

6.0 RESPONSE TO COMMENTS

This chapter consists of seven sections, which include the responses to comments, both written and oral, received on the Draft EIR/EIS for the Santa Rosa Subregional Long-Term Wastewater Project, as well as other material which is related to the responses to comments. These seven sections are:

- Section 6.1, which provides an introduction to the responses to comments, and includes information about the certification of a Final EIR, along with other information to assist the reader in understanding the responses.
- Section 6.2, which includes Master Responses addressing issues which were frequently cited in the comments on the Draft EIR/EIS.
- Section 6.3, which consists of the Responses to Comments.
- Section 6.4, which includes documents cited in the Responses to Comments.
- Section 6.5, which identifies editorial revisions to the Draft EIR/EIS made by the EIR/EIS authors to correct typographical errors or internal inconsistencies within the document.
- Section 6.6, which consists of replacement pages for the Draft EIR/EIS. These pages included amplifying and clarifying changes which are made resulting from comments on the Draft EIR/EIS, as well as editorial changes made by the EIR/EIS authors.
- Section 6.7, which consists of a summary of subject matter of the Appendices produced as part of the EIR/EIS.

Volume XX includes Section 6.1, Section 6.2, and the first part of Section 6.3. Volume XXI includes the remainder of Section 6.3, along with Section 6.4 and Section 6.5. Volume XXII includes Section 6.6 and Section 6.7

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6.2 MASTER RESPONSES

INTRODUCTION

Review of the comments made on the Draft EIR/EIS showed that some comments were made frequently, demonstrating a common concern that was widespread among both those submitting written comments and those speaking at the public hearing. In some cases the array of similar comments about a particular topic provided a clearer picture of a particular suggested alternative, technical concern, or procedural issues than was provided by any single comment. To allow presentation of a response that addresses all aspects of these related comments, Master Responses have been prepared for those topics that were raised in a number of comments from agencies and members of the public. These Master Responses are intended to allow a well-integrated response addressing all facets of a particular issue, in lieu of piece-meal responses to each individual comment, which may not have portrayed the full complexity of the issue. The use of a Master Response is in no way intended to minimize the importance of the individual comments. In fact, Master Responses were used as a way to highlight some of those issues that appeared to be of particular importance to those making comments.

MASTER RESPONSE 1 - DOCUMENT ORGANIZATION

Comment Summary: Several comments objected to the length and organization of the Draft EIR/EIS.

Response Summary: Because of the complex nature of this Project (including 13 subalternatives evaluated at a project-level of detail), a prior 1992 court decision, and the decade-long extensive public controversy, the EIR/EIS authors believe that the length of the Draft EIR/EIS is reasonable and necessary. The Draft EIR/EIS impact evaluation is organized by component rather than by alternative because this approach decreased the length of the document and eliminated frequent repetition. The evaluation by component is all-inclusive: all proposed actions are included and analyzed as a component in the Draft EIR/EIS, and the EIR/EIS authors believe this has resulted in a clearer presentation.

Complex Nature of the Project

The EIR/EIS is lengthy because it analyzes a complex project and contains an analysis of the environmental impacts for five alternatives (13 subalternatives) at a project level of detail. Those alternatives themselves are comprised of various combinations of components. As a result, the EIR/EIS presents a much larger amount of information than most such documents.

This length and detail were compelled by several factors. The Project area encompasses approximately 45,000 acres in Sonoma and Marin counties. The area of potential impacts was thus large, necessitating an extensive analysis.

Also, the City and the Board of Public Utilities wanted to ensure that the EIR/EIS would satisfy not only all requirements of CEQA and NEPA, but would be a document that would address and evaluate the extraordinary range of issues that have been raised by interested members of the public throughout consideration of this Project. As a result, a team was assembled with a range of expert qualifications matched to the issues. Those qualifications are generally explained in Appendix B to the Draft EIR/EIS, and in more extensive statements of expertise on file with the City of Santa Rosa.

In addition, the draft analyses in each section of the proposed Draft EIR/EIS were reviewed by the Project's Peer Review Committee for accuracy and completeness before the document was deemed ready and released for public circulation and review. This Peer Review Committee included individuals from various academic institutions in California and the western U.S., whose qualifications are also on file with the City. This process of expert preparation and peer review necessarily resulted in extensive analyses.

Prior Court Decision

In 1992 the Sonoma County Superior Court invalidated a prior EIR on a proposed long-term wastewater project with certain similarities to the Project. In its decision, the Court

concluded that the EIR was invalid, since it improperly analyzed a preferred project at a higher level of detail than the alternatives: as the Court said, "the public and reviewing agencies should not have to compare alternatives whose analyses are so discrepant that the comparison amounts to one between apples and oranges." The length and complexity of this Draft EIR/EIS reflects a project-level analysis of the five alternatives and potential subalternatives, and thus responds to this specific criticism of the prior EIR.

In that 1992 decision the Court also held that the EIR was inadequate for failing to contain either sufficient analysis of a number of issues or sufficient evidentiary support for certain conclusions. As a result, there were over 100 special studies performed prior to the production of the Draft EIR/EIS and used in the development of alternatives, criteria and the analysis itself. These studies, and their accompanying analysis, necessarily led to a document which is both lengthy and complex.

The authors of the Draft EIR/EIS wanted to ensure that the document reflects the philosophy of CEQA and NEPA that the public and decision makers should have a full explanation of all aspects of the proposed Project so that they can make an informed and responsible decision. This too was a point made by the Court in its prior decision:

"A major function of the EIR is to ensure thorough assessment of all reasonable alternative[s] to proposed projects by those responsible for the decision. An EIR which does not produce adequate information regarding alternatives cannot achieve the dual purpose served by the EIR, which is to enable the reviewing agency to make an informed decision and to make the decision makers' reasoning accessible to the public, thereby protecting informed self-government."

Organization by Component

The Project analyzed in the Draft EIR/EIS is not a single or preferred project. As the Draft EIR/EIS explains, on page 3.1-1, the Board of Public Utilities directed that "alternatives be considered that will represent a wide spectrum of potential solutions to the Subregional System's need to dispose of reclaimed water." As the document explains on page 3.1-4:

"this analysis, by addressing impacts of individual components as well as the five alternatives, is intended to allow the selection of a Project that falls within the range of alternatives included in this EIR/EIS, and which may include components which are reduced in scope, or may combine components from more than one alternative."

This type of analysis was intended to present a "wide spectrum of potential solutions to the Subregional System's need to dispose of reclaimed water" and to maximize public involvement in discussion and choice of the ultimate Project chosen by the Board of Public Utilities and the City Council. Presentation of this spectrum necessarily was extensive and complex.

The task of organizing and presenting this vast amount of information and analysis was difficult. The EIR/EIS authors considered several approaches to document organization. The most important goals in that evaluation were:

- To provide the public with a document that would be easy to read;
- To provide the public with a document that presented the conclusions in as short and concise a document as possible;
- To provide the level of technical environmental analysis required by CEQA and NEPA and the prior Court ruling; and
- To provide a document that would satisfy all CEQA and NEPA requirements.

Layers of Information

As a result, the document was designed to present a three-layered approach to review depending upon the reader's interest. The first layer is the Introduction and Summary contained in Volume I which provides the reader with Project background and a summary of the environmental impacts identified. This Summary was mailed out free to about 700 people at the start of the period for public review of the Draft EIR/EIS.

The second layer, Volumes I, II and III combined contain the complete Draft EIR/EIS, thus providing an interested reader with a significantly greater level of detail than that provided by the Summary alone. Chapter 3 of the Draft EIR/EIS provides a concise description of the existing system and proposed Project, and any reader who wished to understand the alternatives and components was directed to the appendices and maps of the various alternatives.

The third layer, Volumes IV through XVII contain the technical appendices which support the EIR/EIS. These volumes provide detailed technical back-up for readers with a more technical orientation, but it is not necessary to read all 17 volumes to understand the Project and its impacts.

Length of the Document

Within the complete Draft EIR/EIS (Volumes I, II and III), the EIR/EIS authors considered a text which would have evaluated the five proposed alternatives (the No Action/No Project Alternative, plus Alternatives 2 through 5). However, as indicated above, those alternatives themselves are comprised of various combinations of components and many of the components are contained within more than one alternative. Because of this, the EIR/EIS authors concluded that an alternative by alternative analysis would have resulted in a document which contained an extraordinary amount of repetitive and difficult to follow text, one which would have been much lengthier than the actual Draft EIR/EIS.

The CEQA Guidelines, Section 15141, and the NEPA regulations (40 CFR Part 1502.7) state that a draft EIR/EIS should normally be less than 150 pages. These are recommendations to encourage agencies to reduce unneeded bulk in such a document,

and to facilitate disclosure of the key environmental issues to the decision-makers and the public.

In this case, the Draft EIR/EIS evaluated impacts for 13 unique subalternatives at a project level of detail. For example, Alternatives 2 and 3 include ten alternative possible reservoir sites, and Alternative 5 includes two possible alternative discharge points. If each of these subalternatives had been evaluated in a separate project-level EIR/EIS, under the Guidelines and the regulations it would have been reasonable to have spent 150 pages discussing the impacts of each--or a total of 1,950 pages (13 x 150 pages). This document is instead approximately 1,500 pages.

Neither the CEQA Guidelines nor the NEPA regulations provide absolute page limits. Both acknowledge that there will be exceptions. Because of the complex nature of this Project, the prior Court decision, and the decade-long extensive public controversy, the authors believe that the length of the Draft EIR/EIS is reasonable and necessary.

All-inclusive Nature of the Approach

The document was organized to present an evaluation of each component individually, and then evaluate the combined components in the alternatives at the end of each section. At the conclusion of each section of Chapter 4, the discussion of alternatives addresses the combined impact of all of the components in that alternative, and each alternative was defined in terms of specific components (refer to Table 3.3-1 on page 3.3-4 of the Draft EIR/EIS). The EIR/EIS authors believe that this has resulted in a shorter document than otherwise would have been prepared, with a clearer presentation. Importantly, this method of presentation means that the list of components evaluated is all inclusive: that is, there are no proposed actions not included and analyzed as a component in the Draft EIR/EIS.

Assistance Offered

The City also set up a toll-free number to assist any readers with navigation and clarification of the document; that number was made available during the presentation of the document to the Board of Public Utilities and on the cover letter of the 700 summaries that were distributed at the beginning of circulation. That number connected a caller directly with the Project Manager for the EIR/EIS, who was then available to assist with clarification or questions, or use of the CD-ROM.

Conclusion

Indeed, the authors believe that this choice of format and length of the Draft appears to have been successful. While some agencies commented that the document was overly long and complex, the U.S. Environmental Protection Agency (Comment Letter 2) specifically noted and commended "the Corps and the City of Santa Rosa for the organized and well written DEIS." The California Department of Fish and Game

(Comment Letter 12) likewise commended the City "for developing a thorough, rigorous evaluation of environmental impacts associated with the proposed project."

MASTER RESPONSE 2 - STATEMENTS OF OPINION FOR OR AGAINST A PROJECT ALTERNATIVE

Comment Summary: In many cases, comments include an opinion regarding which Project alternative should be selected for implementation.

Response Summary: Comments regarding selection of a Project are not comments on the Draft EIR/EIS, but comments on the selection of an alternative, a process that will occur after the EIR is certified.

A Final EIR/EIS need only respond to comments on the Draft EIR/EIS (CEQA Guidelines 15132 and 40 CFR 1503.4(b)). However, these recommendations for or against a particular Project alternative are valuable input to the process of selecting a Project. These comment letters have been forwarded to the Santa Rosa Board of Public Utilities and City Council. If this Final EIR is certified as adequate, the Board and Council will consider the recommendations in these comment letters as well as the information presented in the EIR, and make its decision regarding selection of a Project.

The Project alternatives evaluated in the EIR/EIS are the result of an extensive screening and scoping process based upon the Regional Water Quality Control Board mandate and Project Objectives and utilizing many screening criteria. This resulted in the selection, not of one preferred project, but a number of alternatives different components. Each of the alternatives is evaluated at an equal level of detail; some alternatives contain similar components, and components of different alternatives can be combined. These alternatives were picked to meet the mandate for a reasonable range of alternatives that could feasibly achieve the Project Objectives. These alternatives were also specifically defined in such a way that they would allow for the valuation of the maximum range of potential environmental impacts of any project that the City may ultimately select. For more information, refer to Sections 1.4 and 1.5, Project Background and Public Involvement, in the Summary of the Draft EIR/EIS.

MASTER RESPONSE 3 - AVAILABILITY AND COST OF THE DOCUMENT

Comment Summary: Several comments have questioned the availability and/or the cost of the Draft EIR/EIS.

Response Summary: The Draft EIR/EIS was noticed properly and made available to the public and agencies as required by CEQA and NEPA regulations. The document could be reviewed for free at numerous locations in Sonoma, Marin, and Mendocino counties and was available for purchase for the cost of reproduction.

Regulatory Requirements

CEQA and NEPA provide that the Lead Agency should furnish copies of Draft EIRs and EISs to public library systems serving the area involved, and copies should be available in the offices of the Lead Agency (CEQA Guidelines Section 15087(e) and 40 CFR 1502.19). Copies of the document must be provided at a fee not to exceed reproduction costs (CEQA Guidelines Section 15045 and 40 CFR 1506.6).

Availability at Libraries and Agencies

For a complete listing of agencies and individuals who received a copy of the Draft EIR/EIS, refer to Table 3-1 at the end of this Master Response. The document was widely distributed at local libraries. Each of the libraries was open at least one evening a week as well as on Saturday. Many of the libraries were open two evenings a week, and the Sonoma County Central Library and the Sonoma State University Library were also open on Sundays. The main body of the Draft EIR/EIS, Volumes I-III was available at 16 regional libraries from Ukiah in the north to San Rafael in the south. The entire Draft EIR/EIS, including appendices, was available at the Guerneville Library, the Sonoma County Library in Santa Rosa, and the Sonoma State University Library in Cotati. A CD-ROM version of the document was available at the Cloverdale Regional Library, the Marin County Library in San Rafael, the Petaluma Regional Library, the Rincon Valley Regional Library in Santa Rosa, the Sonoma County Central Library, the Sonoma State University Library, and the Windsor Library. The CD-ROM contained Volumes I-XV, that is, the main body of the Draft EIR/EIS plus technical appendices. (The CD-ROM did not contain the Scoping Report, Volumes XVI and XVII, which received wide circulation when it was published in 1995 before preparation of the Draft EIR/EIS). The CD-ROM provided for comparative analysis. Separate pages can be opened and viewed on the computer at the same time. The search capability provided a powerful tool in quickly comparing analyses and data.

The complete document, together with copies of referenced material, was available at the Laguna Plant. Although the Laguna Plant Library is generally open only during normal working hours, the staff made special arrangements so that the public could use the document either after hours or on the weekend.

Cost of the Document

A free 60-page Summary of the Draft EIR/EIS was mailed out to about 700 people at the start of the review period. Subsequently, the document either in whole or in part was available for purchase at the City and at Kinko's in Santa Rosa for the cost of reproduction. The main body of the Draft EIR/EIS, Volumes I-III could be purchased for \$120; the entire document including appendices cost \$1,600, which is the cost of reproduction. The CD-ROM was also available for \$120; this cost was determined based upon the costs of transferring the document to the CD-ROM format and the actual pressing of the CD-ROM.

To further assist in the review, a toll-free 800 telephone number was provided that was answered by the EIR/EIS project manager, who provided assistance in locating information or making arrangements to view the document.

Prior to publishing the Draft EIR/EIS, the public also had extensive opportunity to review portions of the document. The criteria for significance were circulated, free to interested persons, and draft versions of each impact analysis section were presented at public roundtable discussion in November and December, 1995. For the "Roundtables", each section was mailed to interested parties for free, the EIR/EIS authors and City staff were available to answer any questions at a series of eight evening meetings, and written or oral comments could be submitted by the public. Refer to pages 1-16 and 1-17 of the Draft EIR/EIS for a complete discussion of public involvement during the Scoping and Study Phases of the Project.

Conclusion

The Draft EIR/EIS was thus made available in a manner that meets CEQA and NEPA requirements.

Master Response 3 - Table 1

Agencies and Individuals Who Received the Draft EIR/EIS

Agency/Individual	Volumes Received (# of Copies)	(C) Charge/ (NC) No Charge
FEDERAL AGENCIES		
Bureau of Land Management	Vol. I-XVII (1)	NC
Defense Technical Information Center	Vol. I-III (12) CD-ROM(12)	NC
Department of the Interior	Vol. I-III (8) CD-ROM(6)	NC
National Marine Fisheries Service/Dick Butler	Vol. I-III (1) CD-ROM(1)	NC
National Oceanic and Atmospheric Administration/Edward Ueber, Sanctuary Manager	Vol. I-III (3) CD-ROM(1)	NC
National Oceanic and Atmospheric Administration - Washington	Vol. I-XVII (1)	NC
Natural Resources Conservation Service (Davis office)	Vol. I-III (1) CD-ROM(1)	NC
Natural Resources Conservation Service (Petaluma office)	Vol. I, II, IV (1) CD-ROM(1)	NC
U.S. Army Corps of Engineers/Wade Eakle	Vol. I-XVII (2)	NC
U.S. Army Corps of Engineers/Kenneth Kimidy	Vol. I-III (1) CD-ROM(1)	NC
U.S. Environmental Protection Agency - Washington D.C.	Vol. I-III (5) Vol. IV-XVII (2) CD-ROM(1)	NC
U.S. Environmental Protection Agency - Region 9, San Francisco	Vol. I-III (1) CD-ROM(1)	NC
U.S. Fish and Wildlife Service, Division of Ecological Service/Wayne White	Vol. I-III (1) CD-ROM(1)	NC
U.S. Fish and Wildlife Service, San Pablo National Wildlife Refuge/Betsy Radtke	CD-ROM(1)	NC

Master Response 3 - Table 1

Agencies and Individuals Who Received the Draft EIR/EIS

Agency/Individual	Volumes Received (# of Copies)	(C) Charge/ (NC) No Charge
STATE AGENCIES		
California Coastal Commission/Mark Delapaine	Vol. I-III (1) CD-ROM (1)	NC
California Department of Forestry/Louis Schiocchetti	Vol. I-III (1) CD-ROM (1)	NC
California Department of Health Services - Drinking Water Program	CD-ROM(1)	NC
California Department of Transportation/Joe Browne	Vol. I-III (1) CD-ROM (1)	NC
California Environmental Protection Agency - State Water Resources Control Board/Marc Del Piero	Vol. I-III (1)	NC
Historical Resources Information Systems, Sonoma State University	Vol. I-III(1)	NC
North Coast Regional Water Quality Control Board/Tuck Vath	Vol. I-XVII (1) CD-ROM(1)	NC
San Francisco Bay Regional Water Quality Control Board/Greg Walker	Vol. I-III (1) CD-ROM(1)	NC
State Clearinghouse	Vol. I-III (10)	NC
State Coastal Conservancy/Joan Cardellino	Vol. I-III (1) CD-ROM(1)	NC
State Department of Fish and Game/Bill Cox	Vol. I-III(1) CD-ROM (1)	NC
State Lands Commission/Jeffrey Adams	Vol. I-XVII (1) CD-ROM (1)	NC
State Lands Commission/Sharon Hadler	CD-ROM(1)	NC
Water Resources Center Archives, Univ. of California Berkeley	Vol. I-III(1)	NC

Master Response 3 - Table 1

Agencies and Individuals Who Received the Draft EIR/EIS

Agency/Individual	Volumes Received (# of Copies)	(C) Charge/ (NC) No Charge
REGIONAL/COUNTY AGENCIES		
County of Marin Environmental Health/Ed Stewart	Vol. I-III (1) CD-ROM(1)	NC
Marin Conservation League	Vol. I-XVII (1)	NC
Marin County Planning/Carol Williams	Vol. I-III (1) CD-ROM(1)	NC
Marin Municipal Water District/Ron Theisen	CD-ROM(1)	NC
Marin/Sonoma Mosquito Abatement District/Charles Dill	Vol. I-III (1) CD-ROM(1)	NC
North Marin Water District/Joyce Arnold	CD-ROM(1)	NC
SF Bay Conservation & Development Commission	Vol. I-III (1) CD-ROM (1)	NC
Sonoma County Agriculture Commission/Richard H. Bennett	Vol. I-III (1) CD-ROM(1)	NC
Sonoma County Permit & Resource Management Department/Richard Rogers	Vol. I-III (1) Vol. IV-XVII (1) CD-ROM(1)	NC NC NC
Sonoma County Water Agency/Renee T. Webber	Vol. I-XVII (1) CD-ROM(1)	NC
CITY AGENCIES		
City of Cotati	Vol. I-III(1)	NC
City of Rohnert Park	Vol. I-XVII (1) CD-ROM(1)	NC
City of Sebastopol	Vol. I-XVII (1) CD-ROM(1)	NC
City of Windsor	CD-ROM(1)	C
Laguna Wastewater Treatment Plant	Vol. I-XVII (1) CD-ROM (1)	NC

Master Response 3 - Table 1

Agencies and Individuals Who Received the Draft EIR/EIS

Agency/Individual	Volumes Received (# of Copies)	(C) Charge/ (NC) No Charge
Valley of the Moon Water District/Mike Alexander	Vol. I-III (1) CD-ROM (1)	NC
LIBRARIES		
Cloverdale Library	Vol. I-III (1) CD-ROM (1)	NC
Forestville Library	Vol. I-III (1)	NC
Guerneville Library	Vol. I-XVII (1)	NC
Healdsburg Library	Vol. I-III (1)	NC
Marin County Library - Civic Center Branch	Vol. I-III (1) CD-ROM (1)	NC
Northwest Santa Rosa Library	Vol. I-III (1)	NC
Novato Library	Vol. I-III (1)	NC
Occidental Library	Vol. I-III (1)	NC
Petaluma Library	Vol. I-III (1) CD-ROM (1)	NC
Point Reyes Library	Vol. I-III (1)	NC
Rincon Valley Library	Vol. I-III (1) CD-ROM (1)	NC
Rohnert Park-Cotati Regional Library	Vol. I-III (1)	NC
Sebastopol Library	Vol. I-III (1)	NC
Sonoma County Library - Central Branch	Vol. I-XVII (1) CD-ROM (1)	NC
Sonoma State University Library	Vol. I-XVII (1) CD-ROM (1)	NC
Ukiah Library	Vol. I-III (1) CD-ROM(1)	NC
Windsor Library	Vol. I-III (1) CD-ROM (1)	NC
GROUPS/INDIVIDUALS		
Agricultural Property Rights Alliance	CD-ROM(1)	C

Master Response 3 - Table 1

Agencies and Individuals Who Received the Draft EIR/EIS

Agency/Individual	Volumes Received (# of Copies)	(C) Charge/ (NC) No Charge
Brenda Adelman/Russian River Task Force	Vols. I, II, III, IV, VII, VIII, IX, X, XI, XIII, XV V(1)	C
Boyle Engineering/Carl E Jacobson	Vol. I-III(1) CD-ROM(1)	C
Carlile Macy Mitchell & Heryford	Vol. I-III(1)	C NC
Pacific Gas & Electric/Dean Cooley	CD-ROM(1)	C
UNOCAL/Douglas S Hackley	Vol. I-III (2) CD-ROM (2)	C
EOA Inc.	CD-ROM(1)	C
Heller Ehrman White & Mcauliffe	CD-ROM(1)	C
John Geddie	Vol. I-III (1) CD-ROM(1)	C
Marin Conservation League	Vol. I-XVII (1)	NC ¹
Marin Environmental Forum	CD-ROM (1)	LOAN
Martin Coopender	Vol I-III(1)	C
Martin Griffin/Russian River Task Force	Vol. I-XVII (1)	C
Muelrath Ranches	CD-ROM(1)	C
Redwood Agricultural Management	CD-ROM(1)	C
Richard Charter	Vol. I-III(1)	C
Robert Anderson/United Wine Growers of Sonoma County	Vol. I-III(1)	C
Robert L Hardy/North Coast Builders Exchange	Vol. I-III(1)	C C
Environmental Center of Sonoma County	Vol. I-XVII (1) CD-ROM (1)	NC ¹
Steve Klausner	CD-ROM(1)	C
Stone & Webster Engineering Corp.	CD-ROM(1)	C
Stone & Youngberg	CD-ROM(1)	C

Master Response 3 - Table 1

Agencies and Individuals Who Received the Draft EIR/EIS

Agency/Individual	Volumes Received (# of Copies)	(C) Charge/ (NC) No Charge
The Press Democrat	Vols. I-III (1) CD-ROM(1)	C
Union Oil Company of California	CD-ROM (2)	C
Winzler & Kelly Consulting Engineers	CD-ROM(1)	C

Note:

- 1 Copies of the Draft EIR/EIS were provided to the Marin Conservation League and the Environmental Center of Sonoma County free of charge because they made the copies available to the public.

MASTER RESPONSE 4 - TIME FOR REVIEW OF THE DOCUMENT

Comment Summary: Several comments have been submitted stating there was inadequate time to review the Draft EIR/EIS.

Response Summary. The Draft EIR/EIS review period was 65 days long, 20 days longer than the law requires.

The required circulation period for a Draft EIR is normally 45 days (CEQA Guidelines 15106), and for a Draft EIS, a minimum of 45 days (40 CFR 1506.10). Copies of the Draft EIR/EIS Summary were mailed to about 700 recipients on August 5, 1996. The Draft EIR/EIS was easily available at libraries or for purchase; refer to Master Response 3 for a list of locations of the document. The complete EIR/EIS was initially published and the Notice of Completion filed with the State Clearinghouse on July 31, 1996. The EPA published notice of the Draft EIS on August 16, 1996. Distribution to the City was made on August 1, and distribution to the libraries was complete by August 2, 1996. Comments were accepted by the City of Santa Rosa until 5 p.m. on October 7, 1996.

Calculating the circulation period beginning on August 3, the first full day the document was available in libraries, the circulation period was 65 days long. This is 20 days longer than the law requires. Realizing that the Draft EIR/EIS is longer and more complicated than most, the City provided this additional time for review, although it was not required. Judging from the large number of letters (138) and comments (3,552) and the detailed nature of many of the comments on even the most technical sections, it appears that the review period was adequate for the public to formulate and submit their comments on the document. Indeed CEQA allows consideration of comments submitted after the official comment period; six comment letters were received after the close of the comment period and responses have been provided to each.

The City of Santa Rosa, as Lead Agency, took several steps to facilitate review of the document, including numerous public participation opportunities, wide distribution of an "in-progress" version of the Draft EIR/EIS at the "Roundtables" in November and December 1995, newsletters, and provision of the document on CD-ROM. Refer to pages 1-16 and 1-17 of the Draft EIR/EIS for a discussion of public involvement in the Scoping and Study Phases of the Project. In addition, cooperating agencies (the Bureau of Land Management and the National Oceanic and Atmospheric Administration, Gulf of the Farallones National Marine Sanctuary) were provided with an Administrative Draft of the EIR/EIS to review 84 days prior to publishing the Draft.

MASTER RESPONSE 5 - USE OF DATA

Comment Summary. A number of commentors have suggested that the information presented in the Draft EIR/EIS was not adequate. In some cases, adequacy was questioned because the commentors recommended that new or different studies should be undertaken. Some commentors felt that there should have been more long-term studies of potential impacts and some felt more data should be gathered about current conditions. In some cases, the commentors themselves were experts in their field and took a contrary position to the analysis presented in the Draft EIR/EIS, or the commentor presented information from experts which appeared to differ from conclusions reached in the Draft EIR/EIS.

Response Summary. The EIR/EIS has been prepared and reviewed by one or more experts after extensive and systematic consultation with the public and agencies. Even though additional studies could be performed the analysis must be governed by what "is reasonably feasible." CEQA and NEPA do not require that all disagreements among experts be reconciled in a Final EIR/EIS.

Expert Review and Consultation

The authors of the EIR/EIS, in consultation with peers and experts in the field, have concluded that the analysis contained in the EIR/EIS is adequate. The authors of the Draft EIR/EIS were guided in the preparation of both the Draft EIR/EIS and in the responses to comments by the relevant sections of CEQA and NEPA, the regulations implementing both CEQA and NEPA, and case law interpreting these statutes. In particular, the authors were guided by the CEQA Guidelines Section 15151 which states:

"An EIR should be prepared with sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness and a good faith effort at full disclosure," (Cal. Code Reg. Section 15151)

An EIR's evaluation of a project's potential impacts is subject to the "rule of reason". An EIR will not be inadequate simply because the data analyzed are not the most complete data that could be obtained. An EIR may rely on informed judgments of the author. In the case of the Draft EIR/EIS, the analysis relied upon an extensive system of literature search; public consultation; consultation with agencies at both a policy and technical level; consultation with interested individuals, organizations and specialists; and the assembly of a consulting team consisting of a broad range of specialists. Refer to the Screening Report for a more complete summary of this process and the conclusions reached. Similarly, the Draft EIR/EIS was prepared after an extensive and systematic

consultation with the public, with agencies, with interested individuals, organizations, and experts. Each section was prepared by one or more experts in the respective field (whose names are set forth at the conclusion of each section). Drafts were reviewed by peer groups for accuracy and adequacy. The analysis contained in the Draft EIR/EIS and the responses to comments integrate information available from existing studies and analysis, information derived from the additional studies conducted as a part of the preparation of the Draft EIR/EIS, and the professional views of the authors and of those who commented on the work of the authors.

Additional Studies

Preparation of the Draft EIR/EIS, including the Scoping Process, required over three years. This is beyond what CEQA or NEPA suggest as guidelines for completion. However, the authors of the Draft EIR/EIS believe that the time was appropriate and necessary for the extensive and complex nature of the Project and the alternatives considered. Part of this preparation time was consumed by the many studies prepared for the Draft EIR/EIS and the analysis of existing data. CEQA does not require the authors of an EIR/EIS to conduct every recommended or possible test or research in evaluating a project's potential environmental impacts. Even though additional studies could be helpful or could shed additional light on the issue, the analysis must be governed but what "is reasonably feasible". Said another way, there is no requirement that an agency or the authors of an EIR wait for those studies that might be conducted that would provide additional information before issuing a draft EIR. The authors of the EIR/EIS, in consultation with peers and experts in the field, have concluded that the analysis contained in the Draft EIR/EIS is adequate.

Disagreement among Experts

Similarly, CEQA and NEPA do not require that all disagreements among experts be reconciled in a Final EIR/EIS. The preparation and review process utilized in preparing the Draft EIR/EIS, as well as the response to comments, has been designed for multiple and overlapping consultation with experts in the field. Certain comments from persons or organizations claiming expertise and commentators submitting information from experts questioned some conclusions reached in the Draft EIR/EIS. CEQA does not require that the disagreements be reconciled. In fact, CEQA recognizes that experts can disagree. The authors of the Draft EIR/EIS, as well as decision makers, are permitted to form their own conclusions about which information from potentially disagreeing experts, is to be relied upon. CEQA requires that the main points of disagreement be summarized. In certifying the Final EIR the City will be required to weigh the accuracy and sufficiency of the information in the Draft EIR/EIS and decide whether to accept it or not. Decision makers may defer to the judgment of the authors of the Draft EIR/EIS, even though other experts disagree (or may reach different conclusions). The responses to comments are designed to provide adequate response, highlight the reasons the authors of the Draft EIR/EIS concluded as they did about any potential environmental consequences, and point to the analysis supporting the conclusions. In addition, the responses to comments have been prepared in such a way as to summarize and highlight points of disagreement.

Thus the public and decision makers will have before them in the Final EIR, a summary of the relevant portions of the Draft EIR/EIS, the reasons for those conclusions, references to the data supporting those conclusions, the comments of those who disagree with the conclusions, and responses to those comments that highlight how they may differ from or be reconciled with the Draft EIR/EIS. In this way, the decision makers and the public are presented with a full discussion of the potential environmental impacts of the Project.

MASTER RESPONSE 6 - LACK OF WILLING IRRIGATORS FOR THE WEST COUNTY ALTERNATIVE

Comment Summary: Several comments have stated that a West County alternative (Alternative 3) is infeasible because it depends upon agricultural irrigation, but lacks willing irrigators. Some comments have cited substantial opposition to irrigation among landowners in the West County, and have referred to a "Notice of Rejection" stating opposition to using reclaimed water for irrigation and circulated on behalf of an organization called the Agricultural Property Rights Alliance. This petition is characterized in one comment as being signed by land owners comprising a significant portion of the lands being considered by the Project for agricultural irrigation. One comment also specifically asked for proof that adequate verifiable acreage exists for willing use of reclaimed water for irrigation under Alternative 3.

Response Summary. There is adequate suitable acreage in the West County for agricultural irrigation under any of the discharge options. The availability of this land and willingness of the owners to use reclaimed water for irrigation is a matter of disagreement. Certainly, if there were no willing irrigators in the West County, or in any area, it would affect the feasibility of an irrigation alternative. However, the analysis of potential acreage led the EIR/EIS authors to conclude that there is enough acreage to carry this alternative forward and the Board of Public Utilities directed that this be considered as one of the Project Alternatives. If during the Project's selection phase, there is a demonstrable lack of recipients for the water in the West County, or in any area, the City could decide not to select that alternative.

Acreage Available for Irrigation

The Draft EIR/EIS recognizes that agricultural irrigation is a necessary component of Alternative 3 (refer to Section 3.3 on page 3.3-36), and indicates that approximately 6,200 acres of irrigable land in the West County would be required for this alternative. The Draft EIR/EIS also recognizes that all property owners in a given area would not necessarily be able to or want to use reclaimed water for irrigation. In addition, Alternative 3 has several sub-alternatives with respect to the location of storage facilities, and the most advantageous location of specific parcels for agricultural irrigation would depend to some degree upon the site selected for a storage facility. For these reasons, as well as other limitations, including setbacks from residential areas and traffic corridors, severe slopes, wetlands and other sensitive habitats, the Draft EIR/EIS evaluated the technical suitability of approximately 19,400 acres of land in the West County for agricultural irrigation. The evaluation of the 19,400 acres of land in the West County shows that 9,750 acres is suitable for irrigation, which is 157% of the land required under Alternative 3. In addition, approximately 2,800 acres of land in the Sebastopol area were evaluated for irrigation suitability, and 1,881 of the 2,800 acres evaluated were found to be suitable for irrigation. These properties could be provided with reclaimed water for irrigation in conjunction with the West County alternative and could reduce the acreage required for irrigation in the West County from 6,200 acres to 4,575 acres. The 5%, 10%

and 15% discharge options evaluated in the Draft EIR/EIS could further reduce the acreage required for agricultural irrigation in the West County if chosen as a component of the Project. Table 2 on page A-4 in Appendix A of the Draft EIR/EIS indicates that a 5% design discharge would reduce the area required for agricultural irrigation in the West County from 6,200 to 4,400 acres, while the 10% and 15% options would reduce the required acreage to 2,900 acres and 1,900 acres respectively. Under the 15% discharge option, it is possible that almost all of the acreage needed for irrigation could be found in the Sebastopol area, and that irrigation in the Americano and Stemple Creek watersheds would not be required.

Statements Regarding Willingness to Use Water

The statements in the comments that land owners in the West County are unwilling to use reclaimed water from the Project for irrigation are substantiated by the "Notice of Rejection" submitted as an attachment to one of the comments (Comment Letter 128). Some landowners have expressed interest in reclaimed water, but have stated they would not use it if the City condemns land for a reservoir (refer to letters from the St. Anthony Foundation and West County Agriculture for Treated Effluent Use attached as comments 44 and 45 to Comment Letter 128). On the other hand, many West County farmers contacted by the City in late 1994 as part of a City survey indicated a potential interest in using reclaimed water on their property (refer to Response to Comment 64-6). Moreover one of the commentors on the Draft EIR/EIS (Comment Letter 33), farmer and member of the Stakeholders Consensus on Reuse, noted that reclaimed water is a "tremendous resource to farmers" that the water "is needed" and "it is clear there is not enough water to meet the interest." This comment specifically noted interest in reclaimed water in the western part of the County.

The group Farmers for Water (Comment Letter 53), an alliance of ranchers, crop growers, and farmers throughout the County, made similar comments, noting that reclaimed water is a "valuable resource" and that "many Sonoma County farmers can use and do want such water." The State Water Resources Control Board (Exhibit A to Comment Letter 38) explicitly noted that "[w]ater reuse will continue to play an increasing role if we are to balance water demand with water supplies within the State" The University of California (Comment Letter 9) likewise noted that "maximizing the reuse of reclaimed water will serve the best interest of the regional and global ecology and economy." Thus, there appears to be a substantial interest in all parts of the County for potential uses of reclaimed water.

The willingness of any individual land owner to use reclaimed water for irrigation and the specific locations of parcels which would use reclaimed water will not be known until the City enters into a process of selecting a Project alternative, after certification of the EIR, and therefore, the proof of willing irrigators requested in the comments cannot be provided at this time.

Conclusion

The Draft EIR/EIS demonstrates that there is adequate suitable acreage in the West County for agricultural irrigation under any of the discharge options. The availability of this land and willingness of the owners to use reclaimed water for irrigation is a matter of disagreement. Certainly, if there were no willing irrigators in the West County, or in any area, it would affect the feasibility of an irrigation alternative. However, the analysis of potential acreage, led the EIR/EIS authors to conclude that there is enough acreage to carry this alternative forward, and the Board of Public Utilities directed that this be considered as one of the Project alternatives. Willingness of farmers in the West County area to use reclaimed water for irrigation will be considered during the Project selection process. If during the selection phase, there is a demonstrable lack of recipients for the water in the West County, or in any area, the City could decide not to select that alternative. However, none of the comments demonstrate that there is today, or will be in the future, such a lack of willing irrigators that the West County alternative would become infeasible.

MASTER RESPONSE 7 - RUSSIAN RIVER TOURISM

Comment Summary: Several comments state that the overall assessment of the potential effect of increased discharge on tourism included in the Draft EIR/EIS is inadequate and that impacts resulting from a decline in tourism such as decreasing property values, lost jobs, failed businesses, and decreasing taxes are not analyzed. Many of the comments also state or presume that any discharge of wastewater into the River will negatively influence public perception and will damage the tourism economy in the River area. Some comments also state that public education and publicity regarding the discharge will not counteract the negative perceptions of tourists, and many tourists will stop vacationing at the Russian River. Lastly, the comments question which resort owners were interviewed for the analysis and state that none of the resort owners in the area report being contacted.

Response Summary. The Draft EIR/EIS did not find any significant impacts on human health from discharge of reclaimed water. Numerous factors affect the tourist industry in the River area, however, the permitted discharge of reclaimed water into the River does not appear to have adversely affected tourism in the River area.

Evaluation of Impacts on Human Health

Exposure to reclaimed water through swimming and other recreational uses was evaluated in the Human Health Risk Assessment, which is contained in Appendix J-3 of the Draft EIR/EIS. The risk assessment concluded that the discharge "would not adversely affect human health..." (refer to page 4.7-61 of the Draft EIR/EIS,. Exposure pathways used in the risk assessment are summarized in Section 4.7, Public Health and Safety (refer to Table 4.7-9 on page 4.7-33).

Recreational use of the river occurs most commonly during the summer months, from Memorial Day through Labor Day. This is also the height of the tourist season in the river area. There will be no discharge of reclaimed water into the river during this period, since discharge would occur only from October 1 to May 14.

Negative Perceptions of Discharge

Resort owners who were interviewed stated that it is the negative perception of an event which may be deleterious to the local tourism economy, rather than the event itself. This opinion was based in part on the recent experience with flooding along the River and the negative perceptions created by the non-permitted discharges which occurred in 1985 and 1986.

However, no specific documentation has been submitted or identified demonstrating significant effects on tourism from permitted discharge of reclaimed water. The City has discharged reclaimed water into the River on a regular basis and the number of visitors to the area has generally increased. As measured by the Transient Occupancy Tax, tourism

has increased by some 40 percent between 1988 and 1994. A decline in the Transient Occupancy Tax in 1995 was due primarily to the winter floods that damaged some of the big resorts and the associated inability to accommodate tourists. Improvements in the treatment process since 1988 have substantially increased the quality of reclaimed water to the point where it is perceived by some to be cleaner than the river water. A Press Democrat editorial of January 13, 1997 states "that recycled water from the regional treatment plant is cleaner than the river itself."

Analysis of Tourism in the River Area

Numerous factors affect the tourist industry in the River area. Insight into the tourist industry along the Russian River was gained, through various interviews of business organizations and resort owners in July of 1995. In addition, an analysis of Transient Occupancy Tax receipts was conducted. The methodology used in this analysis is described in more detail on page 4.18-28 of the Draft EIR/EIS. The following is a list of the types of organizations and businesses that were interviewed. Specific names are not listed as a courtesy to the individuals interviewed:

- | | |
|---|---------------------|
| 1 | Chamber of Commerce |
| 6 | Resorts |
| 1 | Travel Agency |
| 1 | Visitor's Bureau. |

The following is a list of the general interview questions:

- Describe current and historical tourism activity along the Russian River.
- What are the demographics of your clientele?
- How does demand vary by season?
- What are the main uses of the River and how do they vary by season? What are the main factors that affect use of the River? What effect have different historical events, such as the recent floods, had on the use of the River?
- How does the discharge of treated wastewater affect the use of the River? Are tourists to the area aware that this occurs?

The findings from the various interviews are presented on pages 4.18-18 through 4.18-19 and pages 4.18-44 through 4.18-45 of the Draft EIR/EIS. The following summarizes the main findings discussed in those sections.

- The number of tourists to the Russian River region has increased between 1988 and 1995.
- The growth has not been uniform, and some years have seen a decline in tourism, at least as it is measured by the Transient Occupancy Tax receipts. The decline in

tourism in the early 1990's is attributed to the severe recession of the California economy in the early 1990's. The decline in 1995 is attributed to the severe winter flooding in that year.

- The majority of visitors to the Russian River come from the San Francisco Bay Area, and some come from the Sacramento area and the Central Valley. Most out-of-the area tourists were not aware that reclaimed water is being discharged into the River. The reclaimed water discharge may be more of an issue to the local population.
- Tourists who are aware of the reclaimed water discharge are apparently confused as to the meaning of "treated wastewater."
- The summer season is the busiest season along the River, which does not coincide with the timing of the reclaimed water discharge.
- Negative perceptions about events, such as floods, may be deleterious to the local tourism economy.
- Educational campaigns and appropriate publicity regarding the nature of the reclaimed water and the timing of the discharge may help boost tourism in the area. The success of these campaigns is difficult to predict.

There are additional factors that can and do affect the growth of tourism in the River area, such as weather and competition from Lake Sonoma, other water recreational areas, or the wineries.

MASTER RESPONSE 8 - EVALUATION OF PATHOGENS

Comment Summary: Comments on the Draft EIR/EIS were received that relate to the evaluation of Project impacts on pathogens that can affect human health. Specifically, the comments addressed by this response state the following:

- *The summary of pathogens provided in Appendices H-2 and H-3 of the Draft EIR/EIS was not fully considered in the human health risk assessment (Appendix J-3). The protozoan *Cryptosporidium* was found in reclaimed water and the impact of *Cryptosporidium* discharge was not evaluated. The comments requested that the impacts analysis be expanded to address the *Cryptosporidium* data.*
- *Under existing and proposed drinking water regulations, the Sonoma County Water Agency could be required to provide additional treatment, if pathogens other than coliform increase in the River.*

Response Summary. The evaluation of human health impacts from pathogens, including *Cryptosporidium* was updated. The results indicate that discharge of reclaimed water would not measurably increase risk of exposure to protozoan pathogens (including *Giardia* and *Cryptosporidium*) or lead to imposition of additional treatment requirements on the Sonoma County Water Agency.

Project impacts of pathogens on human health were evaluated using a risk assessment approach, and the risk assessment analysis is provided in Appendix J-3 of the Draft EIR/EIS. As described on page 4.7-23, the protozoan *Giardia* and coliform bacteria were used as the indicator species for evaluating pathogen impact significance. This response provides a description of the regulatory background, a summary of protozoan pathogens in reclaimed water, and a description of the existing receiving water conditions. The changes to the Draft EIR/EIR incorporated in this response update the evaluation of impacts in response to comments to reflect *Cryptosporidium* data that were reported in Appendix H-3 of the Draft EIR/EIS and to reflect conversion from chlorine disinfection to ultra-violet disinfection. The ultra-violet conversion project was not addressed in the Draft EIR/EIS because the City of Santa Rosa had not yet decided to implement the conversion prior to issuance of the Draft EIR/EIS. The following changes to the Draft EIR/EIS show that Project alternatives will not cause the density of pathogens to increase in the Russian River, and that the impact on human health is considered less than significant.

The following changes are made to the Draft EIR/EIS:

Page 4.7-33. The second paragraph is revised as follows:

The analysis of risk from detected biological components in the Laguna Plant effluent is evaluated by comparing the data to a known ineffective dose (*Giardia*), to background concentrations (total coliform,

Cryptosporidium and *Giardia*, and heterotrophic bacteria), and to regulatory standards (total coliform).

Page 4.7-62. The last paragraph of the Analysis section under impact 7.9.1 is revised as follows:

Microorganism concentrations (coliform bacteria) are below levels set by the State for reclaimed water usage for recreational impoundments. In addition, the concentrations of coliform bacteria in the Russian River upstream of the confluence with Mark West Creek are higher than the historical concentrations in the Laguna Plant effluent. Thus the discharge does not present any additional risk than already exists in the River, based on the presence of coliform bacteria. While *Giardia* and *Cryptosporidium* cysts were detected in the Laguna plant effluent, the discharge will not cause the existing concentration of cysts in the Russian River to increase; ~~they do not present an unacceptable risk based on the EPA's risk criterion as stated in the Surface Water Treatment Rule and calculated in the human health risk assessment. In addition, *Giardia* cysts have been detected in the Russian River.~~ No other pathogenic microorganisms (*Cryptosporidium*, *Legionella*, *Salmonella*, *Shigella*, or enteric viruses) were detected in the Laguna Plant effluent.

Appendix H-3 page 14. The second paragraph is revised as follows.

Giardia and *Cryptosporidium* values observed in 1996 are greater than those observed previously and upon which the EIR/S analysis is based. However, the 1996 data are not considered representative of long-term reclaimed water quality because of a treatment plant malfunction that appears to have caused the elevated *Giardia* and *Cryptosporidium* values in 1996, with the exception of the detection of *Cryptosporidium* on one date after the filter malfunction was corrected. The implications of the *Giardia* and *Cryptosporidium* measurements of 1996 are described in the addendum to Appendix J-3.

Appendix J-3. Page ii. The Table of Contents is revised as follows.

APPENDIX A
APPENDIX B
APPENDIX C
APPENDIX D
APPENDIX E
APPENDIX F
APPENDIX G

Appendix J-3. Page 3-1. The first paragraph is revised as follows:

This section presents the human health risk from biological components in reclaimed water from the Subregional Wastewater Project. It addresses the potential human health risks resulting from discharge of final treated effluent from the treatment plant to surface water and the subsequent use of surface water as a source of potable water as well as other purposes (e.g., irrigation). [Appendix G of this report updates the analysis of potential impacts in this section.](#)

Appendix J-3. Add Appendix G. The following is added as Appendix G.

APPENDIX G

This addendum updates the evaluation of Project impacts on the density of pathogens in the Russian River and of the potential need for additional drinking water treatment facilities. The addendum is different from the Section 3 of Appendix J-3 in two ways:

- This addendum takes into account the presence of *Cryptosporidium* in effluent that was detected after Appendix J-3 was prepared (as noted on page 14 of Appendix H-3).
- This addendum takes into account the City's decision to convert from chlorine to ultra-violet light disinfection that was made after the Draft EIR/EIS was prepared.

This addendum provides a description of the regulatory background, a summary of pathogens in reclaimed water, a description of the existing receiving water conditions, and an updated evaluation of potential impacts.

Regulatory Background

Coliform is the only pathogen for which a maximum contaminant level (MCL) has been established. The standard established by the California Department of Health Services is described on page 4.7-28: a maximum of five percent of samples each month may be positive for total coliform, and no re-tests may be positive. The State of California's Surface Water Filtration and Disinfection Treatment regulations (Title 22, Sections 64650 - 64666) as the equivalent EPA's Surface Water Treatment Rule (SWTR) establish a treatment standard for *Giardia*, which requires a 3-log removal (1,000 fold reduction) through filtration and chemical disinfection. The SWTR applies to surface waters and groundwaters considered by the California Department of Health Services to be under the direct influence of surface waters. Groundwater under the direct influence of surface water is defined in Title 22 Section 64651.50 as "any water beneath the surface of the ground with significant occurrence of insects or other microorganisms, algae or large diameter pathogens such as *Giardia lamblia*, or significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity or pH which closely correlate to climatological or surface water conditions."

The EPA has proposed the Enhanced Surface Water Treatment Rule (Enhanced SWTR - *Federal Register* 38832, July 29, 1994) wherein several regulatory options are identified as follows:

1. No change from the existing SWTR;
2. Require additional (greater than 1,000 fold) *Giardia* removal depending on *Giardia* cyst density in the source water;

3. Require *Cryptosporidium* removal depending on *Cryptosporidium* oocyst density in the source water; or
4. Two and three above.

The Proposed Enhanced SWTR states that the Final Enhanced SWTR will not be promulgated until after water utilities provide information to EPA on the density of *Cryptosporidium* and *Giardia* in their source and finished waters pursuant to the Information Collection Rule. Data collection has been delayed and is currently scheduled to begin in mid-1997. The date of Final Enhanced SWTR promulgation is not known. The Proposed Enhanced SWTR does not include MCLs for *Cryptosporidium* or *Giardia*. The Proposed Enhanced SWTR applies to surface waters and groundwaters considered by the Department of Health Services to be under the influence of surface waters. The Proposed Enhanced SWTR (beginning of Section II) also states “the Groundwater Disinfection Rule, which is currently under development, will add further protection for systems using ground water.” EPA has not yet issued a Proposed Groundwater Disinfection Rule for public review or comment.

The Sonoma County Water Agency and Sweetwater Springs Water District are the only two drinking water suppliers within Department of Health Services jurisdiction that are potentially affected by the Project discharge components. District wells are located away from the River and have an overall water quality that differs significantly from the River. Department of Health Services expects that the filtration characteristics of River sediments will not change in a manner that would affect the wells’ status under the SWTR (Bruce Burton, Department of Health Services, October 29, 1996, personal communication). The Water Agency’s Intake No. 5 is the only drinking water intake in the Russian River Project area that is considered by the Department of Health Services to be under the direct influence of surface water and thus subject to SWTR and any Final Enhanced SWTR. The four other water agency intakes and District wells are considered by the Department to be not under the direct influence of surface water according to the SWTR. The Department of Health Services considers the “not under the direct influence” status of the four Water Agency intakes to be subject to periodic review because of the potential that the filtration characteristics of River sediments may change or the quality of the River would be degraded.

The Department of Health Services currently has the authority to require more than 1,000 fold *Giardia* removal for any intakes found to be under the direct influence of surface water. Current operating procedures used for the Sonoma County Water Agency’s Intake No. 5 are considered to be an alternative to filtration technologies identified in Title 22 Section 64653(a), as defined in Section 64653(f). Pursuant to Section 64653(h), performance standards may be established for such alternative filtration technologies by the Department for individual systems, such as Intake No. 5. In addition, California Health and Safety Code Section 4014 states that the Department may impose additional

treatment requirements that “it deems necessary to assure a reliable and adequate supply of water at all times which is pure wholesome, potable, and does not endanger the health of consumers.” Thus, the Department can impose additional treatment requirements on any of the Water Agency intakes if it finds that the Project would adversely affect the health of consumers. The treatment performance standard that the Department of Health Services would require is described in the Department’s *Surface Water Treatment Staff Guidance Manual* (May 15, 1991) Appendix B: *Guidelines for Determining When Surface Waters Will Require More Than The Minimum Levels of Treatment Defined in the Surface Water Treatment Regulations*. If the Department were to determine that additional treatment is required for either of the reasons cited above (change in the filtration characteristics of River sediments or the degraded River water quality), the required *Giardia* cyst removal/inactivation is based on source (River) water cyst and coliform density as shown in Table 1:

Table 1

Required *Giardia* Cyst Removal

	<u>If cyst or coliform density is:</u>		
<u>Allowable daily average cyst density /100L (geometric mean in source water)</u>	<u><1</u>	<u>>1 - 10</u>	<u>>10 - 100</u>
<u>Allowable Total Coliform Density /100 mL</u>	<u><1,000</u>	<u>>1,000 - 10,000</u>	<u>>10,000 - 100,000</u>
	<u>The Cyst Removal is:</u>		
<u>Required <i>Giardia</i> cyst removal</u>	<u>3-log (1,000 fold)</u>	<u>4-log (10,000 fold)</u>	<u>5-log (100,000 fold)</u>

The data in Table 1 mean that if, for example, the measured daily average *Giardia* cyst density in the River is between 1 and 10 per 100 liters (L) or the measured median monthly total coliform density is between 1,000 and 10,000 MPN per 100 milliliters (mL), DOHS could require 4-log (10,000-fold reduction) *Giardia* cyst removal instead of 3-log (1,000 fold) cyst removal. The River would be considered the source water if the intakes are found to be under the influence of surface water.

Existing regulations do not address *Cryptosporidium*, but the Proposed Enhanced SWTR includes options for performance standards which recognize that chlorine disinfection is not effective, and removal by filtration and inactivation by non-traditional methods (i.e., ozonation) is effective.

No information about the potential future regulation of groundwater under the Groundwater Disinfection Rule is available on which to base an evaluation of impacts.

Reclaimed Water Quality

Pathogens in reclaimed water are summarized below. A project to convert the disinfection system from chlorine disinfection to ultra-violet light is being implemented, and the impact on pathogens is addressed below.

Measurements of Pathogens in Reclaimed Water

Appendices H-2 and H-3 describe density of pathogens in reclaimed water that were available at the time that the Draft EIR/EIS was issued. The *Cryptosporidium* and *Giardia* density values collected through 14 May 1996 were reported in Appendix 4 of Appendix H-3, and are based on Standard Methods (18th ed.) method 9711B (FA), which reports presumptive values. The City of Santa Rosa has continued to collect protozoan data since 14 May 1996, but has used EPA's Information Collection Rule method exclusively since then. The change to the EPA method occurred for three reasons:

- EPA promulgated the Information Collection Rule method in approximately May 1996.
- The EPA method involves a more detailed analysis that confirms presumptive cyst density data. Thus, data from the EPA method are considered to be more accurate.
- The water and wastewater industry switched to the EPA method to be consistent with the Information Collection Rule requirements. Use of the EPA by the City of Santa Rosa would provide data that are comparable to other studies.

A total of 34 *Cryptosporidium* and *Giardia* measurements in plant effluent have been made after 14 May 1996 through 6 January 1997, and these are summarized in Table 2. The data are provided in Table 3. Of the 34 samples, four were confirmed positive for *Giardia* and one was confirmed positive for *Cryptosporidium*.

Table 2

Summary of *Cryptosporidium* and *Giardia* in Laguna Plant Effluent
From May 23, 1996, through January 6, 1997(cysts/100 L)

<u><i>Cryptosporidium</i></u>		<u><i>Giardia</i></u>	
<u>Median</u>	<u>Range</u>	<u>Median</u>	<u>Range</u>
<u><6.6</u>	<u><1.6 - 9.6</u>	<u><8.5</u>	<u><1.6 - 37</u>

Source: City of Santa Rosa, Initial Study and Negative Declaration for Conversion to Ultra-Violet Disinfection (February, 1997).

Table 3

Density of *Cryptosporidium* and *Giardia* in Laguna Plant Effluent
From May 23, 1996, through January 6, 1997 (cysts/100 L)¹

<u>Date</u>	<u><i>Crypto</i></u>	<u><i>Giardia</i></u>	<u>Reporting Limit</u>	<u>Date</u>	<u><i>Crypto</i></u>	<u><i>Giardia</i></u>	<u>Reporting Limit</u>
<u>23-May-96</u>	<u>ND</u>	<u>ND</u>	<u>3</u>	<u>16-Sep-96</u>	<u>ND</u>	<u>ND</u>	<u>27</u>
<u>28-May-96</u>	<u>ND</u>	<u>ND</u>	<u>5.3</u>	<u>23-Sep-96</u>	<u>ND</u>	<u>ND</u>	<u>12</u>
<u>4-Jun-96</u>	<u>ND</u>	<u>ND</u>	<u>2.5</u>	<u>30-Sep-96</u>	<u>ND</u>	<u>ND</u>	<u>22</u>
<u>13-Jun-96</u>	<u>ND</u>	<u>ND</u>	<u>1.6</u>	<u>7-Oct-96</u>	<u>ND</u>	<u>ND</u>	<u>4.3</u>
<u>19-Jun-96</u>	<u>ND</u>	<u>ND</u>	<u>13</u>	<u>15-Oct-96</u>	<u>ND</u>	<u>ND</u>	<u>7.4</u>
<u>26-Jun-96</u>	<u>ND</u>	<u>ND</u>	<u>6.6</u>	<u>21-Oct-96</u>	<u>ND</u>	<u>ND</u>	<u>12</u>
<u>2-Jul-96</u>	<u>ND</u>	<u>ND</u>	<u>2.6</u>	<u>28-Oct-96</u>	<u>ND</u>	<u>ND</u>	<u>6.6</u>
<u>11-Jul-96</u>	<u>ND</u>	<u>ND</u>	<u>6.6</u>	<u>4-Nov-96</u>	<u>ND</u>	<u>ND</u>	<u>6.5</u>
<u>18-Jul-96</u>	<u>ND</u>	<u>ND</u>	<u>51.4</u>	<u>12-Nov-96</u>	<u>ND</u>	<u>ND</u>	<u>19</u>
<u>24-Jul-96</u>	<u>ND</u>	<u>ND</u>	<u>43.5</u>	<u>18-Nov-96</u>	<u>ND</u>	<u>ND</u>	<u>16</u>
<u>31-Jul-96</u>	<u>ND</u>	<u>ND</u>	<u>6.6</u>	<u>25-Nov-96</u>	<u>ND</u>	<u>37</u>	<u>37</u>
<u>8-Aug-96</u>	<u>ND</u>	<u>ND</u>	<u>3.3</u>	<u>2-Dec-96</u>	<u>ND</u>	<u>16.4</u>	<u>5.4</u>
<u>15-Aug-96</u>	<u>ND</u>	<u>ND</u>	<u>5.4</u>	<u>9-Dec-96</u>	<u>ND</u>	<u>ND</u>	<u>9.5</u>
<u>22-Aug-96</u>	<u>ND</u>	<u>ND</u>	<u>3.3</u>	<u>16-Dec-96</u>	<u>ND</u>	<u>2.7</u>	<u>2.7</u>
<u>27-Aug-96</u>	<u>ND</u>	<u>ND</u>	<u>60</u>	<u>23-Dec-96</u>	<u>ND</u>	<u>ND</u>	<u>13</u>
<u>3-Sep-96</u>	<u>ND</u>	<u>ND</u>	<u>3.2</u>	<u>30-Dec-97</u>	<u>9.6</u>	<u>4.8</u>	<u>--</u>
<u>9-Sep-96</u>	<u>ND</u>	<u>ND</u>	<u>14</u>	<u>6-Jan-97</u>	<u>ND</u>	<u>ND</u>	<u>2.8</u>

Source: Laguna Treatment Facility

¹ ND means that the pathogen was not found in the sample at the indicated reporting limit. For example, *Giardia* cyst density on 23 May 1996 is unknown but is less than 3 cysts per 100 L. The reporting limit varies because it is affected by water sample characteristics (e.g., the amount of particulate matter in the sample).

The median protozoan density values reported in Appendix H-3 (values collected through 14 May 1996) is higher and the range of values is broader than that in Tables 2 and 3 above (23 May 1996 through 6 January 1997). This is because Appendix H-3 values are presumptive (not confirmed) and because data include a period in which the filters were not functioning properly.

Appendix H-3 (Reclaimed Water Quality Update) of the Draft EIR/EIS shows that reclaimed water quality was reduced when the filter medium depth decreased from normal (about four feet) to three feet in some cells. Negligible filter medium loss results from routine filter operation. Less than three inches of medium loss was detected over five years of operation. Construction activities associated with the upgrade of the Laguna plant coincided with an accelerated filter medium loss. This construction involved plant start-ups and shut-downs and filter testing that were unique to this construction. This occurred for approximately a three-month period. The loss of filter medium that occurred in late 1995 was identified, and staff immediately took steps to obtain additional medium to replace that which was lost. Medium replacement was delayed by approximately three months due to the normal purchasing and delivery process, and then was delayed for another three months due to unusually high flows in the Laguna Plant. A filter must be taken off line to add the filter medium, and high flows during early 1996 necessitated keeping all filters that were present at that time on line at all times until early April 1996. The City has instituted a policy to store filter medium on site to avoid delays related to acquiring medium. The policy also requires evaluation and correction of filter medium depth before and after the rainy season when treatment plant flows would further delay problem correction, and at times of non-routine flow conditions. The Laguna Plant upgrade project has added six filters to the eight filters that existed at the time of medium loss. The additional filters provide flexibility for filter maintenance, even during high flows.

Effect of UV Disinfection on Pathogen Density

The City of Santa Rosa is currently implementing the Conversion to Ultra-Violet Disinfection Project, which replaces the existing chlorine disinfection process with one that uses ultra-violet light. The ultra-violet conversion project was not addressed in the Draft EIR/EIS because the City of Santa Rosa had not yet decided to implement the conversion prior to issuance of the Draft EIR/EIS. Since then, however, the City has committed to the ultra-violet conversion project and has described potential impacts in a separate CEQA document (*Initial Study and Negative Declaration for Conversion to Ultra-Violet Disinfection* (February, 1997)). The *Initial Study and Negative Declaration for Conversion to Ultra-Violet Disinfection* is based on confirmed values from 23 May 1996 through 6 January 1997, which are described in Tables 2 and 3. These data are used because they are based on the EPA confirmed test method (instead of the less rigorous presumptive test method that was used prior to 23 May 1996) and because the

data set from prior to 23 May 1996 is skewed by the effect of filter medium loss (which has been corrected and steps have been taken to prevent recurrence).

The City of Santa Rosa's *Initial Study and Negative Declaration for Conversion to Ultra-Violet Disinfection* determined that ultra-violet disinfection is equally effective as chlorine for kill of bacteria and viruses in filtered reclaimed water. The ultra-violet Initial Study/Negative Declaration also found no change in kill of *Cryptosporidium*; neither disinfection method is believed to inactivate *Cryptosporidium* oocysts. Chlorine is capable of 0.5-log *Giardia* reduction, but ultra-violet light is not considered capable of inactivating *Giardia* cysts. Protozoan removal occurs in the filtration step of sewage treatment. The Initial Study/Negative Declaration concluded that ultra-violet disinfected reclaimed water will continue to meet the Title 22 standards. The Initial Study/Negative Declaration concludes that changing to ultra-violet disinfection would not affect protozoan pathogen levels in the receiving water because:

- Filtration at the Laguna Plant and settling in storage provide 4- to 5-log (10,000 to 100,000-fold) removal of *Cryptosporidium* and *Giardia*; and
- The density of protozoan pathogens in reclaimed water is low relative to background levels in receiving waters.

Effect of Storage on Pathogen Density

The Initial Study/Negative Declaration cited above estimated that natural die-off, settling, and predation of *Cryptosporidium* and *Giardia* in storage ponds to predominate over additions of *Cryptosporidium* and *Giardia* to storage ponds. The density of *Cryptosporidium* and *Giardia* is estimated to decrease as a result of storage from the values in Table 2 by 1 log (10-fold) to 2 log (100-fold).

The regulations permit no more than 23 coliforms per 100 mL in fresh effluent, and reclaimed water complies with this regulation (which is measured at the end of chlorine contact at the Laguna plant). This regulation helps assure that pathogens of human origin are killed prior to reclaimed water storage and reuse or discharge. Higher total coliform numbers occur in storage ponds and are a reflection of inputs from waterfowl and other wildlife and not from humans.

Pathogens in Receiving Water

Sonoma County Water Agency's *Russian River Demonstration Study* (July 1993) reports that 48 samples were collected in the Russian River near the Water Agency intakes from April 1992 through May 1993 and analyzed for *Cryptosporidium* and *Giardia*. Three samples were positive for *Giardia* and one sample was positive for *Cryptosporidium*. The data are summarized in Table 4.

Table 4

Density of *Cryptosporidium* and *Giardia* in Russian River
(cysts/100 L)

<u><i>Cryptosporidium</i></u>		<u><i>Giardia</i></u>	
<u>Median</u>	<u>Range</u>	<u>Median</u>	<u>Range</u>
<u><1</u>	<u><1 - 2.7</u>	<u><1</u>	<u><1 - 13.8</u>

Source: SCWA's Russian River Demonstration Study
(July 1993)

Project Impacts

Table 5 compares the density of *Cryptosporidium* and *Giardia* cysts in storage pond discharge to existing background conditions in the River. Table 5 shows that the median density in storage pond discharge and in the River are both less than the limit of detection. Table 5 also shows that the maximum cyst density in storage pond discharge is less than that in the River. Table 5 data show that reclaimed water discharge at any proportion to River flow would have no apparent effect on *Cryptosporidium* or *Giardia* cyst density in the Russian River. These data further indicate that reclaimed water discharge at any proportion to River flow would not measurably increase risk of exposure to protozoan pathogens and that reclaimed water discharge at any proportion to River flow would not measurably degrade water quality or lead to imposition of additional treatment requirements on the Sonoma County Water Agency by the Department of Health Services. Therefore, the impact of discharge alternatives using chlorine or ultra-violet disinfection is considered less than significant for exposure of humans to bacterial and protozoan pathogens.

Table 5

Comparison of *Cryptosporidium* and *Giardia* in River and Reclaimed Water
(cysts/100 L)

	<u><i>Cryptosporidium</i></u>		<u><i>Giardia</i></u>	
	<u>Median</u>	<u>Maximum</u>	<u>Median</u>	<u>Maximum</u>
<u>Discharge From Storage Pond</u> ¹	<u><0.06 - <0.6</u> ³	<u>0.96</u> ⁴	<u><0.08 - <0.8</u> ³	<u>3.7</u> ⁴
<u>Background in River</u> ²	<u><1</u>	<u>2.7</u>	<u><1</u>	<u>13.8</u>

¹ Source: City of Santa Rosa, Initial Study and Negative Declaration for Conversion to Ultra-Violet Disinfection (February, 1997). These values are also reported in Tables 2 and 3 above.

² Source: Sonoma County Water Agency's Russian River Demonstration Study (July 1993), see Table 4

³ The range is based on the median value from Table 2 divided by 10 and 100, which is the estimated attenuation range due to die-off, settling and predation in storage. For example, the median *Cryptosporidium* density from Table 2 is 6.6 cysts/100 mL. Assuming 10-fold reduction in storage ponds, the median concentration in pond discharge would be 0.6 cysts/100 mL. Assuming 100-fold reduction in storage ponds, the median concentration in pond discharge would be 0.06 cysts/100 mL.

⁴ The maximum value is the maximum treatment plant effluent value (Table 2) divided by 10, which is the maximum concentration in reclaimed water from Tables 2 and 3 multiplied by the minimum density attenuation due to die-off, settling and predation in storage (10-fold). Storage will also dampen the magnitude of cyst density variation, as described in Response to Comment 82-200. This effect is not reflected in the maximum value given in Table 5. The maximum value will therefore be less than that shown in Table 5.

MASTER RESPONSE 9 - ENDOCRINE DISRUPTERS (ENVIRONMENTAL ESTROGENS)

Comment Summary: Several comments express concern regarding potential effects of endocrine disruptors in reclaimed water. They cite recent research that has raised concerns about the possibility that a variety of compounds may disrupt endocrine systems of both wildlife and humans. Some comments expressed specific concern regarding chlorinated hydrocarbons, and about the fact that specific standards regarding endocrine disruptors do not yet exist.

Response Summary. The Draft EIR/EIS identifies five pesticides, three phthalate compounds, and three metals that have been detected in reclaimed water from the Laguna Plant which have been identified by researchers as having potential endocrine-disrupting effects (refer to page 4.7-11 of the Draft EIR/EIS). The constituents have generally been identified infrequently and at low levels in reclaimed water from the Laguna Plant. Three of the five pesticides are no longer approved for use. Current scientific information is inadequate to attribute specific health or ecological effects to these compounds at such low levels.

Current Scientific Knowledge

The issue of whether industrial and agricultural chemicals can disrupt the endocrine system continues to be a source of much debate and research within the scientific and regulatory communities (Kavlock, et al. 1996 and Kendall, et al. 1996). It is clear, however, from case studies involving wildlife and humans, that certain environmental chemicals and their metabolites at least have the potential to disrupt the endocrine system. For both wildlife and humans the clearest impacts associated with endocrine-disrupting chemicals are observed in groups with high exposure levels. For humans, these groups generally consist of individuals who have received occupational (e.g., kepone exposure at a pesticide manufacturing facility) or accidental exposure to chemicals (e.g., contamination of cooking oil with PCBs), while for wildlife, large exposures are usually associated with specific chemicals in certain types of effluent (e.g., dioxins in effluent from pulp/paper mills) or historically contaminated water bodies (e.g., PCBs and DDT in portions of the Great Lakes, dicofol in Lake Apopka, Florida). These chemicals (including dioxins, degradation products of certain surfactants, PCBs and DDT) have either not been detected in reclaimed water from the Laguna Plant or are present at concentrations very much lower than those reported to produce clear, endocrine-disrupting effects (refer to Appendices H-2 and J-2 of the Draft EIR/EIS).

Several uncertainties are associated with the assessment of the health risks from exposure to potential endocrine-disrupting chemicals, which make it inappropriate to assign quantitative risk values (for these specific effects) in the human health risk assessment (Refer to Appendix J-3 of the Draft EIR/EIS). The absence of risk values occurs primarily because there is a lack of experimental data that identify the lowest effective concentrations at which endocrine-disrupting chemicals may exert their effects. There is also a general lack of understanding within the scientific community regarding the mode

of action of these chemicals at both the molecular and cellular levels. The lack of a mechanistic understanding is due both to an incomplete knowledge regarding the role of endogenous hormones in regulating normal development as well as to how the putative endocrine-disrupting chemicals exert their adverse biological effects. For example, although dioxins have been studied by many different laboratories, it is still not completely understood how they cause different effects in different species (sac fry viability in fish, cross bills in cormorants, reproductive tract deformities in mammals). Risk values have not been assigned for dioxin exposure due to the diversity of potential effects in different organisms and a lack of mechanistic understanding of these potential effects. Dioxins were not evaluated in the human health risk assessment because they have not been detected in reclaimed water from the Laguna Plant.

Constituents in Reclaimed Water

Where data on reproductive effects are available, the EPA and others have calculated toxicity values and these values were used in the human health risk assessment. Bis(2-ethylhexyl)phthalate [DEHP] is an example. It was detected in reclaimed water from the Laguna Plant and it was quantified in the human health risk assessment. It has been implicated as an environmental estrogen (Refer to Appendix J-2 of the Draft EIR/EIS) and a risk value was calculated in the risk assessment, based on its reproductive toxicity. Although not explicitly stated in the human health risk assessment, reproductive effects (e.g., decreased fertility and reduced live births in mice) were considered by the EPA when deriving the reference dose for DEHP that was used in the risk assessment. The EPA's reference dose for DEHP is believed to adequately protect against potential reproductive health effects because it is about one ten-thousandth of the dose at which these effects were observed in the experimental system. The health risk from DEHP in reclaimed water was found to be less than significant because the predicted exposure in the worst case scenario was only about 2% of the EPA's reference dose.

Further information about the reproductive health effects of phthalates is contained in the support documentation for the human health risk assessment (Appendix J-3), which is available at the Laguna Library. Further complicating the evaluation of risk from potential endocrine-disrupting chemicals are potential synergistic and/or antagonistic effects between chemicals. An assumption of the risk assessment process is that agents that act through the same mechanism will display additivity when they co-occur in an exposure. For endocrine disrupters, this assumption may be overly simplistic because both receptor agonists (chemicals that activate an endocrine hormone receptor) and antagonists may be present simultaneously. Because the underlying molecular and cellular mechanisms are not well understood, no scientific consensus has been reached on how to account for these interactions in predictive risk assessment equations. The lack of information makes it inappropriate to assign quantitative values for use in risk equations--actual risk values may be higher or lower.

Additional Studies

As Appendix J-3 concluded, on page 6-2, "No data were available in the scientific literature concerning threshold levels (i.e., the lowest environmental concentrations in soil, air or water) that may induce estrogenic effects in wildlife or humans. Such data would be needed to evaluate any potential environmental estrogens found in air, water soil or sediment samples. In addition, the effects of exposure to multiple, different estrogenic chemicals may be additive, synergistic or antagonistic. These potential, complex interactions make it difficult to draw conclusions from chemical analytical data alone without additional basic research into these interactions. Without these data from the scientific literature it is not currently possible to quantitatively evaluate chemical analytical data with respect to specific concentrations of potential environmental estrogens in soil, air and water."

Under these circumstances, CEQA does not require that the project be postponed until such information might become available, or that the City of Santa Rosa undertake the extraordinarily expensive and lengthy scientific research to obtain the information for use in this EIR/EIS. As the experts who prepared the human health risk assessment (Appendix J-3, at page 6-2) concluded, "[s]uch basic research is most appropriately conducted by a research institution and is beyond the scope of studies that could feasibly be performed for the Subregional Wastewater Project." Also refer to Master Response 5.

Conclusion

While reclaimed water from the Laguna Plant can contain some small amounts of potential endocrine-disrupting chemicals, it does not contain the large quantities of endocrine-disrupting chemicals that are known to induce adverse reproductive effects in wildlife. A quantitative evaluation of these low concentrations requires additional basic research into the cellular and molecular mechanisms of these chemicals. (Kavlock, R.J., and G.T. Ankley. 1996. A perspective on the risk assessment process for endocrine-disruptive effects on wildlife and human health. *Risk Analysis* 16:731-739.) (Kendall, R.J., and R.L. Dickerson. 1996. Principles and processes for evaluating endocrine disruption in wildlife. *Environmental Toxicology and Chemistry* 15:1253-1254.)

This Master Response, along with the various comments raising the issue of potential impacts of endocrine disruptors in reclaimed water and Appendix J-2 providing a review of the current research on this subject, as well as all other parts of the EIR/EIS and the remainder of the record, will be before the decision makers when they determine whether to certify the EIR/EIS, and they will thus be fully aware and cognizant of the issue and the uncertainties surrounding it as part of their decisions.

MASTER RESPONSE 10 - POTENTIAL IMPACTS OF AGRICULTURAL RUNOFF ON SALINE HABITATS IN THE PETALUMA RIVER

Comment Summary: Several comments expressed concern that irrigation drainage and runoff from Reyes soils (i.e., baylands) would reduce salinity and result in the conversion of salt marsh along the Petaluma River to brackish or freshwater marsh.

Response Summary. Runoff from Reyes soils will be held in drainage ditches until after the fall rains begin. Therefore discharge will occur when dilution is sufficient to avoid water quality impacts or conversion of salt marshes.

The baylands irrigation area is currently drained by a network of ditches. The elevation of the drainage ditches is below that of the salt marsh along the Petaluma River, and the ditches discharge to the salt marshes only when pumps are activated. This is described on page 4.9-33 of the Draft EIR/EIS, page 238 in Appendix I-16, and page 10 in Appendix E-1. Page 27 in Appendix D-19 (Irrigation Management Guidelines for the West County and South County Alternatives), Page 5 in Appendix D-21 (Baylands Screening Study), and Mitigation Measure 2.2.3 specify that irrigation to maintain saturated soils and anoxic soil conditions is appropriate and necessary. Page 238 in Appendix I-16 cites *Hydrologic/Water Quality Evaluation of Irrigation of Baylands (Reyes Soils) with Reclaimed Water*, Questa Engineers Technical Memorandum and states that baylands drainage will be managed to retain runoff and drainage in the ditch system until rainfall runoff occurs in the Petaluma River Watershed, at which time ditch water would be pumped into the Petaluma River. The rationale for this practice is that discharge would occur when dilution is sufficient to avoid water quality impacts (refer to page 239 in Appendix I-16 of the Draft EIR/EIS). The Novato Sanitation District is required by the Regional Water Quality Control Board to operate their system this way to avoid impacts to receiving waters. Another rationale for ditch discharge after fall rains begin is that salt marsh plants are sensitive to reduced salinity conditions during summer, but are adapted to the natural cycle of reduced salinity in fall and winter. Thus, discharge of ditch water after the fall rains begin will not convert salt marshes.

Measure 2.2.3 in the Draft EIR/EIS does not include the requirement that ditch water be discharged only in fall after salinity is reduced by natural rainfall runoff.

Therefore, the following changes are made to the Draft EIR/EIS:

Page 2-24. The fourth paragraph is revised as follows:

Landowners with parcels comprised of Reyes soils may over-irrigate to maintain a high water content and anoxic conditions in the subsoils. However, no contingency (winter) irrigation will be allowed on Reyes Soils parcels. Landowners would ensure that surface ponding is avoided for purposes of mosquito control. Drainage ditches will also be closely monitored for mosquito control.

Page 2-24. The following paragraph is inserted between the fourth and fifth paragraphs.

Drainage ditch water shall not be discharged until fall rainfall occurs in the Petaluma River watershed, because the rainfall runoff reduces salinity in the Petaluma River.

MASTER RESPONSE 11 - POTENTIAL SUCCESS OF MITIGATION FOR WETLANDS IMPACTS

Comment Summary: Several comments question the potential success of accomplishing the wetland mitigation measures presented in Mitigation Measure 2.3.11: Sensitive Resource Conservation Program. Comments requested additional information verifying that suitable acreage for wetland construction and restoration exists within the Project area.

Response Summary. Success of the wetland mitigation measures is ensured because creation or restoration of wetlands has been demonstrated as feasible and sufficient acreage of suitable mitigation areas for all wetland types within the Project area has been identified.

Requirement for Mitigation

While wetlands creation for the purpose of using reclaimed water was eliminated as a Project component, the Federal Clean Water Act requires that if construction of Project components results in loss of wetlands habitat, the habitat value of any lost wetlands must be replaced. Mitigation for loss of wetlands is detailed in Mitigation Measures 2.3.11: Sensitive Resource Conservation Program.

Mitigation Measure 2.3.11 specifies that "[c]onstruction of reservoir sites shall not result in a net-loss of the sensitive resources or the function and value of jurisdictional wetlands." The Mitigation Measure further notes that "[m]any of the biological resources of the reservoir sites, though measurable as separate and distinct units, are functionally inter-related within the local ecosystem," and for that reason the Mitigation Measure specifies that mitigation for any such integrally related resources must "be conducted on an ecosystem basis in order to incorporate all related resources into a coordinated and functional whole." As Appendix M-3-C (page vi) specifies, the mitigation program is intended and will be designed "to ensure, at a minimum, a 1:1 replacement ratio for wetland losses, including functions and values." That same Appendix is a complete report "intended to demonstrate the feasibility of mitigation [of] wetland impacts on any proposed reservoir site for the EIR/EIS Alternative Analysis . . ."

This Mitigation Measure, along with its supporting documents, thus commits the City and the Board of Public Utilities to full compensatory mitigation, which has been demonstrated in this response to be feasible for any loss of wetlands. In fact, the U.S. Environmental Protection Agency also concurred in that commitment: the EPA comments (Comment Letter 2) specifically commended the Corps' and the City of Santa Rosa's "commitment to the detailed mitigation and monitoring program (Chapter 2) which provides validation and implementation monitoring with a focus on compensatory mitigation on an ecosystem basis."

Ultimately, the potential success of Mitigation Measure 2.3.11 of the Draft EIR/EIS is contingent upon:

- the technological feasibility of creating or restoring affected habitat types; and
- suitable mitigation site or sites available to provide sufficient mitigation acreage.

Feasibility of Creating or Restoring Wetlands

A detailed wetland mitigation plan designed for the specific selected alternative (including construction and location of wetland habitat and/or other waters of the U.S. to be created and restored) will be incorporated in the application for a Section 404 permit, and will be made a condition of approval of such a permit by the Corps, if wetland mitigation is needed for the selected alternative. Details of mitigation will be determined in consultation with the Corps and other agencies, following selection of a Project. This permitting process has not been included in the Final EIR process, but will be included as a part of the Final EIS process if the selected alternative requires a Section 404 Permit. This sequence complies with the Corps' regulations, which require identification of a preferred Project in the Final EIS.

Individual and nationwide permit authorizations are issued by the Corps for fills and other direct and indirect impacts upon wetlands and other waters of the U.S. These permits and authorizations are typically contingent on the implementation of compensatory mitigation plans requiring the construction and/or restoration of wetlands and other aquatic habitats. Created habitats are monitored for five or more years, and the results of these monitoring studies have demonstrated the technical feasibility of creating a variety of different types of wetland habitats in California.

Success of wetland creation projects, specifically seasonal wetlands, depends largely on the underlying soil features, availability of natural hydrology and surface topography. The most successful projects occur where wetlands already exist on a portion of the site and new wetlands are created on other areas of the site. There have been successful vernal pool creation projects in the Windsor area related to the Sonoma County Airport. Another local successful mitigation site is on Alton road, south of Fulton, north of Piner road. At this site, existing wetlands were rehabilitated and new wetlands were created. (personal communication, Allan Buckman, Associate Wildlife Biologist, California Department of Fish and Game, May 1997.)

Identification of Acreage for Wetland Mitigation

Impacts on jurisdictional wetlands that will result from the Project are of two kinds: 1) direct fills and/or excavations, and 2) alterations of habitat character (functions or values) that result from hydrologic alterations such as reservoir inundation. Impacts of the first kind result in loss of acreage; impacts of the second kind result in loss of particular functions (e.g., biological values provided by the present habitat), though occasionally accompanied by maintenance or even enhancement of other functions (e.g., groundwater recharge or reduction of a watershed's flooding potential).

Mitigation for Wetland Fills

Table 4.10-5 (page 4.10-36) presents the wetland impact acreage associated with reservoir construction and inundation. The identified impacts are related to both fill and alteration of function. The impact acreage of fill for construction of dams or other facilities is quantitatively relatively small (less than 25 acres). As stated on page 2-77 of the Draft EIR/EIS, mitigation of this direct impact requires creation of new habitat acreage. This relatively small acreage of wetlands could feasibly be created as terraced isolated seasonal wetlands in existing upland grasslands, the hydrology of which can be supported by incident rainfall, possibly supplemented by runoff. Also, as shown by Table 3.3 in Appendix M-3-C, *Mitigation for Wetlands and other Waters of the U.S. for Proposed Reservoir Site*, 41 acres of opportunity for reconversion of agricultural land to wetland habitat is available in the Bayflats Agricultural areas north of Highway 37.

For the pipeline element of the Project alternatives, the acreage of backfilling required for construction will be minimized by using bore-and-jack construction methods at many locations where pipelines will cross waters of the U.S. and adjacent wetlands. In the remaining locations, re-creation of habitat area will occur at the crossing site, thus, backfilling will not result in net loss of acreage.

Mitigation for Loss of Wetland Functions

The great majority of Project impacts on wetlands will result from periodic inundation of existing wetland habitat within one or more reservoir sites. As noted above, the acreage of waters of the U.S. will continue to exist, however, some functions, especially those related to the biological values of wetland habitat, will be lost or substantially altered. These latter impacts are appropriately mitigated by increasing the habitat values of wetland and riparian habitats that are presently degraded. Some degraded habitats in the Project area have been previously affected to the point where one or more of the three mandatory wetland criteria (hydrophytic vegetation, hydric soils, and wetland hydrology) have been lost. For the purposes of this EIR/EIS, wetland creation is deemed to result only where wetland habitat is created in an area which did not previously meet any one of the mandatory wetland criteria (i.e., where prior converted cropland is restored to naturalistic wetland habitat conditions, or where substantial and verifiable lateral expansion of existing wetland can be demonstrated to result from mitigation actions). Other habitat improvements, such as establishment of hydrophytic vegetation in an area where it is presently absent due to ongoing legitimate land uses, are regarded as restoration.

The wetland mitigation approach specified in the Draft EIR/EIS allows for mitigation by means of habitat creation, restoration, and/or preservation at ratios of 1:1, 2:1, and 3:1, respectively. The mitigation ratio specified for restoration (i.e., 2:1), is the same as that suggested by several comments. Mitigation credit for preservation is based upon the reasonable presumptions that reduction of

ongoing degrading land uses will accompany the establishment of conservation easements or transfer of title, and that preservation provides opportunities for active restoration, habitat creation, and enhancement that are not presently economically feasible due the cost of acquisition of land or easements. Which mitigation mechanism or combination of mechanisms that will be used will be defined specifically for each site after selection of the Project alternative. As noted above, the mitigation plan will be subject to the approval of the Corps during the permitting process for the selected alternative.

The Draft EIR/EIS suggests that the various alternative reservoir sites are each also candidate mitigation sites (page 2-81), and states that additional off-site mitigation opportunities exist (to be discussed later). For the purposes of the analysis that follows, the EIR/EIS authors believe that the acreage available for wetland restoration is at least as extensive as is the present acreage of wetland habitat within any particular candidate reservoir site. This is judged reasonable because much of the acreage within present jurisdictional wetlands is in need of restoration, and because, as shown by the planning level wetland maps in Appendix M-3, considerable acreage of hydrophytic and riparian vegetation that do not meet jurisdictional criteria adjoin the mapped wetlands. Much or all of these non-wetland areas of hydrophytic vegetation types are also amenable to restoration.

Using this approach, a preliminary determination of whether sufficient mitigation opportunity is available for a particular reservoir alternative may be made by comparing the total acreage of wetland and riparian habitats affected by that alternative with the total acreage of such habitat that exists in all other sites combined. If the mitigation opportunity in all other sites combined is at least three times the impact acreage, then the mitigation mechanism that requires the greatest acreage, preservation, is theoretically feasible for that Project alternative. If the available acreage is between two and three times the impact acreage, the alternative is mitigable by means of restoration (defined by the Draft EIR/EIS as also entailing preservation of the restored area). If the available mitigation acreage is less than twice the impact acreage for an alternative, then a specific mitigation location must be specified for creation.

Table 1 shows the acreage of impact and habitat that are potentially available for mitigation for each Project alternative defined in the Draft EIR/EIS that includes a reservoir element. The table shows that, for nearly every alternative, the amount of area available for restoration and preservation exceeds the impact acreage by a large factor, generally between five and ten times. Thus, it is clear that, with the exceptions discussed individually below, ample acreage exists to mitigate for Project impacts solely by means of preservation.

Table 1 - Master Response 11

Wetland Impacts and Mitigation

Alternative	Jurisdictional Wetlands (acres)		Cool Water Stream Habitat (lf)		Warm Water A Stream Habitat and B Combined (lf)	
	Impact	Available Mitigation	Impact	Available Mitigation	Impact	Available Mitigation
2A	248	390			29,150	94,300
2B	52	586			17,100	106,350
2C	87	551			14,350	109,100
2D	74	564			28,400	95,050
3A	62	576	350	2700	13,700	109,750
3B	57	580			14,500	108,950
3C	69	569	2700	350	10,300	113,150
3D	102	536			9,300	114,150
3E	48	589			11,100	112,350

Available mitigation figures are the acreages or number of lineal feet (lf) occurring within all reservoir sites combined, minus the impact area or distance for the alternative in question. See text for discussion of assumptions.

Two complex mitigation situations are presented in Table 1. Alternative 2A (with the Tolay extended reservoir element), represents by far the greatest area of wetland impact of any alternative. The available acreage is insufficient to provide for full mitigation solely by means of preservation. For this alternative, restoration of the 390 acres that are estimated to be available for this purpose, plus a minimum of 53 acres of wetland creation is required. As noted in Table 3-3 on page 3-21 of Appendix M-3-C, approximately 41 acres of opportunity for wetland habitat creation by means of reconversion of agricultural land is available in the Bayflats Agricultural Areas north of Highway 37. At least 12 acres of such opportunity exist south of Highway 37.

The other complex mitigation situation occurs with wetlands impacts associated with Alternative 3C. The candidate reservoir/mitigation sites shown in the table do not demonstrate sufficient opportunity for mitigation of the impact on cool water stream habitat resulting from construction of a reservoir at the Carroll Road site. However, ample opportunity for restoration of perennially flowing aquatic habitats is provided at other locations, which are described in Table 3.3, Appendix M-3-C. Specifically, a total of 21,000 linear feet of restoration opportunity is available along Americano Creek, including only freshwater reaches (ID numbers 31 through 34) and excluding identified

restoration opportunities where the water is brackish. An additional 6,000 linear feet of opportunity is available on the unnamed drainage below the Carroll Road reservoir site itself. Restoration at these locations, that entails revegetation with appropriate woody riparian species, will either substantially increase the cool water stream habitat values of those reaches, or possibly convert areas of perennial flow that might presently be categorized as warm water stream habitat into cool water stream habitat, by virtue of the shading provided by overhead woody vegetation.

Conclusion

Based upon reasonable assumptions as described above, sufficient acreage is available to implement wetland creation and restoration measures.

MASTER RESPONSE 12 - STEELHEAD TROUT

Comment Summary: Several comments stated that the current status of Steelhead trout as a proposed federally endangered species is not reflected in the Draft EIR/EIS.

Response Summary. Although not proposed for endangered species listing at the time of publication of the Draft EIR/EIS, steelhead trout were considered in the Draft EIR/EIS to be an important species. The Draft EIR/EIS lists impacts to steelhead as significant for Alternative 3C, where three steelhead were found at the Carroll Road Reservoir site. Conclusions regarding significance are revised to reflect the recent changes in the status of steelhead trout.

Steelhead trout display a unique life history trait in that they may be anadromous or reside only in fresh water residency. Anadromous strains migrate as juveniles from fresh water tributaries to the ocean and then return to these tributaries to spawn. Fresh water residency means that the steelhead live out their entire life cycle in fresh water. These resident forms are commonly referred to as “rainbow trout” while the anadromous forms are called “steelhead.” These two forms are virtually indistinguishable. The National Marine Fisheries Service (NMFS) currently recognizes five distinct populations, or Evolutionarily Significant Units of steelhead trout in the state of California. The Santa Rosa Subregional Long-Term Wastewater Project area is within the range of the Central California Coast Evolutionarily Significant Unit. This particular unit encompasses river basins from the Russian River south to Soquel Creek, Santa Cruz County, including the drainages of San Francisco and San Pablo Bays (excluding the Sacramento-San Joaquin River Basin). Only winter-run steelhead are found in this particular Unit.

Significant Impacts Identified in the Draft EIR/EIS

Extensive studies of steelhead were conducted and are presented in the Draft EIR/EIS. Studies conducted in the Russian River are contained in Appendices L-1 (Anadromous Fish Migration Study Program, 1991-1994) and L-2 (Anadromous Fish Migration Study Program, 1991-1995). Surveys of other Project area streams are reported in Appendix L-5 (Aquatic Life Survey Results). Project impacts are presented in Section 4.9 of the Draft EIR/EIS, Aquatic Biological Resources. The only alternative that was determined to have the potential to have significant effects on steelhead is Alternative 3C, where three steelhead were found at the Carroll Road Reservoir Site. Loss of this aquatic habitat was considered significant in the Draft EIR/EIS (Refer to Impacts 9.5.5 and 9.5.8 in Section 4.9).

Change in Status of Steelhead Trout

The status of steelhead trout within the Project Area, as presented in the Draft EIR/EIS, was current as of the publication date. Though steelhead trout was originally a federal category 2 candidate species (Federal Register 59(219): 58982-59028 [1994]), this status category was eliminated on February 28, 1996 (Federal Register 61(40): 7457-7463 and 7595-7613 [1996]). As a result, the status of steelhead trout in the Draft EIR/EIS was

changed from a Category 2 candidate to a no status and it was not included in Table 4.9-1 - Special-Status Species Associated with Aquatic Habitats. On August 9, 1996, the NMFS petitioned to have the Central California Coast Evolutionarily Significant Unit listed as federally endangered (Federal Register 61(155): 41541-41561). The public comment period associated with this petition ended January 6, 1997. However, A final ruling on the petition for listing will not be made until August 1997 (pers. comm. Steven Stone, NOAA). If this Unit is listed, the steelhead trout in this Unit would receive protection provided by the Federal Endangered Species Act (ESA). Project construction and operation would then be required to comply with all applicable requirements of the ESA.

Even if the Central California Coast Evolutionarily Significant Unit of steelhead trout is not listed in the near future, any impacts from the Project would be considered significant since the steelhead trout in this Unit qualify as a rare or endangered species (as defined by CEQA Guidelines Section 15380) and a mandatory finding of significance is required (CEQA Guidelines Section 15065) if a project has the potential to reduce the number or range of a rare or endangered species. Therefore, the analysis of impact associated with this species and the requirement to mitigate any identified impacts to the species are not contingent upon whether the species becomes Federally listed. However, should the species become federally listed, the ESA requires that the federal lead agency enter into Formal consultation with the U.S. Fish and Wildlife Service. This consultation can result in the imposition of additional mitigation measures that are necessary to prevent jeopardy to the species and that were not required as part of the CEQA or NEPA compliance for the Project.

To show the current status of steelhead trout the following changes are made to the Draft EIR/EIS:

Page 4.9-10. Table 4.9-1 is revised as follows.

Table 4.9-1

Special-Status Species Associated with Aquatic Habitats

Species	Status				Management Concerns	
	State ¹	Federal ¹	CNPS ¹	Source	Habitat	Potential Threats
<i>Oncorhynchus kisutch</i> Coho salmon	SSC	FPT	--	7	Most coastal streams and rivers from San Lorenzo Creek in Santa Cruz County north.	Damming, agricultural development, logging, overfishing, and improper watershed management.
<i>Oncorhynchus mykiss</i> Steelhead trout (Central California Coast Evolutionarily Significant Unit)	--	FPE	--	8	Coastal streams and rivers from the Russian River south to Santa Cruz County.	Damming, agricultural development, logging, and improper watershed management.
<i>Pogonichthys macrolepidotus</i> Splittail	SE	FPT	--	2,5	Backwater slough areas in the lower Delta, San Pablo Bay, and Petaluma River.	Habitat loss, degradation of water quality, and changes in flow regimes.
<i>Spirinchus thaleichthys</i> Longfin smelt	SSC	--	--	2,5	Prefers moderately saline waters in major bays and estuaries from San Francisco Bay northward.	Degradation of water quality and changes in flow regimes.
AMPHIBIANS						
<i>Ambystoma californiense</i> California tiger salamander	SSC	FC	--	2,4,5	Oak savannah, valley-foothill grasslands, and vernal pools.	Habitat destruction due to agricultural and urban development.

Source: Harland Bartholomew and Associates, Inc., 1996

Notes:

- State status data taken from California Department of Fish and Game documents, Endangered and Threatened Animals of California and Listing Dates (Revised January 1995) and Special Animals (Revised August 1994)
 - SE = State-listed Endangered
 - ST = State-listed Threatened
 - SSC = Species of Special Concern

Page 4.9-12. The following is inserted in Table 4.9-1 as Footnote 8:

8. Federal Register 61 (105) 41541-41561

Page 4.9-86.

The Analysis section under Impact 9.1C. is revised as follows:

Analysis: The Project impacts are to alternatives 2, and 3C.

Construction of storage sites will result in the loss of between 1.4 and to 4.8 acres of California red-legged frog habitat associated with Lakeville Hillside, Sears Point, Tolay Confined, and Tolay Extended storage reservoirs. ~~Construction of the Carroll Road storage reservoir would result in the loss of 2,700 linear feet of steelhead trout habitat (Coolwater A).~~ All habitat losses are considered significant and will be fully mitigated through habitat creation, restoration and preservation and red-legged frog translocation. All frogs ~~and steelhead trout~~ were found in marginal habitats. Mitigation will not only fully compensate for the habitat losses, but will provide long-term preservation of their habitats.

Construction of the Carroll Road storage reservoir would result in the loss of 2,700 linear feet of steelhead trout habitat (Coolwater B). This impact is considered to be significant due to the loss of Coolwater B stream habitat and the loss of habitat for a species that is considered rare or endangered under CEQA, whether or not it is ultimately federally-listed as endangered. Mitigation Measure 2.3.11 - Sensitive Biological Resources Conservation Program will be implemented to address this issue. This program provides for restoration of degraded habitat that supported sensitive species historically, but is no longer occupied by the species. There are opportunities for restoration of degraded streams in the project area to compensate for the loss of the 2,700 linear feet of Coolwater B stream habitat associated with the Carroll Road storage reservoir.

~~The cumulative projects list (Appendix D-31) (Cumulative Project List) identifies 504 projects which are undergoing some level of review by the U.S. Army Corps of Engineers for wetlands fill in the cumulative project area. Many of these projects may impact both red-legged frog habitat and steelhead trout habitat. Since the impacts associated with the project will be fully mitigated, the project does not contribute to the cumulative effects of the projects in the region that affect these species. Therefore, no additional mitigation is proposed. The protection of both the California red-legged frog habitat and steelhead trout habitat potentially affected by these projects is guaranteed through the Endangered Species Act which requires federal agencies to insure that their actions (including permitting) are not likely to jeopardize the continued existence of listed species. Therefore, mitigated impacts to red-legged frogs and steelhead trout should be minimal.~~

————— Since the impacts of the Project will be fully mitigated as well as the cumulative projects, no additional cumulative effect is identified for this impact. No additional mitigation is proposed.

Page 2-78. Table 2.3-1 is revised as follows:

Table 2.3-1

Protected or Sensitive Biological Resources Potentially Impacted through Reservoir
Construction and Maintenance

Protected or Sensitive Resource	Mitigation Ratios ¹			Target Habitat/Community
	Creation	Restoration	Preservation	
Oak Woodland/ Oak-Bay-Madrone Woodland ²	1:1	1.5:1	2:1	Oak Woodland/ Oak-Bay Madrone Woodland ²
Native Grassland ²	1:1	2:1	3:1	Native Grassland ²
Riparian Woodland/Coolwater B Stream ²	1:1	2:1	3:1	Riparian Woodland/Coolwater A or B Stream/Red-legged Frog Habitat, Steelhead Trout Habitat , and NW Pond Turtle Habitat ²
Riparian Woodland/Warmwater A Stream/Red-legged Frog Habitat And NW Pond Turtle Habitat ²	1:1	2:1	3:1	Riparian Woodland/Warmwater A Stream/Red-legged Frog Habitat And NW Pond Turtle Habitat ²
Non-wooded Riparian/Warmwater B Stream ²	-	2:1	-	Riparian Woodland/Warmwater A Stream/Red-legged Frog Habitat And NW Pond Turtle Habitat ²
Fresh Water Marsh ²	1:1	2:1	3:1	Fresh Water Marsh ²
Freshwater Ponds/Red-legged Frog And NW Pond Turtle Habitat ²	1:1	2:1	3:1	Fresh Water Marsh/Red-legged Frog And NW Pond Turtle Habitat ²
Freshwater Seep Wetlands Or Other Waters Of The U.S. ²	-	2:1	3:1	Fresh Water Marsh ²
Seasonally Wet Vegetation Wetlands	1:1	2:1	3:1	Seasonally Wet Vegetation Wetlands
Cropped Wetlands Or Other Waters Of The U.S. ²	-	2:1	-	Seasonally Wet Vegetation Wetlands
Drainage Wetlands Or Other Waters Of The U.S. ²	-	2:1	-	Riparian Woodland/Warmwater A Stream
Annual Grassland Wetlands Or Other Waters Of The U.S. ²	-	2:1	-	Seasonally Wet Vegetation Wetlands
All other Wetlands Or Other Waters Of The U.S. ²	-	2:1	-	Riparian Woodland/Warmwater A Stream

Source: Harland Bartholomew & Associates, Inc., 1996

Notes: 1. Subject to change at the discretion of the U.S.

Army Corps of Engineers. 2. Resource may contain Corps jurisdictional wetlands or other waters of the U.S.

Page 2-79.

Table 2.3-2 is revised as follows:

Table 2.3-2

Sensitive Biological Resources and Managing Agency

Sensitive Resource	Managing/Responsible Agency
Oak woodland	CDFG, Sonoma and Marin Counties
Riparian woodland	CDFG
Native grassland	CDFG
Fresh water marsh	USFWS, CDFG, Corps
Aquatic stream and pond habitat	USFWS, CDFG, Corps
California red-legged frog habitat	USFWS, CDFG
Northwestern pond turtle habitat	CDFG
Steelhead trout habitat	NMFS
Other Corps jurisdictional wetlands and other waters of the U.S.	Corps, CDFG, USFWS

Source: Harland Bartholomew & Associates, 1996

Pages 4.9-56 to 58. The following is added to Table 4.9-10:

Table 4.9-10

Aquatic Biological Resources Impacts by Component - Storage Reservoirs,
Criterion #1

Evaluation Criteria	Point of Significance	Impact ¹		Type of Impact ²	Level of Significance ³
Steelhead trout		Individuals	Linear Feet		
• Carroll Road		3	2,700⁴	C, P	⊙
• All other reservoirs		0	0	C, P	≡

Source: Harland Bartholomew & Associates, Inc., 1996

Notes:

1. See note at end of analysis.

2. Type of Impact:

C Construction

P Permanent

3. Level of Significance codes:

⊙ Significant impact before mitigation; less than significant impact after mitigation

≡ No impact

[4. The loss of steelhead trout habitat is addressed in Impact 9.5.5 \(loss of Coolwater B aquatic habitat\).](#)

Pages 4.9-56 to 4.9-58. Impact 9.5.1 is revised as follows:

Impact: 9.5.1. Will the storage reservoir component cause a loss of individuals or occupied habitat of endangered, threatened, or rare aquatic wildlife or plant species?

Analysis: *Significant; Alternatives 2, 3A, 3B, [3C](#), 3D, and 3E.*

Tolay Extended, Tolay Confined, Lakeville Hillside, Sears Point, Two Rock, Bloomfield, Valley Ford, and Huntley Reservoirs and associated facilities (including dams, access roads, pump stations, and diversion channels) will result in the loss of at least one California red-legged frog and greater than zero acres of occupied California red-legged frog habitat. Maps B-1 through B-7 of the *Biological Resources, Volume 4B* illustrate the California red-legged frog occurrences identified for each storage reservoir site (Harland Bartholomew & Associates, Inc. 1996d). Impacts of the Adobe Road site are discussed under No Impact below.

[Carroll Road reservoir and associated facilities will result in the loss of at least three steelhead trout. Note that the loss of steelhead habitat is addressed under Impact 9.5.5. Map B-6 of the *Biological Resources Technical Memorandum, Volume 4B* illustrates the steelhead occurrences identified at the Carroll Road reservoir site \(Harland Bartholomew & Associates, Inc. 1996d\).](#)

No other endangered, rare, or threatened species or their habitat was found.

No Impact; Alternatives 1, 3C, 4, and 5.

[The Adobe Road and Carroll Road reservoirs](#) and associated facilities will not result in the loss of individuals or occupied habitat of federally proposed or listed or federal candidate aquatic wildlife or plant species and therefore there is no impact.

Note: There are two closely related subspecies of red-legged frog in the Project area: California and northern. The identity of the species within any one alternative is unclear. Northern red-legged frogs are a California Department of Fish and Game species of special concern. The California red-legged frog is federally-threatened.

The recent federal ruling establishing the final status of California red-legged frog as federally-threatened provided the geographic range of the species. Red-legged frogs in the Walker Creek, Sonoma Creek, Petaluma River, and Tolay Creek watersheds are identified as the California subspecies and are considered federally-threatened (Miller 1996.) All other red-legged frogs in the Project area appear to be the northern subspecies, although final confirmation has not been received.

In the current analysis, all red-legged frogs in the Project area are considered to be the California subspecies though the status will be confirmed prior to the Final EIR/EIS. All red-legged frogs not determined to be the California subspecies will be evaluated as a species of special concern. Findings of significance and proposed mitigation are not expected to change.

No other endangered, rare, or threatened species or their habitat was found.

Alternatives 1, 4, and 5 do not have a storage reservoir component.

Mitigation: *Alternatives 2, 3A, 3B, [3C](#), 3D, and 3E.*

2.3.11. Sensitive Resource Conservation Program

2.4.4. California Red-legged Frog Capture and Relocation Program

Alternatives 1, ~~3C~~, 4, and 5. No mitigation is needed.

After

Mitigation: *Less than Significant after Mitigation; Alternatives 2, 3A, 3B, [3C](#), 3D, and 3E.*

California red-legged frog [and steelhead trout](#) habitat will be created (one acre created to one acre impacted) or restored (two acres restored to one acre impacted) in conjunction with other associated biological resource mitigation (e.g. jurisdictional wetlands, aquatic habitat, and sensitive vegetative communities). Red-legged frogs on site will be captured and relocated to the mitigation site.

MASTER RESPONSE 13 - CHARGING FOR IRRIGATION USE OF RECLAIMED WATER

Comment Summary: Several comments suggested that charging for the use of reclaimed water for irrigation should be considered, and that this would reduce the impact on ratepayers from increased service charges.

Response Summary. Charging farmers for irrigation water would not appear to bring in sufficient revenue to significantly offset sewer fees; also such charges appear to be infeasible because, on average, only grape and vegetable crops have demonstrated the profitability required to pay for the water.

The issue of water pricing was not specifically addressed in the Draft EIR/EIS. It was presumed that the water would have value, but as a conservative measure no value was assigned. Any revenue collected from irrigation water sales would offset the operating costs of the Project and thus reduce sewer rates paid by rate payers.

Sonoma County Water Agency Study

A recent study (not performed as part of this EIR/EIS), commissioned by the Sonoma County Water Agency, addressed potential for Sonoma County farmers to pay for reclaimed water.¹ In summary, the study found that the net returns per acre in Sonoma County were higher for irrigated crops than for non-irrigated crops in all the crop types evaluated (the evaluated crop types included grapes, vegetables, apples, prunes, silage/greenchop, hay/oats, and pasture). However, the study also concluded that when returns for management and land are accounted for, only the grape and vegetable crop farmers would, on average, be able to pay for irrigation.²

Even with the water demand limited to two crop types, the total acre-feet of irrigation water demand implied by the study's most conservative assumptions is significantly higher than the total amount of reclaimed water available under the one percent discharge scenario. The study findings indicate that vegetable farmers would be willing to pay up to \$371 per acre foot for reclaimed water and that grape farmers would pay up to \$362 per acre foot. At these prices grape and vegetable farmers would demand approximately 25,040 acre-feet. The additional amount of reclaimed water available from the Project at build-out, assuming a one percent discharge level, is projected to be only 13,240 acre-feet.

¹See "Farm Level Payment Capacity for Secondary- and Tertiary-Treated Water in Sonoma County," by Northwest Economic Associates. Fair Oaks, CA, March 14, 1997.

²The study's findings imply that, when reasonable returns for land and management are accounted for, only grapes and vegetable crops are economically viable in the long-run in Sonoma County. The existence of economically viable farms in Sonoma County which currently grow crops other than grapes or vegetables suggests that the study's estimates for management and land costs may be too high or that many farmers regard these as sunk costs.

Several other observations relevant to the potential demand for reclaimed water can be derived from the Study:

- Although the net revenue from using reclaimed water to produce forage or feed-crops (silage/greenchop) was not shown to be positive, these crops may still offer a cost advantage over the alternative source of forage -- imported alfalfa. As a result, dairy farmers may find irrigation advantageous because it would allow them to substitute silage/greenchop crops for the more expensive alfalfa currently imported from other regions.
- The availability of reclaimed water for irrigation can potentially increase the uniformity in crop yields by insulating them against the impact of droughts. At the present time a number of crops, including grapes and apples, are subject to substantial production variation, depending upon rainfall. Agricultural irrigation as proposed in the Project could reduce the risk to Sonoma County farmers, a factor that was not accounted for in the Study.
- Since management and land costs represent sunk or fixed costs for most farmers, many Sonoma County crops could benefit from irrigation, because the marginal costs of irrigation over dryland farming would be exceeded by marginal revenues. In the long-run, those farmers who do not find irrigation economically viable are likely to find dryland farming even less lucrative and may exit the agriculture sector altogether.

Potential Revenues from Charging for Irrigation Water

For purposes of illustrating the impact of water sales upon sewer rates, a scenario where reclaimed water was sold at a net price of \$100 per acre-foot was developed assuming a one percent discharge rate. The results assume that farmers first begin purchasing water in 1999 and that demand will increase at a rate of 1,000 acre-feet per year through 2010. After 2010, water demand is assumed to equal the amount of disposal need in the system.

If farmers pay \$100 per acre-foot for reclaimed water, the costs to rate payers are reduced slightly, but not eliminated. Water charges to farmers generate about \$1.3 million in annual revenues at buildout. This translates into about a \$1.00 per month decline in service charges or about three to four percent of the increased monthly charge, depending on the Alternative.

The total annual redistribution of costs from the rate payers to the agriculture sector as a result of the water charges is about \$1.7 million. This includes the direct redistribution of revenue resulting from the water charges and the indirect redistribution caused by the input-output model calculated multiplier effect.

The total price per acre-foot that would need to be charged in order to reduce the costs to rate payers to zero is approximately \$3,600 per acre-foot at buildout, an amount significantly higher than Sonoma County farmers would be willing or able to pay. The

fact that farmers cannot afford to pay an amount equal to the full economic benefit associated with irrigation is itself evidence that some of this benefit is being captured by sectors other than the agriculture sector.

Conclusion

Regarding the potential to charge for irrigation water as a mitigation for significant socioeconomic impacts, the annual revenues generated by such a fee program would be \$ relatively small compared to the cost of implementing an irrigation Project. The income does not appear to be sufficient to substantially reduce the increase in service charges or alleviate the significant socioeconomic impact. Even this small source of revenue is based upon the assumption that the irrigation would be used on grapes and vegetable crops -- the crops which can "afford" to pay for water. Because of the limited income and because it would not be feasible for the City to require that irrigation users grow only these crops, the mitigation measure appears to be infeasible. Therefore, charging for irrigation water has not been included as a mitigation measure.

MASTER RESPONSE 14 - PHASED APPROACH/SMALL RESERVOIRS

Comment Summary: A large number of comments advocated implementation of a phased project including public-private partnerships, and a "pay-as-you grow" approach. Their approach is based on gradual implementation of small projects using on-farm storage with reservoir sites built by willing property owners, instead of one or two large central reservoirs. They cited the benefits of building trust with agricultural users, potential benefits of private funding for these small projects, possible cost reductions by minimizing up-front costs and suggested that such a project would be less vulnerable to lawsuits. Several comments suggested that environmental impacts of small reservoirs would be less than those for large reservoirs. The Gallo project was cited as an example in several comments. Some of the comments recognized the need for immediate measures to dispose of reclaimed water and recommended "buffers" to be used until storage and irrigation can be expanded. Buffers were defined in comments as areas to store and dispose of excess water when weather and river flow leave too much water in regular storage.

Response Summary. A phased approach to increasing the reuse of reclaimed water using small reservoirs may help to meet the Project objective of reuse, however, it does not provide a long-term solution as required by the North Coast Regional Water Quality Control Board (Regional Board). If a higher percentage discharge solution or the Geysers Alternative is adopted to meet the long-term solution requirements of the Regional Board, small reservoirs could also be undertaken to increase irrigation reuse. This would require additional environmental documentation as those reservoirs are identified and proposed by potential users of reclaimed water.

Phasing Included in the Project

Project phasing is a potential way to reduce costs by delaying implementation of portions of the Project. If some portions of the Project can be constructed later, costs can be incurred later, thereby reducing interest costs. For this purpose, the Project includes two alternatives that could include phased reservoir construction: Alternatives 2B and 2D, both of which have two reservoirs. Both the West County and South County Alternatives could, and probably would, include phased construction of distribution and irrigation systems. It would not be feasible or necessary to bring all of the irrigation areas on line simultaneously. Only the agricultural alternatives lend themselves to phasing, since improvements for discharge and the Geysers would need to be built to accommodate the maximum flows from the beginning. Even this degree of phasing is only possible within the framework of complying with the Regional Board's mandate to put a long-term solution in place.

There has not been any further analysis of Project phasing and potential cost reductions within the EIR/EIS. Although some additional phasing opportunities could be accommodated within the framework of existing alternatives, comments seem to be

suggesting a more extensive phasing program that includes a more gradual implementation of the Project, using many small reservoir sites. The idea of phasing and small reservoir sites is linked in most comment letters that discuss these issues.

Meeting the Requirement for a Long-Term Solution

The central problem standing in the way of such a phased project is the immediate need for large amounts of storage and irrigation land to meet the Regional Water Quality Control Board's requirements for a system that will operate reliably under all foreseeable weather conditions. As described on page 4.18-23 of Section 4.18, of the Draft EIR/EIS, for an alternative with 1% design discharge to the Russian River, 52 percent of the system would serve existing users. If the City selects an alternative with 1% design discharge rate to the Russian River, over 2,000 million gallons (MG) of storage are needed immediately, and about 2,000 to 3,000 acres of irrigation land are needed immediately. This does not provide much opportunity for slow phasing of a project. For example, about 20 reservoirs the size of the Gallo reservoir would have to be identified, evaluated, and permitted immediately to meet the current need.

Because so much storage is needed now, there would be no risk of there being a large reservoir sitting empty, except at the end of the irrigation season, when the goal is to empty the reservoir before the start of the rainy season. If wastewater generation grows more slowly than expected, this may delay the time when additional storage and disposal capacity may be required in the future.

As of April, 1997, the Gallo reservoir is the only reservoir that has been proposed to the City of Santa Rosa by a private party (Dan Carlson, personal communication; April 1977), and it is not evaluated in this EIR/EIS. While it would be preferable to work with property owners who want a reservoir on their property, no additional proposals have emerged.

Consideration of Multiple Small Reservoirs during Scoping

Although phasing was not specifically evaluated, phasing implies use of multiple small storage reservoirs, which were considered but dropped from consideration as costly and infeasible. Refer to Appendix D-6 (Documentation in Support of Elimination of Alternatives) for a discussion of the cost-effectiveness and feasibility of small reservoir sites and on-farm storage. The findings of Appendix D-6 are summarized below.

Appendix D-6 (Documentation in Support of Elimination of Alternatives) provides a discussion of criteria for reservoirs, including a discussion of on-farm storage in multiple small ponds, and a review of the size requirements for reservoirs. Logistics constraints resulted in a criterion that sites be at least 1,000 million gallons (MG) so that more than five new reservoirs need not be built. The City already manages multiple reservoirs, and to keep the operation of reservoirs manageable, City staff have determined that it would be best to keep the number of new reservoirs as few as possible. This criterion was based on the assumption that the City would manage and operate reservoirs.

An extensive search for suitable reservoir sites was conducted, and previous reports by Koretsky King Associates (1980) and Woodward Clyde Consultants (1988 and 1990) were used to develop a list of more than 60 reservoir sites/configurations. Of these, nine sites in ten configurations were carried forward for analysis in the Draft EIR/EIS.

Table 1 in Appendix D-6 provides a summary of the 50 sites that were not carried forward and the reasons that each was dismissed from further consideration. Most were too small (40 of 50 less than 1,000 MG, and 25 less than 500 MG), and/or did not meet the cost criterion of \$5,000 per acre-foot of storage or less that was developed for the Project. As stated on page 24 of Appendix D-6, "In general, construction costs greater than \$5,000 per acre-foot of storage were considered excessive because there are numerous reservoir sites (more than 30) with better cost effectiveness. The costs of preferred reservoir sites range from about \$1,100 to \$3,700 per acre-foot. Basic construction cost for sites smaller than 1,000 MG were up to \$54,000 per acre-foot, with 25 sites costing more than \$5,000 per acre-foot. This does not compare favorably to larger sites, most of which can be built for \$3,000 to \$4,000 per acre-foot, even after adding costs of mitigation, which were not included in the original screening cost estimates. A number of sites were also in poor locations, too far from the Project area to be effective.

Any reservoir less than 1,000 MG has been considered a "small" reservoir. If they are managed like a large reservoir, small reservoirs would need to be operated to serve multiple irrigation users, with the service area for a particular reservoir depending on its capacity. The concept of on-farm storage takes the small reservoir idea a step further, and assumes that all irrigation users provide storage for their particular property. This concept of on-farm ponds results in even more, smaller storage sites.

Appendix D-6 also provides the reasons why multiple on-farm small reservoirs were not considered feasible. A scenario of 30 small reservoirs, each 150 MG, was evaluated in Appendix D-6. The analysis is based on a requirement for 4,500 million gallons (MG) of new storage for a 1% design discharge rate. As shown in Table 3.3-2 in the Project Description, a reservoir with a gross capacity of between 4,400 MG and 5,600 MG is needed to achieve net reclaimed water storage of 4,000 MG. The additional capacity is needed to deal with dead storage and captured runoff. (At about 100 MG, the Gallo reservoir is only about 2/3 the size of the small reservoirs analyzed in Appendix D-6, and the Project would require at least 45 of these 100-MG reservoirs to meet capacity requirements for a 1% Project.)

The reasons for rejection presented in Appendix D-6 are summarized below:

Cost. Construction cost for 30 small reservoirs was estimated at \$138 million, based on the cost for construction of embankments to create the ponds. This translates to a cost of almost \$10,000 per acre-foot (AF), double the cost criterion of \$5,000/AF that was developed for reservoir sites. This cost estimate for multiple small ponds did not consider cost for mitigation measures or runoff diversion structures, the need for which can only be determined after more

detailed study. Construction costs of single large reservoir sites that can accommodate the entire Project's storage needs range from about \$38 million to \$84 million, including mitigation, with most sites in the \$45 million range.

Logistics. For most agricultural uses, a typical pond would require almost one-quarter of the total farm acreage to provide enough storage for a season. This assumes a water use of about 2 acre-feet per acre, and a typical embankment-type pond about 10 feet deep. This would drastically reduce the area of productive farmland, and would make on-farm storage unfeasible for typical agricultural users. For crops with lower water requirements, such as grapes, a small pond would serve a greater acreage, and the loss of land for a pond would be proportionately less. Sites with natural canyons that could be dammed, instead of using embankment type construction, might also allow construction of a deeper reservoir, with a smaller footprint. However, the average site would be severely limited for this type of on-farm storage. Ponds could be designed to be deeper, thus requiring less land, but with a commensurate increase in the cost for earthwork. Embankments more than 25 feet high would come under the jurisdiction of the Division of Safety of Dams, as do the large reservoirs evaluated in the Draft EIR/EIS.

For the City, the logistics of water management with multiple ponds are also difficult. Thus, a system of on-farm storage would be less of a management problem for the City if individual users assume responsibility for managing the storage on their property. This would require that each user manage storage and water demand, without the ability to draw water from other areas during times of high demand. This means that some users may end the season with excess water, while other may run out before the end of the irrigation season. If the City assumes overall responsibility for managing storage, water would have to be moved among ponds throughout the year to balance storage and irrigation requirements.

One of the primary logistics constraints is managing the storage curve to ensure that reservoirs are full at the beginning of the irrigation season, and empty at the end of the season. If the reservoirs are not emptied at the end of the season, the required storage for the winter months will not be available, and this would create problems in complying with discharge limitations. Managing a storage curve for a single reservoir is not a simple task; managing multiple storage curves for multiple reservoirs is infeasible.

Environmental Impacts. Impacts of the multiple small reservoir program have not been evaluated, because such a program did not qualify as a Project alternative.

Relevance of the Gallo Project

A number of comments cited the Gallo project as an example of how the City should go about meeting storage requirements. There are a number of unique elements to the Gallo project, which limit its relevance in this regard. First and foremost of these are the resources of Gallo Vineyards Sonoma, which had the equipment and money to build a reservoir on their property, without any participation from the City of Santa Rosa. Gallo would have built this reservoir regardless of whether reclaimed water was available, and filled it with potable water (Initial Study for the West Cotati Reclamation Pipeline Project, prepared by Brelje & Race for the City of Santa Rosa, June 10, 1996). The Gallo property is very close to the City's existing reclaimed water system. Only 3 miles of pipeline were required to convey reclaimed water to the reservoir and an existing pump station used during the summer months for the Rohnert Park Reuse System was available during winter months. Finally, grapes generally have a low water requirement and high economic return.

The low water requirement means that a relatively small reservoir (the reservoir footprint is about 15 acres) can serve a relatively large number of acres (250 acres of vineyards are planned). The value of grapes means that the remaining acreage generates enough revenue to make up for the loss of the reservoir site to agricultural production. The Gallo reservoir will be filled in the winter, when reclaimed water is available, and this water supply will be used by Gallo during the year. Gallo will be responsible for managing the reservoir to meet their own demands during the irrigation season. The City will not be able to provide reclaimed water during the summer months because all of this water is currently contracted to other users. These elements made the Gallo project feasible for both the City and for Gallo.

Finally, small reservoirs built by landowners do not necessarily have simple permit requirements. Small reservoirs would still require environmental review and, if located on wetlands or other waters of the U.S., would require a 404 permit. For example the overall Gallo project, which includes the reservoir and other site modifications, is subject to an individual 404 permit from the Corps for fill of wetlands.

Environmental Documentation Required

If a reservoir is built as part of an overall program to meet the City's reclaimed water storage requirements, it would not qualify for simplified permitting requirements. To avoid problems of piece-mealing, an overall program addressing impacts of the potential small reservoir sites would need to be developed and evaluated. CEQA does not allow environmental documentation to look at each small reservoir separately and draw the conclusion that it has fewer impacts than a larger site. All of the reservoir sites required to meet the storage requirement would have to be evaluated together to portray the true scope and impact of multiple sites. The current Draft EIR/EIS evaluates all sites that met the criteria described in Appendix D-6.

Conclusions

Although it is true that phasing would allow the system to grow as the population of the Subregional System increases, this is not consistent with the mandate of the Regional Board to construct a long-term solution. Small reservoir sites were not considered to be feasible, do not provide a long-term solution as mandated by the Regional Board, and were not evaluated in the Draft EIR/EIS.

MASTER RESPONSE 15 - ZERO DISCHARGE

Comment Summary: Several comments requested consideration of zero discharge. Some comments have suggested that cultivation of redwood forests could achieve zero discharge without need for additional storage.

Response Summary. Zero discharge was considered and eliminated during the screening process because it was incapable of meeting the North Coast Regional Water Quality Control Board's mandate to construct a reliable long-term system that would not fail under adverse weather conditions. For a discussion of redwood cultivation, refer to Master Response 18.

Several zero discharge options were considered in the Project Screening Report (March, 1994), but were not carried forward because of the extreme difficulty in designing a system that can operate without discharge under all weather conditions. The Regional Board mandate resulted in the Project Objective to: "Operate the wastewater treatment plant and disposal system successfully under all foreseeable weather conditions" (refer to page 1-3 of the Draft EIR/EIS). Zero discharge is not capable of achieving this objective.

Zero discharge is particularly difficult (or impossible) in wet winters. Currently, inflow and infiltration increase plant inflows from less than 20 million gallons per day (mgd) to peak levels of 71 mgd. Alternative 3B from the Screening Report (which is different than the Alternative 3B described in the Draft EIR/EIS) provides some details regarding storage and irrigation requirements for zero discharge. Instead of the 4,000 million gallons (MG) of new storage required for a 1% discharge alternative, a zero discharge alternative would require about 11,000 MG of new storage (at least three new reservoirs). Instead of the 3,800 to 6,200 acres of irrigation area needed with a 1% discharge, a zero discharge alternative would require over 13,000 acres of irrigation land, requiring pipelines to both West County, South County, and Sebastopol. A substantial number of expensive facilities would have to be built, but almost never used, for a zero discharge irrigation system. The zero discharge alternatives evaluated in the Screening Report were eliminated from further consideration because they were not weather independent, there would be substantial problems with management, and because costs were very high.

Of the Project alternatives evaluated in the Draft EIR/EIS, the Geysers Recharge Alternative comes closest to zero discharge, because considerable variation in discharge rates can be accommodated in the geysers pipeline and at the injection wells. However, even for the Geysers Alternative, design of a Project which would accommodate the highest winter flows and totally avoid any River discharge is cost prohibitive.

MASTER RESPONSE 16 - WATERLESS TOILETS

Comment Response: Some comments stated that the EIR/EIS should evaluate waterless toilets, including composting and incinerating toilets as an alternative to conventional wastewater treatment and disposal technology.

Response Summary. Composting toilets and electric toilets were considered in the Draft EIR/EIS and were eliminated from further consideration because technologies for these systems are not yet considered reliable.

Composting toilets are discussed in Appendix D-6 (Documentation in Support of Elimination of Alternatives) starting on page 10. These devices have been used with success in some rural areas, but have not yet been demonstrated to work on a large scale in urban areas.

The City of Santa Rosa did consider a potential demonstration program for composting and incinerating toilets. The project was referred to the Sonoma County Water Agency, because these systems will likely be most useful for rural areas within the Water Agency's jurisdiction. The Water Agency is funding a demonstration program that will explore potential use of waterless toilets. The City of Santa Rosa will continue to monitor developments in this area through the Board of Public Utilities Technology Committee.

MASTER RESPONSE 17 - WATER CONSERVATION

Comment Summary: Some comments urged consideration of increased conservation beyond that already implemented by the City.

Response Summary. The North Coast Regional Board has mandated construction of a reliable long-term system that would not fail under adverse weather conditions. This mandate has resulted in the City's objective to "Develop a disposal system that is manageable and reliable". The City is committed to maximum feasible conservation, and is committed to implementing technology that may become feasible in the future. But for the Long-Term Project, the City is not able, because of the Regional Board mandate and the Project objectives, to rely on technologies or techniques that are not proven or cannot have precisely quantifiable effects.

The Draft EIR/EIS states that measures that go "beyond proven technologies to include greywater use for residences, composting toilets, electric toilets, and other social and behavior changes to reduce wastewater production" are not included in the Project (refer to pages 10 and 11 of Appendix D-6: Documentation in Support of the Elimination of Alternatives).

Water Conservation Included as Part of the Project

The Project already includes an aggressive water conservation program. As described in Appendix D-4 (Wastewater Flow Projections) of the Draft EIR/EIS, the City's existing conservation programs are expected to reduce average dry weather wastewater flows from 26.12 million gallons per day (mgd) to 21.34, mgd an 18.3 percent reduction in flows. The existing program, which is included in the Project, includes a conservation-based rate where billing for water and sewer service is based on metered water use, and where over 80% of revenues are derived from commodity charges (paying for the amount of water used) rather than fixed charges; and a \$3.5 million rebate program for low-flow toilet showerheads and faucets. As of May 1, 1997, Santa Rosa has replaced 14,000 high-volume toilets, 12,000 showerheads and 22,000 faucets in this effort; other Subregional partners have adopted similar rebate programs.

Water Conservation versus Wastewater Flow Reduction

Some comments have suggested that conservation savings on the order of 35 percent should be achievable. For this Project, as explained in Appendix D-3 (Water Conservation) of the Draft EIR/EIS, only conservation measures that are quantifiable and sustainable were included. This eliminates consideration of programs such as water conservation education because the savings per household cannot be accurately quantified. The level of "reliability" required for the Project is addressed in Appendix D-3 (page 1), which states that conservation measures were selected because they would generate quantifiable and sustainable wastewater flow reduction. This is consistent with the Project statement of purpose and need, as stated in Chapter 1 of the Draft EIR/EIS (page 1-4), which requires reliable disposal of the quantified volume of 21 mgd average

dry weather flow (ADWF). This level of reliability is further defined as involving sizing or physical operation of facilities where a specific and sustainable reduction in flow can be determined. Such reductions resulting from conservation devices are not subject to change over time, unlike measures that depend upon behavior modification, because the physical properties of the conservation devices will remain constant while population and socio-cultural conditions may change. Thus, even studies which show reduction in water use through behavior modification are not useful in establishing the level of assured reliability which is necessary for the Project. Potential increases in wastewater flow resulting from a decrease in conservation due to changes in behavior would not be able to be accommodated by the system.

Other conservation programs that reduce outdoor water use are also not included because they do not reduce wastewater flows. Programs to use drought tolerant landscaping and reduce lawn watering may reduce water use, but have no effect on wastewater flows.

Thus, although with implementation of both non-hardware, behavior-based conservation programs, and inclusion of programs to reduce outdoor water use, total *water* conservation of 35 percent may be possible, *wastewater* flow reductions would likely be less than 35 percent. The wastewater flow reductions assumed for Project design are appropriately conservative to ensure that the system will be able to reliably handle foreseeable wastewater flows.

Project Does Not Preclude Further Conservation

None of the conservation assumptions required for design of this Project preclude the City from adopting additional conservation programs in the future. In fact, although such measures are not counted toward reduction of projected wastewater flow for the Project, the City is continuing existing educational programs (behavior-based programs) and is considering others measures both through its Technology Committee and Conservation Subcommittee of the Board of Public Utilities.

MASTER RESPONSE 18 - REDWOODS

Comment Summary: Some comments requested that the City implement an alternative using subsurface irrigation of redwood trees. The comments critique the City's existing irrigation system, which they characterize as inefficient, and suggest that much higher application rates could be possible throughout the year using redwoods. The comments present the example of the Mt. View Sanitary District's marsh forest project in Martinez, where about 4,000 square feet (0.09 acre) of redwood trees are irrigated. The comments suggest that storage requirements would be reduced or eliminated because year-round subsurface irrigation would be possible. Some comments state that 100 to 200 acres of redwoods would enable the City to achieve year-round zero discharge. The comments state that evapotranspiration rates of 7,000 gallons per day (gpd) per acre in the winter and 27,000 gpd per acre in the summer months could be achieved, based on a project in Martinez. Comments further state that the current EIR/EIS erroneously assumes that no winter irrigation is possible.

Response Summary. Although no alternative envisions the City purchasing land to irrigate redwoods, there is nothing to preclude private land owners from planting redwoods and irrigating them with reclaimed water. The City has recently began implementation of a demonstration project to determine the amount of water that could be consumed by a redwood system in the Santa Rosa area. However, subsurface irrigation of redwoods would not be able to meet the Regional Board mandate by itself, because over half of the need for increased disposal is required to meet current demand and redwoods grow too slowly to accommodate the disposal need.

Use of Irrigation Water for Redwoods

Both of the Project alternatives that include irrigation are structured around irrigation contracts with private landowners. None of the Project alternatives include acquisition of irrigation land by the City of Santa Rosa. As stated in Appendix D-6, Documentation in Support of Elimination of Alternatives, "the project description has not set limits on what irrigators irrigate on their property, as long as it is within the management practices described in the Irrigation Management Plan. Irrigation of redwoods has not been specifically evaluated, but is by no means precluded." (Refer to memorandum regarding Evaluation of Project 7 attached to the end of Appendix D-6).

Redwoods Irrigation Demonstration Project

Due to continued public interest in the use of redwoods, the City has recently funded a Redwoods Irrigation Demonstration Project. The study is intended to determine the viability of using reclaimed water as a source of irrigation for redwood trees, and to determine the potential benefits of the "MarFor" system, which was discussed in several comments, and is a subsurface forest transpiration system. The Demonstration Project will include developing test protocols for the demonstration, and water usage, tree selection, MarFor test sites, and seasonal considerations will be reviewed in developing

the Demonstration Project. The project will be designed and constructed, and a three-year technical monitoring program will be implemented.

Use of the MarFor System and the Martinez Redwoods Project

Information provided in comments indicates that redwoods can use water at a higher rate than other types of crops. However, preliminary evaluation of the MarFor system in Martinez has determined that reclaimed water is disposed of both by evapotranspiration of the redwood trees and by percolation into the soil. It is not known to what extent water disposal is partitioned between these two processes. Because the Martinez area has more permeable soils than the clay soils of the Project area, a site-specific demonstration project has been deemed appropriate to determine the amount of water that could be consumed by a redwood system in the Santa Rosa area. The demonstration project will be able to verify what rates of water use may be achieved in local climate and soil conditions during the wet and dry seasons. The City's existing irrigation system uses about 6,000 gpd per acre in the summer months (June through August), and in wet winters, irrigation is not practiced. Winter irrigation at a rate of about 1,350 gpd per acre is proposed as part of the Contingency Plan for dry winters.

Based on data on the Martinez project provided in comments, it does not appear that a 200-acre redwood irrigation area would be capable of eliminating the need for reclaimed water discharge to the Russian River without additional winter storage, even if the high consumption rates of the Martinez area can be approached in the Santa Rosa area. During wet years and without any additional storage, discharge to the Russian River is projected to be up to 200 million gallons per day. Refer to page 32 of Appendix I-8 (Russian River Water Quality Model). If winter irrigation rates of 7,000 gpd per acre provided in comments are determined to be valid for the Santa Rosa area, this would mean that over 28,000 acres of redwoods would be needed to completely avoid winter discharge to the Russian River. Although it is likely that storage could be managed to reduce the peak winter flows that would have to be applied to redwoods, it would still require a large acreage of trees to completely eliminate river discharge. Although winter irrigation of redwoods may be a way of reducing discharges, it would not be possible with the 100 to 200 acres of redwoods that comments suggest would consume all of the reclaimed water produced during winter months. One comment states that mature trees can use up to 100,000 gpd per acre, but it appears that this is maximum rate for summer months, and it would take trees about 60 years to mature.

Conclusion

Should the demonstration project prove that reclaimed water use for redwoods would be beneficial, information would be available to individual landowners who may opt to plant redwoods within any of the irrigation areas evaluated in the Draft EIR/EIS. Each individual landowner would have to weigh the economic benefits depicted in the comments against the cost of planting trees, and the long-term nature of the investment. At the present time the City of Santa Rosa does not plan to embark on commercial production of redwood trees. Should the City decide to implement such a course of

action after completion of the redwood demonstration project, supplemental environmental review to cover such an action would be conducted as needed.

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