>	158	+12 <u>+16.5</u> +52 <u>+56.5</u>
High Density	107	63	170 210	211	-41 -1
Impact Minimization	108	61	169 209	144	+25 +65
No Federal Action	107	75	182 222	145	+37 +77
No Project	0	0	0	0	0
Alternative	Proposed Open Space (acres)			City General Plan Open Space Requirement 1.75 acres per 1,000 population	Total surplus or deficit of open space acreage compared with requirements
<u>Proposed Project</u>	<u>62</u>			<u>55</u>	<u>+7</u>
<u>High Density</u>	<u>62</u>			<u>74</u>	<u>-12</u>
<u>Impact Minimization</u>	<u>57</u>			<u>50</u>	<u>+7</u>
<u>No Federal Action</u>	<u>60</u>			<u>51</u>	<u>-1</u>
<u>No Project</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Note: CRPD = Cordova Recreation & Park District ^a Total parkland including the sports park is shown in <i>italics</i> . ^b Total surplus/deficit with implementation of the sportspark is shown in <i>italics</i> . Source: Data provided by City of Rancho Cordova in 2009.					

Because implementation of the Proposed Project Alternative would result in a surplus of available parkland acreage, deterioration of existing neighborhood and community parks would not occur or be accelerated from increased demand, and there would be **no indirect** impacts.

SECTION 3.13, “HAZARDS AND HAZARDOUS MATERIALS”

The first paragraph on page 3.13-1 of the 2006 DEIR/DEIS is hereby revised to become two paragraphs as follows:

This section discusses environmental conditions that are present today for the entire 3,828-acre project site and will be present in the future within the 2,728-491-acre Inactive Rancho Cordova Test Site (IRCTS). The original IRCTS was composed of approximately 3,891 acres, including the Security Park and several small utility-owned parcels. The IRCTS was reduced in size twice after several investigations concluded that hazardous materials were not present in the released lands. The first reduction of 1,116

acres occurred in 1997 and the second reduction of 2,284 acres occurred in 2008. The remaining 491-acre IRCTS includes approximately 63 acres of the Security Park, which is not part of the Rio del Oro Project. As such, the project includes approximately 428 acres of the IRCTS.

The IRCTS is owned by ~~GenCorp Realty Investments (GenCorp), the parent company of Aerojet General Corporation (Aerojet);~~ Remedial activities will be undertaken by Aerojet and McDonnell Douglas Corporation (MDC), a wholly owned subsidiary of ~~the Boeing Company (Boeing),~~ to characterize and remediate contaminants that are present in soil, soil vapor, and groundwater at the IRCTS because of historical uses at the project site. The IRCTS encompasses those lands within the areas of for Rio del Oro proposed development Phases 2–5 (refer to Chapter 2, “Alternatives,” for further discussion of project phasing). Soil within development Phase 1, owned by Elliott Homes, has been cleared by the California Department of Toxic Substances Control (DTSC) and does not require further cleanup. Remediation of the IRCTS includes ongoing activities that are being carried out under the oversight of DTSC and the Central Valley Regional Water Quality Control Board (RWQCB). These remedial activities are separate actions unrelated to the Rio del Oro project and have been presented to the public by DTSC as ~~a~~ Remedial Action Plans, which includes separate California Environmental Quality Act (CEQA) documentation and public-comment periods.

The following changes are hereby made to the text on page 3.13-2 of the 2006 DEIR/DEIS:

A few of the specific terms related to cleanup activities at the project site are defined below.

- ▶ **Remedial Investigation (RI)**—An in-depth study ~~designed~~ to determine the nature and extent of contamination at a site (e.g., what hazardous substances are present, how much there is, where it is).
- ▶ **Baseline Risk Assessment (BRA)**—A study ~~performed~~ to provide risk managers with an understanding of the actual and potential risks to human health and the environment posed by the site, and any uncertainties associated with the assessment.
- ▶ **Feasibility Study (FS)**—An in-depth study ~~designed to evaluate~~ of the effectiveness and costs of various remedial alternatives for the conditions defined by the Remedial Investigation and Baseline Risk Assessment.
- ▶ **Remedial Action Plan (RAP)**—A plan, approved by DTSC, that outlines a specific program leading to the remediation of a contaminated site. Once the draft ~~Remedial Action Plan RAP~~ is prepared, a public meeting is held and comments from the public are solicited for a period of no less than 30 days. After the public-comment period has ended and public comments have been responded to in writing, DTSC will generally approve the final remedy for the site (the final ~~Remedial Action Plan RAP~~). This plan is generally used for large, long-term projects.
- ▶ **Removal Action Workplan (RAW)**—A plan that is similar to the ~~Remedial Action Plan RAP~~ described above, but that is generally used for small, short-term projects.
- ▶ ~~**Certificate of Completion**—A DTSC document that confirms that the Remedial Action Plan has been completed.~~
- ▶ **No Further Action (NFA)**—The decision by DTSC that remedial actions are not necessary because environmental contamination is not present at a site or after the completion of a RAW.

REGULATORY AND ENVIRONMENTAL HISTORY

The 3,828-acre Rio del Oro project site includes approximately 2,728-1,500 acres of land owned by ~~GenCorp, referred to as the 491IRCTS (project development Phases 2–5), Elliott Homes (project~~

development Phase 1) and approximately 1,100-2,328 acres of land owned by Elliott Homes, Aerojet (project development Phases 2–5), including the 428 acres of the IRCTS. The Elliott Homes land and the non-IRCTS Aerojet land are referred to as the Excluded Area (project development Phase 1)-(Exhibit 3.13-1).

Exhibit 3.13-1 on page 3.13-3 of the 2006 DEIR/DEIS is hereby revised as shown below to include the Central Area OU.

The text from the beginning of page 3.13-5 to the end of the “Residual Mercury” section on page 3.13-6 of the 2006 DEIR/DEIS is hereby revised to read as follows:

The total area actually used by MDC and Aerojet was less than 350 acres of the 3,828-acre project site. More than 90% of the site served as a passive buffer on which no operations took place.

In 1979, trichloroethene (TCE) and other volatile organic compounds (VOCs) were detected in the groundwater on and surrounding the Aerojet National Priorities List (NPL) ~~s~~Site north of the IRCTS (north of White Rock Road, in an area not part of the Rio del Oro project site). Investigations indicated that part of the contaminant plume was migrating southwest toward the IRCTS.

In November 1991, DTSC issued an Imminent and Substantial Endangerment Order (ISEO) to Aerojet and MDC to address the issue of TCE in a well located west of the IRCTS. Issuance of the ISEO established the IRCTS as a state Superfund site. Under the ISEO, MDC is responsible for evaluating the potential release of hazardous substances at the IRCTS from MDC historical activities, and Aerojet is responsible because of its ownership of the property ~~and its limited historical activities~~. Under the provisions of the 1989 Partial Consent Decree (PCD) between Aerojet, the U.S. Environmental Protection Agency (EPA), and state regulatory agencies, Aerojet is required to address the potential release of hazardous substances at all areas where Aerojet conducted operations. EPA has delegated its authority for soils to DTSC under the ISEO, but has retained its authority for contaminated groundwater migrating from the Aerojet NPL ~~s~~Site to the IRCTS.

In 1994, a second ISEO was negotiated with DTSC that superseded the 1991 ISEO. In June 1997, the Central Valley RWQCB issued Cleanup and Abatement Order (CAO) No. 97-093 to Aerojet and MDC for the investigation of perchlorate in groundwater beneath and downgradient of the IRCTS, implementation of corrective action for the perchlorate plume, and monthly sampling of municipal water supply wells at Mather Field for perchlorate analysis. The Boeing Company purchased MDC in 1997, and become responsible for completing MDC’s portion of the remedial action work at the project site. Aerojet and Boeing have constructed numerous monitoring wells throughout the Rio del Oro project site, within roadways west of the project site, on private land south of the project site, and throughout the eastern half of Mather Field. In 2000, the Central Valley RWQCB revised the original CAO to implement the recommendations for remedial action as a result of the ongoing investigation of Mather Field, to monitor select municipal wells on a quarterly basis, and to provide for replacement water for affected wells. In 2008, the Central Valley RWQCB established a groundwater monitoring program for monitoring wells within the original IRCTS and off-site areas.

EXCLUDED AREA

The Excluded Area encompasses approximately 1,100-3,400 acres immediately west of around the IRCTS, primarily to the west, and includes lands that were deemed NFA by DTSC. This area encompasses all of development Phase 1 and portions of Phases 2–5. The Phase 1 Excluded Area served as a buffer zone and was not used for aerospace testing or other industrial activities (Exhibit 3.13-1). The remaining Excluded Area includes mostly buffer zone land with small areas of former aerospace or industrial land.

Aerojet completed an extensive study of the Phase 1 Excluded Area in search of evidence that historical aerospace/industrial activities (post-gold mining via dredging) may have resulted in release of chemical contaminants to soil within the area. Findings from Aerojet's study are described in *Site Investigation of the Western Non-Aerospace/Non-Industrial Area at the Inactive Rancho Cordova Test Site* (Hydro-Search 1995). The Hydro-Search report concluded that the Excluded Area did not contain sources of chemical contamination as a result of aerospace/industrial activities. However, evidence of trash from illegal dumping activities (trash and junked cars), empty drums, and oily/tarry soils were encountered at various locations around the perimeter of readily accessible dredge tailings and at a former ranch site. The oily soils were located at the ranch site and contained diesel fuel and motor oil and trace amounts of polychlorinated biphenyls (PCBs). The tarry soils were located along Sunrise Boulevard. Following cleanup activities that included removal of the contaminated soil, trash, junked cars, and drums, DTSC issued an NFA determination in 1997 to redefine the IRCTS to remove the 1,100-acre Phase 1 Excluded Area from the 1994 ISEO. The Excluded Area was purchased by Elliott Homes in 2001.

For the Phases 2–5 Excluded Area, Aerojet completed a second extensive study of historical aerospace/industrial activities (post-gold mining via dredging) that may have resulted in release of chemical contaminants to soil. Findings from Aerojet's study are described in two reports: *Remedial Investigation for the Central Area Operable Unit [CAOU], Inactive Rancho Cordova Test Site* (ERM 2006) and *Removal Action Completion Report* (ERM 2007). The ERM reports concluded that the vast majority of the CAOU did not contain sources of chemical contamination as a result of aerospace/industrial activities. However, a total of approximately 8 acres showed evidence of industrial activities that adversely affected shallow soils with lead and other metals, polychlorinated biphenyls (PCBs), and/or polychlorinated dibenzo-dioxins/furans. The PCBs were located at a former electrical substation along Douglas Road. The metals and dioxins/furans soils were located along White Rock Road in areas associated with the burning of waste. Following the removal of the 8 acres of affected shallow soils (excavation and transport of contaminated soils to Class 1 or Class 2 landfills), DTSC issued an NFA determination in 2008 to redefine the IRCTS to remove the approximately 2,284-acre CAOU from the 1994 ISEO. Elliott Homes purchased 400 acres of the Phase 3 Excluded Area, including the former Beta Complex, in 2008.

Although the soil is clean, groundwater beneath the Excluded Area, which is between 100-50 and 150-160 feet below the ground surface, is contaminated with VOCs (primarily TCE) and perchlorate. To address DTSC concerns about the contaminated groundwater, Aerojet reserved all rights to water lying below the surface of the Phase 1 Excluded Area (~~project development Phase 1~~) and granted easements to DTSC for the installation of monitoring wells, extraction wells, and pipelines to address the remediation of the contaminated groundwater. These deed restrictions prohibit uses of this groundwater for potable or irrigation-water supply wells without DTSC approval. For the Phases 2–5 Excluded Area, DTSC required deed restrictions to prevent unauthorized extraction from, recharge to, or injection to the groundwater system beneath the area. The deed restrictions also provided DTSC and the Central Valley RWQCB with reasonable access to area for groundwater operation and maintenance activities and other necessary activities for the protection of public health, safety, or the environment.

~~The s~~Sources of potable water for the Rio del Oro project are discussed in detail in Section 3.5, “Utilities and Service Systems,” in the “Water Supply” subsection.

SITE CONTAMINATION

Residual Mercury

Historically, gold mining processes have been shown to generate residual amounts of mercury, which sometimes can occur in concentrations large enough to generate risks associated with human health exposure. The risk to human health is limited to exposure by inhalation. The 2004 EPA Preliminary

Remediation Goals (PRGs) list the threshold for inhalation exposure to elemental mercury in ambient air as 0.31 micrograms per cubic meter. The PRG for mercury compounds in soil varies from 18 milligrams per kilogram (mg/kg) for residential conditions to 310 mg/kg for industrial conditions; the PRG for mercury compounds in tap water is 11 micrograms per liter (µg/l). The California drinking-water standard is 2 µg/l for mercury. Numerous soil samples have been collected from the various aerospace facilities during the RI/FS process. Mercury was included in the analyses but was not encountered at concentrations that necessitated further work.

The “Soil and Groundwater” section extending from page 3.13-6 through page 3.13-10 of the 2006 DEIR/DEIS is hereby revised to read as follows:

Soil and Groundwater

Rocket testing and assembly activities occurred in various locations throughout the ~~2,728-acre original IRCTS, which does not include the 1,100-acre Excluded Area owned by Elliott Homes (i.e., development Phase 1).~~ To structure the study of soil and groundwater within the IRCTS, Aerojet and MDC divided the IRCTS into subareas that are identified as Operable Units (OUs). The OU designations define each study area boundary for the purpose of investigating the presence of chemical contaminants. Operable Units within the IRCTS are listed below, starting with the aerospace OUs. Other OUs are included for other activities that require characterization and potential remediation.

<u>Operable Unit</u>	<u>Status</u>
▶ Alpha Complex	▶ <u>Ongoing soil vapor extraction in rebound phase.</u>
▶ Beta Complex	▶ <u>NFA—Delisted from ISEO in 2008.</u>
▶ Kappa/Gamma Complex	▶ <u>Deed restrictions pending.</u>
▶ Sigma Complex	▶ <u>Partial NFA and delisting from ISEO in 2008.</u>
	<u>Groundwater remediation ongoing.</u>
▶ Sigma Debris Area	▶ <u>NFA—Delisted from ISEO in 2008.</u>
▶ DM14 Assembly Area	▶ <u>Partial NFA and delisting from ISEO in 2008. Soil removal complete.</u>
▶ Circular Feature	▶ <u>NFA—Delisted from ISEO in 2008.</u>
▶ Propellant Burn Area	▶ <u>Partial removal of soils. Other soils pending.</u>
	<u>Groundwater remediation pending.</u>
▶ Metal-Lined Hole	▶ <u>NFA—Delisted from ISEO in 2008.</u>
▶ Antenna Station	▶ <u>NFA—Delisted from ISEO in 2008.</u>
▶ GET F Sprayfield	▶ <u>Soil and groundwater remediation pending.</u>
▶ Municipal Landfill (White Rock Dump No. 1)	▶ <u>Soil remediation pending.</u>
▶ Rice Hull Ash Area	▶ <u>NFA—Delisted from ISEO in 2008.</u>
▶ By-Dry Site	▶ <u>Soil remediation complete. Delisted from ISEO in 2008.</u>
▶ Central Area	▶ <u>NFA—Delisted from ISEO in 2008.</u>
▶ Western Non-Aerospace/Non-Industrial Area (Phase 1 Excluded Area owned by Elliott Homes)	▶ <u>NFA—Delisted from ISEO in 1997.</u>

An additional OU within the IRCTS, the Administration Area (Security Park), is outside of the Rio del Oro project site. Because it is not part of this project, it is not discussed further in this DEIR/DEIS.

Soil investigations at each of the OU study areas included the collection of soil, soil vapor, and/or sediment samples. The samples were analyzed for VOCs, semivolatile organic compounds, metals, hydrazine, nitrosodimethylamine, PCBs, perchlorate, and/or kerosene. As detailed below, soil at the

IRCTS has been contaminated with TCE, freon, methylene chloride, kerosene, perchlorate, dioxins and furans, lead, and other metals. Groundwater beneath the IRCTS has been contaminated with VOCs (primarily TCE) and perchlorate. The information presented below was obtained from the *Elliott Homes, Inc., Revised Hazardous Materials Technical Study for the Inactive Rancho Cordova Test Site and Associated Lands* (ERM 2003), which provides a summary of Aerojet and MDC documents prior to 2003; from various additional Aerojet and MDC documents that have been prepared since 2003; and from discussions with the Aerojet project manager for the IRCTS (Fricke, pers. comm., 2005, ~~and 2006, 2009~~).

Alpha Complex

The Alpha Complex consisted of two test stands, an Initial Operational Capability (IOC) test area, a blockhouse, and support buildings on approximately 50 acres. The complex was originally used for static firing of the Thor liquid rocket. Thor rockets used liquid oxygen and a refined kerosene fuel. TCE was used to clean rocket engine assemblies. During static firing, large quantities of water were used to reduce heat and noise generated by the rocket engine. The water containing TCE was captured in a collection basin that discharged to a nearby drainage. Wastewater was discharged via a septic tank and leach field. Investigative studies determined that TCE, Freon-113, perchloroethylene (PCE), cis-1,2-DCE, methylene chloride, perchlorate, and kerosene are the principal contaminants of concern found in soil and groundwater. A soil vapor extraction (SVE) system has been operating at the Alpha Complex since 2002 to remove VOCs from the soil. ~~A Feasibility Study is in progress to address perchlorate in soil and contaminants in groundwater. During 2009, operation of the SVE system was changed from continuous to intermittent (1 month on, 1 month off, and so on) because of the low, asymptotic removal rate. This mode of operation will provide information on the potential rebound of VOCs and will lead to the termination of SVE operations. Land use restrictions may be necessary to address the potential for a trace-level VOC residual. A downgradient wellfield controls the migration of VOCs and perchlorate in groundwater.~~

Beta Complex

The Beta Complex includes approximately 120 acres that contained two rocket test stands and support facilities that were used for static firing of the Saturn S-IVB liquid rocket engine. Saturn S-IVB rocket engines used liquid oxygen and liquid hydrogen as fuels. Assembly of the engines is reported to have involved the use of small quantities of TCE for cleaning purposes. During firing, large quantities of water were used to reduce heat and noise generated by the motor. Following a review of analytical data demonstrating that contaminants of concern were largely absent or occurred at levels below environmental and human-health thresholds, DTSC approved an ~~No Further Action-NFA~~ designation for the Beta Complex in 2002. The Beta Complex was delisted from the ISEO during 2008.

Kappa/Gamma Complex

The Kappa/Gamma Complex includes approximately 30 acres. Earliest operations at this area began in 1958 as the second IOC area, which consisted of facilities for testing the deployment of the Thor rocket under stormy weather conditions. Static firing did not occur at IOC-2. Solvents may have been used to cleanse the engine after the rocket was loaded with kerosene, which may have been burned in a small pit west of the facility.

Following IOC-2 decommissioning in 1961, the Kappa Complex was constructed for development and testing of hydrogen components. Gaseous nitrogen, liquid hydrogen, liquid argon, liquid nitrogen, and helium were used.

The Gamma Complex was constructed in 1964 for evaluation of the use of self-igniting propellants and testing of engines and supply systems. Hydrazine fuels, nitrogen tetroxide, gaseous helium, and gaseous nitrogen were used.

Testing activities generated wastewater that was channeled to concrete-lined burn basins. After chemicals floating on the surface of the wastewater were burned off, the remaining fluids were pumped to an unlined percolation pond that contained several deep, dry wells to enhance the percolation of wastewater into the soil. Currently, shallow soil within the Kappa/Gamma Complex contains VOCs. DTSC approved a Remedial Action Plan for institutional control (land use restrictions) in January 2006. These land use restrictions would be defined before development of this area.

Sigma Complex

The Sigma Complex includes approximately 25 acres; ~~that were used for static firing of solid-rocket motors~~ occurred on a test stand at the western end of the complex. The ~~Sigma Complex test stand~~ was later the site of “hogout” operations that involved removing solid-rocket fuel from rocket motors using a high-pressure water knife. Effluent from the hogout activities was diverted into two unlined ponds. The effluent contained pieces of solid-rocket propellant and would have dissolved ammonium perchlorate from the fuel. The recovered solid-rocket propellant was removed from the effluent and burned at the Propellant Burn Area (discussed below). The Baseline Risk Assessment concluded that perchlorate in the shallow soil at the Sigma Complex did not occur at concentrations that would pose a risk to human health. However, perchlorate concentrations in deeper soil were found to increase with depth and would continue to affect groundwater. ~~A Feasibility Study is being prepared to evaluate potential remedial actions for deep soil and to minimize further impacts of perchlorate on regional groundwater.~~ Groundwater remediation began in 2008 using an in-situ bioremediation system in the vicinity of the test stand. The remainder of the Sigma Complex was delisted from the ISEO during 2008.

Sigma Debris Area

The Sigma Debris Area includes an approximately 5-acre depression created during gold-mining activities. The depression was used by MDC for limited disposal of inert material during the demolition of the facility, and by persons not associated with aerospace activities. The inert debris is composed of scattered drums, construction and demolition debris, food cans, and glassware. Signs of burning were also observed. The area is reported to have received its name from its proximity to the Sigma Study Area. The Remedial Investigation did not identify any contaminants of concern at this site. The Central Valley RWQCB concurred with these findings but recommended the removal of the debris before future site development. The Sigma Debris Area was delisted from the ISEO during 2008.

DM-14 Assembly Area

The DM-14 Assembly Area includes approximately 20 acres that were used for assembly and painting of ~~Genie~~ solid-rocket motors. There were three buildings, totaling approximately 15,000 square feet, that were surrounded on three sides by earthen berms to prevent damage in case of an explosion. Sampling data indicated that Freon-113, probably from a shallow sump that historically received liquid waste from the painting activities, was the principal contaminant, although the concentrations were below levels of concern. In addition, PCBs in soil associated with a pole-mounted transformer were identified as a potential human-health risk for future residential housing. ~~Remedial Investigations/Baseline Risk Assessments are in progress. Some form of institutional control, such as a land use restriction, may be required for development in this area.~~ Most of the DM-14 Assembly Area was delisted from the ISEO during 2008. The sump and PCB-affected soils were removed during 2009 and the completion report was approved by DTSC and the Central Valley RWQCB.

Circular Feature

The Circular Feature is a 400-foot-diameter area on top of a ridge of dredge tailings that was reported to have been used by Aerojet for Card Gap Testing of small quantities of energetic material during the late 1950s and by DAC during the early 1960s for the explosive/burning characterization of liquid hydrogen.

A personnel bunker was constructed about 500 feet north of the site. Soil samples and analytical testing showed no evidence of soil contamination at this site. In 2002, DTSC and the Central Valley RWQCB approved a ~~No Further Action~~ an NFA determination for this site. The Circular Feature was delisted from the ISEO during 2008.

Propellant Burn Area

The Propellant Burn Area includes approximately 9 acres of dredge tailings where liquid and solid-rocket propellants and chemicals were burned. The Propellant Burn Area was used intermittently between 1957 and 1963. Solid-rocket propellants, containing ammonium perchlorate, aluminum, and some heavy metals, were transported to the Propellant Burn Area either within the existing motor casings or as fragments from the hogout operations (described above) and burned in stacks on the ground along with the containers of chemicals. Liquid propellants were burned in metal troughs. As a result of the burning activities, shallow soils are contaminated by dioxins and perchlorate at levels above residential PRGs and by perchlorate and TCE in deeper soils. A Remedial Action Plan has been approved by DTSC for shallow soils, and removal of soils contaminated with dioxin ~~began in August 2005~~ was completed during 2006. These soils were transported to the Forward Landfill in Manteca, California. ~~Additional soils were removed to the landfill during October 2005.~~ Several remedial alternatives have been evaluated and/or tested for the deeper soils and additional work is necessary. A groundwater remediation system will be installed during 2010.

Metal-Lined Hole

The Metal-Lined Hole area occupies an approximately 1- to 2-acre location that contains two 80-foot circular concrete curbs and a 1.8-foot-diameter by 9-foot-deep vertical steel pipe surrounded by a 6-foot-square concrete pad (36 square feet), approximately 1 foot thick. The Metal-Lined Hole was originally found to be full of an oily fluid of unknown origin. The oily fluid was pumped into three drums by MDC for proper off-site disposal. The Metal-Lined Hole was filled with bentonite and capped with a layer of cement. The site was leased to Cetec Antenna Company in 1978 and was subsequently decommissioned during the late 1980s. The Metal-Lined Hole was used for a vertical antenna array and the concrete curbs were used for horizontal antenna arrays. The Final Remedial Action Plan for this site indicated that the trace VOC concentrations of limited extent near the site did not warrant further remedial actions. The Final Remedial Action Plan was approved by DTSC in December 2000. The Metal-Lined Hole was delisted from the ISEO during 2008.

Antenna Station

The Antenna Station is an approximately 1-acre location within a dredge pit. The station comprises a satellite dish and control building at the bottom of the pit, along with a sump to remove water and a small transmission tower near the top of the pit. The station was constructed during the late 1970s—possibly in 1977, based on the absence of the facility in a 1973 aerial photograph, its presence in a 1978 photograph, and a power pole with “77” nailed on to it. The dredge pit is dry following years of low to normal precipitation; however, following years of high precipitation, the pit becomes inundated. VOCs were detected at extremely low levels, well below residential PRGs, and could be laboratory artifacts. The Antenna Station is not considered to be a source of contamination and was recommended for ~~the No Further Action~~ an NFA designation ~~(ENSR International 2004).~~ DTSC concurred with this recommendation in April 2005 and the Antenna Station was delisted from the ISEO during 2008.

GET F Sprayfield

The GET F Sprayfield includes approximately 30 acres that were used for the disposal of approximately 1.6 billion gallons of treated groundwater from the Sector F groundwater extraction and treatment (GET F) facility located on the north side of White Rock Road. The sprayfield was operated by Aerojet from

December 1984 through February 1990 and from late July through September 1990. The GET F facility used air stripping technologies to remove VOCs from groundwater. However, at the time that the sprayfield was in operation, perchlorate was not regulated and treatment technology was not available; thus the subsurface soils at the GET F Sprayfield became contaminated with low levels of perchlorate—considerably less than the preliminary remediation goal for residential land use. The remedial investigation indicates that perchlorate is being flushed from the upper soils (20 to 30 feet) by precipitation into deeper soils and groundwater. Remediation of groundwater is planned for 2011 or 2012 of perchlorate began in 2005.

Municipal Landfill (White Rock Dump No. 1)

White Rock Dump No. 1 includes approximately 5 acres that were operated as a burn dump for municipal refuse disposal. According to County of Sacramento (County) records, the County contracted with a private individual to operate the dump between November 1955 and July 1957. However, a review of aerial photographs indicates that the dump had already been established by 1952. After burning, ash and noncombustible materials were pushed into piles along the eastern and southern sides of the dump. Analysis of soil samples indicated that lead is the primary contaminant of concern, although cadmium and nickel are also present at concentrations above their respective residential PRGs. The County is responsible for completing the remediation work. Pending DTSC approval of the draft Remedial Action Plan, submitted during 2009, the dump site will be covered with clean soil to a depth of 5 feet, which would prevent public access to any dump site materials. The site is proposed as a park adjacent to an open-space preserve designated under the Rio del Oro project. DTSC will require deed restrictions for the land to ensure proper operation and maintenance of the park.

Rice Hull Ash Area

The Rice Hull Ash Area includes approximately 25 acres that were used by the Beagle Products Company from the late 1940s through the mid-1960s to burn rice hulls. The site was leased to Greasweep Western in 1983, which mined and bagged the rice hull ash and sold it for use as an oil absorbent. Following soil testing, DTSC concurred in 2001 that the rice hull ash did not fall under the category of a hazardous waste. Greasweep Western ceased its operations in ~~spring~~ 2005. Soil tests indicated that the rice hull ash could be used as a soil amendment during future development activities to improve the texture and moisture retention capacity of clay soils at the project site. Alternatively, the ash could be hauled off-site and disposed of in a landfill. The Rice Hull Ash Area was delisted from the ISEO during 2008.

By-Dry Site

The By-Dry site was originally used as a feed products facility, which included storage and processing of raw materials for compost, feeds, and fertilizer. Fertilizer was produced using tomato skins and an on-site kiln was used to produce bone meal. The feed products facility operated from the mid-1950s through 1983. The By-Dry site is currently used by the Clark Cattle Company as headquarters for its operations at the Rio del Oro project site.

Aerojet completed a Remedial Investigation in November 2005 to identify and delineate the vertical and horizontal extent of any contamination that may be present or to address any minor impacts that may have resulted from nonaerospace activities. Piles of ash were found along the northwestern fence. The primary contaminants of concern include dioxins and lead. ~~Aerojet has submitted a Removal Action Workplan to DTSC and will transport the material to a landfill. Removal of the ash and contaminated soil was completed during 2007. These materials were transported to Class 1 and Class 2 landfills. Because the site also has a shallow water-supply well that generates clean water, other contamination is not expected. The By Dry site is currently used by the Clark Cattle Company as headquarters for its operations at the Rio del Oro project site. The By-Dry Site received an NFA designation and was included in the delisting action for the Central Area OU during 2008.~~

Central Area

The Central Area Operable Unit ~~is was~~ composed of the buffer lands that separate the above discussed OUs, ~~and equates to the vast majority (nearly 2,000 acres) of the total 2,728-acre IRCTS.~~ Aerojet completed a Remedial Investigation ~~in November 2005 during 2006~~ to confirm the absence of any impacts or to address any minor impacts that may have resulted from nonaerospace activities. Remedial actions ~~will not be~~ was not required for the vast majority of these buffer lands. Three small areas were affected: an electrical substation with PCB-affected soils and two areas of burning with dioxin/furan-impacted soils. These soils were removed to a Class 2 landfill. The Central Area received an NFA designation and was delisted from the ISEO during 2008.

The first full paragraph on page 3.13-11 of the 2006 DEIR/DEIS is hereby revised as follows:

As described above, geography was the primary basis for defining an Operable Unit (OU) even though remediation goals and treatment processes may be similar. The remediation process for each OU begins with a baseline survey to identify the types and locations of contamination, called a Remedial Investigation. If contamination is not found, DTSC issues a No Further Action (NFA) determination. If contamination is found, a Baseline Risk Assessment is prepared, and is then followed by a Feasibility Study, which evaluates alternatives for cleanup. A Remedial Action Plan is then prepared for the OU. A Removal Action Workplan may be prepared for the small projects. These plans identify the selected cleanup process(es) and proposed timeline(s) that will be used, and is reviewed by the appropriate regulatory agencies and members of the public. A CEQA Initial Study/Negative Declaration or Mitigated Negative Declaration is ~~included as an appendix in~~ required for the Remedial Action Plan with a concurrent public-review period. Following regulatory agency approval of the Remedial Action Plan, the actual cleanup activities can begin. As indicated in Table 3.13-1, some cleanup activities take only a few years to complete; others, such as full remediation of groundwater, will continue for decades. When remediation is complete to an established level such that health risks are reduced to an acceptable level, DTSC will issue ~~a Certification of Completion an NFA designation.~~

The text of the “Western Groundwater Operable Unit,” “Northern Groundwater Study Area,” and “Southern Groundwater Study Area” sections on pages 3.13-11 and 3.13-14 of the 2006 DEIR/DEIS are hereby revised as follows:

Western Groundwater Operable Unit

The Western Groundwater Operable Unit (WGOU) includes the northern portion of the Phase 1 Excluded Area (development Phase 1) (Exhibit 3.13-2). Active groundwater remediation is ongoing within the WGOU to the west of the Rio Del Oro Project, but is not currently planned for the portion of the WGOU within the project area. ~~This area~~ The WGOU was designated to address chemicals in the groundwater originating from the GET F Sprayfield and the Aerojet NPL ~~s~~Site located north of White Rock Road. One former domestic well, one inactive GET well, and 16 monitoring wells have been installed at ~~47-18~~ locations in the portion of the WGOU within the project area. Sampling data indicate that VOCs (primarily TCE) and perchlorate are the primary chemicals of concern in the groundwater, and that the direction of groundwater flow is primarily toward the west-southwest. The migration of this groundwater is controlled by several extraction wells and a treatment system at locations west of Sunrise Boulevard. The domestic well and monitoring wells are measured for water levels on a semiannual basis and water samples are collected periodically for laboratory analysis to track the movement of the contaminant plumes.

Although the WGOU is located within the 1,100-acre Phase 1 Excluded Area, which was removed from provisions of the 1994 ISEO issued for the IRCTS, the Grant Deed for the property in the Excluded Area prohibits the public from using the contaminated groundwater without approval from DTSC. As such,

drilling into groundwater by future Rio del Oro landowners would be considered a trespass of Aerojet's "Water Estate" and the easements granted to DTSC for monitoring wells, extraction wells, and pipelines.

Northern Groundwater Study Area

The Northern Groundwater Study Area (NGSA) includes the central portion of development Phase 1, ~~and~~ all of development Phases 2 and 4, and the northern portions of Phases 3 and 5 of the Rio del Oro project (Exhibit 3.13-2). This area was designated to address chemicals in the groundwater originating from the Propellant Burn Area, and Sigma Complex, and the DM-14 Assembly Area, as well as the Aerojet NPL Site located north of White Rock Road. One active domestic well, three inactive water-supply wells, three inactive GET wells, and ~~63-65~~ monitoring wells (~~70-72~~ total) have been installed at ~~64-66~~ locations in the NGSA. Sampling data indicate that VOCs (primarily TCE) and perchlorate are the primary chemicals of concern in the groundwater, and that the direction of groundwater flow is primarily toward the west-southwest. A Feasibility Study and a Baseline Risk Assessment were submitted to DTSC and the Central Valley RWQCB in 2004. (The Southern Groundwater Study Area was also addressed by these documents.) A revised Feasibility Study was submitted in June 2005 and in April 2006 in response to comments from DTSC and the Central Valley RWQCB. The Remedial Action Plan ~~is in progress~~ was approved in 2008. The monitoring wells are measured for water levels on a semiannual basis and water samples are collected periodically for laboratory analysis to track the movement of the contaminant plumes.

An in-situ bioremediation system has been installed at the western end of the Sigma Complex and is operated by Boeing. Bioremediation systems are being planned by Aerojet for the Propellant Burn Area and GET F Sprayfield. In addition, Aerojet has proposed three extraction wells within the Phase 2 Excluded Area to address contaminants from the Aerojet NPL Site.

Southern Groundwater Study Area

The Southern Groundwater Study Area (SGSA) includes the southern portion of development Phase 1 and most of Phases 3 and 5 of the Rio del Oro project (Exhibit 3.13-2). This area was designated to address chemicals in the groundwater originating from the Alpha Complex and the Administration Area (Security Park). Three water-supply wells (one active and two inactive), ~~three-five~~ GET wells, and ~~49-61~~ monitoring wells (~~55-69~~ total) have been installed at ~~47-60~~ locations within the SGSA, excluding the Security Park and the area south of Douglas Road. Note that one active supply well, two GET wells, and ~~24-20~~ monitoring wells (~~24-23~~ total) are located within the proposed wetland preserve at 21 locations. The supply wells are owned by the California-American Water Company and the one active supply well provides water to the businesses in the Security Park.

Sampling data indicate that VOCs, primarily TCE and perchlorate, are the primary chemicals of concern in the groundwater, and that the directions of groundwater flow vary from south at the Security Park to southwest at other locations further west. The active supply well has not been affected by these chemicals.

DTSC approved an interim Remedial Action Plan in January 2006 for the initial operation of a groundwater control system while working ~~continues~~ on the sitewide groundwater Feasibility Study (NGSA and SGSA). One extraction well and a temporary GET system were installed during 2004 at the intersection of Douglas Road and the entrance to the Beta Complex. The GET system began operating on a limited basis during July 2005 and began continuous operations in October 2005. Two additional extraction wells were installed along Douglas Road during 2005 and will be connected to the temporary GET system along with several extraction wells were installed south of Douglas Road (on land that is part of the Sunrise Douglas Community Plan area) to remediate contaminated groundwater moving south from the Security Park. The Remedial Action Plan was approved in 2008.

Table 3.13-1 on page 3.13-12 of the 2006 DEIR/DEIS, previously referred to in the "Cleanup Processes" text shown above, is hereby revised as follows:

Table 3.13-1 Summary of Primary Study Areas, Primary Constituents of Concern, and Regulatory and Investigation Status on the Rio del Oro Project Site								
IRCTS Primary Study Areas and Responsible Company	Primary Constituents of Concern		Regulatory and Investigation Status and Schedule					
	Soil and/or Sediment	Groundwater	RI Workplan	RI Completed	BRA Completed	FS Completed	RAP Completed	RD Completed
McDonnell Douglas Corporation/Boeing Corporation								
DM-14 Assembly Area	Freon-113 Other VOCs	TCE Perchlorate	October 1996	June 2005	June 2005	NA	NFA	NA
Alpha/IOC-1 Complex	TCE PCE Methylene chloride Cis-1,2-DCE Freon-113 Kerosene	TCE Perchlorate	May 1997	July 2002	July 2002	June 2005	2006; RAW approved November 2001 (soil vapor extraction)	2006
Beta Complex	None	NA	May 2000	October 2001	NFA	NFA	September 2002	NFA
Kappa/Gamma/IOC-2 Complex	TCE Methylene chloride Freon-113	NA	August 1996	February 2000	February 2000	NA	January 2006 (institutional controls)	NA
Sigma Complex	Perchlorate	Perchlorate	June 1997	October 2002	October 2002	June 2005	2006	2007
Southern Groundwater Study Area	NA	TCE Perchlorate	April 1998	June 2003	December 2004	June 2005	2006	2007
Aerojet General Corporation								
GET F Sprayfield	Perchlorate	Perchlorate	2006	TBD	2007	2007	TBD	TBD
Aerojet General and McDonnell Douglas/Boeing Corporations								
Propellant Burn Area	Perchlorate Dioxins & Furans	TCE Perchlorate	June 1995	May 2000 (revised)	September 1998	September 2001	September 2002	September 2003
Circular Feature	None	NA	July 1996	June 2002	NFA	NFA	September 2002	NFA
Northern Groundwater Study Area	NA	TCE Perchlorate	April 1998	February 2003	December 2004	June 2005	2006	2007
Aerojet General Corporation and Sacramento County								
Municipal Landfill (White Rock Dump No. 1)	Lead Other Metals	NA	August 2002	June 2004	March 2005	July 2005	2006	2007

Table 3.13-1 Summary of Primary Study Areas, Primary Constituents of Concern, and Regulatory and Investigation Status on the Rio del Oro Project Site									
<u>Primary Study Areas</u>	<u>Media</u>	<u>Primary Constituents of Concern</u>	<u>RI Workplan</u>	<u>Remedial Investigation</u>	<u>Baseline Risk Assessment</u>	<u>Feasibility Study</u>	<u>RAP Approval</u>	<u>RA Complete</u>	<u>Delisted</u>
<u>McDonnell Douglas Corporation/The Boeing Company</u>									
<u>DM-14 Assembly Area</u>	<u>Soil</u>	<u>PCBs</u>	<u>October 1996</u>	<u>January 2002 and January 2008</u>	<u>January 2002 and January 2008</u>	<u>Not applicable</u>	<u>Not applicable</u>	<u>August 2009 (small area)</u>	<u>March 2008 (majority of area)</u>
	<u>Groundwater</u>	<u>TCE and perchlorate</u>						<u>NA</u>	
<u>Alpha Complex</u>	<u>Soil</u>	<u>TCE and other VOCs</u>	<u>October 1996</u>	<u>November 1999</u>	<u>November 1999</u>	<u>Not applicable</u>	<u>November 2001 (raw)</u>	<u>Intermittent operation</u>	<u>TBD</u>
	<u>Groundwater</u>	<u>TCE and perchlorate</u>					<u>August 2004</u>	<u>January 2008</u>	<u>Ongoing operation</u>
<u>Beta Complex</u>	<u>Soil</u>	<u>None</u>	<u>May 2000</u>	<u>September 2001</u>	<u>No further action</u>	<u>No further action</u>	<u>November 2002</u>	<u>NA</u>	<u>March 2008</u>
	<u>Groundwater</u>	<u>Not applicable</u>							
<u>Kappa-Gamma Complex</u>	<u>Soil</u>	<u>TCE, methylene chloride</u>	<u>August 1996</u>	<u>March 2000</u>	<u>March 2000</u>	<u>Not applicable</u>	<u>January 2006</u>	<u>Deed restrictions pending</u>	
	<u>Groundwater</u>	<u>None</u>						<u>NA</u>	
<u>Sigma Complex</u>	<u>Soil</u>	<u>Perchlorate</u>	<u>June 1997</u>	<u>April 2001</u>	<u>April 2001</u>	<u>August 2004</u>	<u>January 2008</u>	<u>Pending (west end)</u>	<u>March 2008 (majority of area)</u>
	<u>Groundwater</u>	<u>Perchlorate</u>					<u>January 2008</u>	<u>Ongoing operation</u>	<u>NA</u>
<u>Southern Groundwater</u>	<u>Groundwater</u>	<u>TCE and perchlorate</u>	<u>April 1998</u>	<u>June 2003</u>	<u>December 2004</u>	<u>August 2004</u>	<u>January 2008</u>	<u>Ongoing operation</u>	<u>NA</u>
<u>Aerojet General Corporation</u>									
<u>GET F Sprayfield</u>	<u>Soil</u>	<u>Perchlorate</u>	<u>September 2005</u>	<u>June 2008</u>	<u>October 2008</u>	<u>November 2008</u>	<u>2010</u>	<u>TBD</u>	<u>TBD</u>
	<u>Groundwater</u>	<u>Perchlorate</u>						<u>2011 (installation)</u>	<u>NA</u>
<u>Propellant Burn Area</u>	<u>Soil—Shallow</u>	<u>Perchlorate and dioxins/furans</u>	<u>June 1995</u>	<u>July 1998</u>	<u>September 1998</u>	<u>September 2000 (dioxins/furans in shallow soil)</u>	<u>November 2002 (dioxins/furans in shallow soil)</u>	<u>October 2007 (dioxins/furans in shallow soil)</u>	<u>TBD</u>
	<u>Soil—Deep</u>	<u>TCE and perchlorate</u>				<u>2010</u>	<u>2011</u>	<u>TBD</u>	<u>TBD</u>

Table 3.13-1

Summary of Primary Study Areas, Primary Constituents of Concern, and Regulatory and Investigation Status on the Rio del Oro Project Site

<u>Primary Study Areas</u>	<u>Media</u>	<u>Primary Constituents of Concern</u>	<u>RI Workplan</u>	<u>Remedial Investigation</u>	<u>Baseline Risk Assessment</u>	<u>Feasibility Study</u>	<u>RAP Approval</u>	<u>RA Complete</u>	<u>Delisted</u>
	<u>Groundwater</u>	<u>TCE and perchlorate</u>				<u>August 2004</u>	<u>January 2008</u>	<u>2010 (installation)</u>	<u>NA</u>
<u>Circular Feature</u>	<u>Soil</u>	<u>None</u>	<u>June 1996</u>	<u>February 1997</u>	<u>NFA</u>	<u>NFA</u>	<u>November 2002</u>	<u>NA</u>	<u>March 2008</u>
	<u>Groundwater</u>	<u>NA</u>				<u>NFA</u>	<u>November 2002</u>	<u>NA</u>	<u>March 2008</u>
<u>Central Area</u>	<u>Soil</u>	<u>Lead and dioxins/furans</u>	<u>October 2004</u>	<u>November 2005</u>	<u>March 2006</u>	<u>NA</u>	<u>October 2006 (raw)</u>	<u>November 2007</u>	<u>March 2008</u>
<u>Northern Groundwater</u>	<u>Groundwater</u>	<u>TCE and perchlorate</u>	<u>April 1998</u>	<u>June 2003</u>	<u>December 2004</u>	<u>August 2004</u>	<u>January 2008</u>	<u>Ongoing operation off-site</u>	<u>NA</u>
			<u>Aerojet NPL Site</u>						
			<u>April 2002</u>	<u>September 2003</u>	<u>September 2003</u>	<u>February 2004</u>	<u>2010</u>	<u>2013 (installation)</u>	<u>NA</u>
<u>Aerojet General Corporation and Sacramento County</u>									
<u>Municipal Landfill (White Rock Dump #1)</u>	<u>Soil</u>	<u>Lead and dioxins/furans</u>	<u>January 2001</u>	<u>June 2004</u>	<u>March 2005</u>	<u>September 2005</u>	<u>September 2009 (draft)</u>	<u>2011</u>	<u>TBD</u>

Notes:

BRA = Baseline Risk Assessment; FS = Feasibility Study; IRCTS = Inactive Rancho Cordova Test Site; NA = Not applicable; NFA = No Further Action; NPL = National Priorities List; PCE = tetrachloroethene; RAP = Remedial Action Plan; RAW = Removal Action Workplan; RD = Remediation Design; RI = Remedial Investigation; TBD = To be determined; TCE = trichloroethene
Sources: ERM 2003; Fricke, pers. comm., 2005, and 2006, 2009

The reference to the “Aerojet NPL site” in the first paragraph under “Local Regulatory Authority for Remedial Activities at the Project Site” on page 3.13-17 of the 2006 DEIR/DEIS is hereby changed to “Aerojet NPL Site.”

The last two paragraphs of the “Local Regulatory Authority for Remedial Activities at the Project Site” section, on pages 3.13-17 and 3.13-18 of the 2006 DEIR/DEIS, are hereby revised and supplemented as follows:

The first document obligates Aerojet to perform studies and collect data sufficient for EPA, DTSC, and the Central Valley RWQCB to verify the character and extent of contaminants in groundwater from the Aerojet NPL ~~s~~Site. The next two documents obligate Aerojet and MDC to complete activities required to reduce the concentration of contaminants to levels that DTSC and the Central Valley RWQCB find to be protective of human health and the environment. The PCD and the ISEO include community participation guidelines. Both documents are available for public review at the DTSC office, located at 8800 Cal Center Drive in Sacramento, California. The CAO is available for public review at the Central Valley RWQCB office, located at 11020 Sun Center Drive, Suite 200, Rancho Cordova, California.

Remediation of groundwater will be completed according to the conditions set by the Central Valley RWQCB in Waste Discharge Requirements (WDR), Monitoring and Report Programs (MRP), and/or the National Pollutant Discharge Elimination System (NPDES). The Central Valley RWQCB have issued and revised conditions for existing IRCTS groundwater remediations within the Rio Del Oro project:

- ▶ January 2006 Order R5-2006-0014 for WDRs and NPDES CA008549 to Boeing for the SGSA Groundwater Extraction and Treatment System (GET);
- ▶ August 2007 Order R5-2007-0110 for WRDs to Boeing for the Sigma Complex In-situ Groundwater Bioremediation Project;
- ▶ August 2008 Order R5-20080830 for MRP to Aerojet and Boeing for periodic sampling of monitoring wells; and
- ▶ Future Orders for WDRs for new groundwater remediation projects (Propellant Burn Area, GET F Sprayfield, and possibly other locations).

Chemicals could currently be present in soil and groundwater within the IRCTS (development Phases 2–5) at concentrations exceeding thresholds defining hazardous wastes or threats to human health as defined by regulations contained in CCR Title 22. Development of the aerospace OUs within project development Phases 2–5 cannot occur until DTSC issues a ~~Certification of Completion~~ an NFA designation to Aerojet and MDC for the OUs within each development phase and delists the OU from the ISEO.

The text of Impact 3.13-1 for the Proposed Project, High Density, Impact Minimization, and No Federal Action Alternatives on page 3.13-19 of the 2006 DEIR/DEIS is hereby revised to read as follows:

Project development of some aerospace OUs within the ~~2,728–428~~ 428 acres of the IRCTS (Rio del Oro development Phases 2–5) would be limited by the presence of contaminated soils until Aerojet and/or MDC completes investigation and cleanup activities within each OU. DTSC will issue a ~~Certification of Completion~~ an NFA designation when soil cleanup activities are complete, indicating that risks to human health and the environment have been found to be at or below minimum threshold levels. Studies performed at the request of Aerojet (Borch 1995a, 1995b) found that the dredge tailings at the project site do not contain toxic levels of trace elements (such as mercury). As discussed in Impact 3.13-6 below, soils in the 1,100-acre development Phase 1 area are not contaminated. Therefore, construction workers and future residents and employees associated with project development would not come into contact with contaminated soil. ~~DTSC will also include d~~Deed restrictions on future development ~~that will~~ prohibit residential or commercial use of groundwater beneath the project site. Construction workers associated with project development would not come into contact with contaminated groundwater because groundwater

levels typically range between 50 and 160 feet below the current ground surface, and project-related excavation activities would not exceed depths of 15–20 feet. Therefore, there would be **no direct** or **indirect** impacts arising from human exposure to contaminated soil or groundwater. *[Similar]*

The last sentence of Impact 3.13-2 for the Proposed Project, High Density, Impact Minimization, and No Federal Action Alternatives on page 3.13-20 of the 2006 DEIR/DEIS is hereby revised to read as follows:

Aerojet will also retain right of access to certain properties to operate and maintain the monitoring wells, extraction wells, and conveyance piping; and/or to conduct other remediation activities.

Mitigation Measure 3.13-2a on pages 3.13-20 and 3.13-21 of the 2006 DEIR/DEIS is hereby revised to read as follows:

Mitigation Measure 3.13-2a: Require the Project Applicant(s) to Cooperate with Aerojet and Regulatory Agencies to Preserve, Modify, or Close Existing Groundwater Monitoring Wells.

PP, HD, IM, NF ~~The project applicant(s) for all project phases shall submit copies of tentative maps for residential subdivisions and for nonresidential uses to work with Aerojet, DTSC, and the Central Valley RWQCB or any successor in interest for review and approval. Aerojet, DTSC, and the Central Valley RWQCB or any successor shall work with the project applicant(s) to establish the preservation, modification, or closure of existing groundwater monitoring wells. If necessary, Aerojet, MDC, or any successor may purchase lots from the project applicant(s) to maintain access to monitoring wells. Development shall not proceed until DTSC and the Central Valley RWQCB have approved Aerojet's or a successor's plan for well preservation, modification, or closure. If groundwater wells are to be affected by proposed tentative maps, then the project applicant(s) or successors shall provide the City with evidence that the relocation, modification, or closure of the well(s) is approved by the appropriate agencies as part of the City's final map approval process and before development.~~

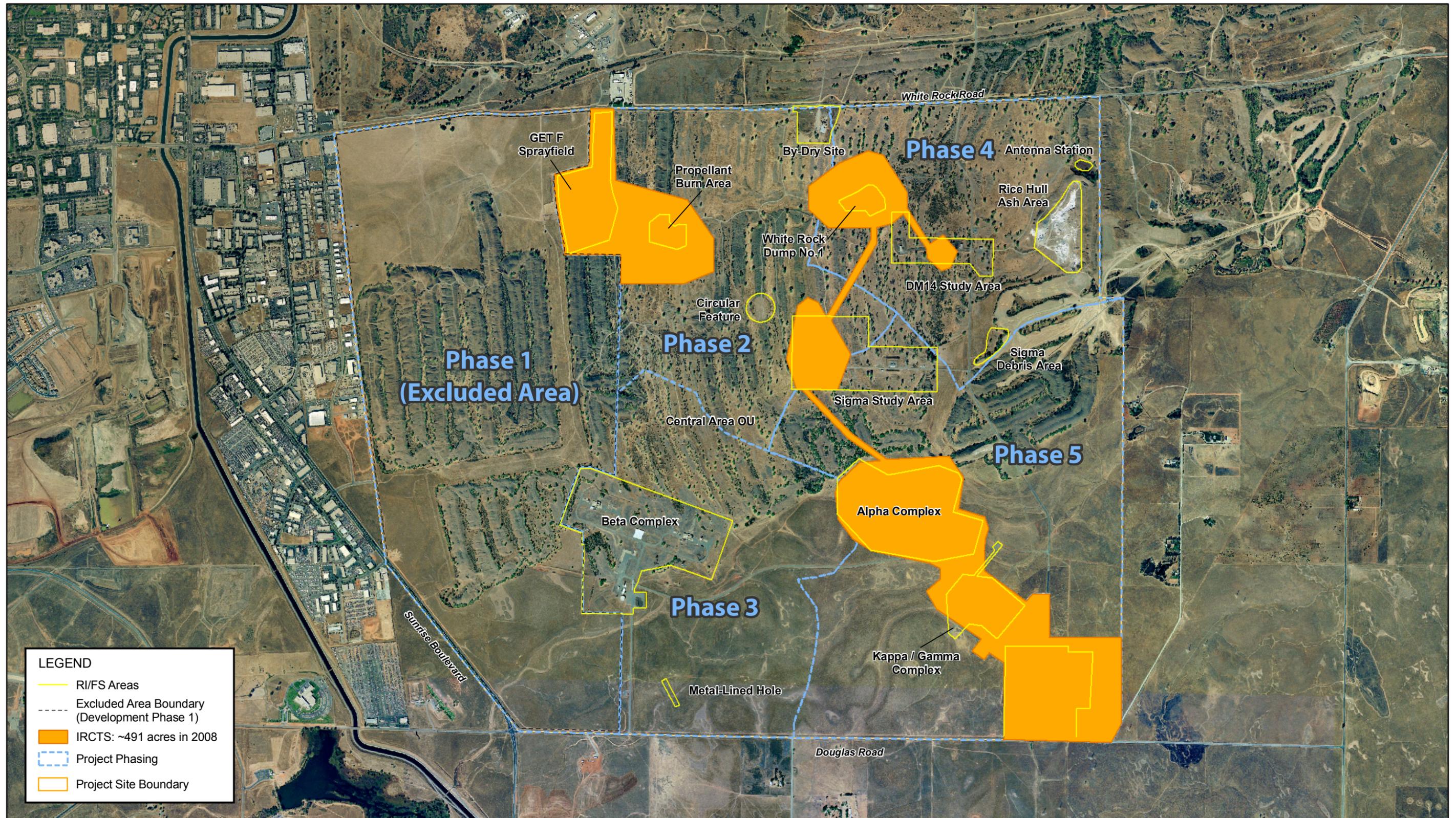
Timing: Before approval of small-lot tentative maps for any portion of the project site except the Phase 1 area as shown in Exhibit 3.13-1.

Enforcement: California Department of Toxic Substances Control, Central Valley Regional Water Quality Control Board, Aerojet General Corporation, and City of Rancho Cordova Planning Department.

NP No mitigation measures are required.

The timing of Mitigation Measure 3.13-2c, “Notify the City in Writing that DTSC-Required Notification Obligations Regarding Deed Restrictions and/or Easements Have Been Fulfilled,” on page 3.13-21 of the 2006 DEIR/DEIS is hereby revised to read as follows:

Timing: Before approval of small-lot final maps and/or issuance of permits for sales trailers and model homes for all project phases.



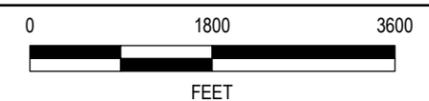
Source: Aerojet 2005, Sacramento County 2002

Map of Areas Subject to Remedial Investigation and Feasibility Study (RI/FS)

EXHIBIT 3.13-1

Rio del Oro Specific Plan Project Administrative FEIR/FEIS
 City of Rancho Cordova and USACE

X 3T089.01 012 1/10



The second sentence of the first paragraph under “Cumulative Impacts” on page 3.13-28 of the 2006 DEIR/DEIS is hereby revised as follows:

However, project implementation on ~~2,728-428~~ acres of the 3,828-acre site cannot occur until investigation and remediation of contaminants in soil and soil vapor have satisfied the requirements of DTSC and the Central Valley RWQCB.

SECTION 3.14, “TRAFFIC AND TRANSPORTATION”

Exhibit 3.14-4 on page 3.14-12 of the 2006 DEIR/DEIS is hereby updated as shown below to reflect revisions to the transit routes in the study area.

Mitigation Measure 3.14-1 on page 3.14-32 of the 2006 DEIR/DEIS is hereby revised to read as follows:

Mitigation Measure Common to All Impacts under Impact 3.14-1

To avoid repetition, the information contained in the following mitigation measure applies to all other mitigation measures required under Impact 3.14-1. Note that no mitigation measures are required for the No Project Alternative because, as described above, no direct or indirect impacts would occur.

PP, HD, IM The project applicant(s) for all project phases shall participate in the necessary improvements identified in all of the following mitigation measures. The project’s fair-share participation and the associated timing of the improvements shall be identified in Tier 2 entitlements for the project and before any physical development of the property and will amend the project conditions of approval and in the mitigation monitoring and reporting program for the project to include these participation and timing details for traffic improvements. ~~, or in conjunction with and as an appendix to the specific plan (see mitigation measures following each identified impact).~~

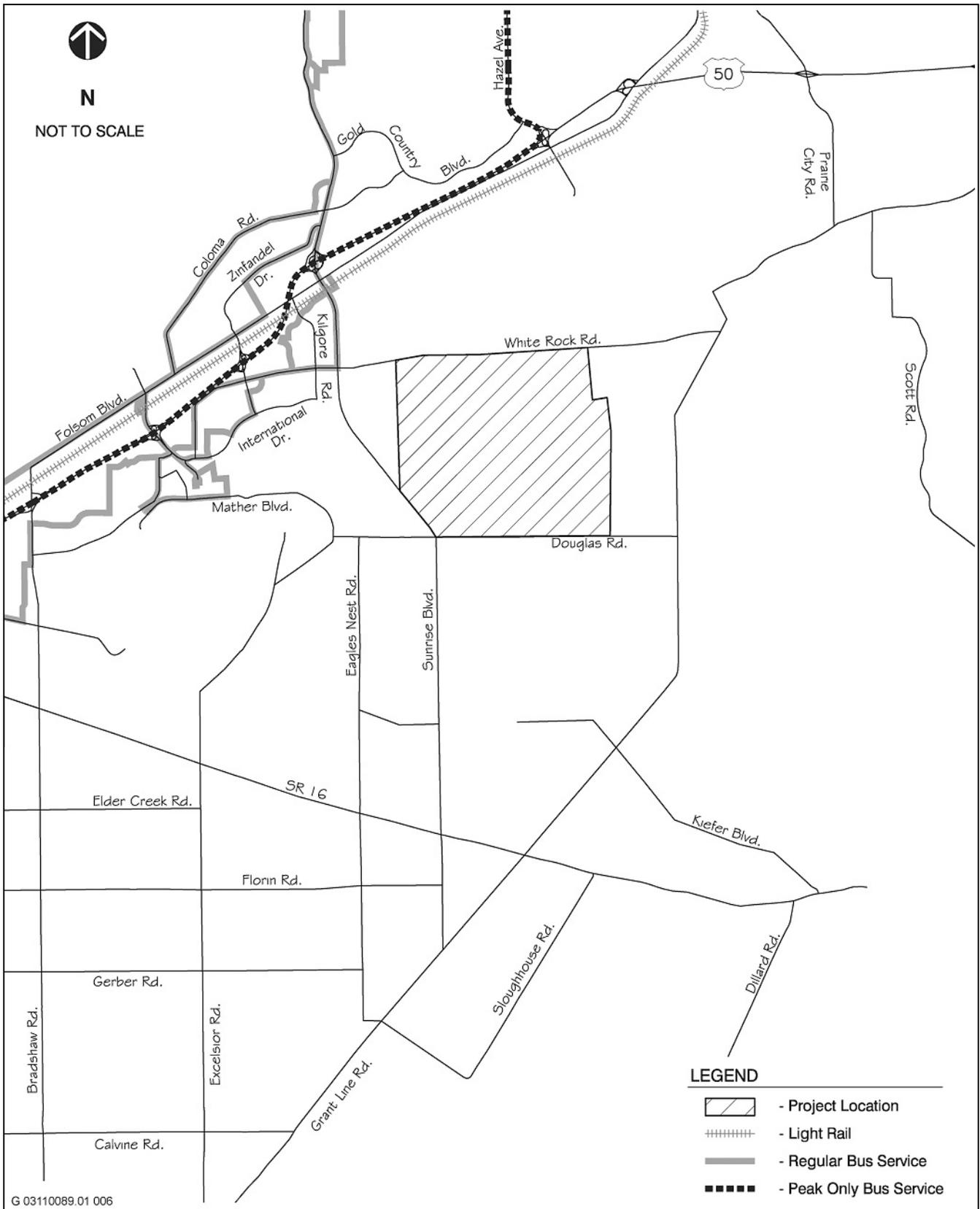
Timing: As part of Tier 2 entitlements and before any physical development of the property (excluding on-site wetland fill and mitigation activities). ~~a condition of project approval and/or as a condition of the development agreement for all project phases.~~

Enforcement: City of Rancho Cordova Public Works Department.

Mitigation Measure 3.14-3a on page 3.14-76 of the 2006 DEIR/DEIS is hereby revised to read as follows:

Mitigation Measure 3.14-3a: Participate in Capital Improvements for Transit Service.

PP, HD, IM The project applicant(s) for all project phases shall participate in capital improvements for transit service providing transit-related services through annexation to the City's Transit-Related Services Special Tax Area and payment of the tax. Capital improvements for transit services will be part of the City's Transportation CIP and will include the construction and operation of the streetcar system, purchase of a shuttle fleet, and construction of a maintenance facility. The project's fair-share participation and the associated timing of the improvements shall be identified in the project conditions of approval and/or the project's development agreement. Improvements shall be coordinated, as necessary, with Sacramento RT. for those facilities shall be satisfied through payment of the transportation fee. Capital improvement costs for on-site ancillary facilities are not in the City Transportation CIP. To fulfill the need for on-site facilities, the project applicant(s) shall provide on-site transfer and connection facilities at appropriate locations as part of site development plans. Transfer facilities shall be provided at major arterial intersections. All transfer, fare collection, and information facilities shall be provided at land uses that are major transit transfer points or destinations. These sites include major commercial and recreational land uses.



Source: Fehr & Peers 2008

Existing Transit Service

Exhibit 3.14-4

Impact 3.14-4 and Mitigation Measure 3.14-4 on page 3.14-77 of the 2006 DEIR/DEIS are hereby revised as follows, because the specific plan's roadway network has been revised to be consistent with the City General Plan:

**IMPACT
3.14-4**

Inconsistency of the Rio del Oro Specific Plan with the City's Adopted General Plan. The project alternative are inconsistent with the City's adopted General Plan.

PP, HD, IM

The circulation network as shown in Proposed Project Alternative is consistent with the City's adopted General Plan. Therefore, there would **no direct or indirect impacts.**

~~Rio del Oro Parkway and Villagio Parkway within the proposed specific plan area are shown, east of Rancho Cordova Parkway, as two-lane facilities. The City's adopted General Plan has identified these as four-lane facilities. Additionally, the proposed specific plan does not reflect the identified alignment of International Drive through the Rio del Oro project site. These inconsistencies are considered a **potentially significant, direct** impact. **No indirect** impacts would occur.~~

~~Rio del Oro Parkway and Villagio Parkway require four lanes only if connectivity through the Aerojet site occurs, as identified in the City's General Plan as occurring after Year 2030. Without this connectivity, two-lane facilities will suffice.~~

~~As part of the City's General Plan EIR, an analysis was conducted to identify impacts with various alignments of International Drive. The resulting shift in traffic volumes was summarized in a letter to the City dated June 19, 2006 (see Appendix J). The letter shows that the shift in volumes associated with the various alignments of International Drive would be minimal and that the shift in traffic volume is not projected to cause any new significant impacts.~~

HD, IM

Rio del Oro Parkway and Villagio Parkway within the proposed specific plan area are shown, east of Rancho Cordova Parkway, as two-lane facilities. The City's adopted General Plan has identified these as four-lane facilities. Additionally, the proposed specific plan does not reflect the identified alignment of International Drive through the Rio del Oro project site. These inconsistencies are considered a **potentially significant, direct** impact. **No indirect** impacts would occur.

Rio del Oro Parkway and Villagio Parkway require four lanes only if connectivity through the Aerojet site occurs, as identified in the City's General Plan as occurring after Year 2030. Without this connectivity, two-lane facilities will suffice.

As part of the City's General Plan EIR, an analysis was conducted to identify impacts with various alignments of International Drive. The resulting shift in traffic volumes was summarized in a letter to the City dated June 19, 2006 (see Appendix J). The letter shows that the shift in volumes associated with the various alignments of International Drive would be minimal and that the shift in traffic volume is not projected to cause any new significant impacts.

Mitigation Measure 3.14-4: Modify Rio del Oro Specific Plan for the High Density and Impact Minimization Alternatives to be Consistent with the City's Adopted General Plan.

PP, HD, IM The project applicant(s) for all project phases shall modify the Rio del Oro Specific Plan to be consistent with the City's General Plan.

Timing: As a condition of project approval and/or as a condition of the development agreement for all project phases.

Enforcement: City of Rancho Cordova Public Works Department.

Implementation of Mitigation Measure 3.14-4 would make the circulation network of the Rio del Oro Specific Plan under the High Density and Impact Minimization Alternatives consistent with the City's adopted General plan and would reduce the impact to a **less-than-significant** level.

Mitigation Measure 3.14-6 on page 3.14-78 of the 2006 DEIR/DEIS is hereby revised to read as follows:

Mitigation Measure 3.14-6: Pay Fair-Share Cost of Identified Improvements that Are Not Fully Funded by the City's Fee Program.

PP, HD, IM, NP The project applicant(s) for all project phases shall provide fair-share contributions to the City's transportation impact fee program to aid in bridging the program's funding shortfall. However, ultimate funding of the improvements cannot be guaranteed (as it would require funding from other developments in the area). Project contributions to the City's transportation impact fee program shall be identified in the project's public facilities financing plan associated with Tier 2 entitlements.

Timing: As part of Tier 2 entitlements and before any physical development of the property (excluding on-site wetland fill and mitigation activities). ~~As a condition of project approval and/or as a condition of the development agreement for all project phases.~~

Enforcement: City of Rancho Cordova Public Works Department.

Mitigation Measure 3.14-7 on pages 3.14-79 and 3.14-80 of the DEIR/DEIS is hereby revised to read as follows:

Mitigation Measure Common to All Impacts under Impact 3.14-7

PP, HD, IM, The project applicant(s) for all project phases shall participate in the necessary improvements identified in all of the following mitigation measures. The project's fair-share participation and the associated timing of the improvements shall be identified in Tier 2 entitlements for the project and before any physical development of the property and will amend the project conditions of approval and in the mitigation monitoring and reporting program for the project to include these participation and timing details for traffic improvements, or in conjunction with and as an appendix to the specific plan (see mitigation measures following each identified impact).

Timing: As part of Tier 2 entitlements and before any physical development of the property (excluding on-site wetland fill and mitigation activities). ~~a condition of project approval and/or as a condition of the development agreement for all project phases.~~

Enforcement: City of Rancho Cordova Public Works Department.

SECTION 3.15, “AIR QUALITY”

The following text is hereby added to the second bulleted list on page 3.15-14 of the 2006 DEIR/DEIS (Sacramento Metropolitan Air Quality Management District [SMAQMD] rules applicable to project construction), between the second and third bulleted items, to reflect the addition of new SMAQMD rule language:

- ▶ **Rule 417: Wood Burning Appliances.** Installation of any new, permanently installed, indoor or outdoor, uncontrolled fireplaces in new or existing developments is prohibited.

The last paragraph on page 3.15-15 (continuing onto page 3.5-16) of the 2006 DEIR/DEIS is hereby revised as follows:

Although the region has made significant progress in reducing ozone, a problem has arisen with regard to another requirement set forth in the CAA. The region’s transportation plan must conform and thus show that it does not harm the region’s chances of attaining the ozone standard. The SIP is tied to a “motor vehicle emissions budget” (MVEB); transportation planners must ensure that emissions anticipated from plans and improvement programs remain within this budget. ~~The region is not required to update the SIP before the ozone (8-hour) plans are due in 2006. However, since a conformity lapse began on October 4, 2004, an expedited process to prepare a plan is under way (SMAQMD 2005).~~

In the March 14, 2006, Federal Register posting, EPA found that the MVEBs for 2008 were determined to be adequate for transportation conformity purposes. The Sacramento Area Council of Governments (SACOG) was able to demonstrate that the 2006 Metropolitan Transportation Plan and the 2006/2008 Metropolitan Transportation Improvement Program for the Sacramento region were below the 2008 MVEB. The Sacramento Regional Nonattainment Area 8-Hour Attainment Demonstration Plan, which was completed December 19, 2008, updated the allowable motor vehicle emissions budgets for ROG and NO_x for 2008 using the new EMFAC model (EMFAC2007) and population and travel activity figures. In addition, it established new budgets for several other years up to and including the attainment deadline year. After EPA finds these new budgets adequate, then SACOG must demonstrate that emissions from subsequent transportation plans will be below the emission budget levels established in this new air quality plan (SMAQMD 2009).

The second bullet point in Mitigation Measure 3.15-1 on page 3.15-22 of the 2006 DEIR/DEIS is hereby revised to read as follows:

- ▶ The project applicant(s) for all project phases shall pay into SMAQMD’s off-site construction mitigation fund to further mitigate construction-generated emissions of NO_x that exceed SMAQMD’s daily emission threshold of 85 lb/day. The calculation of daily NO_x emissions is based on the ~~current 2006~~ cost of \$14,300 to reduce 1 ton of NO_x. The final mitigation fee shall be calculated using the current SMAQMD off-site construction mitigation fee calculation methodology available and fee rate established by SMAQMD at the time of the approval of each project phase. The determination of the final mitigation fee shall be conducted in coordination with SMAQMD before any demolition or ground disturbance occurs for any project phase.

The mitigation for Impact 3.15-2 on page 3.15-26 of the 2006 DEIR/DEIS is hereby revised as follows:

Mitigation Measure 3.15-2a: Implement Measures to Control Long-Term Operational (Regional) Emissions of ROG, NO_x, and PM₁₀.

PP, HD, IM, The project applicant(s) for all project phases shall submit a copy of the Operational Air
NF Quality Plan developed in consultation with and approved by SMAQMD to the City. The
Operational Air Quality Plan shall include measures to reduce operational air quality

impacts associated with the project by a minimum of 15%, and these measures shall be included in the Rio del Oro Specific Plan. The project applicant(s) shall implement all measures included in the Operational Air Quality Plan. (The Operational Air Quality Plan is included in Appendix L of this DEIR/DEIS.)

Timing: Before the approval of grading plans and throughout project construction, as appropriate for all project phases.

Enforcement: City of Rancho Cordova Public Works, Building and Safety, and Planning Departments and Sacramento Metropolitan Air Quality Management District.

NP No mitigation measures are required.

Mitigation Measure 3.15-2b: Locate Electrical Outlets to Support Use of Electrical Landscaping Equipment.

PP, HD, IM, NF The project applicant(s) for all project phases containing residential uses shall promote a reduction in residential emissions by encouraging the installation of conveniently located electrical outlets within the front, side, and rear yards of all residential structures, as appropriate, to support the use of electrical landscaping equipment.

Timing: Throughout project construction of all residential phases.

Enforcement: City of Rancho Cordova Planning Department.

Implementation of Mitigation Measures 3.15-2a and 3.15-2b would lessen long-term regional emissions by a minimum of approximately 15% under the Proposed Project, High Density, Impact Minimization, and No Federal Action Alternatives. Some of the design measures identified to reduce operational emissions, such as mixed-use development and the creation of street and pedestrian connections, are already incorporated into the project; as mentioned previously, they are repeated in Mitigation Measure 3.15-2a to allow a comprehensive listing of both design and operational measures. However, even a reduction of 15% would not reduce ROG and NO_x emissions to levels below the SMAQMD-recommended significance threshold of 65 lb/day for ROG and NO_x, or PM₁₀ emissions (as would be necessary for project implementation not to result in a substantial contribution to an air quality violation). Thus, increases in long-term regional emissions attributable to the project would be considered a significant and unavoidable impact. Implementation of the above-mentioned measures would substantially reduce the level of emissions from this source; however, because of the large size of the proposed development, emissions would still be expected to exceed the applicable thresholds. Thus, this impact would remain **significant and unavoidable**.

The following text is hereby added as a new fourth paragraph in Impact 3.15-7 on page 3.15-37 of the DEIR:

As discussed in the Project Description, the current proposal is to process the Rio del Oro project in two separate phases, or tiers, of development approvals. The Tier 1 entitlements include the Specific Plan and a Tier 1 development agreement for each of the two property owners. Tier 2 approvals, such as tentative maps and use permits, would follow the Tier 1 approvals, and approval of Tier 2 development agreements. Consistent with this sequential process for project approval, the City has proposed Mitigation Measure 3.15-7c to mitigate the project's significant long-term increase in greenhouse gas emissions. The mitigation measure provides a specific performance standard and a menu of possible options for achieving that performance standard. It is not feasible to determine the efficacy or feasibility of those specific measures at this time, as the measures are design-level measures that must be evaluated when the more detailed, Tier 2 project approvals are considered. Furthermore, because technology and planning design will likely evolve over the course of the development of the project, developing a specific mitigation plan at the time of Tier 2 project approvals is more likely to result in improved mitigation. The options in the measures are considered to be efficacious in a general sense because they have been

extracted from recommendations from expert agencies on reducing greenhouse gas emissions. As set forth in the mitigation measure, the mitigation plan shall include an analysis of the efficacy and feasibility of the measures proposed to be included in the plan, and shall be subject to public review.

The mitigation for Impact 3.15-7 on page 3.15-37 of the 2006 DEIR/DEIS is hereby revised as follows:

Mitigation Measure 3.15-7a: Implement Mitigation Measures 3.15-2a and 3.15-2b.

Mitigation Measure 3.15-7b: Incorporate Green Building Measures into Residential Construction.

PP, HD, IM,
NF

The project applicant(s) for all project phases containing residential uses shall participate in the GreenPoint Rated program or equivalent program. Each home shall be built to achieve the GreenPoint Rated label by earning a minimum of 50 total points and meeting the minimum point thresholds in specific categories: Energy (30), Indoor Air Quality/Health (5), Resources (6), and Water (9). The measures to achieve these points are outlined in the *New Home Construction Green Building Guidelines (Build It Green 2007)* and grouped into sections corresponding to the various stages of construction. Other programs may be used in place of the GreenPoint Rated program as long as they can be demonstrated to have equivalent green building measures. The measures incorporated into the project may include but are not limited to the following:

- ▶ **Site:** Manage the construction process to minimize disruptions to the building site, reduce waste, and prevent pollution of air, soil, and waterways.
- ▶ **Foundation:** Incorporate recycled fly ash in concrete, using frost-protected shallow foundations in cold climates, and installing radon-mitigation measures where appropriate.
- ▶ **Landscaping:** Utilize strategies to keep pollutants out of waterways, reduce water use, promote healthy soils, create fire-safe landscaping, and reduce excessive outdoor lighting.
- ▶ **Structural Frame and Envelope:** Implement measures to address the building's structural frame, including the walls, floors, and roof, for more durable buildings that use energy and other resources more efficiently.
- ▶ **Exterior Finish:** Install siding, roofing, and decking materials that will hold up well for decades and help protect the home from moisture damage, fire, and general wear and tear.
- ▶ **Insulation:** Follow proper insulation installation techniques, and use insulation products with recycled content and low or no formaldehyde emissions.
- ▶ **Plumbing:** Design the plumbing system to reduce hot-water runs, insulate hot-water pipes, and install water-efficient toilets.
- ▶ **Heating, Ventilation, and Air Conditioning:** Utilize high-efficiency heating and cooling equipment and effective ductwork and ventilation for better indoor air quality.
- ▶ **Renewable Energy:** Pre-plumb or install solar hot water systems and pre-wire or install photovoltaic systems.

- ▶ **Building Performance:** Design and build high-performance homes that meet or exceed the state’s building energy efficiency standards by including improved insulation, installation of energy efficient windows, installation of tankless hot-water heaters, and other measures.
- ▶ **Finishes:** Utilize healthier options for paints, trim, cabinets, and countertops that perform well and are readily available and promote environmentally preferable materials for interior finishes.
- ▶ **Flooring:** Utilize finish flooring materials that are attractive, long-lasting, and environmentally friendly.
- ▶ **Appliances:** Install high-efficiency residential appliances that can significantly cut a home’s energy and water use, including dishwashers, clothes washers, and refrigerators that exceed minimum federal efficiency standards.
- ▶ **Other:** Utilize innovative approaches to green building that go beyond the basic measures described in these guidelines.

Timing: Throughout project construction of all project phases containing residential uses.

Enforcement: City of Rancho Cordova Building and Safety and Planning Departments.

NP No mitigation measures are required.

Mitigation Measure 3.15-7c: Incorporate Green Building and Development Measures.

PP, HD, IM,
NF

Each increment of new development within the project site requiring a discretionary approval (e.g., proposed tentative subdivision map, conditional use permit), shall be subject to a requirement, the details of which shall be established through project-specific environmental review, that GHG emissions from t construction and operation of the increment of development at issue will be reduced by 30% from business-as-usual 2006 emissions. In determining 2006 business-as-usual emissions, the assumptions and analysis regarding traffic and operational conditions of the project used in the EIR/EIS may be utilized.

For each increment of new development, the developer shall submit to the City, prior to the release of any project-specific environmental document, a proposed mitigation plan that lists the measures selected to be implemented as part of the proposed development increment and/or consideration of previously implemented measures in the specific plan area, including analysis demonstrating the associated reduction in GHG emissions. The list shall reflect the then-current state of the regulation of GHG emissions and climate change, which is expected to continue to evolve under the mandate of AB 32. The mitigation plan shall be accompanied by an analysis demonstrating why, in the developer’s view, the selected measures are both feasible and efficacious. The City , in consultation with the SMAQMD, shall review the mitigation report for the applicable increment of development and shall include the proposed mitigation strategy and accompanying analysis, with any changes considered by City staff to be necessary and potentially feasible, as part of the project-specific environmental review for the proposed increment of new development. After receiving and considering any public input on the proposed mitigation strategy, the City shall ultimately approve the strategy (with modifications, if considered necessary and feasible) prior to granting any requested discretionary approval for that increment of development. In determining what sort of

measures should appropriately be imposed by a local government under the circumstances to attain the overall, project-wide 30% emissions requirement, the City shall consider the following factors:

- ▶ The extent to which rates of GHG emissions generated by motor vehicles traveling to, from, and within the project site are projected to decrease over time as a result of regulations, policies, and/or plans that have already been adopted or may be adopted in the future by ARB or other public agency pursuant to AB 32, or by EPA;
- ▶ The extent to which mobile-source GHG emissions, which at the time of writing this EIR comprise a substantial portion of the state's GHG inventory, can also be reduced through design measures that result in trip reductions and reductions in trip length;
- ▶ The extent to which GHG emissions emitted by the mix of power generation operated by SMUD, that will serve the project site, are projected to decrease pursuant to the Renewable Portfolio Standard required by SB 1078 and SB 107, as well as any future regulations, policies, and/or plans adopted by the federal and state governments that reduce GHG emissions from power generation;
- ▶ The extent to which replacement of CCR Title 24 with the California Green Building Standards Code or other similar requirements will result in new buildings being more energy efficient and consequently more GHG efficient;
- ▶ The extent to which any stationary sources of GHG emissions that would be operated on a proposed land use (e.g., industrial) are already subject to regulations, policies, and/or plans that reduce GHG emissions, particularly any future regulations that will be developed as part of ARB's implementation of AB 32, or other pertinent regulations on stationary sources that have the indirect effect of reducing GHG emissions;
- ▶ The extent to which the feasibility of existing GHG reduction technologies may change in the future, and to which innovation in GHG reduction technologies will continue, affecting cost-benefit analyses that determine economic feasibility; and
- ▶ Whether the total costs of proposed mitigation for GHG emissions, together with other mitigation measures, required for the proposed development, are so great that a reasonably prudent property owner would not proceed with the project in the face of such costs.

In considering how much, and what kind of, mitigation is necessary in light of these factors, the City shall consider the following list of options, though the list is not intended to be exhaustive, as GHG reduction strategies and their respective feasibility are likely to evolve over time. These measures are derived from multiple sources including the Mitigation Measure Summary in Appendix B of the California Air Pollution Control Officer's Association (CAPCOA) white paper, CEQA & Climate Change (CAPCOA 2008), the California Attorney General's Office (2008) and the Sacramento Metropolitan Air District Draft GHG Measures (2009).

Energy Efficiency

- ▶ Include clean alternative energy features to promote energy self-sufficiency (e.g., photovoltaic cells, solar thermal electricity systems).

- ▶ Site buildings to take advantage of shade and prevailing winds and design landscaping and sun screens to reduce energy use.
- ▶ Install efficient lighting in all buildings (including residential). Also install lighting control systems, where practical. Use daylight as an integral part of lighting systems in all buildings.
- ▶ Install Energy Star compliant highly reflective roofing materials.
- ▶ Install light-colored “cool” pavements, and strategically located shade trees along all bicycle and pedestrian routes.

Project developers should be encouraged to incorporate “green building” points into the construction and design of all projects (including additions of 25,000 square feet of office/retail commercial or 100,000 square feet of industrial floor area) for which “green building” points are available. Such points may be achieved through conformity with the checklists identified by New Home Construction Green Building Guidelines available at www.builditgreen.org (which were developed to apply to residential construction, but which include measures that are also pertinent to commercial construction), or through any similar list that distinguishes specific measures targeting efficiencies in energy, resource use, or other measures that would also directly or indirectly result in GHG emission reductions. Specific efficiencies that would reduce GHG emissions shall be implemented where feasible, for all project areas including site design, landscaping, foundation, structural frame and building envelope, exterior finishing, plumbing, appliance use, insulation, heating, venting and air conditioning, building performance, use of renewable energy, finishes, and flooring.

Project developers should be encouraged to incorporate any combination of the following strategies to reduce heat gain of the non-roof impervious site landscape (including roads, sidewalks, courtyards, parking lots, and driveways) into the construction and design of all new (additions of 25,000 square feet of office/retail commercial) projects:

- ▶ Shaded (Within 5 years of occupancy)
- ▶ Paving materials with a Solar Reflective Index (SRI) of at least 29
- ▶ Open grid pavement system (pavement that is less than 50% impervious and contains vegetation in the open cells)
- ▶ Parking spaces under cover (defined as underground, under deck, under roof, or under building). Any roof used to shade or cover parking should have an SRI of at least 29.
- ▶ Optional level of LEED certification, such as silver or gold which can allow for further reductions in energy consumption and GHG emissions.

Water Conservation and Efficiency

The Project includes water conservation as part of the project. In addition, the project would comply with Title 22, Chapter 32.180, “Water Use and Conservation,” of the City’s Municipal Code, which specifies design criteria for irrigation systems and requirements for plant selection. These requirements include but are not limited to: installation of irrigation systems that minimize overspray and runoff, use of control

valves to account for different site-specific characteristics and use of rain shutoff systems, and installation of plants that are suited to the local climate and require moderate amounts of water (Sections 22.180.070 and 22.180.080). In addition, the following should be considered:

- ▶ With the exception of ornamental shade trees, use water-efficient landscapes with native, drought-resistant species in all public area and commercial landscaping.
- ▶ Install the infrastructure to use recycled water for landscape irrigation. (Part of the project)
- ▶ Install water-efficient irrigation systems and devices, such as soil moisture-based irrigation controls.
- ▶ Design buildings and lots to be water-efficient. Install water-efficient fixtures and appliances. (e.g., Ultra low-flow toilets, no flow urinals etc.)
- ▶ Restrict watering methods (e.g., prohibit systems that apply water to non-vegetated surfaces). Prohibit businesses from using pressure washers for cleaning driveways, parking lots, sidewalks, and street surfaces unless required to mitigate health and safety concerns.

Solid Waste Measures

Project developers should be encouraged to incorporate any combination of the following strategies:

- ▶ Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard).
- ▶ Provide interior and exterior storage areas for recyclables and green waste at all buildings.
- ▶ Provide adequate recycling containers in public areas, including parks, school grounds, paseos, and pedestrian zones in areas of mixed-use development.
- ▶ Provide education and publicity about reducing waste and available recycling services.

Transportation and Motor Vehicles

Project developers should be encouraged to incorporate any combination of the following strategies:

- ▶ Promote ride sharing programs at employment centers (e.g., by designating a certain percentage of parking spaces for ride sharing vehicles, designating adequate passenger loading and unloading zones and waiting areas for ride share vehicles, and providing a web site or message board for coordinating ride sharing).
- ▶ Provide the necessary facilities and infrastructure in all land use types to encourage the use of low or zero emission vehicles (e.g., electric vehicle charging facilities and conveniently located alternative fueling stations).

- ▶ At commercial land uses, all forklifts, “yard trucks,” or vehicles that are predominately used on-site at non-residential land uses should be electric-powered or powered by biofuels (such as biodiesel [B100]) that are produced from waste products, or shall use other technologies that do not rely on direct fossil fuel consumption.
- ▶ Provide the necessary facilities and infrastructure to encourage the use of low or zero-emission vehicles (e.g., electric vehicle charging facilities and conveniently located alternative fueling stations).
- ▶ Prioritized parking within new commercial and retail areas shall be given to electric vehicles, hybrid vehicles, and alternative fuel vehicles.
- ▶ Incorporate bicycle lanes, routes, and intersection improvements into street systems within the Specific Plan.
- ▶ For commercial land uses, provide adequate bicycle parking near building entrances to promote cyclist safety, security, and convenience.
- ▶ For commercial land uses, provide “end-of-trip” facilities including showers, lockers, and changing space.
- ▶ Create Class II bicycle lanes and walking paths directed to the location of schools, parks and other destination points.
- ▶ Construction of transit facility/amenity (bus shelters, bicycle lockers/racks, etc.) for existing public and private transit.
- ▶ Provide secure bicycle storage at public parking facilities.
- ▶ Design site and building placement to facilitate the expansion and use of alternative modes of transportation, and integrate the project site with the surrounding development and circulation pattern by creating street and pedestrian/bicycle access throughout the project site to enable trips without depending exclusively on major roads, secondary roads, or the automobile.
- ▶ Design roadways to reduce motor vehicle speeds and encourage pedestrian and bicycle trips by featuring traffic calming features.

Timing: Throughout project construction of all project phases.

Enforcement: City of Rancho Cordova Planning Department.

NP No mitigation measures are required.

Mitigation Measure 3.15-7d: Locate Electrical Outlets to Support Use of Electrical Landscaping Equipment.

PP, HD, IM, The project applicant(s) for all project phases containing residential uses shall promote a reduction in residential emissions by encouraging the installation of conveniently located electrical outlets within the front, side, and rear yards of all residential structures, as appropriate, to support the use of electrical landscaping equipment.
NF

Timing: Throughout project construction of all residential phases.

Enforcement: City of Rancho Cordova Planning Department.

NP No mitigation measures are required.

Implementation of Mitigation Measures 3.15-7a, 3.15-7b, 3.15-7c, and 3.15-7d would reduce GHG emissions from mobile sources by approximately 15%. However, a reduction in project-generated emissions of approximately 65% would be required to achieve the threshold of 2 tons CO₂/person. Thus, this impact would remain **significant and unavoidable**.

SECTION 3.16, “NOISE”

The following language is hereby added at the end of Mitigation Measure 3.16-5, immediately preceding the specifications for timing and enforcement, on page 3.16-32 of the 2006 DEIR/DEIS:

Project-related residential development within the MAPA boundaries but outside the 60-dB CNEL contour shall be subject to the following conditions before approval by the City of Rancho Cordova:

- ▶ minimum noise insulation to protect persons from excessive noise within new residential dwellings (including detached single-family dwellings) that limits noise to 45 dB CNEL with windows closed in any habitable room;
- ▶ notification in the public report prepared by the California Department of Real Estate disclosing to prospective buyers that the parcel is located within the applicable airport planning policy area and that aircraft operations can be expected to overfly that area at varying altitudes less than 3,000 feet above ground level; and
- ▶ execution and recordation with the County Recorder of aviation easements prepared by the County Counsel’s office on each individual residential parcel contemplated in the development in favor of the County. All aviation easements recorded pursuant to this policy shall, once recorded, be copied to the Director of Airports and shall acknowledge the property location within the appropriate airport planning policy area and shall grant the right of flight and unobstructed passage of all aircraft into and out of the appropriate airport.

Exceptions: New accessory residential dwellings on parcels zoned Agricultural, Agricultural Residential, Interim Agricultural, Interim General Agricultural, or Interim Limited Agricultural shall be exempt from the Airport Planning Policy Area’s prohibitions.

The timing of Mitigation Measure 3.16-5, “Implement Measures to Improve Land Use Compatibility with Noise Sources,” on page 3.16-32 of the 2006 DEIR/DEIS is hereby revised as follows:

Timing: Before the recordation of small-lot final maps and during all project construction activities for all project phases where applicable.

CHAPTER 5, “REFERENCES”

The following new references are hereby added to Section 3.15, “Air Quality,” of the 2006 DEIR/DEIS:

California Air Resources Board. Sacramento Region 8-Hour Ozone Attainment Plan and Reasonable Further Progress Plan. December 2008. Available: <<http://www.arb.ca.gov/planning/sip/planarea/sacsip/sacplanozone2009.pdf>> Accessed October 8, 2009.

Sacramento Metropolitan Air Quality Management District. 2007. Sacramento Regional Clean Air Plan Update Information. Available: <<http://www.airquality.org/cleanairplan/index.shtml>>. Accessed June 2007.

Sacramento Metropolitan Air Quality Management District. 2009. Sacramento Regional Clean Air Plan Update Information. Available: <<http://airquality.org/cleanairplan/index.shtml>> Accessed October 2009.

APPENDICES

Appendix F, *Consistency of the Rio del Oro Project with the City of Rancho Cordova General Plan*, has been modified and is hereby reattached as revised Appendix F to the 2006 DEIR/DEIS.

Off-site construction fee calculation worksheets are hereby added as Appendix K-6 to the 2006 DEIR/DEIS.

5.3 CORRECTIONS AND REVISIONS TO THE 2008 RDEIR/SDEIS

SECTION 3.5, “UTILITIES AND SERVICE SYSTEMS—WATER SUPPLY”

The first full paragraph on page 3.5-19 of the 2008 RDEIR/SDEIS is hereby revised as follows:

Approximately ~~4,400 afy~~ 800 afy of recycled water is currently provided to SCWA by the Sacramento Regional County Sanitation District (SRCSD). This water is used within the Zone 40 service area to offset demand by parks and for other nonpotable uses. “Recycled water” refers to wastewater treated to a tertiary level—filtration and disinfection (Title 22, unrestricted use)—and is used for nonpotable uses such as landscape irrigation at parks, schools, and rights-of-way. The 2005 Zone 40 WSMP has a recycled-water supply component of 4,400 afy. SRCSD and SCWA have identified projects that could potentially provide this supply of 4,400 afy noted in the WSMP.

The first and second paragraphs under “City of Rancho Cordova’s Recycled-Water Supplies” on page 3.5-24 of the 2008 RDEIR/SDEIS are hereby revised as follows:

~~SRCSD is responsible for the collection, treatment, disposal, and reuse (of recycled water) of up to 5 mgd of wastewater throughout most of the urbanized areas of Sacramento County, including the majority of the SWCA retail service areas. SRCSD implemented a water recycling program on the Sacramento Regional Water Treatment Plant (SRWTP) site, which began service to communities in southern Sacramento County in 2003.~~

Through an agreement between SCWA and SRCSD, SCWA has successfully implemented a water recycling program. Approximately 4,400 afy of recycled water is currently provided to SCWA by SRCSD and used within the Zone 40 service area. This program provides recycled water for SRCSD’s on-site uses and for large commercial irrigation customers within Zone 40 (e.g., commercial uses, industrial uses, right of way landscaping, schools, and parks). Because of its high reliability and its independence of hydrologic conditions in any given year, recycled water is a desirable source of water for a community’s outdoor irrigation demands—parks, schools, street medians, landscaping of residential front and back yards, and public open space. It is also desirable for industrial uses such as cooling water. In addition, recycled water is commonly used for environmental purposes such as wetlands and habitat restoration. SRCSD is working in partnership with SCWA to serve areas in Zone 40, including Rancho Cordova. The expanded water recycling facility and new water recycling service areas will be called Phase II of the SRCSD Water Recycling Program. Phase II construction will be timed with the need for the higher capacity and is currently expected to be in service in five to ten years.

SRCS D provides wastewater conveyance, treatment, and disposal services for most of the urbanized areas of the Sacramento metropolitan region, including the majority of the SCWA retail service areas. In 2002, SRCS D and SCWA entered into a wholesale agreement to wholesale and retail recycled water. Through this agreement, SRCS D is responsible for providing up to 3.5 mgd of recycled water to SCWA. SCWA is responsible for retailing this recycled water to selected customers within its service area. Because of its high reliability and its independence of hydrologic conditions in any given year, recycled water is a desirable source of water to meet nonpotable demands such as landscape irrigation.

Since 2003, SRCS D has been producing high-quality recycled water at its water reclamation facility (WRF) located at the Sacramento Regional Wastewater Treatment Plant (SRWTP). The WRF was designed to produce 5 mgd of recycled water and was permitted to be expanded to produce up to 10 mgd. The recycled water is used in lieu of potable water to irrigate parts of school facilities, greenbelts, landscaped medians, and freeway interchanges. It is also used in the treatment processes at the SRWTP. SRCS D and SCWA are currently evaluating potential recycled-water projects to expand the recycled-water capacity of the Water Recycling Program.

The first and second paragraphs under “Expanded Use of Recycled Water” on page 3.5-25 of the 2008 RDEIR/SDEIS are hereby revised as follows:

~~The water recycling program on the SRWTP site was designed and constructed to be readily expandable from 5 mgd to 10 mgd in accordance with SRCS D’s Master Reclamation Permit (WDR #97-146). To plan for water recycling projects beyond 2010, a planned plant expansion of the water recycling facility from 5 mgd to 10 mgd could serve new areas of planned and expected growth and public open space areas. The increased use of recycled water within Zone 40 would increase the total volume of supplies available to SCWA to meet its projected demands within Zone 40. The WROS serves to:~~

~~SRCS D has prepared a *Water Recycling Opportunities Study* (SRCS D 2007) to study the feasibility of meeting its goal to increase water recycling throughout the Sacramento region on the scale of 30–40 mgd over the next 20 years. The study serves to:~~

In February 2007, SRCS D completed its *Water Recycling Opportunities Study* (WROS). The WROS is a planning document that would guide the SRCS D in reaching its goal of producing 30–40 mgd of recycled water over the next 20 years. The WROS studied different target areas throughout the Sacramento Region as a master planning level to evaluate the possibility of providing recycled water to these areas. The WROS identified 18 potential recycling water projects and recommended conducting more detailed feasibility studies on the most promising projects or target areas. The increased use of recycled water within Zone 40 would increase the total volume of supplies available to SCWA to meet its projected demands within Zone 40. The WROS serves to:

The fourth paragraph under “Expanded Use of Recycled Water” on page 3.5-25 of the 2008 RDEIR/SDEIS is hereby revised as follows:

~~Future Potential~~ projects to provide recycled water to Rancho Cordova may include diversion of wastewater from ~~the Bradshaw/Folsom Interceptor System~~ an interceptor located near the vicinity and may require construction of a new wastewater satellite treatment plant, ~~an~~ aboveground storage tanks, a pump stations, and new infrastructure to convey and distribute this recycled water. (SRCS D 2007.)

A portion of Table 3.5-10 on page 3.5-38 of the 2008 RDEIR/SDEIS is hereby revised as follows:

Table 3.5-10 Water Demands for Rio del Oro Remaining Phase 1 Development								
Land Use	Dwelling Units ¹	Acres	Unit Water Demand Factor ² (af/ac/yr)	Average Annual Water Demand (afy)	Maximum Annual Water Demand (afy)	Average-Day Demand (gpm)	Maximum-Day Demand (gpm)	Peak-Hour Demand (gpm)
Total	861	162.4	–	2,224.7	4,449.4	1,366.1	2,732.2	5,464.4
			7.5% system loss	166.9	333.8	102.5	205	410
			Total Demand	<u>2,057.8</u>	<u>4,115.6</u>	<u>1,263.6</u>	<u>2,527.2</u>	<u>5,055.4</u>
				<u>2,391.6</u>	<u>4,783.2</u>	<u>1,468.6</u>	<u>2,937.2</u>	<u>5,874.4</u>

Source: Wood Rodgers 2007a

Table 3.5-11 on page 3.5-39 of the 2008 RDEIR/SDEIS is hereby revised as follows:

Table 3.5-11 GSWC's Options A and B Water Supply Compared to Water Demand Associated with the Remaining Phase 1 Development				
Option	Average Annual Water Demand (afy)	Maximum Annual Water Demand (afy)	Average-Day Demand (gpm)	Maximum-Day Demand (gpm)
Option A	750	1,500	464.5	929
Option B	3,150	6,300	1,951.5	3,903
Total	3,900	7,800	2,416	4,832
Remaining Phase 1 Development	<u>2,057.8</u>	<u>4,115.6</u>	<u>1,263.6</u>	<u>2,527.2</u>
	<u>2,391.6</u>	<u>4,783.2</u>	<u>1,468.6</u>	<u>2,937.2</u>
Surplus	<u>1,842.2</u>	<u>3,684.4</u>	<u>1,152.4</u>	<u>2,304.8</u>
	<u>1,508.4</u>	<u>3,016.8</u>	<u>947.4</u>	<u>1,894.8</u>

Notes: afy = acre-feet per year; gpm = gallons per minute; GSWC = Golden State Water Company
Source: Data compiled by MacKay and Soms in 2008 and EDAW in 2008

The timing of Mitigation Measure 3.5-2, “Submit Proof of Water Supply Availability,” on page 3.5-41 of the 2008 RDEIR/SDEIS is hereby revised as follows:

Timing: Before approval of project-specific discretionary land use entitlements and approvals (subsequent to the approval of the specific plan), including all final small-lot maps; or for nonresidential projects, before issuance of use permits, building permits, or other entitlements.

The timing of Mitigation Measure 3.5-3, “Submit Proof of an Off-Site and On-Site Infrastructure Delivery System or Assure that Adequate Financing is Secured,” on page 3.5-51 of the 2008 RDEIR/DEIS is hereby revised as follows:

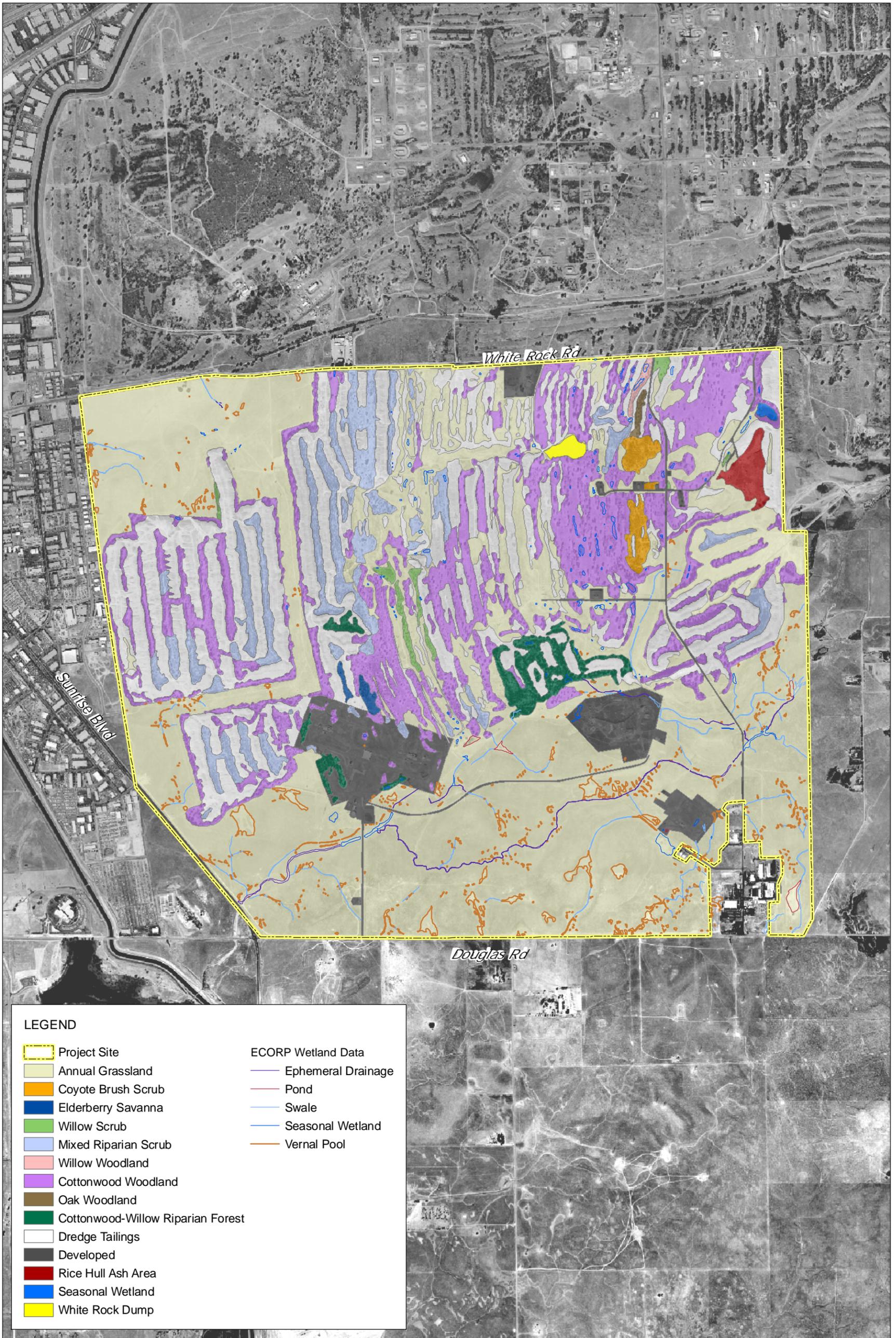
Timing: Before the approval of project-specific discretionary land use entitlements and approvals (subsequent to the approval of the specific plan), including all final small-lot maps; or for nonresidential projects, before issuance of use permits, building permits, or other entitlements.

SECTION 3.10, “BIOLOGICAL RESOURCES”

Exhibit 3.10-1 on page 3.10-3 of the 2008 RDEIR/SDEIS is hereby revised as shown below to show the correct location of the White Rock Dump.

The last sentence under “Willow Woodland” on page 3.10-5 of the 2008 RDEIR/SDEIS is hereby revised as follows:

Two large pools of water were observed in this habitat type during the time that surveys were conducted for the *Rio del Oro Habitat Assessment* (EDAW 2005) (Appendix E of the 2006 draft environmental impact report/draft environmental impact statement [2006 DEIR/DEIS]) and were identified as seasonal wetlands during the wetland delineation that was verified by the U.S. Army Corps of Engineers (USACE) ~~in 2004 (ECORP Consulting 2004a)~~ on January 10, 2005.



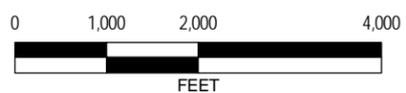
Source: EDAW 2005, Sacramento County 2002, ECORP Consulting 2004(b)

Habitat Types at the Rio del Oro Project Site

Rio del Oro Specific Plan Project Recirculated DEIR/Supplemental DEIS
City of Rancho Cordova and USACE

X 03110089.01 006 9/08

EXHIBIT 3.10-1



The last portion of the paragraph under “Cottonwood Woodland” on page 3.10-5 (continuing onto page 3.10-6) of the 2008 RDEIR/SDEIS is hereby revised as follows:

Some seasonal wetlands were mapped within this habitat type, particularly in the eastern half of the project site, during the wetland delineation that was verified by USACE in 2005 2004 (ECORP Consulting 2004a), but the hydrology that initially allowed cottonwood woodland to establish here was observed to be absent. Cottonwood trees throughout the cottonwood woodland on the project site appear old and senescent and no cottonwood regeneration was observed in any of this habitat.

A portion of Table 3.10-1 on page 3.10-8 of the 2008 RDEIR/SDEIS is hereby revised as follows:

Species	Status			Habitat and Blooming Period	Potential for Occurrence
	USFWS	DFG	CNPS		
PLANTS					
Northern California black walnut <i>Juglans hindsii</i>	–	–	1B	Riparian scrub, riparian woodland. Blooms April-May	Known <u>Unlikely</u> to occur; walnut trees were identified at the project site during the tree survey in 2003 (Sierra Nevada Arborists 2003); <u>however, they are likely to be hybrids between <i>Juglans hindsii</i> and <i>J. regia</i>.</u>

A portion of Table 3.10-2 on page 3.10-10 of the 2008 RDEIR/SDEIS is hereby revised as follows:

Species	Listing Status		Habitat	Potential for Occurrence
	Federal	State		
BIRDS				
Tricolored blackbird <i>Agelaius tricolor</i>	–	SC	Forages in agricultural land and grasslands; nests in marshes and other areas that support cattails or dense thickets	Likely to forage year-round; suitable <u>foraging</u> habitat present on-site; unlikely to nest; <u>no suitable nesting habitat present</u>
INVERTEBRATES				
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	T	–	Vernal pools in valley and foothill grasslands	Known to occur; suitable habitat present; documented on-site during focused surveys (<u>Sugnet and Associates 1994; Gibson & Skordal 2000b, 2001</u>)
Vernal pool tadpole shrimp <i>Lepidurus packardii</i>	E	–	Vernal pools in valley and foothill grasslands	Known to occur; suitable habitat present; documented on-site during focused surveys (<u>sugnet and Associates 1994; Gibson & Skordal 2000b</u>)

The first sentence in the first paragraph on page 3.10-17 of the 2008 RDEIR/SDEIS is hereby revised as follows:

A wetland delineation conducted by ECORP Consulting in June 2004 and verified by USACE in ~~September 2004~~ January 2005 identified a total of 56.632 acres of waters of the United States, including wetlands, on the project site.

The first full paragraph on page 3.10-19 of the 2008 RDEIR/SDEIS is hereby revised as follows:

Executive Order ~~41342~~13112: Invasive Species

Executive Order ~~41342~~13112 directs all federal agencies to prevent and control introductions of invasive nonnative species in a cost-effective and environmentally sound manner to minimize their economic, ecological, and human health impacts. Executive Order ~~41342~~13112 established a national Invasive Species Council made up of federal agencies and departments and a supporting Invasive Species Advisory Committee composed of state, local, and private entities. The Invasive Species Council and Advisory Committee oversee and facilitate implementation of the Executive Order, including preparation of a National Invasive Species Management Plan.

The last two bullets in the list on page 3.10-22 of the 2008 RDEIR/SDEIS are hereby revised as follows, and three new bullets are hereby added:

- ▶ ~~Draft Wetland Mitigation and Monitoring Plan Proposal for Rio del Oro, Sacramento County, CA (ECORP Consulting 2007a-2009)~~ (Appendix Q of this Recirculated DEIR/Supplemental DEIS);
- ▶ ~~Draft Valley Elderberry Longhorn Beetle Mitigation Plan for Rio del Oro, Sacramento County, CA (ECORP Consulting 2007b-2009)~~ (Appendix R of this Recirculated DEIR/Supplemental DEIS);
- ▶ Late Season Special-Status Plant Survey for Rio del Oro, Sacramento County, California (ECORP Consulting 2006);
- ▶ Results of Surveys for Special-Status Wildlife Species at the Aerojet Property, Sacramento County, CA (Miriam Green Associates 1999); and
- ▶ Special-Status Species Determination, Aerojet Property, Sacramento County, California (Sugnet and Associates 1995).

The second full paragraph on page 3.10-22 of the 2008 RDEIR/SDEIS hereby revised as follows:

The project includes the creation of a 507-acre wetland preserve in the southern portion of the project site ~~and the establishment of two open space preserves that would be used for elderberry mitigation (Exhibit 3.10-3)~~. It also includes the creation of ~~197-187~~ acres of ~~drainage parkways and~~ open space corridors and 39 acres of stormwater detention basins. The open space corridors would consist of drainage corridors, constructed seasonal wetlands, and associated upland and riparian habitats. A total of 25.3 acres of wetlands consisting of approximately 8 acres of low-flow channel and 17 acres of seasonal wetlands would be constructed within the open space corridors. Drainage corridors would be recreated from historic drainage channels that existed on the project site before dredge mining activities. The creation of the drainage parkway would entail alteration of the western portion of the current channel of Morrison Creek. The proposed ~~drainage parkways~~ open space corridors would range from 200 feet to 300 feet in width and would consist of a meandering low-flow channel, adjacent wetlands, ~~and~~ riparian plantings, and a bike trail (ECORP Consulting ~~2007a-2009~~). Although development of the site would occur in distinct phases over time, ultimate buildout of the site would result in retention of little to no existing habitat in its current condition in those portions of the project site slated for urban development. Additionally, the scheduled closure and remediation of White Rock Dump Site No. 1, ~~located within the~~

~~open space preserve~~, would also result in ~~short term~~ loss of some existing habitat (i.e., elderberry shrubs) (ECORP Consulting 2005). The wetland preserve would be established before development of Phase 1 and the mitigation would occur as defined in the Section 404 permit. Compensatory mitigation would likely be tied to the various phases of development and would be phased in with project implementation.

Exhibit 3.10-3 on page 3.10-23 of the 2008 RDEIR/SDEIS is hereby revised as shown below to show that one of the elderberry preserves has been removed.

The fifth sentence from the end of the page on page 3.10-26 of the 2008 RDEIR/SDEIS is hereby revised as follows:

Vernal pools and other wetland habitat types within the wetland preserve and on adjacent parcels could be adversely affected by the effects of habitat fragmentation and resulting indirect impacts, including those resulting from the proposed construction of ~~17.9-13.45~~ acres of vernal pools ~~(plus 2 acres for mitigation of vernal pools not under USACE jurisdiction)~~ and 0.75 acre of associated seasonal wetland swale proposed as part of the project applicant(s)' wetland mitigation monitoring plan (MMP) for this project (ECORP Consulting ~~2005~~2009).

The fifth sentence on page 3.10-27 of the 2008 RDEIR/SDEIS is hereby revised as follows:

However, a hydrologic modeling analysis conducted for the proposed preserve using ArcGIS software tools and a Light Detection and Ranging (LiDAR) derived, fine-scale topographic model indicates that construction of Rancho Cordova Parkway and Americanos Boulevard would not jeopardize the hydrological integrity of vernal pools in the preserve because microwatersheds-ratios would be maintained, as described below.

The second paragraph under "Mitigation Monitoring Plan" on page 3.10-28 of the 2008 RDEIR/SDEIS is hereby revised as follows:

A revised draft wetland MMP was developed by ECORP Consulting in ~~September 2007~~June 2009 and is the applicant's proposed mitigation plan (ECORP Consulting ~~2007a~~2009). The revised draft MMP, included in Appendix Q to this document, is subject to review and approval by the appropriate regulatory agencies. Proposed mitigation in the revised draft MMP includes a combination of on-site preservation and compensatory mitigation (i.e., vernal pool creation), as well as off-site mitigation through purchase of the Cook Property (described below) and credit purchase in the Clay Station Mitigation Bank. Proposed on-site mitigation consists of designation of a 507-acre wetland preserve in the southern portion of the project site. A total of 20.4 acres of existing vernal pools are located in the proposed preserve, and restoration and creation of an additional ~~17.9-13.4~~ acres of vernal pools and 0.75 acre of seasonal wetland swale would occur in the preserve under the proposed MMP. The proposed preserve also contains 2.5 acres of seasonal wetland swale, 3.4 acres of seasonal wetland, 0.6 acre of pond, and 1.9 acres of ephemeral drainage. All of these features, as well as that portion of Morrison Creek that is within the 507-acre wetland preserve, would be preserved. The details of the MMP are still being reviewed by USACE; the ~~September 2007~~June 2009 draft is not the final, approved version. In compliance with City General Plan Policies, the wetland preserve would include wildlife-passable boundary fencing, and informational signage or kiosks would be erected along trails outside the preserve boundary to educate the public about the importance and benefit of wetlands.

The first full sentence on page 3.10-33 of the 2008 RDEIR/SDEIS is hereby revised as follows:

The Cook Property contains ~~22.3-15.2~~ acres of wetland habitat, ~~including 15.2~~ consisting of 2.7 acres of vernal pools, 9.9 acres of seasonal marsh, and 2.6 acres of seasonal wetland swales, as well as other waters of the United States consisting of a 6.5-acre pond and 0.58 acre of intermittent drainage (Frye Creek).

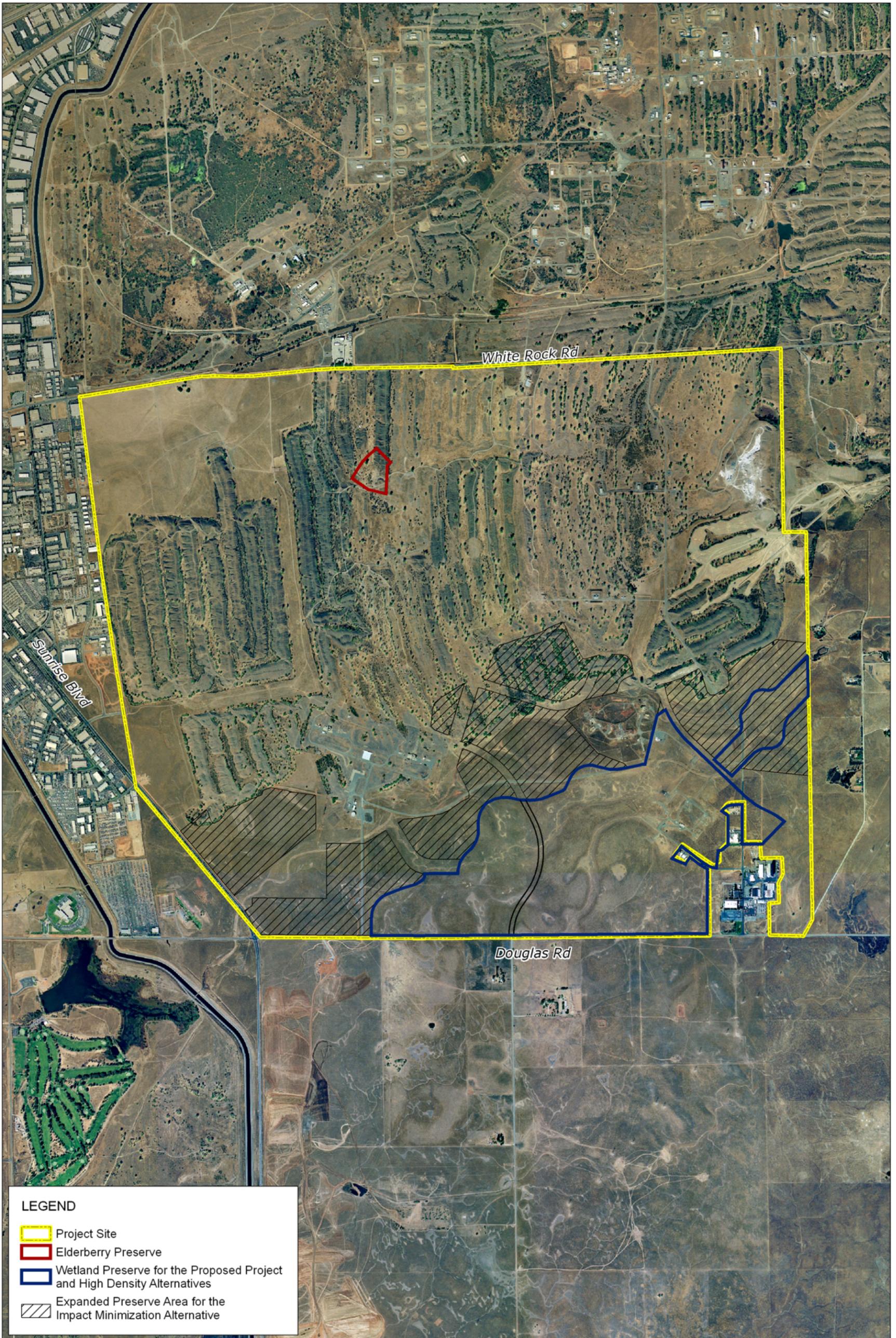
The first full paragraph on page 3.10-33 of the 2008 RDEIR/SDEIS is hereby revised as follows:

An additional ~~13~~16.7 acres of created seasonal wetland habitat are proposed to be purchased at the Clay Station Mitigation Bank (ECORP Consulting 2009). The Clay Station Mitigation Bank is located approximately 15 miles south of the project site and is bounded by Clay Station Road to the east, Laguna Creek and associated riparian habitat to the west, farmland to the north, and Brown’s Creek to the south. Clay Station is adjacent to other large preserves, such as Gill Ranch, that provide habitat connectivity to a larger preserve area. ~~The~~Success monitoring of the wetland habitat that would be purchased at the Clay Station Mitigation Bank has been completed and all mitigation habitat available is in the long-term monitoring and management phase, meaning that all of it ~~monitored for several years and is fully functioning as wetland habitat~~ (ECORP Consulting 2000, 2004d2009). These created wetlands exhibit functions and values similar to those of the wetland habitat to be affected at the project site. In addition, these wetlands currently support vernal pool fairy shrimp and tadpole shrimp (ECORP Consulting 2004d, 2007a2009). Both the Cook Property and Clay Station Mitigation Bank are currently owned by one of the project applicants (i.e., Elliott Homes) and in its control (ECORP Consulting 2007a2009).

Table 3.10-3 on page 3.10-34 of the 2008 RDEIR/SDEIS is hereby revised as follows:

Table 3.10-3 Summary of Wetland Impacts and Proposed Mitigation Acreage									
Wetland Type	Existing Acres	Isolated Acres	Impacts			On-site Preservation Acres ¹	On-site Creation Acres ²	Off-site Preservation Acres ³	Off-site Creation Acres ⁴
			Direct		Indirect				
			Jurisdictional Acres	Isolated Acres	Jurisdictional Acres				
Vernal pool	35.485	2.414	15.072	2.414	2.179	20.413	17.867 <u>13.449</u>	2.67	0
Pond	3.54	0.721	2.924	0.721	0	0.616	0	6.51	0
Seasonal wetland swale	6.044	0.653	3.587	0.653	0	2.457	<u>0.752</u>	0 <u>2.63</u>	0
Seasonal wetland	6.418	9.158	3.064	9.158	0	3.354	20.785 <u>16.941</u>	12.53 <u>9.90</u>	13 <u>16.67</u>
Ephemeral drainages	5.145	0	3.256	0	0	1.889	0	0.58	0
Channel/low-flow	0	0	0	0	0	0	8.402	0	0
Total	56.632	12.946	27.903	12.946	2.179	28.729	47.054 <u>39.544</u>	22.29	13 <u>16.67</u>
Total Impact:	43.028	Ratio							
Total Preservation:	51.019	1.19:1							
Total Compensation:	60.054 <u>56.21</u>	1.40:1 <u>1.31:1</u>							

Notes:
¹ Within 507 acres of on-site wetland preserve.
² Vernal pool habitat is proposed within a 507-acre wetland preserve and all other habitat is proposed within drainage corridors.
³ Preliminary Assessment of wetland acreage to be preserved off-site at the Cook Property.
⁴ Seasonal wetland habitat to be purchased at a bank to replace mitigation previously proposed within detention basins that are no longer feasible.
Source: ECORP Consulting ~~2007a~~2009



LEGEND

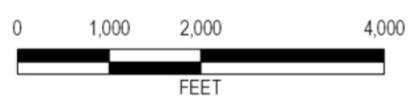
- Project Site
- Elderberry Preserve
- Wetland Preserve for the Proposed Project and High Density Alternatives
- Expanded Preserve Area for the Impact Minimization Alternative

Source: EDAW 2005, Sacramento County 2002, ECORP Consulting 2004(b), ECORP Consulting 2009

Proposed Preserves at the Rio del Oro Project Site

EXHIBIT 3.10-3

Rio del Oro Specific Plan Project Draft FEIR/FEIS
City of Rancho Cordova and USACE



The first sentence after Table 3.10-3 on page 3.10-34 of the 2008 RDEIR/SDEIS is hereby revised as follows:

The hydrologic analysis suggests that project implementation would not decrease the watershed ratios below levels necessary to sustain existing depressional wetlands or the proposed ~~17.9~~13.5 acres of compensatory vernal pools.

The following text is hereby inserted between the first and second full paragraphs on page 3.10-35 of the 2008 RDEIR/SDEIS:

An assessment of representative vernal pools and vernal pool systems within the proposed on-site wetland preserve was performed in 2008 using the California Rapid Assessment Method (CRAM) for Wetlands, Version 5.0.1 (Collins et al. 2007). Data obtained using CRAM shall be used to evaluate current conditions and serve as a baseline for future monitoring. CRAM shall be reapplied to the original CRAM assessment areas 1 year after construction of compensatory vernal pools to track changes in wetland functional condition of previously existing vernal pools and help identify potential causes of any adverse effects. CRAM shall be applied to the constructed pools and nearest neighbor pools within 3 years after creation of the constructed pools and CRAM shall be conducted on reference pools, constructed pools, and nearest neighbor pools again 1 year after project development adjacent to the wetland preserve has been completed. If overall CRAM scores drop by more than 20 points, a remediation or contingency plan shall be developed and CRAM shall be conducted again following implementation of remedial efforts to determine if CRAM scores have improved.

The current draft MMP (ECORP 2009) specifies that monitoring on the project site shall be conducted on 30 vernal pools in each of the following three categories: constructed pools, previously existing vernal pools within the same watershed as constructed pools (nearest neighbor pools), and previously existing pools that are not within the same watershed as a constructed pool or nearest neighbor pool (reference pools). The set of success criteria outlined in Table 3 of the draft MMP, or other success criteria agreed upon by the regulatory agencies in the final MMP, shall be used to determine the functional performance of the constructed and nearest neighbor pools compared to the reference pools.

The second sentence of the second full paragraph on page 3.10-35 of the 2008 RDEIR/SDEIS is hereby revised as follows:

Specific performance standards and success criteria, as agreed upon by the regulatory agencies, shall be specified in the final MMP, once approved by the agencies.

The first and second primary bullet points in Mitigation Measure 3.10-1a on pages 3.10-40 and 3.10-41 of the 2008 RDEIR/SDEIS are hereby revised as follows:

To accomplish this mitigation, the project applicant(s) shall take the following steps:

- ~~▶ The project applicant(s) shall conduct an assessment of representative portions of the proposed wetland preserves within the Rio del Oro property and any other proposed preserve areas using the California Rapid Assessment Method (CRAM) for Wetlands. Data shall be used to evaluate current conditions and serve as a baseline for future monitoring. The following requirements apply to the assessment of the proposed wetland preserves:~~
 - ~~• The field assessment shall be conducted during the flowering period for plant species associated with vernal pools, typically March through June.~~
 - ~~• The investigation shall define and evaluate assessment areas. Such areas shall be analyzed using 17 different metrics organized into four main attributes developed for vernal pool systems (*California Rapid Assessment Method for Wetlands Depressional Field Book, Version 5.0,*~~

~~September 2007). Those attributes are: buffer and landscape context, hydrology, physical structure, and biotic structure.~~

- ~~• CRAM scores shall be calculated for each assessment area by adding up the component metrics of each attribute and converting the sum into a percentage of the maximum score possible for that attribute.~~
- ~~• The CRAM analysis shall also include a discussion of potential stressors associated with human activities within or surrounding the wetlands assessed, which may provide qualitative information regarding the CRAM scores.~~

~~The data collected during the initial assessment shall serve as the baseline (preproject condition), to which data collected during future monitoring efforts shall be compared.~~

- ▶ As part of the Section 404 permitting process, a draft wetland MMP has been developed for the project (Appendix Q) by ECORP Consulting on behalf of the project applicant(s) (ECORP 2009). Before any ground-disturbing activities that would adversely affect wetlands and before engaging in mitigation activities associated with each phase of development, the project applicant(s) shall submit the draft wetland MMP to USACE, the Central Valley RWQCB, and the City for review and approval of those portions of the plan over which they have jurisdiction. Once the MMP is approved and implemented, mitigation monitoring will continue for a minimum of 5-10 years from completion of mitigation, or human intervention (including recontouring and grading), or until the performance standards identified in the approved MMP have been met, whichever is longer. Monitoring reports shall include baseline CRAM scores and the CRAM scores from all previous years shall be plotted to show the “restoration trajectory.”

The plan shall be prepared to the satisfaction of the City, in accordance with the City’s Grading and Erosion Control Ordinance, as well as to the satisfaction of those agencies with jurisdiction over all or portions of the plan.

The following text included in Mitigation Measure 3.10-1a at the end of page 3.10-42 (continuing onto page 3.10-43) of the 2008 RDEIR/SDEIS is hereby revised to read as follows:

- Authorization to place dredged or fill material into waters of the United States shall be secured from USACE through the CWA Section 404 permitting process before any fill is placed in jurisdictional wetlands or other waters of the United States. USACE has determined that the project will require an individual permit. In its final stage and once approved by USACE, the proposed mitigation and monitoring plan for the project is expected to detail proposed wetland restoration, enhancement, and/or replacement activities that would ensure no net loss of aquatic functions ~~and values~~ in the project vicinity. Approval and implementation of the wetland mitigation and monitoring plan shall fully mitigate all impacts on jurisdictional waters of the United States, including jurisdictional wetlands. In addition to USACE approval, approval by the City and the Central Valley RWQCB, as appropriate depending on agency jurisdiction, and as determined during the Section 401 and Section 404 permitting processes, will also be required. To satisfy the requirements of the City and the Central Valley RWQCB, mitigation of impacts on nonjurisdictional wetlands and waters of the state beyond the jurisdiction of USACE shall be included in the same mitigation and monitoring plan. ~~All mitigation requirements determined through this process shall be implemented before grading plans are approved.~~ Wetland mitigation must be approved before any impacts on ~~wetlands~~ waters of the United States or waters of the state commence.

The discussion under “Elderberry Savanna and Single Elderberry Shrubs Occurring at Isolated Locations Throughout the Project Site” on pages 3.10-47 and 3.10-48 of the 2008 RDEIR/SDEIS is hereby revised as follows:

~~Implementation of the Proposed Project Alternative or the High Density Alternative would result in the loss of 16.5 acres of elderberry savanna. Elderberry savanna is considered a sensitive natural community as identified by DFG and is tracked in the CNDDDB because elderberry shrubs are the host plant for VELB, a species that is federally listed as threatened. To minimize potential effects on VELB, two elderberry preserve areas, designated as Open Space/Preserve, would be established on the project site (Exhibit 3.10-3). The elderberry preserves would be located on land designated under the specific plan as Open Space/Preserve and would be maintained as such in perpetuity. There are currently 38 elderberry shrubs within the two 10- and 14-acre designated preserve areas. All 16 existing elderberry shrubs in the designated western preserve area would be preserved. The 22 existing elderberry shrubs in the designated preserve area that currently contains White Rock Dump No. 1 would have to be replanted because the majority of the shrubs would be displaced because of dump closure activities. Closure of White Rock Dump No. 1 requires a cap of clean soil to a depth of 5 feet, requiring that all elderberry shrubs be removed. The elderberry shrubs located in areas proposed for development would be relocated to the elderberry preserve areas. Elderberry shrubs removed as part of the closure of White Rock Dump No. 1 would be replaced after the preserve is created. Elderberry seedlings and associated natives would be planted in the elderberry preserve areas and within the proposed drainage corridors.~~

~~Although Section 7 consultation for the project is ongoing, a draft VELB mitigation plan has been developed by and ECORP Consulting (2007b)(Appendix R). Details from this draft plan, which might be modified slightly as a result of the issuance of the final biological opinion (BO) for the project, are provided in Impact 3.10-4. Implementation of this plan, as discussed under Mitigation Measure 3.10-4b, is in the process of developing a draft VELB mitigation plan, which would incorporate all recommendations and requirements specified in the final biological opinion (BO). The final VELB mitigation plan would be designed to satisfy mitigation requirements for the removal of elderberry savanna, a sensitive habitat as identified by DFG, as well as single elderberry shrubs. The final plan may include transplanting all existing shrubs, as well as planting elderberry seedlings in the open space corridors, and purchase of credits in a USFWS-approved mitigation bank. Mitigation measures in the plan include on-site preservation, transplanting, and seedling plantings within the two proposed preserves at ratios agreed upon by USFWS. Implementation of the mitigation plan with such measures (once approved) is expected to reduce impacts on elderberry savanna and elderberry shrubs occurring throughout the site to a less-than-significant level; therefore, a **direct** and **indirect less-than-significant** impact would occur.~~
[Similar]

The second sentence under “Elderberry Savanna and Single Elderberry Shrubs Occurring at Isolated Locations Throughout the Project Site,” referring to the Impact Minimization Alternative on page 3.10-49 of the 2008 RDEIR/SDEIS is hereby revised as follows:

~~A VELB mitigation plan similar to that developed for the Proposed Project and High Density Alternatives would be developed for this alternative.~~

The first paragraph under “Federally Listed Vernal Pool Invertebrates” on page 3.10-54 of the 2008 RDEIR/SDEIS is hereby revised as follows:

~~Suitable habitat for three federally listed vernal pool invertebrates is present on the project site. The vernal pool fairy shrimp and vernal pool tadpole shrimp have been identified in vernal pools located along the outer edges of the project site. Potential habitat for conservancy fairy shrimp is also present on the project site. Surveys for special-status aquatic invertebrates were conducted by Sugnet and Associates during February and March 1994. The surveys were conducted by pulling a D-frame 150-micron aquatic dip net across each pool. Each wetland basin present on the project site was sampled. The surveyors~~

identified vernal pool fairy shrimp and vernal pool tadpole shrimp at numerous locations. Vernal pool tadpole shrimp were encountered in vernal pools, seasonal wetlands, and swales throughout the project site while vernal pool fairy shrimp were restricted primarily to vernal pools in the southern half of the project site. Vernal pool tadpole shrimp and conservancy fairy shrimp are federally listed as endangered. Vernal pool fairy shrimp is federally listed as threatened.

The third sentence in the third full paragraph on page 3.10-55 of the 2008 RDEIR/SDEIS is hereby revised as follows:

In addition, the Proposed Project and High Density Alternatives include creation of approximately ~~17.9~~ 13.5 acres of vernal pools that could provide habitat for federally listed vernal pool invertebrates in the future, as well as off-site mitigation consisting of 22.3 acres at the Cook Property and 13 acres at Clay Station Mitigation Bank.

The text describing impacts of the Proposed Project and High Density Alternatives on VELB on pages 3.10-55 and 3.10-56 is hereby revised as follows:

Valley Elderberry Longhorn Beetle

VELB is federally listed as threatened, although in October 2006 its “delisting” was proposed. It is not known whether the species occurs on the project site, but because the site is within the range of the species and suitable habitat is present (e.g., elderberry shrubs), it is assumed that the species could be present. A total of 329 elderberry shrubs were identified on the project site in 2000 (Gibson & Skordal 2000a). A total of 310 elderberry shrubs would be directly affected by project implementation because they would be removed from their present locations. Exit holes, which may have been created by the beetle and suggest the presence of the beetle, were found on 42 of the shrubs (ECORP Consulting 2007b).

Although Section 7 consultation for the project is ongoing, an applicant-proposed *Draft Valley Elderberry Longhorn Beetle Mitigation Plan* has been developed by ECORP Consulting (2007b) and is included in Appendix R. After consultation with USFWS, the project applicant(s) developed a revised VELB mitigation plan in June 2009. The 2009 draft VELB mitigation plan includes the preservation of 19 existing shrubs, plus 3,230 elderberry plantings and 4,170 associated native plantings, totaling 7,400 plantings required for mitigation, as determined according to the USFWS conservation guidelines for VELB (USFWS 1999). The 2009 draft VELB mitigation plan proposes to satisfy 290.4 mitigation credits through plantings within a 12-acre on-site preserve and to purchase 449.6 credits at an off-site mitigation bank approved by USFWS. The draft mitigation plan is subject to review and approval by USFWS, and might be modified slightly when the final BO for the project is issued.

~~Two elderberry preserve areas, designated as Open Space/Preserve, would be established on the project site (Exhibit 3.10-3). There are currently 37 elderberry shrubs within the two 10- and 12-acre designated preserve areas. All 19 existing elderberry shrubs in the designated western preserve area would be preserved. The 18 existing elderberry shrubs in the designated eastern preserve area would also be retained. These areas would be fenced off during construction with the recommended 100-foot buffer zone marked with colored pin flags. The 292 elderberry shrubs located in areas proposed for development would be relocated to the elderberry preserve areas. In addition, 2,997 elderberry seedlings and 3,869 associated natives would be planted in the elderberry preserve areas and within the proposed drainage corridors. Furthermore, 154.2 VELB credits would be purchased at a USFWS-approved mitigation bank. The two preserves would be monitored over 10 consecutive years. The two preserve areas would be permanently fenced, protected by deed restrictions and conservation easements, and managed as wildlife habitat in perpetuity. A minimum of two field surveys would be conducted between February 14 and June 30 by a qualified biologist and a written report prepared and submitted for each of the 10 consecutive years.~~

Although the presence of VELB on the project site is not known, relocating the shrubs to land designated as Open Space/Preserve would not be expected to result in any measurable benefit to the species because the conservation areas would eventually be surrounded by development and isolated from larger areas of potential habitat. Furthermore, there are no assurances that the open space/preserve land would promote the long-term viability of the habitat. Therefore, as long as VELB remains a species considered threatened under the ESA, implementation of the Proposed Project Alternative or the High Density Alternative would result in **direct** and **indirect significant** impacts on VELB. *[Similar]*

The first, second, third, and fourth full paragraphs of Mitigation Measure 3.10-4a for the Proposed Project, High Density, and Impact Minimization Alternatives on page 3.10-59 of the 2008 RDEIR/SDEIS are hereby revised as follows:

A revised draft wetland MMP was developed by ECORP Consulting in ~~September 2007~~ June 2009 and is the applicant's proposed plan for addressing project impacts on habitats that potentially support federally listed vernal pool invertebrates. The draft MMP, included in Appendix Q to this document, is subject to review and approval by the appropriate regulatory agencies. Project implementation would result in the fill of 33.9 acres of habitat that could potentially support federally listed vernal pool invertebrates. This habitat consists of 17.5 acres of vernal pools, 4.2 acres of seasonal wetland swale, and 12.2 acres of seasonal wetlands. Indirect impacts on an additional 2.2 acres of vernal pools would also result from project implementation.

Proposed mitigation in the draft MMP includes a combination of on-site preservation and compensatory mitigation (i.e., creation of vernal pools), as well as off-site mitigation through purchase of a 160-acre property, known as the Cook Property, and credit purchase in the Clay Station Mitigation Bank. The Cook Property mitigation proposal would preserve 21.7 acres of existing wetland habitat, including 2.7 acres of vernal pools, 2.6 acres of seasonal wetland swale, and 9.9 acres of seasonal wetland within the Mather Core Recovery Area that could potentially support federally listed branchiopods. Surveys in the vicinity of the Cook Property have identified vernal pool fairy shrimp and vernal pool tadpole shrimp, and the property is contiguous with other conservation properties that support vernal pool habitat. The Clay Station Mitigation Bank would provide compensatory mitigation in the form of ~~13~~ 16.7 acres of created vernal pool habitat that has ~~been monitored for approximately 10 years met success criteria~~ and currently supports both vernal pool fairy shrimp and vernal pool tadpole shrimp. Proposed on-site mitigation consists of designation of a 507-acre wetland preserve in the southern portion of the project site. A total of 20.4 acres of existing vernal pools would be retained in the proposed preserve and an additional ~~17.9~~ 13.4 acres would be restored and created in the preserve under the proposed MMP. The proposed preserve also contains 2.5 acres of seasonal wetland swale, 3.3 acres of seasonal wetland, 0.6 acre of pond, and 1.9 acres of ephemeral drainage. All of these features, as well as that portion of Morrison Creek that is within the 507-acre wetland preserve, would be preserved. In addition, the proposed draft MMP proposes creation of ~~20.8~~ 16.9 acres of seasonal wetlands within the ~~drainage parkways~~ open space corridors that would be developed for the project.

In summary, the project would directly or indirectly affect 36.1 acres of potential vernal pool branchiopod habitat; the proposed MMP would preserve 41.4 acres of potential habitat and would create ~~51.6~~ 47.8 acres of potential habitat. This would result in a preservation ratio of 1.15:1 and a compensatory mitigation ratio of ~~1.43:1~~ 1.32:1, which would result in no net loss of vernal pool or seasonal wetland habitat that could potentially support federally listed vernal pool invertebrates. The details of the MMP are still being developed and reviewed by USACE, and the ~~September 2007~~ June 2009 draft is not the final, approved version.

The project applicant(s) shall complete and implement a habitat MMP that will result in no net loss of acreage, function, and value of affected vernal pool habitat. The final habitat MMP shall be consistent with ~~guidance provided in Programmatic Formal Endangered Species Act Consultation on Issuance of 404 Permits for Projects with Relatively Small Effects on Listed Vernal Pool Crustaceans within the Jurisdiction of the Sacramento Field Office, California (USFWS 1996)~~ and the SSCHCP (if adopted) or

shall provide an alternative approach that is acceptable to the City, USACE, and USFWS and accomplishes no net loss of habitat.

The second paragraph of Mitigation Measure 3.10-4b for the Proposed Project, High Density, and Impact Minimization Alternatives on page 3.10-61 (continuing onto page 3.10-62) of the 2008 RDEIR/SDEIS is hereby revised as follows:

Relocation of existing elderberry shrubs and planting of new elderberry seedlings shall be implemented on a no-net-loss basis. Detailed information on monitoring success of relocated and planted shrubs and measures to compensate (should success criteria not be met) would also likely be required in the BO. Ratios for mitigation of VELB habitat will ultimately be determined through the ESA Section 7 consultation process with USFWS, but shall be a minimum of “no net loss.” ~~Although Section 7 consultation for the project is ongoing, a draft VELB mitigation plan has been developed by ECORP Consulting (Appendix R). Because the proposed MMP is in draft form and a final BO has not been issued by USFWS, the proposed MMP may be modified in the future. Details from this draft plan are provided under the impact discussion above.~~ Section 7 consultation for the project is ongoing, and a VELB mitigation plan is being developed by ECORP Consulting. The final VELB mitigation plan may include creation of a 12 acre on-site preserve areas, transplanting of all existing shrubs to the on-site preserve areas, as well as planting of 2,997 elderberry seedlings in the proposed preserve areas and drainage parkways open space corridors, and purchase of 154.2 credits in a USFWS-approved mitigation bank. Based on the current (dated) knowledge of the number of shrubs on-site and the latest VELB preservation guidelines, it is expected that approximately 3,088 seedlings would need to be planted over an area of approximately 25 acres to fulfill VELB mitigation requirements and no net loss of habitat. Implementation of ~~this~~ the final approved plan would satisfy mitigation requirements for the removal of elderberry savanna, a sensitive habitat as identified by DFG, as well as single elderberry shrubs. A copy of the USFWS-approved mitigation plan shall be submitted to the City before the approval of any grading or improvement plans or any ground-disturbing activities within 100 feet of VELB habitat for all project phases.

The last sentence in the first paragraph of Mitigation Measure 3.10-4b for the No Federal Action Alternative on page 3.10-62 of the 2008 RDEIR/SDEIS is hereby revised as follows:

Conservation and minimization measures are likely to include preparation of supporting documentation that describes methods for ~~relocation of~~ relocating and maintaining existing shrubs ~~and maintaining existing shrubs and other associated vegetation in the preserve.~~

The last sentence of Mitigation Measure 3.10-5 on page 3.10-68 is hereby revised as follows:

Monitoring of the existing population of Greene’s legenera and the seeded populations shall be conducted in conjunction with monitoring of vernal pools and shall continue for a minimum period of 5 years, ~~as specified in Mitigation Measure 3.10-4.~~

CHAPTER 5, “REFERENCES”

The following new references for Section 3.10, “Biological Resources,” are hereby added to the list of references in Chapter 5 of the 2008 RDEIR/SDEIS:

ECORP Consulting, Inc. 2006. Late Season Special-Status Plant Survey for Rio del Oro, Sacramento County, California.

Miriam Green Associates. 1999. Results of Surveys for Special-Status Wildlife Species at the Aerojet Property, Sacramento County, CA.

APPENDICES

The wetland MMP for Rio del Oro, presented as Appendix Q of the 2008 RDEIR/SDEIS, was substantially revised in June 2009. Therefore, a revised Appendix Q to the 2008 RDEIR/SDEIS is hereby attached to replace the contents of the June 2009 version of the wetland MMP.

The VELB mitigation plan for Rio del Oro, presented as Appendix R of the 2008 RDEIR/SDEIS, was substantially revised in July 2009. Therefore, a revised Appendix R to the 2008 RDEIR/SDEIS is hereby attached to replace the contents of the July 2009 version of the VELB mitigation plan.

New Appendix S, *Memorandum Prepared by Lee Shull of Montgomery, Watson, Harza to Savid Suderquist of Youngdahl Consulting Regarding Arsenic in the Soil at the Rio del Oro Site (2007)*, is hereby added to this EIR/EIS.

New Appendix T, *Rio del Oro Development Project, Groundwater Impact Evaluation, Technical Memorandum* prepared by WRIME in 2005, is hereby added to this EIR/EIS.

New Appendix U, *Comparison of 2005 and 2007 Traffic Counts* prepared by Fehr & Peers Transportation Consultants in 2007, is hereby added to this EIR/EIS.

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6 REFERENCES

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