CITY OF SUISUN CITY
701 CIVIC CENTER BOULEVARD
SUISUN CITY, CA 94585
(707) 421-7300, FAX: (707) 429-3758

NOTICE OF AVAILABILITY

FROM:	Community Development Dept. City of Suisun City 701 Civic Center Blvd. Suisun City, CA 94585	TO:	Clerk of the Board County of Solano 675 Texas Street, Suite 6500 Fairfield, CA 94533

CITY OF SUISUN CITY
COMMUNITY DEVELOPMENT DEPARTMENT
***PUBLIC NOTICE* - NOTICE OF AVAILABILITY OF THE SECOND PARTIAL RECIRCULATION OF THE GENTRY-SUISUN DRAFT ENVIRONMENTAL IMPACT REPORT**
(SCH# 2004092077)

Date: August 20, 2007

TO: RESPONSIBLE AGENCIES
TRUSTEE AGENCIES
OTHER INTERESTED PARTIES

SUBJECT: NOTICE OF AVAILABILITY OF THE SECOND PARTIAL RECIRCULATION OF THE GENTRY-SUISUN DRAFT ENVIRONMENTAL IMPACT REPORT (SCH# 2004092077)

OVERVIEW: The City of Suisun (City) prepared a Draft Environmental Impact Report (DEIR) (SCH#2004092077) to consider the potential environmental effects of the proposed Gentry-Suisun Project (generally located just south of State Route 12, east and west side of Pennsylvania Ave. within the City's Sphere of Influence). The proposed project requires the approval by the City of a General Plan amendment, prezone (to redesignate) the area for Mixed-Use development, and subdivision approval, and may also involve approval of a development agreement, though such an approval is not required for the project to go forward. All of these City approvals, moreover, would be premised on the subsequent approval by the Solano County Local Agency Formation Commission of annexation into the City. A Notice of Availability of the Gentry-Suisun Draft Environmental Impact Report (DEIR) was given on April 4, 2006. For reasons discussed below, the City has chosen to send out for public review some additional information and analysis in what the City is calling a "Second Partial Recirculation of the DEIR."

ENVIRONMENTAL IMPACTS: The DEIR found significant impacts related to aesthetics, transportation and circulation, biological resources, air quality, noise, hydrology and water quality, and public services and utilities. Many of these impacts were reduced to a less-than-significant level through the implementation of mitigation measures. However, even with implementation of

applicable mitigation measures, the DEIR found that the project would still result in significant and unavoidable impact to aesthetics, air quality, biological resources, and traffic and circulation.

As a result of the Notice of Availability for the DEIR, comments were submitted to the City of Suisun City regarding the DEIR that identified the Water Supply Assessment was not included as one of the Appendices and raised questions concerning Cultural Resources and Hazards research and documentation. The City of Suisun City concluded these items should be included in the DEIR and that a limited recirculation of the DEIR was needed, just for these items, and public notice was given August 23, 2007.

Since the limited recirculation for which notice was given September 29, 2006, the City of Suisun City became aware that there may be concerns related to climate change and water treatment. The City of Suisun City concluded these items should be included in the DEIR and that a limited recirculation of the DEIR was needed, just for these items.

AVAILABILITY OF DRAFT EIR LIMITED RECIRCULATION DOCUMENTS: Copies of the climate change and water treatment documentation, which is the subject of this notice, and is also to be included in the DEIR can be reviewed or purchased at the City of Suisun, 710 Civic Center Boulevard during normal business hours. The documents may also be reviewed at the Solano County Library located at 1150 Kentucky Street, Fairfield, CA 94533.

Notably, the recirculation of only "portions" of a draft EIR does not permit commenters to comment anew on topics not subject to a partial recirculation. CEQA Guidelines section 15088.5, subdivision (f)(2), provides:

> When the EIR is revised only in part and the lead agency is recirculating only the revised chapters or portions of the EIR, the lead agency may request that reviewers limit their comments to the revised chapters or portions of the recirculated EIR. The lead agency need only respond to (i) comments received during the initial circulation period that relate to chapters or portions of the document that were not revised and recirculated, and (ii) comments received during the recirculation period that relate to the chapters or portions of the earlier EIR that were revised and recirculated. The lead agency's request that reviewers limit the scope of their comments shall be included either within the text of the revised EIR or by an attachment to the revised EIR.

Pursuant to this provision, the City of Suisun directs that public comments must be restricted to the newly circulated information contained in this document related to climate change and water treatment.

The City is not obligated to respond to any new comments that are directed to the portions of the DEIR that were not revised and are not being recirculated in this document. The Final EIR for the Project will contain detailed responses to all comments made on the original DEIR, to all comments on the Partially Recirculated DEIR that were properly limited to the subjects of Cultural Resources, Hazards and Hazardous Materials, and the Water Supply Assessment, and all comments made on

this Second Partially Recirculated DEIR that are properly limited to the subjects of Climate Change and Water Treatment.

Reviewers who wish to comment on the Second Partially Recirculated DEIR are urged to submit written comments to:

Heather McCollister Community Development Director
City of Suisun City
701 Civic Center Blvd.
Suisun City, CA 94585
(707) 421-7396

Comments can also be sent via e-mail to hmccollister@suisun.com

STARTING AND CLOSING DATE OF REVIEW: Written comments will be received by the city beginning August 23, 2007 and are due to the City of Suisun by 5:00 p.m. on or before October 9, 2007.

HAZARDOUS WASTE SITES: The project lands are not listed on any list of hazardous waste sites prepared pursuant to Government Code Section 65962.5.

Heather McCollister
Community Development Director

GENTRY - SUISUN

SCH# 2004092077

SECOND PARTIALLY RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT

PREPARED FOR
THE CITY OF SUISUN CITY
Heather McCollister
Community Development Director
(707) 421-7396

AUGUST 2007

PREPARED BY
RANEY PLANNING & MANAGEMENT, INC.

RANEY PLANNING & MANAGEMENT, INC.
1401 HALYARD DRIVE, SUITE 120, WEST SACRAMENTO, CA 95691

Gentry-Suisun Project
Second Partially Recirculated Draft
Environmental Impact Report

SCH# 2004092077

Prepared For
the City of Suisun

Prepared By
Raney Planning & Management, Inc.
West Sacramento, CA

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1. INTRODUCTION

1 INTRODUCTION

INTRODUCTION

This Second Partially Re-Circulated Draft Environmental Impact Report (Draft EIR) was prepared in accordance with the California Environmental Quality Act of 1970 (CEQA) as amended. CEQA Guidelines §15088.5 requires the recirculation of some or all portions of a draft EIR when significant new information is added to the EIR after public notice is given. The City of Suisun City (City) is the lead agency for the environmental review of the proposed Gentry-Suisun Project (the Project) evaluated herein and has the principal responsibility for approving the project. At the time it is called upon to consider approving the Project, the City Council of Suisun, as the lead agency's decision-making body, shall consider the information in the EIR along with other information that may be presented to the City during the environmental review process and public hearing(s) on the Project.

It should be noted that two of the three chapters presented in this Limited Re-Circulated EIR (Public Services and Utilities and Alternative Analysis) are revised versions of chapters included in the original DEIR. New text in these chapters is shown in double-underline and deleted text is shown with ~~strike-outs~~.

BACKGROUND

The DEIR was circulated to the public for 45 days consistent with CEQA Guidelines §15105(a). The public review period began on April 4, 2006, and ended on May 19, 2006. A total of 19 comment letters were received during the open public comment period on the DEIR by residents and State and local agencies. The DEIR contained the following technical chapters:

- Chapter 4.1 – Land Use and Agriculture
- Chapter 4.2 – Aesthetics
- Chapter 4.3 – Air Quality
- Chapter 4.4 – Noise
- Chapter 4.5 – Traffic and Circulation
- Chapter 4.6 – Biological Resources
- Chapter 4.7 – Hydrology and Water Quality
- Chapter 4.8 – Public Services and Utilities
- Chapter 4.9 – Energy
- Chapter 4.10 – Socio Economic

Based on the responses received on the Draft EIR, Suisun City made the determination to prepare two additional chapters not included in the Draft EIR: one dealing with Cultural Resources; and the other dealing with Hazards and Hazardous Materials. A Re-Circulated Draft EIR was circulated to the public for 45 days consistent with the CEQA Guidelines §15088.5(c). The public review period began on September 29, 2006, and ended on November 13, 2006. A total of three comment letters were received during the open public comment period on the Re-Circulated Draft EIR by residents and State and local agencies. The Re-Circulated DEIR contained the following technical chapters:

- Chapter 4.11 – Hazards
- Chapter 4.12 – Cultural Resources

In addition, the Water Supply Assessment (WSA) was inadvertently left out of the original DEIR. Therefore, the WSA was included as an appendix in the Re-Circulated document.

In the months following release of the Re-Circulated DEIR, two developments in state environmental law have prompted the City to undertake a second partial Recirculation. The first is the growing importance of new state legislation relating to Climate Change (AB 32) and new case law relevant to the extent to which land use EIRs should address water supply issues (*Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412). Related to the latter point is the fact that the City now has new information regarding water treatment capacity needed for the Project. For these reasons, this Second Partially Recirculated DEIR has been prepared. Although not a basis, by itself, for recirculating any prior analysis, the applicant has also modified the "project" for which it is seeking approval. As will be described and explained below, this new variant of the original project is now known as "Modified Alternative 1." It, too, will be addressed in this document.

The Second Partially Recirculated DEIR contains the following technical chapters:

- Chapter 4.8 – Public Services and Utilities (Recirculated)
- Chapter 4.13 – Global Climate Change
- Chapter 5 – Alternatives (Recirculated)

SUBMITTAL OF PUBLIC COMMENTS

CEQA requires a lead agency to issue new notice and "recirculate" a revised EIR, or portions thereof, for additional commentary and consultation if, subsequent to the commencement of public review and interagency consultation but prior to final EIR certification, the lead agency adds "significant new information" to an EIR. (Pub. Resources Code, section 21092.1; CEQA Guidelines, section 15088.5; *Laurel Heights Improvement Association of San Francisco, Inc. v. Regents of the University of California* (1993) 6 Cal.4th 1112 (*Laurel Heights II*).) CEQA Guidelines section 15088.5 provides four examples of disclosure which constitute "significant new information" for purposes of requiring recirculation of a revised EIR:

(1) A new significant environmental impact would result from the project or from a new mitigation measure proposed to be implemented;

(2) A substantial increase in the severity of an environmental impact would result unless mitigation measures are adopted that reduce the impact to a level of insignificance;

(3) A feasible project alternative or mitigation measure considerably different from others previously analyzed would clearly lessen the environmental impacts of the project, but the project's proponents decline to adopt it; or

(4) The draft EIR was so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded.

The revised environmental document must be subjected to the same "critical evaluation that occurs in the draft stage," so that the public is not denied "an opportunity to test, assess, and evaluate the data and make an informed judgment as to the validity of the conclusions to be drawn therefrom." (*Sutter Sensible Planning, Inc. v. Board of Supervisors* (1981) 122 Cal.App.3d 813, 822; see also *Save Our Peninsula Committee v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 131.)

Recirculation of an EIR requires notice pursuant to CEQA Guidelines section 15087, and consultation pursuant to section 15086. (CEQA Guidelines, section 15088.5, subd. (d).) Where an agency determines that recirculation is required, the agency can satisfy its obligation by reissuing only the revised part or parts of the EIR, rather than a whole new document. "If the revision is limited to a few chapters or portions of the EIR, the lead agency need only recirculate the chapters or portions that have been modified." (CEQA Guidelines, section 15088.5, subd. (c).)

Notably, the recirculation of only "portions" of a draft EIR does not permit commenters to comment anew on topics or text not subject to a partial recirculation. CEQA Guidelines section 15088.5, subdivision (f)(2), provides:

> When the EIR is revised only in part and the lead agency is recirculating only the revised chapters or portions of the EIR, the lead agency may request that reviewers limit their comments to the revised chapters or portions of the recirculated EIR. The lead agency need only respond to (i) comments received during the initial circulation period[s] that relate to chapters or portions of the document that were not revised and recirculated, and (ii) comments received during the recirculation period that relate to the chapters or portions of the earlier EIR that were revised and

> recirculated. The lead agency's request that reviewers limit the scope of their comments shall be included either within the text of the revised EIR or by an attachment to the revised EIR.

Pursuant to this provision, the City of Suisun directs that public comments must be restricted to the newly circulated information contained in this document related to climate change, water issues not addressed previously and more particularly information related to water treatment capacity and off-site water transmission to the project site, and the updated portions of the Alternatives Analysis.

The City is not obligated to respond to any new comments that are directed to the portions of the DEIR or (First) Partially Re-Circulated Draft EIR that were not revised and are not being recirculated in this document. The Final EIR for the Project will contain detailed responses to all comments made on the original Draft EIR, the Partially Recirculated Draft EIR, and this Second Partially Recirculated Draft EIR that are properly limited to the subjects of water treatment capacity, off-site water transmission to the project site, and climate change, as well as the updated portions of the Alternatives Analysis.

MODIFIED ALTERNATIVE 1

Since the release of the DEIR for public review, the Applicant, in coordination with the City, has revised the description of the project for which approval is being sought. The starting point for the newly refined "project" is Alternative 1, as presented in the DEIR. Based on this alternative, the applicant has produced a new version of the proposed project that not only results in an enhanced design, but also serves to reduce some environmental impacts occurring under the original Alternative 1. The revised Alternative 1, hereafter referred to as "Modified Alternative 1," replaces the original Alternative 1, and is now the Applicant's preferred alternative, which will be presented to the City Council for its consideration.

Modified Alternative 1

This Second Partially Recirculated DEIR includes modifications to Alternative 1 as described in the DEIR. Overall, the Modified Alternative 1 would result in land uses that are similar to those included within the previous Alternative 1 but with fewer residential units overall. Table 1-1 shows these modifications.

For Planning Area-1 (PA-1), the General Plan designations and prezoning districts would be the same except for the locations of certain uses. Specifically, the residential area in PA-1 would be moved from the northwest corner to the southwest portion of PA-1.

The proposed land use designations for PA-2 would change from Residential High Density under the previous Alternative 1 to Residential Medium Density under the Modified Alternative 1. The prezoning would be Medium Density Residential (R-M) with PUD Overlay.

For PA-3, the General Plan redesignation would be from Residential High Density under the previous Alternative 1 to Agricultural/Open Space under the Modified Alternative 1. The prezoning would be to the Transportation and Utility District under the Modified Alternative 1.

Table 1-1
Modifications to Alternative 1

Planning Area	Previous Alt. 1 Land Use	Modified Alt. 1 Land Use	Difference
PA-1	Approx. 120 dwelling units and 480,000 sf of Retail	Approx. 135 dwelling units and 480,000 sf of Retail	15 more dwelling units
PA-2	Approx. 196 dwelling units	Approx. 97 dwelling units	99 fewer dwelling units
PA-3	Approx. 84 dwelling units	Stormwater retention basin and preserved wetland	84 fewer dwelling units
PA-4	Preserved and created habitat	Preserved and created habitat	No change
PA-5	Preserved and created habitat	Preserved and created habitat	No change
Total	**Approx. 480,000 sf of retail plus 400 dwelling units**	**Approx. 480,000 sf of retail plus 232 dwelling units**	**168 fewer dwelling units**

General Plan Land Use Designations for Mixed-Use Site

- Planning Area 1 of the Mixed-Use Site would be redesignated from Limited Industrial / Business Park and General Commercial to General Commercial and Residential Medium Density.

- Planning Area 2 of the Mixed-Use Site would be redesignated from Limited Industrial / Business Park to Residential Medium Density.

- Planning Area 3 of the Mixed-Use Site would be redesignated from Limited Industrial / Business Park to Agriculture / Open Space.

Table 1-2, below, shows the maximum density permitted for the Mixed-Use Site for Modified Alternative 1, pursuant to the General Plan (as amended).

Table 1-2 Maximum Density of Mixed-Use Site – Modified Alternative 1 After General Plan Re-designation			
Planning Area	**Maximum Allowable Density**	**Site Area (gross acres)**	**Proposed Development**
Planning Area 1 – General Commercial	0.30 FAR	± 57.51	Approx. 480,000 sf of retail (0.19 FAR)
Planning Area 1 - Residential	15 dwelling units/acre	± 13.20	Approx. 135 dwelling units (10.23 du/acre)
Planning Area 2	15 dwelling units/acre	± 13.11	Approx. 97 dwelling units (7.40 du/acre)
Planning Area 3	N/A	± 4.00	stormwater retention basin and preserved wetland
Totals		**± 87.82**	**Approx. 480,000 sf of retail plus 232 dwelling units**

Table 1-2 identifies the maximum buildout potential for the proposed land use designations. As indicated above, PA-1 would contain both commercial and residential development (See Figure 1-1, Modified Alternative 1 Site Plan).

In addition, this Second Partially Recirculated DEIR analyzes the development of Modified Alternative 1, plus the potential 10,000 square feet of retail on the Gilbert Parcel, and 4,000 square feet of office and 12,000 square feet of limited industrial on the Ardave Parcel. The total development results in 490,000 square feet of retail, 4,000 square feet of office, and 12,000 square feet of limited industrial/business park, and 232 residential units.

Prezoning of Mixed-Use Site

Table 1-3, below, lists the proposed zoning designations for the Mixed-Use site under Modified Alternative 1.

Parcel One

Acres: ± 13.2 Ac.
Units: ± 123 Greencourt Cluster Units
Density: ± 9.3 DU/Ac. Gross

Street Sections:
20' C/C (no parking)
4' Walk (both sides)

Parking:
Garage: 246 Spaces
Open: 76 Spaces
Total: 322 Spaces
(2.61 Spaces/Unit)

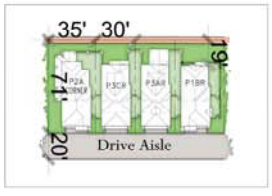
Parcel Two

Acres: ± 11.32 Ac.
Units: ± 68 Conventional Units
± 29 Alley-loaded Units
Density: ± 8.57 DU/Ac. Gross

Street Sections:
28' C/C (parking one side)
4' Walk (both sides)

Parking:
Garage: 194 Spaces
Open: 78 Spaces
Total: 272 Spaces
(±2.8 Spaces/Unit)

Typical Plots:



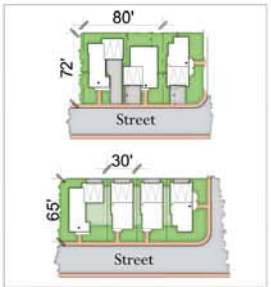


Table 1-3
Planning Area Acreage and Prezoning for Mixed-Use Site
Modified Alternative 1

Planning Area	Site Area (acres)	Prezoning
1	± 70.71	General Commercial (CG) and Medium Density Residential (R-M) with Planned Unit Development (PUD) Overlay
2	± 13.11	Medium Density Residential (R-M) with PUD Overlay
3	± 4.00	Transportation and Utility (T)
Total	**± 87.82**	

Project Components of Modified Alternative 1

Planning Area 1 (approximately 70.7 gross acres) encompasses the northern portion of the Mixed-Use Site and is intended primarily for the development of a major retail center to meet the retail and commercial needs of residents of Suisun City and the region. Approximately 57.5-acres of Planning Area 1 would have a mix of retail tenants, which may include small shops, general merchandise stores, "big box" establishments such as a home improvement center, and service providers. The remaining acreage within Planning Area 1 is intended to provide approximately 135 two- and three-story patio-homes in a neighborhood consisting of small-lot single-family residential clusters. A series of landscaped walkways, including a new fenced-off riparian corridor along Ledgewood Creek would connect residents and guests to the retail area and pocket parks.

Planning Area 2 (approximately 13.1 gross acres) encompasses the southern portion of the Mixed-Use Site, and is intended for the development of approximately 97 single-family homes. Current development plans for this Planning Area include traditional two-story single-family-detached homes with front porches and backyards. Landscaped walkways, including a new fenced-off riparian corridor along Ledgewood Creek would connect residents and guests to Planning Area 1.

Planning Area 3 (approximately 4.0 gross acres) is located just northeast of the intersection of Pennsylvania Avenue and the existing UPRR tracks, and is intended to allow for the preservation of existing wetland habitat and for the creation of a storm-water cleansing pond.

Comparison of Environmental Effects to Previous Alternative 1

Land Use

Modified Alternative 1 would result in buildout similar to the previous Alternative 1 but with fewer residential units overall. Specifically, there would be 99 fewer units in PA-2 and 84 fewer units in PA-3, although there would be 15 more units in PA-1, compared to

the previous Alternative 1. Overall, there would be 168 fewer dwelling units under the Modified Alternative 1. As a result, Modified Alternative 1 would generally cause impacts less intensive than, or no worse than, those that would have occurred with the original Alternative 1, as is explained below.

General Plan redesignation and proposed prezoning districts would be the same, except the residential portion would be moved from the northwest corner to the southwest portion of PA-1. PA-2 would be redesignated to Residential Medium Density under the Modified Alternative 1, rather than Residential High Density under the previous Alternative 1. Prezoning for PA-2 would be Medium Density Residential (R-M) with PUD Overlay. Under the Modified Alternative 1, PA-3 would be designated as Agricultural/Open Space, rather than High Density Residential (R-H) with PUD Overlay under the previous Alternative 1. PA-3 would be prezoned to Transportation and Utility District.

Fewer new residents would be exposed to railroad noises. In addition, by reducing the number or residences fewer sources of light would be created. The Modified Alternative 1 would still be consistent with City of Suisun and LAFCo standards, and the same amount of land would be proposed for annexation into City of Suisun. Because the same amount of land would be annexed, Modified Alternative 1 would not reduce the loss of Prime Agricultural Farmland.

Aesthetics

Modified Alternative 1 would decrease the total developed area on the site, specifically in PA-3. This would result in greater visibility to neighboring motorists of existing wetland habitats on the project site. Fewer total residences would result in fewer sources of light and glare, and fewer new residents, who would comprise sensitive receptors to light and glare from proposed commercial uses. The Modified Alternative 1 would still be consistent with PUD Guidelines.

Air Quality

Modified Alternative 1 would result in 168 fewer residential units. As a result, the Modified Alternative 1 would generate 891 fewer total daily vehicle trips, which would result in a corresponding decrease in carbon monoxide levels at congested intersections and air pollutant emissions generated from onsite operations. BAAQMD construction emission controls would still be implemented. In addition, fewer sensitive receptors would be introduced to the project site as a result of the Modified Alternative 1, and the new residents in PA-1 would be farther from SR-12 than they would have been under the original version of Alternative 1. The number of delivery truck trips would be the same, because the amount of commercial land use would remain the same.

Noise

Modified Alternative 1 would result in 891 fewer total vehicle trips and a corresponding decrease in traffic noise along the surrounding roadway network. In addition, fewer sensitive receptors (new residents) would be introduced to the project site as a result of the Modified Alternative 1. The amount of commercial development would be the same; therefore, on-site operational noise level would be the same. Construction noise would be similar but would occur over a shorter duration as the construction (grading) period on PA-3 would be reduced.

Traffic and Circulation

Modified Alternative 1 would result in 168 fewer residential units and 891 fewer total vehicle trips, as well as fewer trips during all peak hours (see Table 1-4). Trip distribution would be the same; therefore, the residential contribution to intersection congestion would be lower for most of the PA-1 internal intersections. Furthermore, Modified Alternative 1 would include one less intersection (Pennsylvania Avenue and Driveway #3). Sidewalks would still be constructed along the west side of Pennsylvania Avenue and Cordelia Road (south of Pennsylvania Avenue). The Modified Alternative 1 would include transit and bike facilities, as well as onsite parking in compliance with the City's requirements (see Table 1-5). Delivery trucks could enter PA-1 through any of the three driveways. Minimum distance between driveways would be no less than under the previous Alternative 1. Though the number of vehicle trips would be reduced should the Modified Alternative 1 project be implemented, the traffic impacts and mitigation measures identified in the Draft EIR would remain adequate for Modified Alternative 1, with some impacts being reduced to less-than-significant, and others remaining significant and unavoidable. However, it should be noted that based upon the sidewalk information provided on the Site Plan for Modified Alternative 1, sidewalks would be provided along the project frontage with Pennsylvania Avenue (See Figure 1-1). These sidewalks have a minimum width of 5 feet, which is adequate based on published design standards such as those used by the American Association of State Highway and Transportation Officials (AASHTO). Therefore, the Modified Alternative 1 would have a less-than-significant impact on pedestrian connections, and Mitigation Measure 4.5-48 is no longer necessary.

Table 1-4
Trip Generation

LAND USE	Base Project in EIR	EIR Alt. 1	EIR Alt. 2	Modified Alt. 1
Commercial*	720,839 sf	490,000 sf	360,000 sf	490,000 sf
Office*	15,682 sf	4,000 sf	4,000 sf	4,000 sf
Limited Industry*	0 sf	62,000 sf	62,000 sf	62,000 sf
Residential	359 du	400 du	530 du	232 du
*these include future development on Gilbert and Ardave parcels, which are not parts of Gentry mixed-use project but are included in traffic study as part of the annexation area.				
TRAFFIC	**Base Project**	**EIR Alt. 1**	**EIR Alt. 2**	**Modified**

GENERATION RATES	in EIR			Alt. 1
AM Peak Rate (trips)				
Retail Commercial*	0.71	0.83	0.94	0.83
Office	1.55	1.55	1.55	1.55
Limited Industry	0.92	0.92	0.92	0.92
Residential	0.40	0.40	0.40	0.40
PM Peak Rate (trips)				
Retail Commercial	3.20	3.65	4.05	3.65
Office	1.49	1.49	1.49	1.49
Limited Industry	0.98	0.98	0.98	0.98
Residential	0.48	0.48	0.48	0.48
Saturday Peak Rate (trips)				
Retail Commercial	4.34	4.96	5.53	4.96
Office	0.41	0.41	0.41	0.41
Limited Industry	0.14	0.14	0.14	0.14
Residential	0.41	0.41	0.41	0.41
Daily Rate (trips)				
Retail Commercial	34.02	38.94	43.38	38.94
Office	11.01	11.01	11.01	11.01
Limited Industry	6.97	6.97	6.97	6.97
Residential	5.30	5.30	5.30	5.30

*Retail Commercial traffic generation rates differ based the composition of the retail portion of the project.

TRAFFIC GENERATED	Base Project in EIR	EIR Alt. 1	EIR Alt. 2	Modified Alt. 1
AM Peak Trips (trips)				
Retail Commercial	512	407	338	407
Office	24	6	6	6
Limited Industry	0	57	57	57
Residential	144	160	212	93
Passby Reduction (20% of Commercial)	-102	-81	-68	-81
Total	**577**	**549**	**546**	**481**
PM Peak Trips (trips)				
Retail Commercial	706	480	353	480
Office	23	6	6	6
Limited Industry	0	61	61	61
Residential	172	192	254	111
Passby Reduction (20% Comm)	-141	-96	-71	-96
Total	**761**	**643**	**603**	**562**
Sat Peak Trips (trips)				
Retail Commercial	3,128	2,430	1,991	2,430

Office	6	2	2	2
Limited Industry	0	432	432	432
Residential	1,903	2,120	2,809	1,230
Passby Reduction (20% Comm)	-626	-486	-398	-486
Total	**4,412**	**4,498**	**4,835**	**3,608**
Daily Trips (trips)				
Retail Commercial	24,523	19,081	15,617	19,081
Office	173	44	44	44
Limited Industry	0	432	432	432
Residential	1,903	2,120	2,809	1,230
Passby Reduction (20% Comm)	-4,905	-3,816	-3,123	-3,816
Total	**21,694**	**17,861**	**15,779**	**16,970**

Table 1-5
Onsite Parking in Modified Alternative 1

Land Use	Units	Parking Ratio	Stalls Required	Stalls Provided
Commercial	480,000 sf	4 stalls/1000 sf	1920	Approx. 2,648
Residential	232 du	2 stalls/du	464	Approx. 617

Biological Resources

Unlike the previous Alternative 1, the Modified Alternative 1 would avoid development on existing wetland habitats in PA-3. The majority of annual grassland in PA-3 would be developed into a stormwater retention basin. Human and pet activities would not occur in PA-3; therefore, indirect affects to vernal pools and other habitats near PA-3 would not occur. In addition, Modified Alternative 1 includes a new fenced-off riparian corridor along Ledgewood Creek; therefore, the Alternative would result in an enhancement of wildlife value of the riparian area along Ledgewood Creek. The overall conversion of habitat for special-status plant and animal species would be the same as for the original Alternative 1. The same ratio of habitat creation/preservation would be implemented as mitigation.

Hydrology and Water Quality

Modified Alternative 1 would result in the creation of fewer impervious surfaces (in PA-1, PA-2, and PA-3) and thus decreased water quality impacts, as a lower level of urban pollutants would enter the downstream system. Additionally, fewer acres of seasonal marshes, as identified in Figure 5-1 of the DEIR, would be impacted, as the Modified Alternative 1 would avoid development of wetlands in PA-3. The preliminary storm drainage infrastructure design would remain relatively similar, with ponds and bioswales draining the planning areas, and best management practices (BMPs) included into the system. Less development would occur within the 100-year floodplain under the Modified Alternative 1.

Public Services and Utilities

The Modified Alternative 1 would result in a decrease in the scale of the proposed project, reducing by 168 the total number of residential units. Therefore, the Modified Alternative 1 would result in a lesser need for public services and utilities on the project site. Necessary infrastructure and parkland would still be constructed and required fees would be paid to support the development proposed under the Modified Alternative 1.

Energy

Modified Alternative 1 would include 168 fewer residential units, as compared to the previous Alternative 1. Therefore, the operational and construction-related energy needs associated with the Modified Alternative 1 would be expected to be less. The demand for energy infrastructure upgrades would also be less. Development under the Modified Alternative 1 would be compliant with Title 24 standards.

Socio-economic

Modified Alternative 1 would include the same amount of commercial and industrial uses as the previous Alternative 1. However, the Modified Alternative 1 would result in 548 fewer new residents in the City of Suisun (assuming 3.26 persons per household, per DEIR Page 4.10-34). The resulting population represents 4.4 percent of the anticipated population growth between 2009 and 2014 in the primary market area (12,586 residents, from DEIR Page 4.10-32). The sales revenues generated by new onsite residents at offsite retail locations would be slightly lower under the Modified Alternative 1 than under the previous Alternative 1, but current market conditions, retailer interest, and re-tenanting potential would remain essentially the same.

Summary of Impacts/Absence of Need to Recirculate DEIR

As the preceding discussions explain, Modified Alternative 1, with its reduction in residential units, will have levels of impact very similar to, and in some instances less than, those of Alternative 1 as set forth in the Draft EIR. The formulation of Modified Alternative 1 did not require the City to recirculate some or all of the Draft EIR because (i) Modified Alternative 1 is not "considerably different" from the original Alternative 1 and (ii) the project applicants are now seeking City Council approval of Modified Alternative 1, and thus are not "declining" to pursue the Modified Alternative 1. CEQA Guidelines section 15088.5, subdivision (a)(3), requires recirculation due to a new alternative only where such an alternative (a) is feasible, (b) is "considerably different" from other alternatives previously analyzed, (c) would "clearly lessen the significant environmental impacts of the project," and (d) the project proponents "decline to adopt" the alternative. These factors triggering recirculation are not present here. Thus, the information provided herein is not being included for reasons of legal necessity, but rather is provided for the sake of maximizing public input and participation.

Infrastructure

Creegan + D'Angelo Engineers have developed an Infrastructure Master Plan for the Modified Alternative 1. The stormwater, water, and sewer plans are summarized below.

Stormwater

The project engineers have developed a stormwater drainage plan to comply with the *City of Suisun Design Standard*, which mandates that the detention system be designed for a 100-year, 24 –hour storm in which post-development peak runoff is restricted to 95 percent of the predevelopment peak runoff. Detention basins would be placed in the northeast corner of PA-1, and a second basin would comprise the majority of PA-3 (See Figure 1-1, above). The system of storm drains ranging from 12-inches to 18-inches would gather and convey stormwater to the detention basins.

Water

The proposed project would be served by a looped water supply that would connect to the Suisun-Solano Water Authority (SSWA) systems located to the north and east (see Figure 1-3, Water Infrastructure). The system would tie into a 20-inch SSWA pipeline in the vicinity of Ohio Street and Pennsylvania Avenue 1,800 feet north of the site, and the Suisun City grid system on Cordelia Road, 2,200 feet east of the site. Water pressure would be sufficient to meet both the project demand and the commercial fire flow, which is a combined 4,240 gallons per minute (gpm).

Sewer

The sanitary sewer system would be designed to accommodate the anticipated peak hour flows for Modified Alternative 1 of 263 gpm, including wet weather infiltration. The on-site sewage would flow north to south, and would require a crossing from PA-1 to PA-2 via a bore under the Southern Pacific Railroad right of way. All sewage would be conveyed to a proposed lift station at the southeast corner of PA-2 near Cordelia Road. The proposed lift-station would be owned by a homeowners association, but would be maintained under contract with the Fairfield-Suisun Sewer District (FSSD). The sanitary force main would connect from the on-site lift-station to a manhole on Cordelia Road 1,000 feet west of Beck Avenue. The pipe would cross Ledgewood Creek on the north side of Cordelia Road via a bore before returning to the road alignment. The FSSD has made the determination that the trunks between the connection point and the treatment plant have sufficient capacity to accommodate project flows without additional improvements.

REFERENCES

The references for this Second Partially Recirculated DEIR are as follows:

Ballanti, Don, *Greenhouse Gas Evaluation For Gentry/Suisun Project, Suisun City*, July 2007.

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Brekke, L.D., N.L. Miller, K. E. Bashford, N. W. T. Quinn, and J.A. Dracup 2004. Climate Change Impacts Uncertainty for Water Resources in the San Joaquin River Basin, California. *Journal of the American Water Resources* 40(1):149-164.

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Le Treut, H., R. Somerville, U. Cubasch, Y. Ding, C. Mauritzen, A. Mokssit, T. Peterson and M. Prather, 2007: Historical Overview of Climate Change. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Medellin, J., J. Harou, M. Olivares, J. Lund, R. Howitt, S. Tanaka, M. Jenkins, K. Madani. Climate Warming and Water Supply Management in California. California Climate Change Center, State of California. White Paper CEC-500-2005-195-SF, March.

Meehl, G.A., T.F. Stocker, W.D. Collins, P. Friedlingstein, A.T. Gaye, J.M. Gregory, A. Kitoh, R. Knutti, J.M. Murphy, A. Noda, S.C.B. Raper, I.G. Watterson, A.J. Weaver and Z.-C. Zhao, 2007: Global Climate Projections. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Personal communication with Roger Reynolds of Summers Engineering, Inc., July 16, 2007, 3:45pm.

Personal communication with Roger Reynolds of Summers Engineering, Inc., July 18, 2007, 3:30pm.

Personal Communication with Ron Anderson, Suisun Assistant City Manager, SSWA Board Member, July 12, 2007, 10am.

Personal Communication with Trevor Greco, Engineer, Creegan and D'Angelo, June 5, 2007, 10am.

Settlement Agreement and Stipulation among Solano County Water Agency, Solano Irrigation District, Main Prairie Water District, Cities of Vacaville, Fairfield, Vallejo, and Suisun City and Putah Creek Council, City of Davis and the Regents of the University of California, 2000.[i]

Suisun-Solano Water Authority, Water Supply Options to Meet Future Demands report, July 3, 2007.

Endnotes

[i] This document is also known as the Putah Creek Accord.

4.8 PUBLIC SERVICES AND UTILITIES - RECIRCULATED

4.8 PUBLIC SERVICES AND UTILITIES

INTRODUCTION

This section will summarize setting information and identify potential new demands on water supply, wastewater systems, solid waste disposal, law enforcement, fire protection, schools, libraries, and parks and recreation, which would result from buildout of the proposed Gentry-Suisun project. Information for this section was drawn from project information provided by the City of Suisun April 2005 Municipal Services Review Comprehensive Annexation Plan,[1] Water Supply Assessment for the Gentry Gateway Project,[2] and personal communication with service providers.

ENVIRONMENTAL SETTING

This setting section describes the existing project site, including the water system, wastewater collection and treatment, law enforcement, fire protection, schools, solid waste collection and disposal, parks and recreation facilities, and other related public utilities.

Project Site

The proposed project site is located in Suisun City in central Solano County. The City is located on the Suisun Channel, which connects with Suisun and Grizzly Bays and links the City with the Sacramento River and the San Francisco Bay. The project site is located approximately 45 miles northeast of San Francisco and 45 miles southwest of Sacramento. Solano County is bordered by Napa, Yolo, San Joaquin, and Contra Costa Counties and covers 823 square miles, about half of which lies in the Sacramento Valley. In addition, the project site is located within the Suisun City Sphere of Influence (SOI).

The Gentry-Suisun project site consists of approximately 171.50 acres in Solano County, which would be annexed to the City of Suisun City as part of the proposed project.

Project Description

The proposed project involves two components, the annexation of the Gentry site of approximately 171.50 acres and a Mixed Use Development component that consists of the subdivision and development of a mixed use project on the approximately 87.82-acre Mixed Use site. The Mixed Use site is comprised of Planning Area 1, Planning Area 2, and Planning Area 3. The proposed project includes a Base Project, Alternative 1, and Alternative 2.

Base Project
Planning Area 1 would be comprised of 655,499 square feet of commercial space on approximately 70.71 acres, 15,682 square feet of Limited Industrial / Business Park on the Ardave Parcel, and 65,340 square feet of retail on the Gilbert Parcel. Planning Area 2 would accommodate approximately 275 residential dwelling units on approximately 13.1 acres. Planning Area 3 would also accommodate 84 residential dwelling units on approximately 4 acres. Planning Area 4 would remain as open space.

Alternative 1
Planning Area 1 would be comprised of 480,000 square feet of commercial space and 120 residential dwelling units on approximately 70.71 acres, 12,000 square feet of Limited Industrial / Business Park and 4,000 sq. ft. of office uses on the Ardave Parcel, and 10,000 square feet of retail and 50,000 sq. ft. of limited industrial land uses on the Gilbert Parcel. Planning Area 2 would accommodate approximately 196 residential dwelling units on approximately 13.1 acres. Planning Area 3 would also accommodate 96 residential dwelling units on approximately 4 acres. Planning Area 4 would remain as open space.

Modified Alternative 1
As discussed in the Introduction Chapter of this Second Partially Recirculated Draft EIR, the Modified Alternative 1 replaces the original Alternative 1 and is now the preferred project.

Modified Alternative 1 consists of four Planning Areas. Planning Area 1 would be comprised of 480,000 square feet of commercial space and 135 residential dwelling units on approximately 70.71 acres. Planning Area 2 would accommodate approximately 97 residential dwelling units on approximately 13.1 acres. Planning Area 3 would contain a stormwater retention basin and preserved wetland areas on approximately 4 acres. Planning Area 4 would remain as open space. In addition, this Limited Re-Circulated DEIR analyzes the development of Modified Alternative 1, plus the potential 10,000 square feet of retail on the Gilbert Parcel, and 4,000 square feet of office and 12,000 square feet of limited industrial on the Ardave Parcel. The total development results in 490,000 square feet of retail, 4,000 square feet of office, and 12,000 square feet of limited industrial/business park, and 232 residential units.

Alternative 2
Planning Area 1 would be comprised of 350,000 square feet of commercial space and 250 residential dwelling units on approximately 70.71 acres, 12,000 square feet of Limited Industrial / Business Park and 4,000 sq. ft. of office land uses on the Ardave Parcel, and 10,000 square feet of retail and 50,000 sq. ft. of limited industrial uses on the Gilbert Parcel. Planning Area 2 would accommodate approximately 196 residential dwelling units on approximately 13.1 acres. Planning Area 3 would also accommodate 96 residential dwelling units on approximately 4 acres. Planning Area 4 would remain as open space.

Water System

The proposed project site is located within the Suisun-Solano Water Authority (SSWA), which manages water supply and distribution to the City. The SSWA is a joint powers authority between the City of Suisun City and the Solano Irrigation District under an implementation agreement entered into in 1990. Both Suisun City and Solano Irrigation District have contracted with the Solano County Water Agency for water supplies from the federal Solano Project. The Solano County Water Agency is the contracting agency with the United States Bureau of Reclamation (USBR~~RB~~) for water supplies from the Solano Project.

In 1996 the SSWA adopted the "Master Plan for the Water Supply and Delivery System" ("Plan"), which provides comprehensive details about past, present, and projected water supply and delivery issues. The SSWA currently has a water treatment facility that receives surface water from the Solano Project, and following treatment, delivers it to the service area. Table 4.8-1 summarizes the annual allocations Suisun City and the Solano Irrigation District have from the Solano Project water. The table also lists an annual allocation Suisun City has from the State Water Project's North Bay Aqueduct. Table 4.8-2 shows the City's State Water Project allocation will continue to increase at 50 acre-feet per year until the maximum amount of 1,300 acre-feet per year is reached in 2015. Solano Irrigation District, under their Implementation Agreement with SSWA, delivers from its Solano Project entitlement the additional water needed to provide treated water service to the SSWA service area.

Table 4.8-1
Solano Project Water Supplies

Agency	Annual Entitlement (Acre Feet)
Suisun City	1,600
Solano Irrigation District (Ag, M & I)	141,000
Source: Water Supply Assessment, 2004.	

Table 4.8-2
State Water Project Supplies

Agency	Annual Entitlement (Acre Feet)				
	2000	2005	2010	2015	2020
Suisun City	550	800	1,050	1,300	1,300
Source: Water Supply Assessment, 2004.					

Service Area Boundary

The SSWA is responsible for the City's water treatment and distribution system. The SSWA provides potable water to development within the City limits. The service area consists of two separate and distinct areas. The largest area is located southerly of the Union Pacific Railroad and includes Suisun City and the Tolenas area. A smaller service area is located northwesterly of the Gregory Hill Water Storage in Suisun Valley. This

rural area includes twenty-six service connections. The service area encompasses a current population of approximately 28,000. Ultimate population projections are based on aerial photography of acreage within the service area that has yet to be developed in addition to acreage adjacent to the service area targeted for future development. The Suisun City General Plan population data was utilized to establish residential and apartment density factors (units per acre). The Suisun City and SSWA ultimate service area population is estimated at approximately 32,000.

Water Supply and Demand

Supply

The Solano Project, operated by the United States Bureau of Reclamation, will provide a reliable water supply for the buildout of the City. The watershed includes 576 square miles above Monticello Dam, and the Lake Berryessa reservoir provides a storage capacity of 1,602,000 acre-feet. The average annual inflow from Putah Creek is estimated at 360,000 acre-feet. The inflow over the period of record has varied from a maximum of 1,140,000 acre-feet in 1983 to a minimum of 35,000 acre-feet in 1941. The Lake Berryessa storage capacity allows Solano Project water users the ability to store and carry over 440 percent of the project's average annual yield. A primary reason for construction of the large reservoir was to increase the annual safe yield. With a 1,602,000 acre-foot reservoir, a pre-project operation study estimated the safe annual yield at 262,000 acre-feet. The annual contractual entitlements of Solano Project water users are 207,350 acre-feet. The remaining inflow covers the reservoir evaporation losses and downstream flow requirements. During a normal rainfall year, defined as a year when the average annual runoff for the Solano Project is available, the SSWA will be able to meet its demands using water allocations mentioned above. During drought years 1987 – 1992 the cumulative Putah Creek runoff to Lake Berryessa was approximately 800,000 acre-feet. However, due to the large storage capacity in Lake Berryessa, mandatory curtailments in contractual entitlements did not begin until 1992, the sixth year of the drought. Table 4.8-3 summarizes the historic water deliveries to SSWA from the Solano Irrigation District contractual entitlement, and which are delivered to SSWA under their Implementation Agreement. The Solano Irrigation District was able to provide the additional supplies needed during the drought.

Demand

In 1996 an Updated Master Plan for the Water Supply and Delivery System of SSWA was prepared. This report provided a demand analysis model for the ultimate build out of the service area using projected Suisun City General Plan population data. A study of housing and commercial development modified to estimate current water use within SSWA was completed in 2004 (Water Supply Assessment for the Gentry Gateway Project, January 2004). Table 4.8-3 ~~provides a reasonably accurate estimate of the annual water supply/demand deliveries from 1990 - 2001~~ summarizes historic water deliveries to SSWA and shows that the Suisun City water entitlement was reduced from 1,600 to 1,256 acre-feet in 1992, a 21.5 percent reduction. This reduction was a result of

mandatory curtailments in contractual entitlements resulting from the 1987-1992 drought. The historic deliveries that occurred during the 1987-1992 drought show that although there were reductions in the available Solano Project supplies, the SSWA Implementation Agreement allows Suisun City and Solano Irrigation District (SID) to work together to meet the SSWA water requirements.

Table 4.8-3
Historic Solano Project Water Supply Deliveries (Acre-Feet)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Suisun City	1,600	1,600	1,256	1,600	1,436	1,600	1,600	1,600	1,600	1,600	1,600	1,600
SID-Suisun	1,863	1,318	2,003	1,768	2,393	2,261	2,573	2,748	2,425	2,846	2,779	3,159
Total	3,463	2,918	3,259	3,368	3,829	3,861	4,173	4,384	4,025	4,446	4,379	4,759

Comparison of Water Supply and Demand

The ultimate SSWA projected water demand anticipated in the 1996 Master Plan for Water Supply and Deliver Systems is 6,500 acre-feet per year, and is based on a population of 33,000 in the year 2020. The 2020 population at buildout, estimated at 33,000, was confirmed with Suisun City staff in the Fall of 2006 by Summers Engineering. This estimate is fairly consistent with ABAG's *Projections 2005,* which forecast a total population of 35,400 in this same year. The most current estimate (June 2007) of water demand for buildout of the SSWA service area was performed by Summers Engineering and is included in "Appendix A" of the *Water Supply Options to Meet Future Demands* report prepared for the Suisun-Solano Water Authority, July 3, 2007.[3] (See Appendix L of this document for the complete report including Appendix A). Appendix A is entitled *SSWA, Estimated Ultimate Water Demand at Buildout*. It should be noted that Appendix A is an update of Table 4, which was included in the March 2004 *Gentry-Gateway Water Supply Assessment* (See Appendix I of the Gentry-Suisun Recirculated Draft Environmental Impact Report). The June 2007 demand projection is based on Suisun City staff's review of the existing and future proposed or anticipated development within the service area, including the Gentry-Suisun project. It is important to note that the buildout demand projection was based upon the Modified Alternative 1 Site Plan presented in Chapter 1 of this Second Partially Recirculated EIR. The total projected water demand for the SSWA service area as of June 2007 is 6,000 acre-feet per year, or 7,691 gallons per minute (gpm). This is a reduction of the original 2004 buildout water demand estimate by 500 acre-feet per year. The 500 acre-feet reduction is primarily a result of the utilization of a different commercial water usage rate for the June 2007 modeling effort.[4] Specifically, the original estimate of 6,500 acre-feet for the total buildout of SSWA service area for commercial and residential water usage was generated using a commercial water usage rate of 2.5 gpm /acre. However, Roger Reynolds indicated that upon a recent review of commercial water usage in Solano County, it was determined that rate could be reduced to 1.7 gpm /acre.

With an average of 3.2 residents per residential dwelling (U.S. Census Bureau), the City's population will grow by approximately 1,968 when the 615 homes discussed under

"near term annexations" are built. Based on a consumption of 120 gpd per capita, these homes will increase water demand by approximately 264 acre-feet per year. New water treatment facilities and distribution pipelines will be constructed as development occurs.

Summary

Therefore, Suisun City and Solano Irrigation District's Solano Project allocations, together with the Suisun City's additional State Water Project water allocations, will provide SSWA the ability to meet its estimated water demands, which includes the water demand associated with the Gentry-Suisun project. Although adequate water supply exists to serve the proposed project, additional water treatment capacity is necessary to serve the project.

Water Treatment

Before the Gentry-Suisun project would receive its water, the water would first need to be treated. The conditions and limitations of the current water treatment system is most thoroughly addressed in the *Water Supply Options to Meet Future Demands* report prepared for the Suisun-Solano Water Authority by Summers Engineering, July 3, 2007.

As discussed above and shown in Table 4.8-4, the estimated ultimate maximum day water demand in the service area is 7,691 gpm or 11.08 million gallons per day (mgd). Water treatment facilities within the service area are designed to meet the maximum day demand. Water storage tanks provide additional water supplies which are utilized to meet the peak hour demands during the maximum day. Listed in Table 4.8-4 is the existing Cement Hill Water Treatment Plant (CHWTP) maximum day capacity, estimated at 8.5 million gallons per day (mgd). Staff testing confirms CHWTP can sustain a flow rate of 8.5 mgd and would likely be able to maintain a one day peak flow of 9.0 mgd. This flow, however, could not be maintained over a several day period. Subtracting the existing production capacity from the ultimate maximum day water demand indicates an additional water supply demand of approximately 1,788 gpm (2.57 mgd) is required. The total water demand for the Modified Alternative 1 at peak hour is approximately 525-gpm, including both the residential and commercial development elements of the proposed project.

TABLE 4.8-4

SUISUN-SOLANO WATER AUTHORITY
Estimated Ultimate Water Demand At Buildout &
Additional Treatment Capacity Required

Description of Data	Flow	
	(GPM)	(MGD)
1. Estimated Ultimate Maximum Day Water Demand[1]	7,691	11.08
2. Existing Cement Hill Water Treatment Plant Maximum Day Capacity (8.5 MGD)[2]	5,903	8.50
3. Additional Maximum Day Capacity Required to Meet Ultimate Demand	**1,788**	**2.57**

Notes:
[1] Based upon Appendix A of the *Water Supply Options to Meet Future Demands* report prepared for the Suisun-Solano Water Authority by Summers Engineering, July 3, 2007.
[2] Based on testing during the summer of 2004, Summers Engineering estimates that the CHWTP could maintain a flow rate of 8.5 MGD and possibly could maintain a one-day peak flow of 9 MGD.

Four options for increasing the available water treatment capacity by 2.57 MGD are currently being considered by SSWA. These four options are described in the Water Supply Options to Meet Future Demands report, and are summarized below.

1. Future Water Supply from City of Fairfield to Meet Increased Demand

Water supply discussions with City of Fairfield staff during 2004 -05 indicated the City of Fairfield could provide the additional peak demand requirements of SSWA. The supply options discussed included (1) connecting into a City of Fairfield water main adjacent to the existing Gregory Hill Water Treatment Plant site on Waterman Boulevard below the 2 million gallon Gregory Hill Water Storage Tank, and (2) connecting into the Fairfield distribution system along the alignment of the SSWA 20-inch water transmission pipeline running from the Gregory Hill Water Storage Tank to Suisun City. There is an existing intertie from Fairfield into this pipeline at Pennsylvania Avenue and Ohio Street and the suggestion was to just increase the size of the connection to meet the demand requirements.

Cost Estimate

Further discussions will be needed to clarify the costs, but initial contacts with the City of Fairfield and the Fairfield Suisun Sewer District (FSSD) indicate the anticipated capital cost to provide 2,250 gpm from Gregory Hill tank, including connection charges, may be approximately $2,975,000.[5]

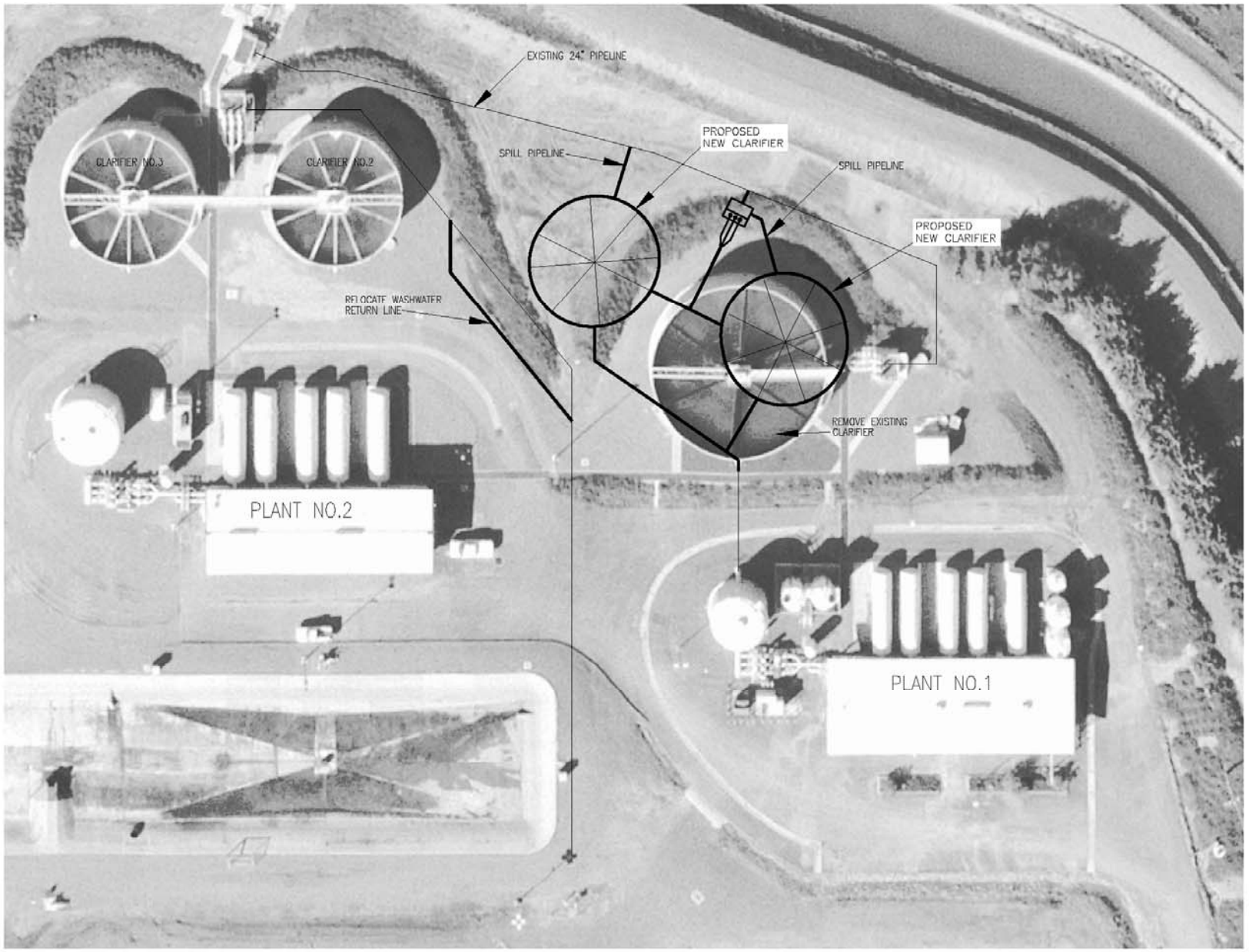
2. Modify Clarification System at Cement Hill Water Treatment Plant No. 1 to Increase Water Treatment Capacity

The original design capacity of the Cement Hill Water Treatment Plants (CHWTPs) 1 and 2 combined was 10 million gallons per day (mgd). In 1998 the Environmental Protection Agency formulated the Enhanced Surface Water Treatment Rules to strengthen protection against microbial contaminants. The Enhanced Surface Water Treatment Rules reduced the allowable maximum contaminant level (MCL) for turbidity and placed an emphasis on further improving the quality of treated water. The percentage of time filter backwashing occurs has been increased resulting in a reduced filter effluent maximum contaminant level for turbidity. However, this has also resulted in a reduction in the original treatment plant design capacity. As stated in Table 4.8-4, based on testing during the summer of 2004, Summers Engineering believes the CHWTP could maintain a treatment capacity flow rate of 8.5 MGD. Treatment Plant No. 1 was constructed in the late 1970's. Treatment Plant No. 2, constructed in the early 1990's, is still able to meet its design capacity. Options were reviewed to determine what further improvements could be made at Treatment Plant No. 1 to increase the treatment capacity back to its original flow rate (see below).

Cost Estimate

Treatment Plant No. 1 has a large clarifier and on hot days during peak flow conditions the clarifier experiences upwelling of its sludge blanket, which hampers efficient operation; this increases filter backwash requirements and reduces treatment capacity. The preferred option for improving Treatment Plant No. 1 clarifier operations is to remove the existing large clarifier and install two smaller clarifiers similar to the configuration which is working efficiently for Treatment Plant No. 2 (See Figure 4.8-1) Two equal clarification processes at CHWTP would simplify the water treatment process and improve ongoing operation and maintenance by staff. Treatment Plant No. 1 has been in operation for nearly 30 years. To further improve the water treatment capacity it is also recommended the pressure filters be replaced. A gradual replacement of the pressure filters could be implemented over the next 6 years. The SSWA report indicates an updated cost of $2,000,000 for the installation of two new clarifiers and the initial replacement of two pressure filters at Treatment Plant No. 1. Coupled with the gradual replacement of the existing pressure filters, the changes at Treatment Plant No. 1 should increase the overall CHWTP capacity from 8.5 MGD to at least 9.75 MGD.

Figure 4.8-1
Proposed Improvements to Cement Hill Water Treatment Plant



Figur

LEGEND

EXISTING PIPELINES

PROPOSED PIPELINES

SUISUN-SOLANO WATER AUTHO
VACAVILLE CALIF
CEMENT HILL WATER TREATMENT PLAN
SITE PLAN
PROPOSED NEW CLARIFIE
SUMMERS ENGINEERING INC
HANFORD Consulting Engineers CAL
MAY 2007

3. Construct New Gregory Hill Water Treatment Plant

Another option to meet the ultimate peak demand for SSWA would be to construct a new water treatment plant at the existing Gregory Hill Water Treatment Plant (GHWTP) site to meet the previously estimated additional maximum day demand (See Figure 4.8-2 for a conceptual site plan). It should be noted that two design options have been considered for the new GHWTP. One of the options involves the construction of a WTP with a capacity of 2,250 gpm. Although this option would provide more than the needed capacity of 1,788 gpm, it is consistent with the SSWA Board's desire to have capacity above the buildout demand in order to provide a safety factor to address unforeseen circumstances (e.g., multiple peak use days during periods of high temperatures). The second GHWTP design options involves the construction of a smaller GHWTP (1,400 gpm) together with modifications at Cement Hill Water Treatment Plant No. 1 to meet the ultimate maximum day demand of the SSWA service area. A Location Map for this option showing the proposed raw water pipeline from the Putah South Canal to the treatment plant site and a treated water pipeline up to the Gregory Hill Water Storage Tank is shown in Figure 4.8-3.

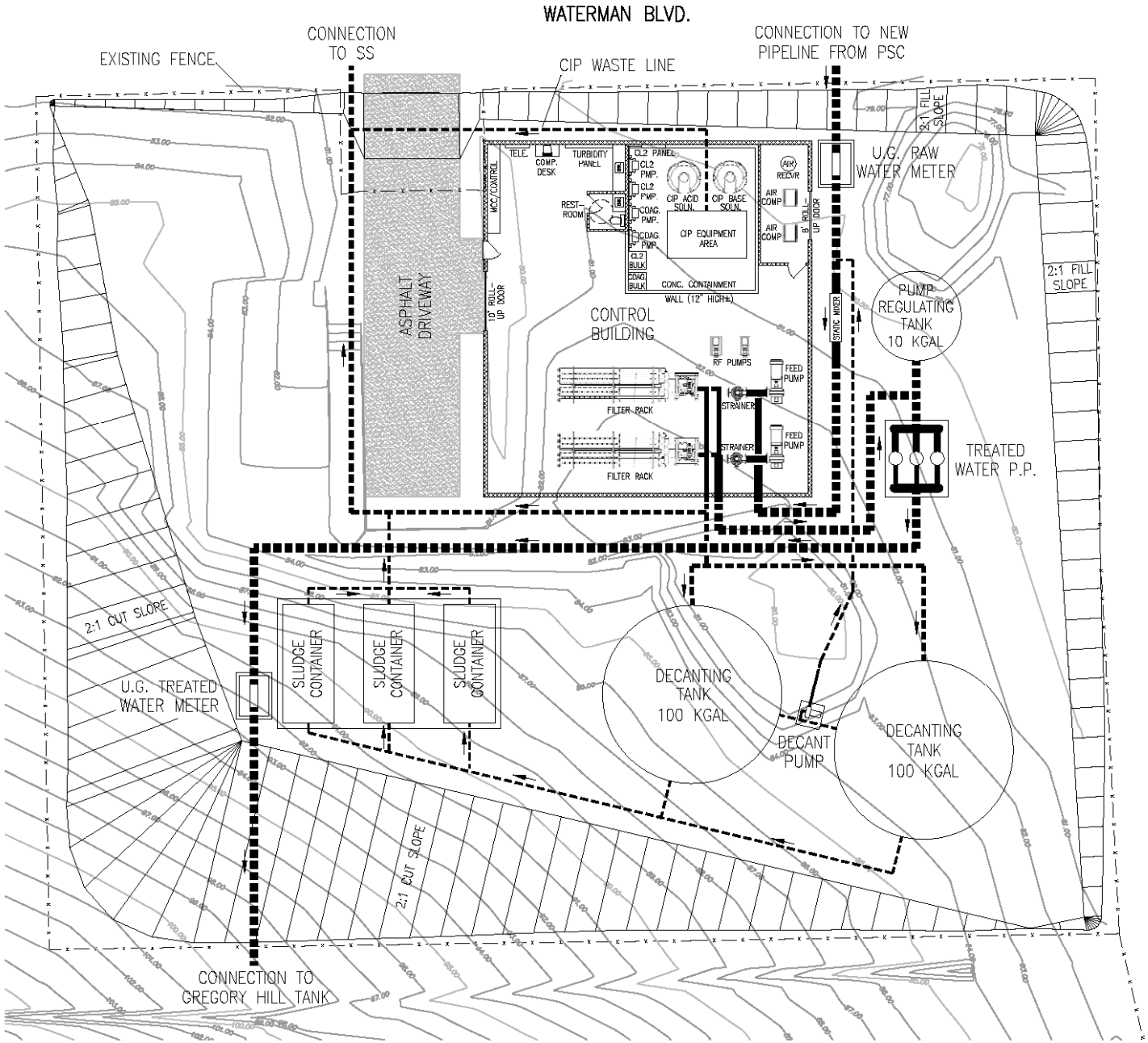
The original treatment plant constructed by the City of Suisun is located on the South side of Waterman Boulevard at the base of Gregory Hill. The original treatment plant was a diatomaceous earth filtration plant with a capacity of approximately 400 gpm. It has not been operated since 1989 and would require extensive renovation to utilize at the present time. The water supply for the existing site is from the Putah South Canal. Figure 4.8-1 shows an existing 12-inch pipeline running southerly from the Putah South Canal to the treatment plant site. The pipe alignment is between existing homes and the pipeline is not readily accessible for operation and maintenance purposes. The construction of a new treatment plant would include the installation of a new raw water pipeline running from the Putah South Canal down Capitola Way and then running westerly along Waterman Boulevard to the treatment plant site. A new 2,250 gpm treatment plant would require a 16-inch raw water pipeline while a 1,400 gpm treatment plant would require a 12-inch raw water pipeline.

Cost Estimate

Following additional review of water treatment plant options, it is recommended that a water treatment plant with a capacity of 2,250 gpm be constructed at the existing Gregory Hill Water Treatment Plant site on Waterman Boulevard below Gregory Hill. A significant elevation difference exists across the site affecting the ability to construct sludge ponds to allow for full recovery of the water rejected during treatment. Backwash recovery tanks are proposed, and it has been assumed one-half of the reject or backwash water would need to be discharged to the local sewer system. Further discussions will be needed to clarify the costs, but initial contacts with the Fairfield Suisun Sewer District (FSSD) indicate the anticipated connection charge may be approximately $1,100,000. The updated estimated construction cost for a 2,250 gpm water treatment plant, including the sewer connection fees is $6,800,000.

Figure No. 2

Conceptual Site Plan for New Gregory Hill Water Treatment Plant



SUISUN-SOLANO WA
VACAVILLE

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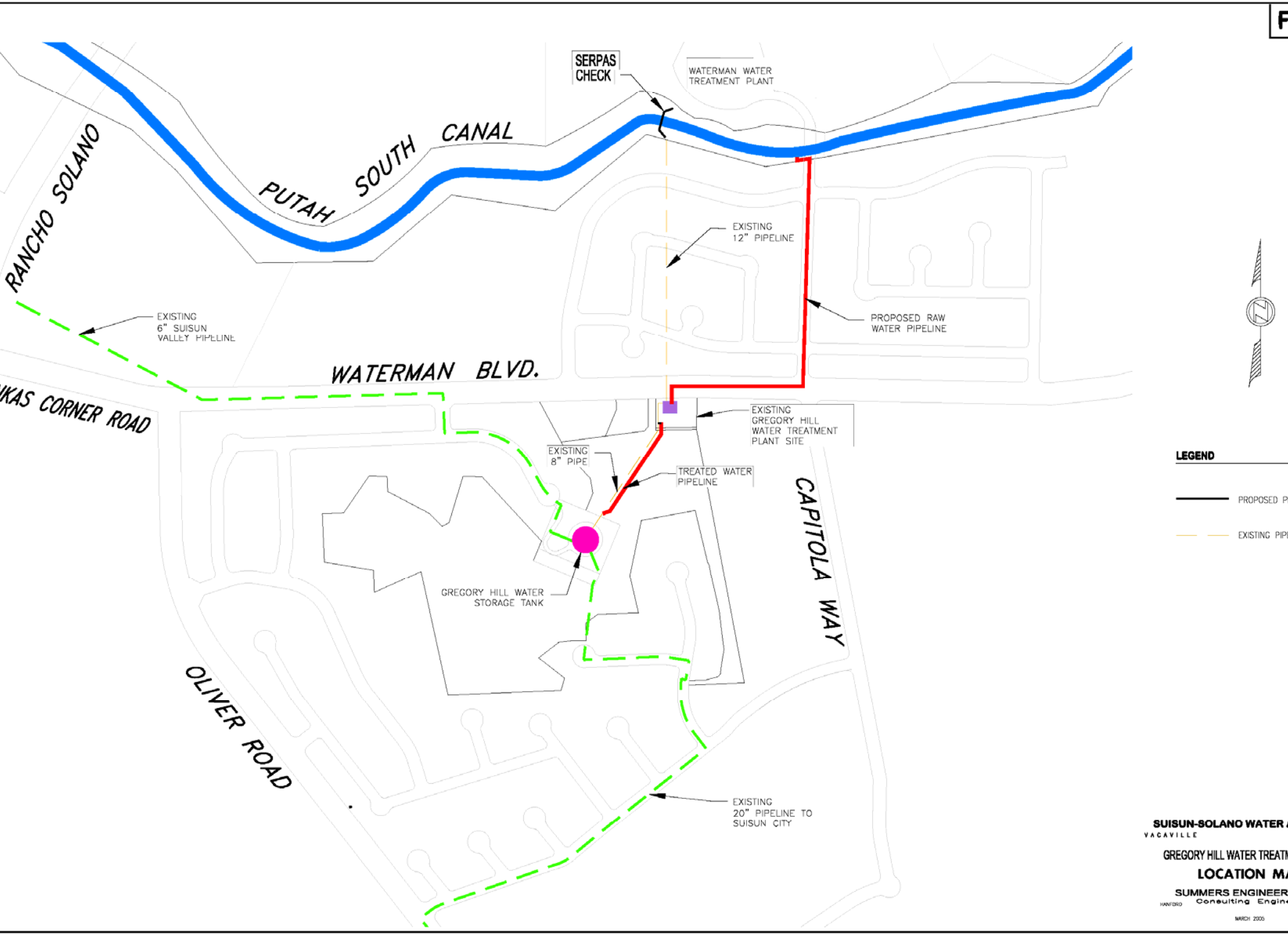
HANFORD Consulting E

MAY 2007

Figure No 3

Proposed Improvements to Gregory Hill Water Treatment Plant



4. Construct an additional clarifier at CHWTP and construct a new Gregory Hill Water Treatment Plant

This option would involve both the construction of a new water treatment plant at the Gregory Hill site, as well as the modification of the existing Cement Hill Water Treatment Plant site to provide additional capacity. The combined costs would be $8,800,000. Construction of a new Gregory Hill Water Treatment Plant and modifications or upgrades to CHWTP would have the highest one-time capital costs; however, the option would also have the lowest annual capital and operation and maintenance costs.

Conclusions and Recommendations

In 2005, the SSWA board members expressed the opinion that it would be preferable for SSWA to develop its own water supply rather than being dependent on the City of Fairfield. At this time, the Board also indicated it would be preferable to develop a water supply exceeding the estimated peak day demand. On July 17, 2007, the SSWA board reaffirmed that it would like to proceed with the construction of a new 2,250 gpm (3.24 mgd) Gregory Hill Water Treatment Plant (Phase I), and improve the existing Cement Hill Water Treatment Plant to increase its capacity to 9.75 mgd (Phase II). Consequently, the SSWA board directed its consultant, Summers Engineering, to proceed with next steps, including preparation of a rate study. Implementation of both water supply options would provide a maximum day treatment capacity of approximately 13.0 mgd. This treatment capacity would provide a safety factor of nearly 17 percent over the estimated Ultimate Maximum Day Water Demand of 11.08 mgd per Table 4.8-4.

Water Transmission to Project Site

The following section describes the background to water rights issues associated with the Solano Project and Putah Creek.

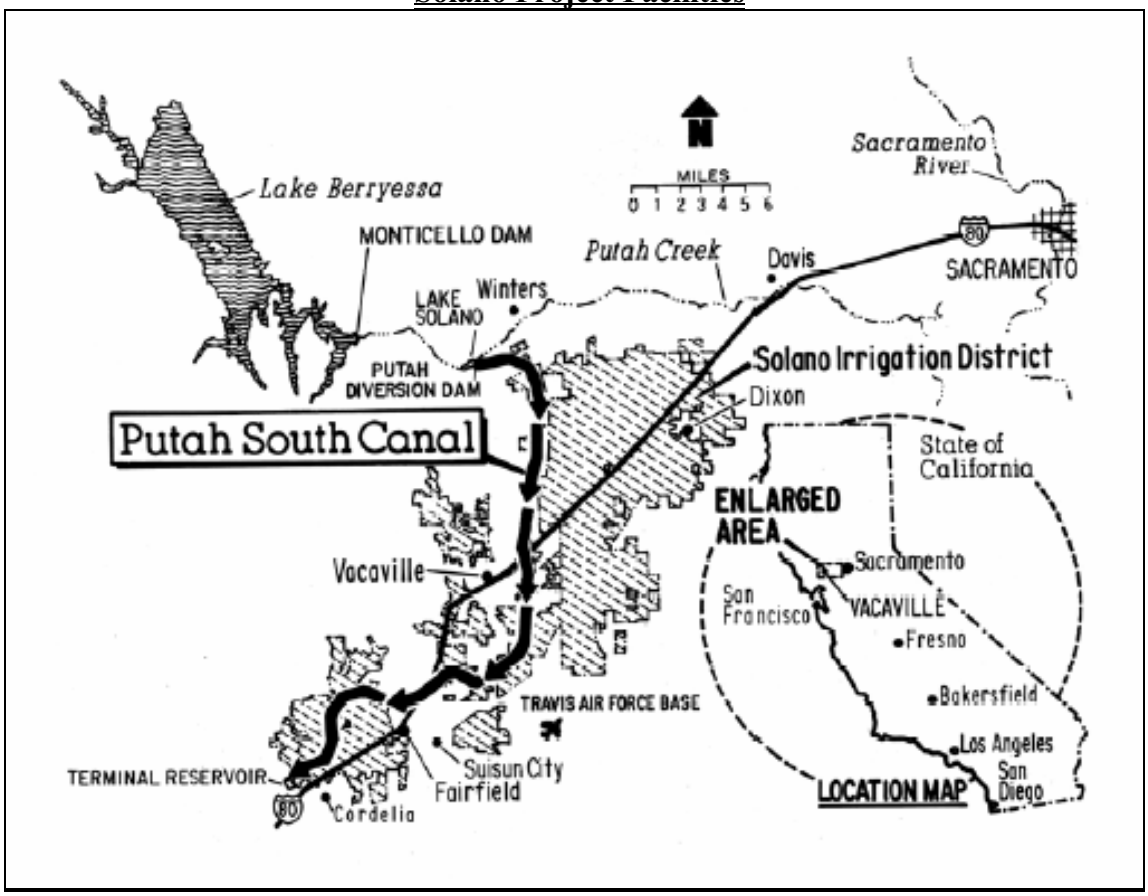
Background

As mentioned above, the Solano Project was constructed by the United States Bureau of Reclamation (USBR) in the late 1950's. The principal project facilities are Monticello Dam and its reservoir, Lake Berryessa, the Putah Diversion Dam, and the Putah South Canal, which conveys water to the agricultural and urban member units of the Solano County Flood Control and Water Conservation District, reorganized into the Solano County Water Agency (SCWA) in 1989 (see Figure 4.8-4). The agricultural users are the Solano Irrigation District and the Maine Prairie Water District, and the urban users are the cities of Vacaville, Fairfield, Suisun City, and Vallejo.

The Solano Project was designed and built on the basis of a 40-year operation study from 1915-16 through 1954-55, which assumed the average annual Putah Creek runoff at 309,500 acre-feet. Estimated reservoir evaporation losses and releases down Putah Creek to satisfy prior riparian water rights determined an available supply of 247,000 acre-feet

per year. Decision 869 adopted by the State Water Resources Control Board on February 7, 1957, authorized the USBR to store 1,600,000 acre-feet in Lake Berryessa behind Monticello Dam. Stored water is released down the creek to Putah Diversion Dam where it is diverted into the Putah South Canal with some minor releases into lower Putah Creek.

Figure 4.8-4
Solano Project Facilities



Source: Summers Engineering, Inc.

The water rights permits issued under Decision 869 were subject to several different conditions. One permit condition issued under Decision 869 required the release of enough water down Putah Creek to 1) meet prior riparian rights, and 2) to be sufficient to maintain the same percolation of water into the groundwater basin as occurred under pre-project conditions. Another permit term required USBR to maintain a live stream *"as far below the diversion dam as possible, consistent with the purposes of the project and the requirements of downstream users."* The intent was to release enough water to maintain the flow in the creek to the Yolo Bypass whenever the inflow to Lake Berryessa was sufficient. Determination of the required releases under the live stream scenario was difficult for the USBR to implement due to the highly varied and unpredictable inflow into Lake Berryessa from its numerous tributaries. This was also complicated by the difficulty in estimating the downstream demand requirements. The USBR filed a petition

with the SWRCB in 1969, 12 years after Decision 869 was approved, to set aside the live stream flow releases and replace them with a monthly schedule of releases. No opposition to the release schedule was presented at the public hearing in 1969 and in 1970 the SWRCB adopted the fixed release schedule and also relieved the USBR of some of its monitoring requirements.

In 1970 when the SWRCB adopted the fixed release schedule, the agency again retained jurisdiction over the release schedule. In 1976 and 1977 California experienced the driest two year drought since construction of the Solano Project. Concerns regarding water supply needs for cities, agriculture, and the environment began to be heard. At a SWRCB hearing held in 1978 to review whether or not the 1970 release schedule was supplying sufficient water to Putah Creek, arguments were presented to increase the releases. The Putah Creek Riparian Landowners/Water Users wanted to increase the release schedule, claiming existing operations were impacting recharge to the groundwater basin. The University of California at Davis mentioned that water levels on the north side of Putah Creek were lowering, that increased releases would benefit fish, and that continued monitoring of the impacts was needed. Testimony on fishery issues in Putah Creek was presented. The initial movement that would lead to the Putah Creek Adjudication had begun.

Due to the continuing unresolved Putah Creek water supply and water right issues, in April 1990, the Solano County Water Agency, Solano Irrigation District, the cities of Vallejo, Vacaville, Fairfield, and Suisun City, and the Maine Prairie Water District jointly filed a complaint in the Sacramento Superior Court for adjudication of all Putah Creek water rights. The adjudication was initiated to resolve the ongoing uncertainties regarding the legal rights to Putah Creek water both upstream and downstream of Lake Berryessa. The adjudication would resolve the status of water right filings in the upper watershed tributary to Lake Berryessa, and would determine the adequacy of Putah Creek releases to maintain the rights of riparian users and the recharge of the downstream Putah Creek fan groundwater basin. It would also address challenges made regarding how much water should be released to maintain the fishery and riparian habitat in Putah Creek. In August 1990 the Putah Creek Council, founded in February 1988 by people interested in protecting Putah Creek's riparian habitat and the water flows in the creek, filed a complaint for injunctive relief to keep water flowing in lower Putah Creek for fish. The City of Davis and the University of California, Davis joined the legal efforts.

Regarding the downstream issues, negotiations and legal maneuvering continued for the next six years in an attempt to reach a settlement on flow requirements. The differences were significant, however, and when it became apparent the parties would not reach a settlement, it proceeded to trial in Sacramento Superior Court in March 1996. At the conclusion of a 5 week trial, the judge ruled that flows should be increased in order to increase groundwater recharge and maintain needed flows for fish. The judge was in agreement with the U.S. Fish and Wildlife Service and University of California experts that the flows in the 1970 release schedule were not sufficient to keep the creek fish in good condition.

The Solano parties appealed this ruling, but over the next 4 years entered into settlement discussions with the other parties to define the terms of the increased flows required for Putah Creek. Negotiations concluded in 2000 with the signing of a Putah Creek Accord resolving all of the disputes.

Putah Creek Accord

In June 2000, the Solano County Water Agency (SCWA), Solano Irrigation District (SID), Maine Prairie Water District, City of Vacaville, City of Fairfield, City of Vallejo, Suisun City, Putah Creek Council (PCC), City of Davis, and the Regents of the University of California became parties to the Putah Creek Accord.

The parties agreed that a maximum of 248,000 acre feet per year could be diverted from Putah Creek by Solano Project water users from the Solano Project for beneficial use. Under the Putah Creek Accord, all parties agreed to the establishment of the minimum Solano Project releases and minimum instream flows for Putah Creek downstream of the Putah Diversion Dam ("Lower Putah Creek"). The parties also established management measures for the benefit of fish and riparian habitat in and adjacent to the creek. The Accord established minimum instream flows for the following flow regimes for Lower Putah Creek: 1) Rearing Flows; 2) Spawning Flows; 3) Supplemental Flows; and 4) Drought Year Flows. For Rearing Flows, the Accord established a Mean Daily Release and Mean Daily Flow, as illustrated in Tables 4.8-5 and 4.8-6 below, respectively. The Rearing and Spawning Flows are intended to protect the aquatic and related resources in Lower Putah Creek, including the following native anadromous fish species: chinook salmon, steelhead trout, and Pacific lamprey.

The instantaneous releases at the Putah Diversion Dam are required to be equal to, or exceed, 90 percent of the applicable mean daily release requirement (see Table 4.8-5).

Table 4.8-5
Required Mean Daily Release

	Oct	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sept**
Mean Daily Release (CFS)	20	25	25	25	16	26	46	43	43	43	34	20

Source: Putah Creek Settlement Agreement

The above release schedule is required to maintain, or exceed, the flows shown in Table 4.8-6 in Lower Putah Creek. The instantaneous flow, as measured near the Interstate 80 bridge over Putah Creek, is required to equal, or exceed, 90 percent of the applicable mean daily flow at all times.

Table 4.8-6
Required Mean Daily Flow

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Mean Daily Flow (CFS)	5	10	10	15	15	25	30	20	15	15	10	2

Source: Putah Creek Settlement Agreement

For Spawning Flows, the Accord specifies additional releases from the Putah Diversion Dam into Lower Putah Creek during the months of February and March.

Supplemental Flows are intended to enhance the aquatic and related resources of Lower Putah Creek above the baseline (i.e., Rearing and Spawning Flows). These flows are released during the months of November through May. During years when total storage in Lake Berryessa is less-than 750,000 acre feet as of April 1st, the release and instream flow requirements shown in Tables 4.8-5 and 4.8-6 are superceded by drought year flows, as shown in Table 4.8-7.

Table 4.8-7
Required Drought Year Flow

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Mean Daily Release (CFS)	15	25	25	25	16	26	46	33	33	33	26	15

Source: Putah Creek Settlement Agreement

SID and SCWA are required to release sufficient water to maintain a minimum mean daily instream flow of 2 cfs at the I-80 bridge, with instantaneous flows always equal to or exceeding 1 cfs.

Lower Putah Creek Coordinating Committee

The Lower Putah Creek Coordinating Committee (LPCCC) was established in 2000 as part of a historic water accord (Accord) to provide water sufficient for fish, wildlife, and human needs. The LPCCC serves as the watershed group joining several primary stakeholders together to oversee implementation of the Accord and to begin planning for the protection and enhancement of Putah Creek's resources. The members include a riparian landowner, the cities of Davis, Fairfield, Suisun City, Vacaville, Vallejo, and Winters; counties of Solano and Yolo; Maine Prairie Water District; Putah Creek Council; Solano County Water Agency; Solano Irrigation District; and the University of California, Davis.

One of the first actions undertaken by the LPCCC was the development of a Lower Putah Creek Watershed Management Action Plan (WMAP) (December 2005) to provide a

comprehensive initial assessment of lower Putah Creek's resources and to determine, with watershed stakeholders, the primary restoration and enhancement objectives to improve the health of the watershed and riparian corridor. Development of the WMAP enables a community-based, comprehensive approach to watershed resource protection and enhancement. Permits and regulatory approvals have already been acquired by the LPCCC for initial restoration and enhancement actions throughout the watershed, expediting implementation of projects conducted by or in coordination with the LPCCC and interested landowners. Funding for these projects has been provided by a series of grants administered by the LPCCC. The WMAP is a planning document that is not binding on individual landowners, but that reflects the collective willingness of landowners to support resource protection and enhancement projects.

Wastewater Collection and Treatment

Service Area Boundary

The Fairfield-Suisun Subregional Wastewater Treatment Plant (WWTP) provides tertiary treatment of wastewater generated from domestic, commercial, and industrial sources within the City boundaries of Fairfield and Suisun City. Service is also provided to Travis Air Force Base and Anheuser Busch. The WWTP is owned by Fairfield-Suisun Sewer District (District) and is located on Chadbourne Road just southeast of Interstate 80. The District also maintains a network of gravity sewers and pump station to collect wastewater and convey it to the treatment plant.

Existing Collection and Treatment Facilities

Collection

The existing collection system consists of gravity sewers, pump stations, and forcemains. Responsibility for operation and maintenance of gravity pipelines smaller than 12-inches in diameter lies with the City of Fairfield and the City of Suisun City. All pipelines of 12-inch size and larger, as well as pump stations and forcemains, are operated and maintained by the District.

The system is laid out with small gravity sewers (City-operated) contributing flow to the larger District-operated sewers. Wastewater, flowing by gravity, eventually reaches one of three conveyance pump stations. Conveyance pump stations include Cordelia, Central, and Suisun Pump Stations. In addition, the Inlet Pump Station, located at the WWTP, pumps wastewater from nearby portions of the City of Fairfield and return/recycle flows from within the WWTP. Several smaller pump stations serve as lift stations. The District-operated portion of the collection system includes a total of approximately 340,000 lineal feet (64 miles) of gravity sewer ranging from 12-inch to 48-inch diameter.

Approximately $20 million has been spent on collection system upgrades over the last 15 years. Projects have included upgrades for capacity deficient sewers, rehabilitation of old

and/or leaking sewers with modern, leak-resistant materials, and pump stations upgrades to increase capacity and improve reliability.

The system exhibits only moderate infiltration/inflow. The generally good level of infiltration/inflow is due, in part, to the District's collection system monitoring and maintenance programs. An integral part of the District's program is an ongoing schedule of collection system flow monitoring. Portable flow monitoring equipment has been placed at critical locations throughout the system to record flows before, during, and after storm events.

Collection System Analysis

The Fairfield-Suisun Sewer District (FSSD) studied collection system capacity in its 2002 Collection System Master Plan. The area currently served by sewers was divided into a set of sub-basins for analysis. Each sub-basin was assumed to contribute all its flow at one manhole. Flows were calculated by intersecting the land use information with these sub-basins. Additional sub-basins were created for areas where sewer service extension is expected. Zones reserved for future development were minimal.

Sewers were considered undersized if the 20-year design storm caused an overflow. Using the model, a set of improvement projects was developed that would prevent overflows during the 20-year design storm. To verify the calibration, the model was run to simulate conditions during the largest storm for which hourly flow data were available at the plant. The storm began on February 2, 1998 and continued for approximately 30 hours. This storm produced 3.23 inches of precipitation during the maximum 24 hours, slightly less than a 5-year storm.

Treatment (Flow and Capacity)

The existing WWTP serves an area with an estimated population of 122,600 based on 2000 population data. The rated average dry weather capacity of the Fairfield-Suisun WWTP is 17.5 mgd while the wet weather capacity is estimated to be 40 mgd. The 2001 average dry weather and annual average flows were 14.3 and 15.3 mgd, respectively (1999 values).

Wastewater flows were estimated using the land use criteria evaluated in the Sewer System and Treatment Master Plan (Volume 2). In that Plan flow projections for six planning periods (year 2000, 2005, 2010, 2015, 2020, and ultimate buildout) were derived from unit flow factors and projected land-use and development densities.

Following the desktop analysis and field tests, an assessment of the entire treatment plant was performed to determine the rated capacity based on field test results and recommended modes of operation. Process operating modifications for optimizing the existing treatment facilities focus on the secondary treatment process, specifically the aeration basin and secondary clarifiers. These modifications include:

- Maintaining a sludge age of 12 days instead of 18 days.
- Reducing RAS flow rates from 5.5 mgd per clarifier under any conditions to a more typical operating range of 40 to 60 percent of the influent flow.

Based on adopting these operating modifications, the rated sustained peak flow capacity of the treatment facility is 30.5 mgd, which is equivalent to an average dry weather flow of 15.5 mgd based on historic factors. This flow represents a continuous sustained flow over a 7- to 10-day duration. With the improvements to the existing secondary clarifiers, the rated capacity of the existing treatment plant is expected to increase to 34.8 mgd. Based on average dry weather flow conditions alone, the rated capacity is 17.9 mgd. These factors indicate there will be sufficient wastewater capacity for Suisun to meet its estimated wastewater demands.

Solid Waste Collection and Disposal

Suisun City's solid waste is hauled to the Potrero Hills Landfill (PHL), owned and operated by Republic Services, Inc. PHL's current service area encompasses portions of the Bay Area, Central Valley, Sierra foothills, and north coast of California, within an approximately 150-mile radius. PHL accepts wastes from a variety of communities and transfer facilities located throughout northern California, including the Sierra foothill counties and Alameda, Contra Costa, Marin, Mendocino, Napa, Sacramento, Santa Clara, San Mateo, Solano, and Yolo Counties. The City contracts with Solano Garbage Company to provide waste disposal services for residents, businesses and industries within City limits. Residential, commercial, and industrial service is mandatory.

The PHL is a municipal solid waste landfill where residual non-hazardous wastes are buried, coupled with a materials processing center where resource recovery activities are conducted and materials are diverted from landfilling through composting, wood recycling, concrete and asphalt rubble crushing and screening, metal salvage recovery, and other recycling services.

Existing and Projected Facilities and Capacity

The PHL 190-acre Phase I portion of the 320-acre currently permitted land parcel contains a potential total fill capacity (wastes plus soil cover) of about 21.5 million cubic yards (cy). The 2001 Annual Monitoring Report, submitted to the County as required by the conditional land use permit (CLUP) and Solid Waste Facility Permit (SWFP), indicates that the remaining expected life of PHL as now permitted is between 8 and 11 years, depending largely on the rate of wastes received. As seen in Table 4.8-8~~4~~ below, the landfill currently receives 2,602 tons of solid waste per day and 949,713 tons per year. A reasonable estimate, based on this disposal rate, is that the PHL would be able to accept wastes until about 2010. Therefore, expansion planning is necessary and currently underway.

Table 4.8-~~4~~8
Actual and Projected Annual Waste Stream for Potrero Hills Landfill (1985-2049)

Year	Total Annual Waste Received		Year	Total Annual Waste Received	
	TPD7	Tons		TPD7	Tons
1985			2018	2,961	1,080,862
1986	75	27,375	2019	2,991	1,091,670
1987	324	118,260	2020	3,021	1,102,587
1988	515	187,975	2021	3,051	1,113,613
1989	610	222,650	2022	3,082	1,124,749
1990	612	223,380	2023	3,112	1,135,996
1991	564	205,860	2024	3,143	1,147,356
1992	788	287,620	2025	3,175	1,158,830
1993	616	224,840	2026	3,207	1,170,418
1994	715	260,975	2027	3,239	1,182,122
1995	489	178,485	2028	3,271	1,193,944
1996	629	229,407	2029	3,304	1,205,883
1997	1,030	376,121	2030	3,337	1,217,942
1998	1,336	487,481	2031	3,370	1,230,121
1999	1,042	380,195	2032	3,404	1,242,422
2000	1,095	399,623	2033	3,438	1,254,847
2001	1,427	520,827	2034	3,472	1,267,395
2002[a]	1,741	635,535	2035	3,507	1,280,069
2003	1,759	641,891	2036	3,542	1,292,870
2004[b]	2,576	940,310	2037	3,578	1,305,799
2005	2,602	949,713	2038	3,613	1,318,857
2006	2,628	959,210	2039	3,649	1,332,045
2007	2,654	968,802	2040	3,686	1,345,366
2008	2,681	978,490	2041	3,723	1,358,819
2009	2,708	988,275	2042	3,760	1,372,407
2010	2,735	998,158	2043	3,798	1,386,131
2011	2,762	1,008,139	2044	3,836	1,399,993
2012	2,790	1,018,220	2045	3,874	1,413,993
2013	2,818	1,028,403	2046	3,913	1,428,133
2014	2,846	1,038,687	2047	3,952	1,442,414
2015	2,874	1,049,074	2048	3,991	1,456,838
2016	2,903	1,059,564	2049	4,031	1,471,406
2017	2,932	1,070,160			

Notes:
TPD7 - Tons per day averaged over 7 days of wastes that are buried in the landfill; does not include recyclable materials.

The 1986-2001 tonnage data were obtained from computer records of actual quantities of wastes disposed in the landfill; estimates after 2001 assumed an increase of 1 percent per year.

a – Added 300 TPD7 additional out-of-county wastes.
b – Added 800 for West Contra Costa County.
Source: PHLF 2002a

Currently capacity at Potrero Landfill is expected to be reached in 2010. However, the owner's plans to expand the landfill would increase capacity by 61.6 million cubic yards, adding 35 years of disposal life to the site. Therefore, when the landfill expansion is approved and construction is completed, the landfill would have the capacity to meet solid waste needs at buildout of the City's General Plan. Suisun City also has the option of contracting to use other landfills in Northern California, which have excess capacity.

Law Enforcement

The Police Department provides safety services within the incorporated Suisun City limits. The Police Department provides patrol and detective services with support from the Solano County Sheriff's Department pursuant to a Memorandum of Understanding between the County and the City. Suisun City currently has a budget for 22 sworn full-time staff that support the police department including: 1 police chief, l lieutenant, 5 sergeants, 14 police officers, 1 school resource officer (Suisun City CAP, 2005). The Department also employs 11 full-time and 5 part-time non-sworn staff, including: 1 youth services specialist, 1 administrative services manager, 5 communication technicians, 1 administrative assistant, 1 crime prevention specialist, 2 neighborhood preservation specialists, 1 police aide (part-time), and 1 background investigator (part-time). The city maintains one primary station and one small substation in the new Peterson Ranch Subdivision, which houses three non-sworn staff.

Currently, 206 community volunteers provide a variety of services to the Department. The Solano County Sheriff's Department provides additional support services to the City under a Memorandum of Understanding, including two fully equipped Deputy Sheriff patrol units to augment law enforcement activities in the city limits of Suisun City between the hours of 2:00 am and 7:00 am.

As the City experiences additional growth and annexations, increased call volume will occur for Police Department services, which are primarily funded through the City's General Fund. The Department has planned for a maximum buildout population of approximately 35,000. The Department has also established a policy to provide one officer per every 1,000 residents, which at build out would be a need for 35 sworn officers. The need for personnel would represent an increase of 13 more officers than are currently employed, and additional non-sworn personnel to support the additional need.

Currently, the Department's response time to emergency calls is 4:08 minutes, and 8:34 minutes for non-emergency calls. The Gentry-Suisun Project would increase the City's' population by approximately 2,000. Therefore, the Department would require two additional officers, including necessary safety equipment, at the completion of the entire project. The Department would also require an additional Communications Technician, 520 square feet of added police station space, two police interceptor vehicles, 21% of the cost of a SWAT van and 21% of the cost of an I.D. van.

Fire Protection

The project site is currently served by the Suisun Fire Protection District (SFPD). Although the SFPD has two stations that are predominantly staffed by volunteers, the SFPD has two career firefighters on-staff. A SFPD station is located in approximately 0.5 miles northeast of the project site in the City of Fairfield. Should the project entitlements be approved, it is anticipated that the project site would be served by the Suisun City Fire Department. The Suisun City Fire Department has one fire station, which was built in 1981 and is located at the intersection of Pintail and East Widgeon. The Fire Department is a volunteer fire department protecting approximately 28,000 residents within four

square miles of area. The Department has a paid staff of one (1) Fire Chief, two (2) paid Captains, and 45 volunteers.

The Fire Department is currently unable to meet the General Plan policy of a 3-minute response time to calls. The minimum response time averages 4 to 6.5 minutes as shown in Table 4.8-9~~5~~. As traffic increases in the future, the response times will become longer and at certain times of the day, they may be dramatically longer. As population growth occurs with Suisun City, additional fire services will be needed which would include the following: an increase in the Fire Department's overall budget, construction of a new fire station, the purchase of new equipment and fire engines, and hiring additional fire support staff. More specifically, the Fire Chief has indicated that response times to the Gentry Project site would be six minutes or greater due to the fact that the project site is located west of the City and the existing station is located in the center of the City at Pintail Drive and East Widgeon Way.[6] In addition, the Chief has indicated that a new fire station is needed to adequately serve the project, but that the project site would not be a desirable location for the new station; the preferred location for a new fire station would be at SR 12 and Marina Boulevard.

Table 4.8-~~5~~9
Fire Department Response Times

Time/Min	Location	Route	Area
4.5	Charleston & Fort Ord	Pintail-Walters-Bella Vista-Charleston-Fort Ord	Peterson
4.0	Whitby & Potrero	Pintail-Emperor-SR 12 E-E Lawler Ranch Pkwy-Whitby-Potrero	SE Lawler Ranch
4.5	Corp Yard	Pintail-Walters-Peterson	East Side
4.5	Oliver & Tabor	Pintail-Cacklng-Canvasback-Worley-Railroad-Tabor-Olive	North
4.0	Marina & Railroad	Pintail-Buena Vista-Marina-Railroad	NW
5.0	Cordelia & Pennsylvania	Pintail-Emperor-SR 12-Pennsylvania-Cordelia	SW
6.5	Boat Ramp	Pintail-Emperor-SR 12-Main-Cordelia-Kellogg	South

Suisun City anticipates that impact fees and annual property tax payments associated with the development of these projects, in particular those anticipated with the Gentry annexation, would pay for some of the costs of expanding fire services. The City has recommended the exercising of a concrete plan of action to increase fire support services, including sustainable revenue.

Schools

The Fairfield-Suisun Unified School District provides service to all incorporated areas of the City of Suisun City. Existing school information contained in Tables 4.8-10~~6~~ through 4.8-11~~7~~ was provided by the Fairfield-Suisun Unified School District:[7]

Table 4.8-6~~1~~0 Fairfield-Suisun Unified School District Enrollment		
Name of School	**Current Enrollment***	**Capacity**
Crescent Elementary School (K-5) 1001 Anderson Drive Suisun City, CA 94585 (707) 435-2771	768	776
Crystal Middle School (7-8) 400 Whispering Bay Lane Suisun City, CA 94585 (707) 435-5800	780	913
Rodriguez High School (9-12) 5000 Red Top Rd Fairfield, CA 94534 (707) 863-7950	2,174	2,036 + 280 in portable classrooms
*Enrollment numbers are estimated based on current registration figures.		

Table 4.8-7~~1~~1 Student Generation Rates			
Development Type	**K-6 Elementary**	**7-8 Middle**	**9-12 High School**
Single Family (SF)	0.343	0.109	0.195
Multi Family (MF)	0.053	0.024	0.041

Library

The Suisun City Library is the only public library located in Suisun City and is part of the larger Solano County Library system. The Suisun City Library is relatively small with inadequate services and not easily accessible requiring local residents to use the Fairfield-Suisun Community Library instead. Currently the Suisun City Library has no program space in the library except for an open area in the children's area used for story hour, which hinders a full complement of library services. The Suisun City Library is located at 333 Sunset Avenue on the second floor. The library is currently open on Monday and Thursday from 10:00am-9:00pm, Tuesday and Thursday from 10:00am-6:00pm, and Friday and Saturday from 10:00am-5:00pm.

Although the Suisun City Library is small, future plans for a new library are in the planning stages. A community partnership between the City of Suisun City, Solano-County Library, and the Fairfield-Suisun Unified School District has been established to determine what type of library and community facilities would be needed to serve the growing Suisun City. Recently a Community Meeting was held at the Joe Nelson Community Center on May 12, 2005 to present and discuss several site plan ideas for a much larger community library and community facilities which would include many amenities to service Suisun City.

Parks and Recreation Facilities

The City's Recreation and Community Services Department is responsible for providing park and recreation services for residents of Suisun City. The Department oversees all City sponsored recreation programs and facilities. The service area boundary is the incorporated land of the City.

The General Plan indicates a standard for park development of 3.0 acres per 1,000 residents for Neighborhood Parks and 1.5 acres per 1,000 acres for Communitywide Parks. Currently 18 parks exist within the City limits with 45.3 acres of Neighborhood Parks and a Communitywide Park of 50 acres totaling 90.41 acres. In addition to existing parks as shown in Table 4.8-12~~8~~, the City has anticipated an additional 3 parks would be constructed as development occurs within the City as shown in Table 4.8-13~~9~~. As indicated in the Municipal Services Review and Comprehensive Annexation Plan, Suisun City is in a solid position to provide parks and recreation services to new growth as it occurs. The City continues to expand its recreation program to serve existing and new residents as population increase. New parks in new growth areas would be built as new residential growth develops through the City's Public Faculties Fee Program

Table 4.8-~~8~~12
Suisun City Public Parks Inventory

Park	Acres
Day Park (NP)	3.0
Florida Street Mini Park (SNP)	0.1
Main Street Plaza Park (SNP)	1.1
Solano Street Mini Park (SNP)	0.1
Hall Park (NP)	11.4
Harbor Park (NP)	0.5
Geopp Park (NP)	4.3
Lawler Falls Park (NP)	3.5
Harbor Village Park (NP)	5.0
Montebello Vista Park (NP)	5.1
Boat Launch (NP)	2.5
Heritage Park (NP w/CP characteristics)	10.0
McCoy Park (SNP)	1.0
Lambrecht Sports Complex (CP)	35
Merganser Park (SNP)	0.2
Josiah Circle Park (SNP)	1.0
Peterson Ranch Park 1	3.98
Peterson Ranch Park 3	2.63
Total Park Acreage	**90.41**

NP=Neighborhood Park SNP=Sub-Neighborhood Park CP=Communitywide Park

Table 4.8-~~9~~13 Planned Park Development	
Park	**Acres**
Peterson Ranch Park 2 (under construction)	4.67
Lawler Ranch Park (under construction)	10
Sheldon Plaza Park (within 5 years)	1.5
Total Planned Park Development	**16.17**

Building Inspection

The impact on the Building Department from the Gentry-Suisun project would be as follows:

If the entire project, comprised of commercial space and residential unites, were to be under construction at one time at least four and one half additional people would be required to handle the paperwork and inspection load. This is based on the assumption that one inspector could handle about three hundred home in one year. Therefore two inspectors would be necessary to handle the residential portion. The commercial space could probably be handled by two inspectors. All plan checks are already sent out to an outside consultant for review so no additional plan checkers would be needed, but additional clerical support will be needed to process the permit issuance and other clerical duties. Therefore, at least one half of one employee will be needed for clerical. Adding all of these up, we need approximately four and one half people.

In as much as the cost of operating the Building Department is covered by building permit fees, the cost for these additional people should be covered by the permits issued for the project. All fees are collected at the time of the permit issuance. At the appropriate time the City will make the decision to hire additional employees or bring in contract inspectors for the project. The number of additional employees that are needed will depend partly on the phasing schedule of the project.

If the developer desires expedited service above normal service levels, the developer will be given the option of paying for additional staffing. This additional staffing would be at an additional cost above normal permit costs and at the option of the developer.

REGULATORY CONTEXT

Existing policies, laws and regulations that would apply to the proposed project are summarized below.

SB 610

Senate Bills 610, which took effect January 1, 2002 requires extensive, specific information about water availability be presented and considered by land use agencies during the processing of certain land use entitlement applications. SB 610 apply to residential projects that include more than 500 residential units and retail projects with

more than 500,000 square feet of floor space, as well as other kinds of projects of similar magnitude.

SB 610

SB 610 refers to numerous details that must be addressed in the water supply assessment, which are described in portions of the amended Water Code § 10910:

> (d) (1) The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system…under the existing water supply entitlements, water rights, or water service contracts.
>
> (2) An identification of existing water supply entitlements, water rights, or water service contracts held by the public water system […] shall be demonstrated by providing information related to all of the following: (A) Written contracts or other proof of entitlement to an identified water supply. (B) Copies of a capital outlay program for financing the delivery of a water supply that has been adopted by the public water system. (C) Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply. (D) Any necessary regulatory approvals that are required in order to be able to convey or deliver the water supply.
>
> (e) If no water has been received in prior years by the public water system […] under the existing water supply entitlements, water rights, or water service contracts, the public water system […] shall also include in its water supply assessment […] an identification of the other public water systems or water service contract holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water…
>
> (f) If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water supply assessment:
>
> (1) A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.
>
> (2) A description of any groundwater basin or basins from which the proposed project will be supplied. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the public water system, or the City or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present

management conditions continue, in the most current bulletin of the department that characterizes the condition of the groundwater basin, and a detailed description by the public water system, or the City or county if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the City or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the City or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(5) An analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project.

A water supply assessment shall not be required to include the information required by this paragraph if the public water system determines…that the sufficiency of groundwater necessary to meet the initial and project demand associated with the project was addressed in [its urban water management plan].

SB 50

Senate Bill 50 (SB 50) and Proposition 1A provided a comprehensive school facilities financing and reform program. The provisions of SB 50 prohibit local agencies from denying land use approvals on the basis that school facilities are inadequate and reinstate the school facility fee cap for legislative actions. Government Code Section 65996 states that the development fees authorized by SB 50 are deemed to be "full and complete school facilities mitigation."

Suisun-Solano Water Authority (SSWA)

The Suisun-Solano Water Authority (SSWA) manages water supply and distribution to the City. The SSWA is a joint powers authority between the City of Suisun City and the Solano Irrigation District under an implementation agreement entered into in 1990. Both Suisun City and Solano Irrigation District have contracted with the Solano County Water

Agency for water supplies from the federal Solano Project. In 1996 the SSWA adopted the "Master Plan for the Water Supply and Delivery System," which provides comprehensive details about past, present, and projected water supply and delivery issues.

Solano Irrigation District

The Solano Irrigation District (SID) is an independent special district, a local governmental agency, formed in 1948. SID currently has entitlements for 151,000 acre-feet of agricultural and domestic water for service to many areas in Solano County each year. The District also is the operator of the Solano Project which delivers Lake Berryessa water to four cities and Maine Prairie Water District and the SID customers. The District owns and operates the hydroelectric power plant at the base of Monticello Dam. SID is partners with the Cities of Dixon and Suisun City in water delivery.

Suisun City General Plan

The City of Suisun City General Plan (1992) addresses water service and wastewater service in the Community Services and Facilities Element (Chapter VIII). The following General Plan goals and policies apply to the proposed project:

Chapter VIII. Community Facilities and Services Element

Municipal Services and Facilities

Goal: To provide municipal and school services and facilities to both new development and existing residents and businesses at a level that will maintain and improve the standard of living for the entire community.

> Objective 1: To ensure that new development does not exceed the capacity of the City to provide adequate municipal services and does not overly burden the capacity of existing infrastructure and service levels.
>
> > Policy 1: The Community Services Element sets forth policies for the provision of public services and facilities and how these will be provided to accommodate new development and redeveloped areas. The City's Capital Improvements Program (CIP) sets forth standards for public services and facilities and timelines for public improvements. A property owner may wish to develop in advance of the schedule set forth by the City. The City will not attempt to dictate the timing of development so long as land proposed for development is properly designated under the General Plan and zoned for the proposed use, so long as the applicant has an adequate plan for providing needed facilities and services in advance of the schedule set forth by the CIP, and so long as the proposal will not be detrimental to the implementation of the CIP or other City programs or services.

The City would approve development in an area without services and facilities, in advance of their scheduled installation under the CIP, only if the developer agrees to extend needed sewer and water lines, provide drainage facilities, and install other necessary improvements to serve that property and adjacent properties. The developer could seek reimbursement at a later date as adjacent properties develop.

Policy 2: Water Treatment Plant - As water use in Suisun City approaches the design capacity of the Cement Hill water treatment plant, the City should consider increasing water treatment capacity at the plant to service a target population of approximately 32,000 and a worker population of approximately 4,700.

Policy 3: Water Conservation- Water conservation should continue through regulations which require the installation of practical water conservation devices with homes, businesses and industries, and public facilities.

Policy 4: Wastewater Treatment – Suisun will require that all development connect to the regional water system. Standards for trunk lines and connections to individual properties will be governed by the Suisun City Subdivision Ordinance.

Policy 5: Drainage - The City will require that new developments contain drainage features and facilities which channel run-off away from adjacent properties, control erosion, and assure that water quality will not be adversely affected. The City will encourage development designs which incorporate natural features into the drainage system provided water quality and erosion concerns are addressed. Drainage standards will be governed by the Development Guidelines and Subdivision Ordinance.

Objective 4: To ensure that school capacity is adequate to serve children expected to reside in new residential developments between 1992 and 2010.

Emergency Services

Goal: To maintain an acceptable level of emergency services for public safety.

Objective 1: To maintain acceptable ISO fire ratings, water pressure, and emergency response times for police and fire services.

Policy 11: Emergency Services Standards – The City will acquire and maintain sufficient equipment and high sufficient personnel to achieve an ISO rating of 4 or better, with a three minute response time for fire emergencies. Water delivery capacity, buildings, and equipment standards

for fire and police emergency services shall be established by the Capital Improvements Program.

Park Facilities

Goal: To meet the recreational, leisure time, and cultural arts needs of all age groups and segments of the population, concentrating on those activities, facilities, or experiences for which people are largely unable to be provided through private resources.

Objective 1: To provide sufficient park facilities to accommodate a wide range of active and passive recreation activities according to the standards of the Capital Improvement Program.

Policy 15: Park and Recreation Space Standards for Suisun City – The City shall require new developments to provide or fund, through payment of development fees or other financial mechanisms acceptable to the City, park facilities that meet the following standards:

Neighborhood Parks:	3.0 acres/1000 population
Community-wide Parks:	1.5 acres/1000 population

Policy 17: Park and recreation requirements for new residential developments – Each large new residential development should provide recreation opportunities within walking distance of local residents and also contribute to recreation facilities and programs that meet the needs of the entire City. Recreation facilities that serve residents within the immediate vicinity of their homes and should be included within each development include:

- Informal open spaces (no play equipment) that are within two or three blocks of the residents they are intended to serve;
- Children's play equipment and space for adult passive recreation within a five-minute (1/4 mile) walk of most residents;
- Neighborhood parks within ½ mile of most users; and
- Community-wide facilities, if the Community Facilities Map indicates such a facility located within the development.

Policy 18: Localized (neighborhood or smaller) recreation facilities benefit the residents of the development only and should be set aside for acquisition through development fees or be required through dedication as part of the subdivision approval process. The City may require a landscaped informal open space of between 10,000 and 12,000 square feet for each 50 to 75 dwelling units and/or a pocket park of one-half to one

acre for each 150 to 250 dwelling units (depending on the density and housing type) in new development that are not within ½ mile of existing parks.

Policy 19: In addition to localized and neighborhood facilities, all new development should contribute to community-wide facilities. The amount of land required to be set aside for parks, and the number and types of recreational facilities needs, are to be based on the standards in Policy 14 and the Capital Improvement Program.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

An impact to the public services and utilities of the proposed project area would be considered significant if the proposed project would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:
  - Fire Protection,
  - Police Protection,
  - Schools,
  - Parks, or
  - Other public facilities.
- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Have insufficient water supplies available to serve the project from existing or permitted entitlements and resources, or require new or expanded entitlements;
- Result in a determination by the wastewater treatment provider that serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs;

- Fail to comply with federal, state, and local statutes and regulations related to solid waste;
- Increase demand on existing water supply and distribution facilities, such that the facilities cannot meet the demand;
- Adversely impact the wastewater delivery system and increase the wastewater capacity beyond the ability of the wastewater treatment plant;
- Increase the demand for additional law enforcement or fire protection services beyond the ability of the existing departments to provide adequate service;
- Increase the demand for recreational uses beyond the existing or proposed parks and recreational facilities; and
- Exceed the available provisions of local solid waste disposal/recycling agencies.

Method of Analysis

The following section evaluates the impacts of the proposed project on the existing public services that would occur if the project as currently proposed went into effect. Impact significance is determined by comparing project conditions to the existing conditions. The responsible agencies for each service have been contacted regarding the potential impacts on their facilities.

Project-Specific Impacts and Mitigation Measures

4.8-1 Impact to existing water supply and distribution facilities

Base Project, Alternative 1, and Alternative 2

Water Supply

Water Code § 10910 (c)(3) requires an analysis of the projected water demand for the Gentry-Suisun project. In 1996 an *Updated Master Plan for the Water Supply and Delivery System* of SSWA was prepared. In this report a water demand analysis model for the ultimate buildout of the service area was developed using projected Suisun City General Plan population data. For the Water Supply Assessment (WSA) prepared for the project, a review of the residential and commercial development projects completed over the past seven years has been made and the 1996 demand analysis has been modified to estimate current water use within SSWA as of 2003 (See Table 3 of Appendix H to this Draft EIR). The model provides a reasonably accurate estimate of the annual water usage. In 2003 the water delivered by SSWA was 4,778 acre-feet, and converting the estimated annual average flow of 2,823 gpm to acre-feet, estimates a usage of 4,553 acre-feet. A further review of undeveloped sites within the service area was made with Suisun City staff, and using the demand analysis model, an ultimate buildout water demand for SSWA is estimated (See Table 4 of Appendix H to this Draft EIR). The additional water demand anticipated from the proposed project (including the potential development of 26,000 square feet of industrial,

commercial, and office uses on the Gilbert and Ardave parcels) is included in this estimate.

The population growth within Suisun City has been approximately 19 percent over the last fifteen years. Although according to the WSA the population of the City (as of 2004) should be close to 28,500, population estimates from the Association of Bay Area Governments indicate the current population is approaching 27,000, and current Suisun City estimates indicate commercial development is at approximately 102 acres. Table 4.8-1~~0~~ summarizes the population growth since the 1990 census and the projected growth through buildout in 2020. The estimated ultimate population for Suisun City was projected at approximately 33,000 in the 1996 *SSWA Updated Master Plan for the Water Supply and Delivery System*. Significant reductions occurred in the 1996 development estimates, but the additional residential development proposed for the Gentry-Suisun project would not be expected to exceed the estimated 33,000.

Table 4.8-1~~0~~4
Suisun City Population Growth
Existing and Projected

Year	Population	Estimated Households
1990 Census	22,686[1]	6,645[1]
2000 Census	26,118[2]	7,987[2]
2002	26,635[2]	8,296[2]
2003	26,869[2]	8,212[2]
2005 est.	29,600[3]	9,080[6]
2010 est.	31,900[3]	9,785[6]
2015 est.	32,500[4]	9,969[6]
2020 est.	33,000[5]	10,123[6]

Notes:
1. 1990 Census, Suisun City Demographics
2. Data from California Department of Finance, Demographic Research Unit
3. Data from Association Bay Area of Government Projects
4. Estimated
5. Estimated Builout
6. Calculated from persons per household rate (2003) of 3.26

Source: Water Supply Assessment, 2004.

Based upon the assumption that the proposed Gentry-Suisun project would be complete within five years and the ultimate buildout of the remaining residential and commercial areas within Suisun City are completed by 2020, the estimated water supplies SSWA will need to meet the projected water demand through buildout in the SSWA service area are listed in Table 4.8-15~~1~~. The water supplies would come from the existing water allocations of Suisun City and Solano Irrigation District, as described in the SSWA Implementation Agreement.

Table 4.8-1~~1~~5 Suisun-Solano Water Authority Required Water Supply	
Year	**Required Water Supply (Acre Feet)**
2003	4,778[1]
2005	5,500[2]
2010	6,100[2]
2015	6,300[2]
2020	6,500[2~~3~~]

[1] Actual Water Delivered
[2] Estimated
[~~3~~]Original estimate in the Gentry Gateway Water Supply Assessment. This estimate has been revised to 6,000 Acre Feet as discussed in the first paragraph on page 4.8-5 above.
Source: Water Supply Assessment, 2004.

All present and future deliveries would be provided from the City of Suisun and Solano Irrigation District Solano Project water supplies or the City of Suisun State Water Project North Bay Aqueduct supplies. As indicated in Table 4.8-1~~5~~1, the ultimate buildout water demand is estimated to be approximately 6,500 acre-feet per year. According to the WSA, Suisun City and Solano Irrigation District's Solano Project entitlements, together with the Suisun City's additional State Water Project water rights, would provide SSWA the ability to meet their estimated water demand for the proposed project and for the ultimate build out of SSWA, even if a single or a series of four dry years occur. In addition, the applicant would be required to pay development impact fees to the City in accordance with AB 1600, as stated in the Suisun City CAP.

Although, as discussed earlier, expanded water treatment plant capacity may be needed to serve the Gentry-Suisun project and other anticipated development within the SSWA's service area, the water supply for the project is nevertheless considered certain or likely to come to fruition because of the firmness of SSWA's legal entitlements to water from the above-described sources. No regulatory approvals are necessary to divert the water needed to serve the project site and other lands within the SSWA service area. Rather, the main challenge facing SSWA is the accumulation of the funds needed to expand existing treatment capacity. Such funds should be obtainable through fees collected at the time of project approval or otherwise. Importantly, as discussed in more detail below, water service for the project would not lead to diversions from the Solano Project system, and in particular Putah Creek, in excess of the amounts permitted under the Putah Creek Accord, and would be consistent with the Lower Putah Creek Watershed Action Management Plan.

Water Delivery Infrastructure

On-site Water Network
The project includes the construction of the necessary water delivery infrastructure. On-site piping for water would consist of several loops of 8 and 12-

inch piping totaling approximately 14,000 feet (Planning Areas 1-3). Domestic water lines would be 8-inch lines, totaling approximately 6,000 feet within Planning Areas 1-3.

Off-site Water Network
Two alternative schemes for supplying the project from off-site facilities are being considered. These include a single supply pipe, 16-inches in diameter, constructed under Pennsylvania Avenue and terminating at the site connection approximately 100 feet south of Cordelia Road. Alternatively, a 12-inch pipe could be constructed under Pennsylvania Avenue connecting to the existing 20-inch Suisun-Solano Water Authority (SSWA) pipe and a 12-inch pipe constructed under Cordelia Road connecting to a 6-inch SSWA pipe west of the Union Pacific Railroad crossing of Cordelia Road.

Because adequate water supply exists to serve the proposed project and the applicant would construct the necessary water delivery infrastructure needed to serve the proposed project, a ***less-than-significant*** impact would result.

Mitigation Measure(s)
None Required.

4.8-2 Impacts to Existing Water Treatment Plant Capacity.

As demonstrated above, the current capacity of the Cement Hill Water Treatment Plant is not adequate to provide for the projected 6,000 acre feet per year demand needed to serve ultimate buildout of the SSWA service area, including the Gentry-Suisun project.

SID staff has indicated that the remaining excess capacity of the Cement Hill Water Treatment Plant (CHWTP) may be able to serve up to approximately 30 percent of the Gentry-Suisun project ultimate water demand.[8] The total water demand for the Modified Alternative 1 at peak hour is approximately 525-gpm, including both the residential and commercial development elements of the proposed project. Per Appendix A of the 2007 SSWA "*Water Supply Options to Meet Future Demands*" report, the peak hour commercial water demand for the proposed project is 312-gpm, while the residential need is 213-gpm. Thirty percent of the total water demand represents approximately 158-gpm peak hour capacity, which is equivalent to approximately 50 percent of the total commercial demand or equivalent proportion of a combination of some commercial and residential development. With some excess capacity available from the existing water treatment facilities of SSWA, a portion of the proposed project can obtain occupancy until one of the treatment options discussed above is implemented and additional treatment capacity is achieved, at which time SSWA would have enough treatment capacity to service the entire project. It should be noted that SID indicated that it has sufficient fire flow capacity in its existing system to service the entire project[9]; therefore, construction of facilities, except the installation of

landscaping, would not be dependent on the proposed SSWA treatment facility upgrades.

Pertinent to this water treatment capacity discussion is the consideration of SID implementing a Water Conservation Program Best Management Practice (BMP). Water Conservation Programs, such as the program implemented in the City of Fresno, CA, where even- and odd-numbered homes are required to water on alternate days, can achieve an approximate 15 percent savings.[10] A 15 percent savings of the total demand experienced by the SSWA CHWTP (8.5 MGD) would result in a savings of 1.2 MGD, which would be adequate to serve the proposed project. The SSWA Board will be considering the adoption of such a program in the coming months.[11]

Future Water Treatment Capacity Improvements

As a result of the limited capacity at the CHWTP, future improvements to the SSWA system would be needed to provide the capacity for buildout of the SSWA service area. Implementation of the preferred option, construction of a new Gregory Hill Water Treatment Plant, would require certain off-site improvements. Figure 4.8-1 shows an existing 12-inch pipeline running southerly from the Putah South Canal to the treatment plant site. The pipe alignment is between existing homes and the pipeline is not readily accessible for operation and maintenance purposes. The construction of a new treatment plant would include the installation of a new raw water pipeline running from the Putah South Canal down Capitola Way and then running westerly along Waterman Boulevard to the treatment plant site. A new 2,250 gpm treatment plant would require a 16-inch raw water pipeline. Although, this pipeline would be located entirely within existing right-of-way, short-term construction noise levels may adversely impact the residential areas adjacent to Capitola Way and Waterman Boulevard. In addition, traffic circulation along Waterman Boulevard and Capitola could be temporarily interrupted during installation of the pipeline within the roadway. Short-term air quality impacts associated with earth-moving and construction equipment could contribute to local and regional air quality pollution levels. Short-term noise impacts associated with construction of a new water treatment plant on Gregory Hill could also impact the sensitive residential receptors to the west, south, and east. Additionally, the portion of Gregory Hill identified for the new plant is a southern-facing grassy slope, which terminates at Waterman Boulevard. Construction of the new water treatment plant on this undeveloped slope could result in impacts to unidentified cultural resources and/or protected species. Biological impacts could also occur as a result of construction of the connection point of the proposed 16-inch water pipeline with Putah South Canal.

As a result of the above-described potential impacts, the following mitigation measures are recommended to ensure that impacts associated with the proposed Gregory Hill Water Treatment Plant improvements would be less-than-significant (it should be noted that these measures are not a requirement of this project, but

are recommended for incorporation into future environmental review documents for water treatment plant improvements):

1. Prior to issuance of grading permits, the contractor shall submit plans for review and approval that indicate (via notation on the improvement plans) that if any archaeological resources are encountered during site grading or other site work, all such work shall be halted immediately within the area of discovery and the contractor shall immediately notify the Public Works Department of the discovery. In such case, the applicant shall be required to retain the services of a qualified archaeologist for the purposes of (i) determining whether the find includes any unique archaeological resources or historical resources and (ii) formulating recommendations to the Public Works Director regarding possible strategies for recording, protecting, or curating the discovery as appropriate.

2. Prior to commencement of construction activities, a preconstruction survey shall be conducted by a qualified biologist to determine the presence/absence of special-status species and their habitats. If no special-status species or their habitats are detected, further mitigation is not required. If special-status species or their habitats are detected, the appropriate avoidance measures shall be implemented, as determined by the qualified biologist in consultation with the lead agency.

3. Prior to any construction taking place, the project applicant shall prepare a Construction Traffic Management Plan. The plan should include all plans for temporary traffic control, temporary signage and striping, location points for ingress and egress of construction vehicles, staging areas, and timing of construction activity which appropriately limits hours during which large construction equipment may be brought on or off the site.

4. Construction hours associated with all project improvements shall comply with local noise ordinance requirements.

5. Consistent with guidance from the BAAQMD, the following measures shall be required of construction contracts and specifications for future water treatment plant improvements:

    - Water all active construction areas at least twice daily and more often during windy periods; active areas adjacent to existing land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers or dust palliatives;
    - Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard;
    - Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites;

- Sweep daily (preferably with water sweepers) all paved access roads, parking areas, and staging areas at construction sites; water sweepers shall vacuum up excess water to avoid runoff-related impacts to water quality;
- Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets;
- Apply non-toxic soil stabilizers to inactive construction areas;
- Enclose, cover, water twice daily, or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.);
- Limit traffic speeds on unpaved roads to 15 mph;
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways;
- Replant vegetation in disturbed areas as quickly as possible.

However, it is anticipated that a detailed project-level environmental review will be performed by the lead agency at such time design-level plans are submitted for these improvements. This analysis will evaluate potential impacts associated with installation of the new pipeline as well as construction of the new WTP, and identify mitigation measures aimed at reducing potential impacts to less-than-significant levels.

Conclusion

Because the above-described Water Conservation Program may not be implemented, and because adequate water treatment capacity does not currently exist to serve the entire Gentry-Suisun project as well as other anticipated development within the SSWA services area, a ***potentially significant*** impact would occur.

Mitigation Measure(s)
Implementation of the following mitigation measure would reduce this impact to a *less-than-significant* level.

4.8-2 Prior to recordation of any final map, or prior to City approval of any similar project-specific discretionary approval or entitlement required for nonresidential uses, the applicant shall demonstrate the availability of a long-term, reliable water treatment capacity from SSWA for the amount of development (including landscaped areas) that would be authorized by the final map or project-specific discretionary nonresidential approval or entitlement. Such a demonstration shall consist of a written certification from the water service provider that either existing treatment capacity is available or that needed improvements will be in place prior to occupancy.

4.8-3 The current limited available water treatment capacity could yield less treated water than the projected demand needed for total buildout of the Gentry-Suisun project, resulting in a temporary curtailment in development in Suisun City until such time as adequate capacity is in place.

On February 1, 2007, the California Supreme Court issued its decision in the matter of *Vineyard Area Citizens For Responsible Growth v. City of Rancho Cordova* (42 Cal.4th 412), reversing the lower court's ruling in favor of the respondents. Germane to this impact discussion is the principle enunciated by the decision dealing with the curtailment of development. The Court held that where an EIR makes a sincere and reasoned attempt to analyze the water sources the project is likely to use, but acknowledges the remaining uncertainty (in this case the full provision of water to meet the total water demand of the Gentry-Suisun project), a measure for curtailing development may play a role in impact analysis. However, an alternative or mitigation measure to curtail development may not be substituted for the required analysis. Further, the environmental effects of curtailing development, which may result in a partially built-out project, must also be analyzed.

In the long-term, the full buildout of the Gentry-Suisun project would necessitate the construction of additional water treatment facilities, as discussed above. If additional water treatment capacity from either of the four above-discussed options does not materialize because the proposed facilities are not constructed within a foreseeable time frame, or the amount of water available, due to unforeseen contingencies, is inadequate to meet all of SSWA's service commitments, a temporary, and possibly a permanent, curtailment of development within the Gentry-Suisun project area could occur. Although, for reasons discussed earlier, a permanent curtailment appears to be very unlikely, it is possible that such a curtailment could result from climatic or other environmental conditions that are unforeseen and cannot be predicted or from unexpected regulatory or legal developments. For this project analysis, the potential impacts of a permanent curtailment could result from implementation of Mitigation Measure 4.8-2 and is discussed below.

Analysis of the Effects of Mitigation Measure 4.8-2

To address a potential shortfall in the initial water treatment capacity, this Second Partially Recirculated Draft EIR proposes Mitigation Measure 4.8.2, which would temporarily curtail development until the long-term treatment capacity becomes available. In the *Vineyard* decision, the California Supreme Court found that the environmental effects of curtailing development, which may result in a partially built-out project, must also be analyzed. Although the Court does not reference CEQA Guidelines Section 15126.4, subdivision (a)(1)(D), because Measure 4.8.2 is governed by that provision, the required analysis should be undertaken consistent with its dictates (i.e., "If a mitigation measure would cause one or more significant effects in addition to those that would be caused by the project as

proposed, the effects of the mitigation measure shall be discussed but in less detail than the significant effects of the project as proposed").

It is important to note that any effects of the curtailment are likely to be temporary and would be rectified upon receipt of the long-term or buildout water treatment capacity, which is probable, if not absolutely certain, for reasons discussed above.

Because Mitigation Measures 4.8-2 could be used to temporarily curtail development during the period of time that the project would be dependent on the initial limited water treatment capacity, the following analysis is provided of the potential effects of a curtailment.

Land Use and Agriculture

Land use as approved by the City for the Gentry-Suisun project would not be altered by the temporary curtailment of development. Buildout would be potentially slowed, but the ultimate buildout pattern would, in all likelihood, eventually be achieved. The potential for internal conflicts between pre-development land uses and those built for the proposed project could occur, due to the greater period of time required for buildout. In other words, pre-development land uses such as cattle grazing could remain in place for longer periods of time, causing temporary conflicts with land uses developed for the proposed project. It should also be noted that any identified conflicts with planning policies, as discussed in Section 4.1 of the Draft EIR, would not generally be altered by the curtailment.

Aesthetics

If development were to be temporarily curtailed, some of the effects related to visual character, light, and glare would be delayed and areas of existing open space would remain for a greater period of time. Additionally, curtailment of development would not substantially alter the impacts from light and glare occurring under full buildout. However, should the commercial portion of the proposed project be built prior to the residential areas, resulting in the curtailment of the residential portions of the project, light and glare impacts resulting from commercial light sources would be postponed until such time the curtailment is eliminated and residential development occurs.

Air Quality

Emissions are tied to the amount of development occurring and trips generated during and following construction. Therefore, temporary curtailment would also curtail related emissions temporarily. Although the sequence of development for the proposed project has not been set forth determinedly, should the residential areas on the project site be developed prior to the commercial areas, the reduction in emissions could be offset by longer trips. The possibility exists that

curtailment would cause Gentry-Suisun residents to have to leave the project area in their pollutant-emitting vehicles for jobs and retail opportunities that would otherwise be available on-site under a scenario without curtailment. Any air pollution increases from such external effects, however, are not expected to substantially increase the already significant air emissions from the Project.

Noise

Noise affecting the Gentry-Suisun project area and surrounding uses is primarily generated by construction activities and vehicle traffic. Temporary curtailment would reduce noise generated by construction and traffic. Adverse effects from curtailment have not been identified.

Transportation and Circulation

The mitigation measures and conditions of approval for the project will require key backbone infrastructure to be substantially complete prior to issuance of building permits. The key backbone infrastructure will include primary roadways. Therefore, a temporary curtailment would have no effect on the timing or construction of these improvements. More specific roadway improvements that would be merely intended to provide access/internal circulation to specific buildings would not be needed until those buildings are issued permits for construction.

However, a number of off-site roadway improvements for which the project proponents would pay a fee are tied to completion of certain portions of the project (e.g., MM 4.5-12 states "Prior to the completion of all commercial buildings within Planning Area 1"). If the project were temporarily curtailed, and all commercial buildings could not be constructed at the same time, those fees for certain off-site improvements would not be paid until the water treatment capacity became available for all commercial buildings. By the same measure, the project also would not generate traffic warranting the payment of the fee and, presumably, the improvement. It is recognized that a perfect match will not always exist between fees collected and the timing of roadway improvements, and that market conditions often similarly curtail projects and the payment of fees that might otherwise be expected. Thus, in some instances there may be insufficient fees (from Gentry-Suisun and other projects competing for limited water treatment capacity) to pay for needed improvements; in other instances, there may not be sufficient need for improvements for which some fees have been collected but not spent.

Although the traffic projections assume that there would be trips attracted internally by employment and retail centers that would otherwise leave the project area, thus increasing external congestion, such internal trip attractants would only be a concern if the commercial portion of the proposed project was not initially built. If the commercial buildings for the project are constructed later in the

development sequence of project buildout, external congestion could temporarily increase until such time that the commercial buildings are built and begin attracting internal trips. In other words, it is possible that curtailment would cause Gentry-Suisun residents to have to leave the project area in their vehicles for jobs and retail opportunities that would be available on-site under a scenario without curtailment. Any such external effects, however, are not expected to be incrementally considerable or significant in and of themselves, given the reduction in overall trips that would occur due to curtailment. Thus, a temporary curtailment is unlikely to significantly increase traffic congestion based on the number of dwelling units in the project.

Biological Resources

Temporary curtailment would delay some direct effects on biological resources. In addition, because the provision of compensatory habitat is required prior to issuance of grading permits, even if only a portion of the project could initially be built, all mitigation requirements would need to be met prior to issuance of grading permits for that limited portion of the project.

Hydrology and Water Quality

If development were curtailed, some immediate effects of development on water quality could be delayed. Due to the fact that any level of development on-site would require the construction of a stormwater system, curtailment would have no impact on capacity of stormwater systems to serve the project. Nor would curtailment have an adverse effect regarding water quality, considering that water quality BMP's would need to be in place prior to construction of any buildings/pavement surfaces.

Public Services and Utilities

Wastewater: Backbone infrastructure for wastewater collection and disposal is required to be constructed upon project initiation. In-tract improvements would be required prior to the issuance of any affected building permits. Temporary curtailment would have no effect on the adequacy or provision of sewer service to completed construction or homes for which building permits have been issued.

Fire: As stated above, SID has indicated that it has sufficient fire flow capacity in its existing system to service the entire project; therefore, construction of facilities, except the installation of landscaping, would not be dependent on the proposed SSWA treatment facility upgrades.

Police: As stated on page 4.8-26 of the Draft EIR, the City will require the applicant to contribute to Public Facilities Fees upon the approval of the final maps. A portion of these fees would contribute to public safety, and would further help fund any necessary increases in staff and equipment for the Suisun Police

Department. Therefore, curtailment of development would not adversely affect police services as fees towards these services would be paid prior to the approval of each final map.

Solid Waste Disposal: Temporary curtailment would have no effect on solid waste disposal. Use of disposal facilities would be reduced during the temporary curtailment, but would resume upon development of the long-term water treatment capacity.

Parks and Recreation: Parks and recreation facility development is required prior to approval of the final map(s). Therefore, in the event that only a portion of the proposed project can be built, park requirements would have to be appropriately satisfied prior to approval of the final map for that phase of the project, thereby remaining unaffected by any curtailment.

Library Services: As stated on page 4.8-29 of the Draft EIR, the City will require the applicant to contribute to Public Facilities Fees upon the approval of the final maps. A portion of these fees would contribute to library services, and would further help fund any necessary increases in staff and equipment. Therefore, curtailment of development would not adversely affect library services as fees towards these services would be paid prior to the approval of each final map.

Schools: As stated on page 4.8-30 of the Draft EIR, the City will require the applicant to pay fees to the Fairfield-Suisun Unified School District prior to the approval of the final map(s). Therefore, curtailment of development would not adversely affect schools. In any event, State law provides that the payment of school impact fees by new development is sufficient, as a matter of law, to mitigate all impacts related to school facilities to a less than significant level (Gov. Code § 65996).

Energy

Curtailment of development would not adversely affect energy facilities and/or resources due to the consideration that prior to issuance of any building permits each building would be required to comply with Title 24 standards.

Socio-Economic

Page 4.10-53 of the Draft EIR states "In conclusion, while it is expected that the Gentry-Suisun Project and Gilbert Parcel will result in some diverted sales and that some closures of primary market area stores may occur, these events are not expected to lead to physical deterioration so prevalent and substantial that it impairs the proper utilization of affected real estate or the health, safety, and welfare of the surrounding community. Therefore, Sedway Group concludes that although development of the Gentry-Suisun Project and the Gilbert Parcel may contribute to further retail vacancies in the primary market area, those vacancies

are unlikely to result in urban decay, and a ***less-than-significant*** impact would occur." To the extent that curtailment could tend to delay the creation of new commercial or retail square footage on the project site, these delays would tend to minimize the already less-than-significant urban decay impacts of the project. Stated another way, should curtailment of development occur for the project due to limited water treatment capacity, fewer retail vacancies would be expected to occur in the primary market area.

Hazards

A temporary curtailment would have little environmental effect. Hazards abatement typically occurs as property is developed consistent with the various mitigation measures contained in the (First) Partially Re-Circulated Draft EIR Section 4.11. Any curtailment would simply lengthen the time in which full abatement would occur. There is a potential for dwellings to be constructed adjacent to properties on which abatement has not been completed due to curtailment, thus increasing the potential for exposure of residents to unhealthy conditions; however, this same potential would exist under a market-driven buildout and any potential concerns would be monitored by the County's Environmental Health Division under either circumstance.

Cultural Resources

Temporary curtailment would delay some effects on cultural resources and would have no potential to increase impacts. Mitigation Measures contained in the (First) Partially Recirculated Draft EIR (Section 4.12) are operative when specific ground-disturbing activities occur and would remain effective under a temporary curtailment scenario.

Conclusion

The above analysis demonstrates that the potential effects resulting from the curtailment of development of the proposed project would be ***less-than-significant***.

4.8-4 Effects of increased water demand on aquatic resources.

As demonstrated above, SSWA's current Solano Project and State Water Project water rights provide adequate water supply for buildout of the SSWA service area, which includes the Gentry-Suisun project. Furthermore, according to Roger Reynolds of Summers Engineering, the maximum allowable direct diversion from Putah Creek (per the Accord) includes SSWA's Solano Project water right entitlements.[12] Therefore, the municipal water which will be delivered for the Gentry-Suisun project would not result in the diversion of water from Putah Creek, above the level currently allowed by the Accord. It should be noted that although SSWA has rights to State Water Project North Bay Aqueduct supplies,

water is not currently diverted from this source. As a result, the proposed project would not result in any impacts to potential resources within this water canal.

In addition, due to the fact that the maximum allowable water that can be diverted from Putah Creek is regulated on a daily basis to maintain minimum instream flows for the protection of aquatic and related resources, the Gentry-Suisun project would not adversely impact natural resources within Lower Putah Creek.

As stated above, minimum flows and maximum withdrawals have been established to protect aquatic resources in Putah Creek. Compliance with the Putah Creek Accord ensures that the proposed project would not adversely effect aquatic resources in Putah Creek. Therefore, increased water demand associated with the proposed project would have a ***less-than-significant*** impact on aquatic resources.

Mitigation Measure(s)
None Required.

4.8-~~2~~5 Increased demand for wastewater and sewer infrastructure.

Base Project, Alternative 1, and Alternative 2

Wastewater Treatment

The project engineer provided the expected sewer demand associated with the Base Project, Alternative 1, and Alternative 2. These calculated demands are included below in Table 4.8-16~~2~~. The below sewage flow analysis is based upon the Fairfield-Suisun Sewer Districts' March 2004 Pump Station and Collection System Design Standards.

Although the Gentry-Suisun project was not anticipated for development in the Suisun City General Plan, Marcie Bodeaux, P.E., from the Fairfield-Suisun Sewer District, studied potential impacts of this project on sewer collection and concluded it would have "minimal hydraulic impacts to the system and would not require the developer to pay for any improvements to the existing collection system."[13] Furthermore, the project applicant would be required to pay the applicable connection fees to the Fairfield-Suisun Sewer District and development impact fees to the City in accordance with AB 1600.

Table 4.8-1~~2~~6 Project Sewer Demands			
Gentry-Suisun Project	**Base Project**	**Project Alt. 1**	**Project Alt. 2**
SEWAGE PRODUCTION			
Dry Weather flows			
Average Day rate (gpd) =	185,636	158,648	163,068
Max Day rate (gpd) =	255,178	207,924	209,484
Peak Hour rate (gpd) =	298,271	260,714	274,520
Peak Hour rate (gpm) =	207	181	191
Infiltration Flows			
Average Day rate (gpd) =	9,400	9,400	9,400
Max Day rate (gpd) =	9,400	9,400	9,400
Peak Hour rate (gpm) =	7	7	7
20 yr Storm Related Inflow (Central)			
Max Day rate (gpd) =	197,400	197,400	197,400
Peak Hour rate (gpm) =	137	137	137
Total Dry+Infiltration+Storm Flows			
Max Day rate (gpd) =	461,978	414,724	416,284
Peak Hour rate (gpd) =	505,071	467,514	481,320
Peak Hour rate (gpm) =	**351**	**325**	**334**
Source: Creegan and DeAngelo, 2005.			

Wastewater Delivery Infrastructure

On-site Sewer Network

A sewer network has been designed for Planning Areas 1, 2, and 3 of the proposed Gentry-Suisun project based upon anticipated flows (See Table 4.8-1~~6~~2). As part of the proposed project, an estimated 6,000 feet of on-site piping would be required. The network would cross from Planning Areas 1 and 2 to Planning Area 3 via a bore under the Union Pacific Railroad. A pump station is proposed at the southeast corner of Planning Area 3 near Cordelia Road.

Off-site Sewer Network

Effluent water from the project site would be pumped off-site to the southwest parallel to Cordelia Road, to a 27-inch sewer at Beck Avenue via a bore under Ledgewood Creek. The required pipe diameter from pump to the Beck Avenue sewer is estimated at six inches (6-inch). Beyond the connection at Beck Avenue, an existing 33-inch pipe on Cordelia Road is deemed to have adequate capacity.

Conclusion

Based upon information provided by the Fairfield-Suisun Sewer District, the requirement for the project applicant to pay connection fees to the District, and

the construction of needed wastewater delivery infrastructure by the project applicant, the proposed project would have a ***less-than-significant*** impact.

Mitigation Measure(s)
None Required.

4.8-~~3~~6 Adequate ratio of fire department personnel to residents.

Base Project

The proposed project is located within the jurisdiction of and is currently provided services by the Suisun City Fire Department. Applying the California Department of Finance 2005 standard of 3.2 average persons per household, the Base Project would add approximately 1,148 residents (359 du x 3.2). Policy 11 of the Suisun City General Plan states that "the City will acquire and maintain sufficient equipment and high sufficient personnel to achieve an ISO rating of 4 or better, with a three-minute response time for fire emergencies." In order to maintain the Department's goal of a three-minute response time, additional fire protection services would be required as a result of the introduction of approximately 1,148 new residents to the City. As mentioned above, the Fire Chief has indicated that response times to the Gentry project site would be six minutes or greater due to the fact that the project site is located west of the City and the existing station is located in the center of the city at Pintail Drive and East Widgeon Way. In addition, the Chief has indicated that a new fire station is needed to adequately serve the project, but that the project site would not be a desirable location for the new station; the preferred location for a new fire station would be at SR 12 and Marina Boulevard. Should a new fire station be constructed, the Fire Chief has indicated that three additional paid staff would be needed to operate the station. Additional Volenteer Firefighters will also be needed to staff the station. The minimum requirement will be to have seven on duty per shift in the City (two engine crews of three and one chief officer). Because the Base Project would contribute to the need for a new station and result in the need for additional personnel, the project would have a ***potentially significant*** impact.

Alternative 1

Applying the California Department of Finance 2005 standard of 3.2 average persons per household, Alternative 1 would add approximately 1,280 residents (400 du x 3.2). Similar to the Base Project, because Alternative 1 would contribute to the need for a new station and result in the need for additional personnel, the Alternative would have a ***potentially significant*** impact.

Alternative 2

Applying the California Department of Finance 2005 standard of 3.2 average persons per household, Alternative 2 would add approximately 1,696 residents (530 du x 3.2). Similar to the Base Project, because Alternative 2 would

contribute to the need for a new station and result in the need for additional personnel, the Alternative would have a ***potentially significant*** impact.

Mitigation Measure(s)
Implementation of the following mitigation measure, which requires the developer to make a fair share contribution, would reduce this impact, but not to a less-than-significant level. Therefore, the impact would remain *significant and unavoidable*.

4.8-~~3~~6 Prior to the issuance of any building permits, the project applicant shall pay impact fees towards the construction of a new fire station as well as hiring additional personnel and acquiring needed equipment. The fee amount for the above shall be determined by the Suisun Fire Department and the City Manager.

However, it should be noted that this project will generate sales tax from the City, which is discretionary funding. This funding source could be used to meet fire protection needs and reduce this impact to less-than-significant.

4.8-47 Adequate ratio of law enforcement personnel to residents.

Base Project

The Base Project involves the construction of commercial and residential development which is proposed for annexation into the City of Suisun City. Currently the City's service ratio standard is 1 officer per 1,000 population. At this time 22 sworn officers currently serve the City of Suisun City. The Base Project would introduce an additional 1,148 residents into the City limits. Utilizing the City's service ratio standard of 1 officer per 1,000 residents, the Base Project would require an additional 1.1 officers. Because the project site was not identified for residential development in the General Plan, the direct increase in population associated with the Base Project would result in previously unanticipated demands for police services.

Alternative 1

Alternative 1 would introduce an additional 1,280 residents into the City limits. Utilizing the City's service ratio standard of 1 officer per 1,000 residents, Alternative 1 would require an additional 1.3 officers. Because the project site was not identified for residential development in the General Plan, the increased population associated with Alternative 1 would result in previously unanticipated demands for police services.

Alternative 2

Alternative 2 would introduce an additional 1,696 residents into the City limits. Utilizing the City's service ratio standard of 1 officer per 1,000 residents,

Alternative 2 would require an additional 1.3 officers. Because the project site was not identified for residential development in the General Plan, the increased population associated with Alternative 2 would result in previously unanticipated demands for police services.

However, the buildout of the proposed project would also result in a marked increase in city revenue through taxes and increased economic activity. The increased revenue would contribute to the City's General Fund and, in turn, provide additional funding for the Suisun Police Department. Additionally, the proposed project would be required by the City to contribute to Public Facilities Fees upon the approval of the final maps. A portion of the Public Facilities Fees contribute to public safety, and would further help fund any necessary increases in staff and equipment for the Suisun Police Department. Therefore, because the proposed project would result in an overall increase in revenue for the City, and because the project would contribute to the Public Facilities Fee program, the impact would be expected to be ***less-than-significant***.

Mitigation Measure(s)
None Required.

4.8-~~5~~8 Increased demand for solid waste disposal services.

Base Project, Alternative 1, and Alternative 2

Solid waste services are provided to the City of Suisun City by the Solano Garbage Company. All non-recyclable waste collected from the City is disposed of at the Potrero Hills Landfill (PHL) which is owned and operated by Republic Services, Inc. Currently capacity at PHL is expected to be reached in 2010. However, the owner's plans to expand the landfill would increase capacity by 61.6 million cubic yards. The ultimate Phase I plus Phase II fill capacity is about 83 million cubic yards (See above discussion for more detail). These improvements would add 35 years of disposal life to the site. Once the landfill expansion is approved and construction is completed, the landfill would have the capacity to meet solid waste needs at buildout of the City of Suisun City General Plan. In addition, Suisun City has the option of contracting to use other landfills in Northern California, which have excess capacity. As discussed in the Suisun City CAP, user fees provide all funding for solid waste disposal.

The proposed project includes the development of a Mixed-Use site and also involves the annexation of several parcels into the City of Suisun City. The project would introduce approximately 1,148 (Base Project), 1,280 (Alternative 1), or 1,696 (Alternative 2) residents to the City of Suisun City. Although the General Plan did not anticipate that buildout of the project site would result in a direct population increase from residential uses, the project site was planned for General Commercial and Light Industrial uses in the GP, which would still generate waste. Furthermore, commercial tenants and residential customers would

be required to pay user fees. As a result, the Base Project, Alternative 1, and Alternative 2 would be expected to have ***less-than-significant*** impacts to solid waste disposal.

Mitigation Measure(s)
None Required.

4.8-6~~9~~ Increased demand for park and recreation services and facilities.

Base Project

The City's standard for the provision of parkland acreage for new developments requires the provision of 3 acres per 1,000 people for neighborhood parks and 1.5 acres per 1,000 people for community-wide parks. Therefore, the Base Project would be required to provide 3.4 acres of neighborhood park (1,148 people * 3 acres per 1,000 people = 3.44 acres) and 1.72 acres of community-wide park(1,148 dwelling units * 1.5 acres per 1,000 people = 1.72 acres). The current site plan indicates that the project would provide numerous parks within the residential development areas, but the amount of parkland has yet to be determined. Therefore, because the site plan does not specify acreage for the proposed parks, a ***potentially significant*** impact would occur.

Alternative 1

Alternative 1 would be required to provide 3.84 acres of neighborhood park (1,280 people * 3 acres per 1,000 people = 3.84 acres) and 1.92 acres for a community-wide park (1,280 people * 1.5 acres per 1,000 people = 1.92 acres). The current site plan indicates that the project would provide numerous parks within the residential development areas, but the amount of parkland has yet to be determined. Therefore, because the site plan does not specify acreage for the proposed parks, a ***potentially significant*** impact would occur.

Alternative 2

Alternative 2 would be required to provide 5.08 acres of neighborhood park (1,696 people * 3 acres per 1,000 people = 5.08 acres) and 2.54 acres for a community-wide park (1,696 people * 1.5 acres per 1,000 people = 2.54 acres). The current site plan indicates that the project would provide park acres within the residential development areas, but the total dedicated acres have not been provided to date. Therefore, because total parkland acreage is not provided on the site plan and because parkland acreage cannot be determined whether or not sufficient acreage exists, a ***potentially significant*** impact would occur.

Mitigation Measure(s)
Implementation of the following mitigation measure would reduce this impact to a *less-than-significant* level.

4.8-~~6~~9 The developer shall dedicate parkland in accordance with the provisions of State law and city ordinances and/or pay associated Public Facilities Fees, which include Park Improvement Plan Fees. The City shall determine appropriate acreage or in-lieu fees in accordance with City Council Resolution No. 94-6, prior to approval of the Final Map(s).

4.8-~~7~~10 Increased demand for library services and facilities.

Base Project, Alternative 1, and Alternative 2

The Suisun City Library is the only public library located in Suisun City and is part of the larger Solano County Library system. The Suisun City Library is relatively small with inadequate services and not easily accessible requiring local residents to use the Fairfield-Suisun Community Library instead. Currently the Suisun City Library has no program space in the library except for an open area in the children's area used for story hour, which hinders a full complement of library services.

Although the Suisun City Library is small, future plans for a new library are in the planning stages. A community partnership between the City of Suisun City, Solano-County Library, and the Fairfield-Suisun Unified School District has been established to determine what type of library and community facilities would be needed to serve the growing Suisun City.

At full buildout, the proposed project would introduce an additional 1,148 to 1,280 residents to the City of Suisun. This increase would further strain the already overburdened library system within the City. However, the project developer would be required to pay Public Facilities Fees, in accordance with Suisun City Counsel Resolution No. 94-6, which provides funding for library services. Therefore, the proposed project would have a ***less-than-significant*** impact after the payment of Public Facilities Fees.

Mitigation Measure(s)
None required.

4.8-~~8~~11 Impacts to school facilities.

Base Project, Alternative 1, and Alternative 2

Using the student generation rates provided in Table 4.8-1~~7~~3, the project would be expected to generate the following number of students:

Table 4.8-1~~3~~7 Student Generation Estimates			
Description	**K-6 Elementary**	**7-8 Middle**	**9-12 High School**
Base Project 359 SF Units	19	8.6	14.7
Alternate 1 400 SF Units	21.2	9.6	16.4
Alternate 2 530 SF Units	57.93	21.45	37.59

As indicated in the Memo provided by the Fairfield-Suisun Unified School District, according to current enrollment and school building capacities, the District will likely not have the ability to accommodate the students generated from the proposed project at Crescent Elementary School and Rodriguez High School. However, the District appears to have the capacity to accommodate the additional students at Crystal Middle School. Furthermore, the District has indicated that in order to accommodate the students from the project at the elementary and high school, the District will likely have to do one or more of the following:

- Adjust attendance boundaries and send the students to another school with available classrooms or acreage necessary for the additional classrooms that would have to be constructed.
- Add portables at the above mentioned schools.

The proposed project is not within a School District Mello-Roos Community Facilities District (CFD). New homes that are not within a Mellos-Roos CFD are subject to a per square-foot development fee. As indicated by the District, the current fee is $3.50 per square-foot for both single and multi-family dwelling units, as set forth by SB 50; however, the fee would not provide the District with enough revenue to fund the full cost of accommodating new students.

The provisions of SB 50 prohibit local agencies from denying land use approvals on the basis that school facilities are inadequate and reinstate the school facility fee cap for legislative actions. Government Code Section 65996 states that the development fees authorized by SB 50 are deemed to be "full and complete school facilities mitigation." Without the payment of appropriate SB 50 fees, the project would have a ***potentially significant*** impact.

Mitigation Measure(s)

Implementation of the following mitigation measure would, as a matter of state law, reduce this impact to a *less-than-significant* level.

4.8-~~8~~11 Prior to approval of the Final Map(s), the developer shall pay fees to the Fairfield-Suisun Unified School District in accordance with

the "per square-foot" fee in effect at the time of approval of Final Map(s).

Cumulative Impacts and Mitigation Measures

4.8-9~~1~~2 Long-term impacts to public services and facilities from the proposed project in combination with existing and future developments in the Suisun area.

Base Project, Alternative 1, and Alternative 2

Implementation of the Base Project, Alternative 1, and Alternative 2 would contribute toward an increased demand for public services and facilities in the City of Suisun City. Public service and facility needs for the City of Suisun City have been evaluated in the Suisun General Plan and ensure that adequate services will be available for build out of the General Plan according to the Land Use Diagram. The proposed project is located outside the City limits, but is located within the Sphere of Influence. The proposed project includes annexation of several properties, currently located within Solano County, to Suisun City. Therefore, development of the project site with urban uses would exceed the demand for public services and facilities anticipated in the General Plan. However, as demonstrated in this Draft EIR, with the incorporation of mitigation measures, impacts to public services and facilities as a result of the proposed project would be less-than-significant. Therefore, the project's cumulative contribution to the City's public service and facility needs would also be less-than-significant. Furthermore, other future development projects would be required by the City to pay their fair share fees toward the expansion and creation of public services and facilities. Therefore, although certain facilities would be adversely impacted as a result of project implementation, cumulative impacts associated with public services and facilities would be considered ***less-than-significant*** after the incorporation of the mitigation measures identified above.

Mitigation Measure(s)
None Required.

Endnotes

[1] City of Suisun City, Municipal Services Review, Comprehensive Annexation Plan, April 2005.
[2] Suisun-Solano Water Authority, Water Supply Assessment for the Gentry Gateway Project, City of Suisun City, California, March 2004.
[3] Suisun-Solano Water Authority, Water Supply Options to Meet Future Demands report, July 3, 2007.
[4] Personal communication with Roger Reynolds of Summers Engineering, Inc., July 16, 2007, 3:45pm.
[5] Suisun-Solano Water Authority, Water Supply Options to Meet Future Demands report, July 3, 2007, Table C-1.
[6] Personal communication with Mr. Mike O'Brien, Fire Chief, March 14, 2006.

[7] Fairfield-Suisun Unified School District, EIR comments on Gentry Development in Suisun City Sphere of Influence Located Near Pennsylvania Avenue, South of State Route 12, near the junction of the Union Pacific and Northern Pacific Railroads, March 13, 2006.
[8] Personal Communication with Trevor Greco, Engineer, Creegan and D'Angelo, June 5, 2007, 10am.
[9] Personal Communication with Trevor Greco, Engineer, Creegan and D'Angelo, June 5, 2007, 10am.
[10] Personal Communication with Ron Anderson, Suisun Assistant City Manager, SSWA Board Member, July 12, 2007, 10am.
[11] Personal Communication with Ron Anderson, Suisun Assistant City Manager, SSWA Board Member, July 12, 2007, 10am.
[12] Personal communication with Roger Reynolds of Summers Engineering, Inc., July 18, 2007, 3:30pm.
[13] Fairfield-Suisun Sewer District, Letter to Gentry project engineer, November 30, 2004.

4.13 Global Climate Change

4.13 Global Climate Change

4.13 GLOBAL CLIMATE CHANGE

INTRODUCTION

In February 2007, the International Panel on Climate Change released its fourth assessment on climate change. The report detailed the solidifying consensus around the science of global climate change. On April 2, 2007 the Supreme Court of the United States determined that greenhouse gases (GHG) are pollutants, and that the Environmental Protection Agency has authority to regulate them. In California, lawmakers have been taking steps to regulate and reduce the State's contribution to global GHG emissions. All of the above actions are based on observable trends in the global climate, scientific projections of future global GHG emissions, and the potential for significant regional environmental impacts. Research suggests that in addition to natural processes, human activities, such as the burning of fossil fuels (including coal, natural gas, and petroleum products), deforestation, and industrial livestock practices, contribute additional carbon dioxide (CO_2), methane (CH_4), and other heat trapping gas emissions into the atmosphere. Climate change could result in adverse consequences for both the natural resources and economy of California.

This section considers the impacts of the proposed Gentry-Suisun project ("the Project") on greenhouse gas emissions and global climate change. Project specific emissions information is based on analysis conducted by Don Ballanti, Certified Consulting Meteorologist[1].

ENVIRONMENTAL SETTING

The following setting information provides an overview of the existing body of knowledge related to global climate change. In addition, the regulatory agencies associated with climate change and GHG regulation are described.

Existing Conditions

Gases in the Earth's atmosphere, classified as atmospheric greenhouse gases, play a critical role in determining the Earth's surface temperature. The sun emits solar radiation that enters Earth's atmosphere from space. A portion of the radiation is absorbed by the Earth's surface and the rest is reflected back toward space. However, the reflection changes the properties of the radiation from short-wave/high-frequency solar radiation to long-wave/lower-frequency infrared radiation. Greenhouse gases, which are transparent to solar radiation, absorb infrared radiation. As a result, the radiation that in previous times would have dispersed into space is now retained, resulting in warming of the atmosphere. This process is known as the greenhouse effect in reference to the structures used to grow plants in cold weather by using glazing to retain solar radiation.

Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and synthetic halocarbons (chlorofluorocarbons (CFCs), hydrofluorocarbons, perfluorocarbons, halons and sulphur hexafluoride). The primary GHG is CO_2, which is a byproduct of fossil fuel combustion. Methane, a GHG approximately 21 times more potent than CO_2, results from offgassing associated with agricultural practices, landfills, and the decomposition of vegetation. Processes that absorb and accumulate CO_2, often called CO_2 "sinks," include absorbtion by vegetation and dissolution into the ocean.

Human-caused emissions of GHGs in excess of natural ambient concentrations are responsible for enhancing the greenhouse effect[2]. Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors[3]. In California, the transportation sector is the largest emitter of GHGs, producing 41 percent of all emissions. Electricity generation is the second largest emitter (including out of state emissions for imported electricity) followed by industrial uses (California Energy Commission 2006a).

While California is a significant contributor of GHGs, global climate change is a global problem. The cumulative effect of worldwide emissions is the driving force behind climate change. In 2002, depending on the source, California ranks as the 10^{th} to 16^{th} largest emitter of CO_2 in the world (the rankings also include Texas, the only state to emit more CO_2 than California) and produced 492 million gross metric tons of carbon dioxide equivalents in 2004 (California Energy Commission 2006a).

Carbon dioxide equivalents is the unit of measurement used when measuring GHGs to account for the different potential of the various GHGs to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. The global warming potential of a GHG is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, one ton of Methane has the same contribution to the climate changes as approximately 21 tons of CO_2 (California Energy Commission 2006a). Expressing GHG emissions in carbon dioxide equivalents allows the contribution of all GHG emissions to be measured as a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

Global Changes

The Intergovernmental Panel on Climate Change (IPCC) report indicates that the average global temperature is likely to increase between 3.6 and 8.1 degrees Fahrenheit by the year 2100, with larger increases possible but not likely. Temperature increases are expected to vary widely in specific locations depending on a variety of factors. The increase in temperature is expected to lead to higher temperature extremes, precipitation extremes leading to increased flooding and droughts, ocean acidification from increased carbon content, and rising sea levels. Because the effects of warming are likely to include making dry areas drier, and rising sea levels may inundate coastal areas, subtropical and low-lying areas are expected to be the areas most affected by climate change.

Changes in the Western United States and California Climate

Climate models indicate that if GHG emissions continue to proceed at a medium or high rate, temperatures in California are expected to increase by 4.7 to 10.5 degrees Fahrenheit by the end of the century[4]. Lower emission rates would reduce the projected warming to 3 to 5.6 degrees Fahrenheit. Almost all climate scenarios include a continuing trend of warming through the end of the century given the vast amounts of greenhouse gases already released, and the difficulties associated with reducing emissions to a level that would stabilize the climate. According to the 2006 California Climate Action Team Report (CCAT, 2006), the following climate change effects are predicted in California over the course of the next century:

- A diminishing Sierra snowpack declining by 70% to 90%, threatening the State's water supply.
- Increasing temperatures from 8 to 10.4 degrees F under the higher emission scenarios, leading to a 25 to 35% increase in the number of days ozone pollution levels are exceeded in most urban areas.
- Coastal erosion along the length of California and sea water intrusion into the Delta from a 4- to 33-inch rise in sea level. This would exacerbate flooding in already vulnerable regions.
- Increased vulnerability of forests due to pest infestation and increased temperatures.
- Increased challenges for the State's important agriculture industry from limited water shortage, increasing temperatures, and saltwater intrusion into the Delta.
- Increased electricity demand, particularly in the hot summer months.

Therefore, temperature increases would lead to environmental impacts in a wide variety of areas, including: reduced snowpack resulting in changes to the existing water resources, increased risk of wildfires, changing weather expectations for farmers and ranchers, and public health hazards associated with higher peak temperatures, heat waves, and decreased air quality.

Water Resources

Depending on the climate model, precipitation is predicted to increase or decrease slightly. However, the form in which precipitation occurs could change substantially. Warmer winters and springs would lead to less snow and more rain. As a result, the Sierra snowpack would be reduced and would melt earlier. This change could lead to increased flood risks as more water flows into reservoirs and rivers during the winter rainy period. Furthermore, late spring and summer flows to reservoirs would be reduced, leading to restricted water supplies for cities, agriculture, and rivers.

Increased temperatures also lead to a rise in the sea level, from both thermal expansion and the melting of land based glaciers. During the past century, sea levels along the California coast have risen by approximately seven inches. Climate forecasts indicate the sea level will rise by 7 to 23 inches over the next 100 years depending on the climate

model[5]. Substantial melting of either the Greenland or Antarctic ice sheets would lead to even greater increase; however, the IPCC models do not indicate that this would occur within the next 100 years, which is the boundary of most climate models. Longer forecast periods are inherently less reliable as they require more assumptions, and tend to compound the effects of assumptions that may be incorrect. Increases in sea-level could lead to increased coastal flooding, salt water intrusion into aquifers, and disrupt wetlands and estuaries.

Wildfires

Increased temperatures will lead to increases in evapotranspiration. The summers will likely be drier, and vegetation will also be more likely to dry out, and as a result more flammable. In addition, warmer temperatures could lead to the expansion of pests that kill and weaken trees, leading to increases in the amount of highly flammable dead trees, increasing the risk of large forest fires.

Weather Extremes

The temperature increases presented in climate change models are yearly averages. Within those averages is the potential for hotter summers and/or colder winters. As a result, the weather is expected to become more variable, with larger extremes. In California, the increase in temperatures is expected to lead to more days with temperatures in excess of 95 degrees. More days of extreme heat has implications for public health as Californians will face greater risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat. In addition, increased temperatures have implications for agricultural crops, particularly long-term crops such as grapes and fruit trees that are planted in particular locations to take advantage of micro-climates.

Air Quality

As indicated in the discussion of weather extremes, increased temperatures can increase air quality problems. Increased temperatures create the conditions in which ozone formation can increase. In addition, hotter temperatures will likely result in increased electricity use to power air conditioners and refrigerators. Increased power use has the potential to result in increased air pollutant emissions as more electrical generation is needed to meet the demand.

Uncertainty Regarding Global Climate Change

The scientific community has largely agreed that the earth is warming, and that humans are contributing to that change. However, the earth's climate is composed of many complex mechanisms, including: ocean currents, cloud cover, as well as the jet-stream and other pressure/temperature weather guiding systems. These systems are in turn influenced by changes in ocean salinity, changes in the evapotranspiration of vegetation, the reflectivity (albedo) of groundcover, as well as numerous other factors. Some changes

have the potential to reduce climate change, while others could form a feedback mechanism that would speed the warming process beyond what is currently projected. The climate system is inherently dynamic; however, the overall trend is towards a gradually warming planet.

Prediction of impacts to specific localities is not yet possible. Improvements to Global Climate Models have led to Regional Climate models. However, the accuracy of these models is limited. In particular, the weather patterns at a particular site are guided by micro-climates that include such influences as elevation, prevailing wind patterns, and humidity among many other factors. Therefore, potential impacts to the proposed project resulting from climate change are based on inferences out of climate models that provide generalized impacts for a large area.

REGULATORY CONTEXT

Thus far the approach to address the emission of GHGs is through environmental regulations enforced through air quality laws. The United States Supreme Court has determined that GHGs are pollutants that can be regulated under the federal Clean Air Act. In addition, California has passed laws directing the Air Resources Board to develop actions to reduce CHG emissions. However, at the time of this writing, regulations setting ambient air quality emissions standards for greenhouse gases do not exist.

Federal

U.S. Environmental Protection Agency

The United States Environmental Protection Agency (USEPA) is charged with enforcing the Clean Air Act. The USEPA has established air quality standards for common pollutants. These ambient air quality standards represent the allowable levels for each contaminant, according to the various thresholds of each pollutant for causing adverse health effects. The standards cover what are called "criteria" pollutants because health and other effects of each pollutant are described in criteria documents. The USEPA has been directed to develop regulations to address the GHG emissions of cars and trucks. At the time of this writing, EPA regulations for GHGs do not exist, and are not expected until late 2008 at the earliest.

State

Assembly Bill 1493

In 2002, then-Governor Gray Davis signed Assembly Bill (AB) 1493 (Stats. 2002, ch. 200) (Health & Saf. Code, §§ 42823, 43018.5). AB 1493 requires that the California Air Resources Board (ARB) develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty truck and other vehicles determined by the Air Resources Board (ARB) to be vehicles whose primary use is noncommercial personal transportation in the state."

Currently, the State is waiting for a determination on the State's request for a waiver from the USEPA to begin regulation of GHG emissions from vehicles.

Executive Order S-3-05

In 2005, Governor Schwarzenegger signed Executive Order S-3-05, which established total greenhouse gas emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80% below the 1990 level by 2050. The Executive Order directed the Secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce greenhouse gas emissions to the target levels. The Secretary is also directed to submit biannual reports to the governor and state legislature describing: (1) progress made toward reaching the emission targets; (2) impacts of global warming on California's resources; and (3) mitigation and adaptation plans to combat these impacts.

To comply with the Executive Order, the Secretary of the CalEPA created a Climate Act Team (CAT) made up of members from various state agencies and commissions. CAT released its first report in March 2006. In addition, the CAT has released several "white papers" addressing issues pertaining to the potential impacts of climate change on California.

Assembly Bill 32, The California Climate Solutions Act of 2006

In September 2006, Governor Arnold Schwarzenegger signed AB 32, the California Climate Solutions Act of 2006 (Stats. 2006, ch. 488) (Health & Saf. Code, § 38500 et seq.). AB 32 requires that statewide GHG emissions be reduced to 1990 levels by the year 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then ARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

Senate Bill 1368

SB 1368 (Stats. 2006, ch. 598) (Pub. Util.Code, §§ 8340-8341) is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 requires the California Public Utilities Commission (PUC) to establish a greenhouse gas emission performance standard for baseload generation from investor owned utilities by February 1, 2007. The California Energy Commission (CEC) must establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the greenhouse gas emission rate from a baseload combined-cycle natural gas fired plant. On January 27, 2007, the PUC adopted an interim Greenhouse Gas Emissions Performance Standard to require that all new long-term commitments for

baseload power generation to serve Californians do not exceed the emissions of a combined cycle gas turbine plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the PUC and CEC.

California Air Resources Board (ARB)

The ARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for the California Clean Air Act (CCAA) adopted in 1988. The CARB has primary responsibility in California to develop and implement air pollution control plans designed to achieve and maintain the National Ambient Air Quality Standards established by the USEPA. As discussed above, the ARB is charged with developing rules and regulations to cap and reduce GHG emissions.

Local

City of Suisun General Plan

The Suisun City General Plan is applicable to the proposed project. The General Plan sets forth various goals, policies and programs that would apply to projects in the City of Suisun. The following goals, policies and programs are applicable to the proposed project.

Open Space and Conservation Element

Policy 14: Commercial and Industrial Land Uses. Suisun City will encourage commercial and industrial uses to meet the air pollution control objectives of the appropriate air pollution control district.

Policy 15: Traffic. Suisun City will implement traffic and transportation policies as part of the Circulation Element to mitigate the air quality effects of increasing vehicular traffic in the City.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

At the time of this writing, none of the air districts in California, including the Bay Area Air Quality Management District, had identified a significance threshold for GHG emissions or a methodology for analyzing air quality impacts related to greenhouse gas emissions. The State has identified 1990 emission levels as a goal through adoption of AB 32. To meet this goal, California would need to generate lower levels of GHG emissions than current levels. However, standards have not yet been adopted quantifying 1990 emission targets. For most projects a simple metric is not available to determine if a single project would help or hinder meeting the AB 32 emission goals. In addition, at this time, AB 32 only applies to stationary source emissions. Consumption of fossil fuels in the transportation sector accounted for over 40% of the total GHG emissions in

California in 2004. Current standards for reducing vehicle emissions considered under AB 1493 call for "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks and other vehicles," and do not provide a quantified target for GHG emissions reductions for vehicles.

The BAAQMD has prepared a GHG emissions inventory using 2002 as the base year[6]. The BAAQMD estimated that in 2002, 85.4 million tons of GHG (measured in CO_2 equivalents) were emitted. GHG gases were emitted from anthropogenic sources in the Bay Area in 2002 (BAAQMD, 2006). Fossil fuel consumption in the transportation sector (on-road motor vehicles) accounted for approximately 43 percent (BAAQMD, 2006). Stationary sources, including industrial and commercial sources, power plants, oil refineries, and landfills were responsible for approximately 49 percent (BAAQMD, 2006). Construction and mining equipment was estimated to account for approximately two percent (or about 1.7 million tons) of the total anthropogenic GHG emissions (BAAQMD, 2006).

Emitting CO_2 into the atmosphere is not itself an adverse environmental effect. The adverse impact results from increased concentration of CO_2 in the atmosphere resulting in global climate change and the associated consequences of climate change that results in adverse environmental effects (e.g., sea level rise, loss of snowpack, severe weather events). Although generally estimating a project's incremental contribution of CO_2 into the atmosphere is possible, determining whether or how an individual project's relatively small incremental contribution might translate into physical effects on the environment is not considered to be possible. Given the complex interactions between various global and regional-scale physical, chemical, atmospheric, terrestrial, and aquatic systems that result in the physical expressions of global climate change, discerning whether the presence or absence of CO_2 emitted by the project would result in any altered conditions is not possible.

Given the challenges associated with determining a project-level significance criterion for GHG emissions when the issue must be viewed on a global scale, a quantitative significance criteria is not proposed for the project. For the purpose of this analysis, a project's incremental contribution to global climate change would be considered significant if a substantial increase in GHG emissions relative to existing conditions were to occur due to the size or nature of the project.

Method of Analysis

The bulk of new GHG emissions associated with the project would be due to transportation and on-site fuel combustion. New emissions from vehicles were estimated using the CARB's EMFAC-2007 model emission factors for CO_2 multiplied by Vehicles Miles Traveled as estimated by the URBEMIS-2002 program. Vehicle emissions for methane and nitrous oxides were based on published emission factors (BAAQMD, 2006).

Natural gas combustion emissions were estimated using URBEMIS-2002 defaults for natural gas consumption. These usage factors were multiplied by published emissions

factors (BAAQMD, 2006). The resulting estimated annual emissions of greenhouse gases associated with the project are shown in Table 4.13-1.

Emissions are expressed both as tons per year and CO_2-equivalent tons per year. Expressing emissions in CO_2-equivalent tons per year accounts for the greater global warming potential of methane and nitrous oxide. Methane has a global warming potential 21 times that of carbon dioxide, while nitrous oxide is 310 times that of the same amount of carbon dioxide.

Impacts and Mitigation Measures

4.13-1 Project impacts concerning the production of greenhouse gases.

The cumulative increase in GHG concentrations in the atmosphere has resulted in and will continue to result in increases in global average temperature and associated shifts in climatic and environmental conditions. Multiple adverse environmental effects are attributable to global climate change, such as sea level rise, increased incidence and intensity of severe weather events (e.g., heavy rainfall, droughts), and extirpation or extinction of plant and wildlife species. Given the significant adverse environmental effects linked to global climate change induced by GHGs, the emission of GHGs is considered a significant cumulative impact. Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors (California Energy Commission 2006a). Therefore, the cumulative global emissions of GHGs contributing to global climate change can be attributed to every nation, region, and city, and virtually every individual on Earth. The challenge in assessing the significance of an individual project's contribution to global GHG emissions and associated global climate change impacts is to determine whether a project's GHG emissions—which, it can be argued, are at a micro-scale relative to global emissions—result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact.

Table 4.13-1
Greenhouse Gas Production

	Carbon Dioxide (CO_2)	Nitrous Oxide (N_2O)	Methane (CH_4)
Modified Alternative 1			
Tons Per Year	18,120	0.143	0.378
CO_2 Equivalent Tons Per Year	18,120	45	8

Source: Ballanti, 2007.

CO_2 emissions in California totaled approximately 391 million tons in 2004 (California Energy Commission 2006). Estimated project total CO_2 emissions, as shown in Table 4.13-1, would be 0.0046% to 0.0051% of this statewide total.

GHG emission estimates from an individual project have a relatively high uncertainty. In addition, the potential affects of current and future regulations on CO_2 emissions attributable to the project and cumulative CO_2 emissions from other sources in the state cannot be quantified. Furthermore, the way in which CO_2 emissions associated with the project might or might not influence actual physical effects of global climate change cannot be determined. For these reasons, whether the project would generate a substantial increase in GHG emissions relative to existing conditions, and whether emissions from the project would make a cumulatively considerable incremental contribution to the significant cumulative impact of global climate change is uncertain.

For this analysis, a conservative approach is taken and the project is considered to have a ***potentially significant*** incremental contribution to the cumulatively considerable production of greenhouse gases resulting in the cumulative impact of global climate change.

Mitigation Measure(s)

Measures to reduce greenhouse gas emissions are equivalent to measures to reduce energy consumption and air pollutant emissions. Therefore, GHG emission mitigation measures are identified in Section 4.9-Energy and Section 4.3-Air Quality, and are listed below:

4.3-4 In conjunction with submittal of a Final Map and Building Permits, the applicant shall include in the project design the following measures to the satisfaction of the Community Development Director and the Public Works Director:

- *Provide bicycle lanes, sidewalks and/or paths within the Mixed Use Project area, connecting project residences to schools, parks, the nearest transit stop and nearby commercial areas. Provide a satellite tele-commute center within or near the development.*
- *Provide conveniently place bicycle racks at Mixed Use Project parks and other Mixed Use Project facilities.*
- *Allow only natural gas fireplaces, pellet stoves or EPA-Certified wood-burning fireplaces or stoves in single-family houses. Conventional open-hearth fireplaces should not be permitted. EPA-Certified fireplaces and fireplace inserts are 75 percent effective in reducing emissions from this source.*
- *Residences will include outside electrical outlets to allow electric lawn and garden equipment for landscaping.*

- *Within the Mixed Use Project area, construct transit amenities such as bus turnouts/bus bulbs, benches, shelters, at approved transit stops in the Mixed Use Project.*
- *Provide direct, safe, attractive pedestrian access from Mixed Use Project land uses to transit stops and adjacent Mixed Use Project development areas.*
- *Utilize reflective (or high albedo) and emissive roofs and light colored construction materials where reasonable and practical to increase the reflectivity of roads, driveways, and other paved surfaces, and include shade trees near buildings to directly shield them from the sun's rays and reduce local air temperature and cooling energy demand.*
- *Provide physical improvements within the Mixed Use Project, such as sidewalk improvements, landscaping and bicycle parking that would act as incentives for pedestrian and bicycle modes of travel.*
- *Provide transit information kiosks.*
- *Provide secure and conveniently located bicycle parking and storage for workers and patrons.*
- *Provide some preferential parking for Low Emission Vehicles (LEVs). Specialty equipment (utility carts, forklifts, etc.) should be electrically, CNG or propane powered.*

4.3-5 Diesel delivery trucks shall be prohibited from idling for more than 5 minutes in conformance with CARB regulations. This requirement shall be posted in loading dock areas and included in any contracts between tenants and vendors.

4.9-1 Prior to the issuance of any building permits for the commercial component of the development, the applicant shall demonstrate to the City Building Official that building plans comply with Title 24. In addition, measures beyond Title 24 shall be implemented to further increase energy efficiency. The proposed measures shall be reviewed and approved by the City Building Official. Such measures could include the use of skylights, energy-efficient HVAC units, solar-reflective roofing materials, energy-efficient lighting systems, and the reclamation of the "heat of rejection" from refrigeration equipment to generate hot water, among other things.

These mitigation measures would reduce project GHG impacts, but not to a level that is less than significant. GHG emission impacts would be *significant and unavoidable*.

4.13-2 Impacts to the proposed project from climate change.

As discussed above, climate change is currently having, and will continue to have, an effect on the physical environment in which future project residents and patrons will live, work, and shop. Of particular concern for the project area are changes related to sea level and the provision of water provision.

Sea level rise

Climate change is projected to cause thermal expansion of ocean waters and melting of ice from land surfaces, which in turn could cause sea levels to rise. Among the risks of sea level rise would be threats to levee integrity and tidal marshes and increased salinity in the Delta region (Kiparsky and Gleick 2003). As discussed above, sea levels are expected to rise between seven and 23 inches by 2100. The project site elevation ranges between two and ten feet above sea level. Therefore, even at the higher end of the sea level rise range the project site would remain safely above the adjoing bay and tidal slough areas.

Water Provision

As discussed above, many scientists believe that existing water supply systems are sensitive to climate change. Much uncertainty remains, however, with respect to the overall impact of global climate change on future water supplies. For example, models that predict drier conditions (i.e., parallel climate model [PCM]) suggest decreased reservoir inflows and storage and decreased river flows, relative to current conditions. By comparison, models that predict wetter conditions (i.e., HadCM2) project increased reservoir inflows and storage, and increased river flows[7]. In addition, much uncertainty also exists with respect to how climate change will affect future demand of water supply. One of the largest factors in determining water supply is the expected shift in precipitation from snow to rain. A study, conducted for the California Energy Commission, to ascertain California's vulnerability to climate change induced water shortages found that under a high emissions "worst-case" scenario, climate change would reduce water deliveries by 17 percent in the year 2050[8]. However, the reduction in deliveries was not equally distributed across the state, and urban scarcity was almost absent outside of Southern California. In addition, the project site would receive water supplies from the Berryessa Reservoir which is primarily fed by rainwater. Given the low elevation and the relatively scant snowfall in the coastal ranges, Lake Berryessa would be minimally affected by a decrease in snowfall, and an increase in rainfall.

Other Impacts

Global climate change is expected to result in changes to virtually every area of the biological and built environment, including: air quality, biological resources, water resources, agriculture, energy, and hazards. These changes will result

from both the increase in temperature and other resultant changes caused by increased temperature and affected by other interconnected processes. For example, increases in the melting of polar ice could result in sea level rise and a decrease in ocean salinity. The two secondary effects would in turn have tertiary effects. The tertiary effects may amplify or reduce the effects of climate change. Ongoing studies are attempting to forecast these potential effects; however, the science is largely speculative at this point and varies significantly depending on the climate model assumptions. Therefore, attempting to identify additional potential impacts to project site residents, employees, and patrons would be speculative.

Climate change is likely to result in changes to the existing conditions. The exact nature and extent of those potential changes is not known at this time. However, as discussed above, the water supply for the project site is considered to be largely secure. In addition, while located near sea level, the project site is at a sufficiently high elevation to avoid inundation under the upper end of the likely scenario of sea level rise identified by the IPCC. Therefore, climate change is expected to have a ***less-than-significant*** impact on the proposed project.

Mitigation Measure(s)
None required.

Endnotes

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5. ALTERNATIVES ANALYSIS - Recirculated

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5. ALTERNATIVES ANALYSIS

INTRODUCTION

The primary intent of the alternatives evaluation in an EIR, as stated in Section 15126.6(a) of the CEQA Guidelines, is to "[…] describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives [...]." Furthermore, Section 15126.6 (f) states that "[…] The range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice […]."

The following objectives for the project were provided by the applicant (for purposes of this discussion, the project objectives are broken out into four categories, Land Use Planning, Economic Development, Housing, and Fiscal.)

A. LAND USE PLANNING

1. To implement the City of Suisun City's Comprehensive Annexation Plan (CAP) by annexing an area of land outside the City's limits but within its Sphere of Influence, and which is designated a "Near Term (1-5 years) Annexation" in the June 2005 CAP;

2. To implement the City's General Plan by developing a mixed-use retail and residential project in an integrated fashion consistent with policies in the City's General Plan at a location to which urban services can readily be extended;

3. To create land uses that provide employment opportunities for residents of the City, striving to address the City's existing jobs/housing imbalance;

4. To provide a well-designed retail center with distinctive architecture and quality landscaping appropriate for a major gateway entry to the west side of the City;

5. To set aside, preserve, and protect significant adjacent areas for wetlands and habitat;

6. To provide for the orderly and systematic development of a planned community with a mix of residential and retail uses, supported and enhanced with open space, pedestrian amenities, and regional wildlife habitat; and

7. To provide housing in close proximity to jobs and shopping and with convenient access to regional transportation systems.

B. ECONOMIC DEVELOPMENT

1. To provide a fair return on the costs and investments made in the land and the project by the private development entities;

2. To promote and strengthen the economic vitality of the City through the development of the infill area west of the City center as a multi-tenant, major retail center;

3. To provide retail options for the residents of Suisun City, which they currently do not enjoy;

4. To enhance the City's employment opportunities through the development of a well-designed commercial project within the City;

5. To provide complementary retail shopping services in an integrated center at the intersection of two major arterials, in proximity to existing residential uses and existing and planned major business users;

6. To enhance the City's position to better serve the regional and community retail needs in the larger Solano County community; and

7. To provide a location for major department stores and complementary retail stores that will provide convenience and value for the public.

C. HOUSING

1. To provide a housing units to help the City meet its Regional Housing Needs Allocation administered by the Association of Bay Area Governments;

2. To provide a variety of housing types consistent with Policy 1.A. of the City's General Plan Housing Element;

3. To offer the City the opportunity to create affordable housing opportunities consistent with Policy 1.B. of the City's General Plan Housing Element;

4. To propose residential development in a "village" environment with pedestrian connections and amenities; and

5. To place housing near jobs and transportation facilities.

D. FISCAL

1. To increase the City's employment opportunities with the development of well-designed retail and commercial uses;

2. To strengthen the economic vitality of the City by providing retail opportunities currently non-existing in the City;

3. To support the efforts of the City to revitalize its historic Downtown by providing complementary retail opportunities (i.e., those retail opportunities that are not appropriate in the Downtown);

4. To begin to address the City's existing structural budget deficit of approximately $800,000, which if not corrected will result in the continuation of services reductions and staff layoffs;

5. To generate a level of sales tax revenue that potentially doubles the current level, and that will allow public services to be provided to the current and future residents of the City; and

To generate property tax revenue that will accrue to the various taxing agencies within the project area.

Furthermore, Section 15126.6 (f) states that "[…] The range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice […]."

The CEQA Guidelines (§15126.6 (e)(1)) state that a 'no project' alternative should be evaluated along with its impact. Specifically, the Guidelines state:

> The specific alternative of the "no project" shall also be evaluated along with its impact. The purpose of describing and analyzing a no project alternative is to allow decision-makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. The no project alternative analysis is not the baseline for determining whether the proposed project's environmental impacts may be significant, unless it is identical to the existing environmental setting analysis, which does establish that baseline.

In addition, Section 15126.6 (d) of the CEQA Guidelines states that "[…] If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed."

Selection of Alternatives

Alternatives that are included and evaluated in this EIR must be potentially feasible alternatives. According to the CEQA Guidelines Section 15126.6(f), "[…] the alternatives shall be limited to ones that would avoid or substantially lessen any of the

significant effects of the project […].” In addition, Section 15126.6(f)(1) states that the feasibility of an alternative may be determined based on a variety of factors including, but not limited to, site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, and site accessibility and control.

Although agency staff and consultants should use their best judgment in formulating alternatives they consider to be potentially feasible, the lead agency’s decision-making body (here, the Suisun City Council) is the ultimate arbiter of whether any of the proposed alternatives are in fact feasible or infeasible. (See Pub. Resources Code, § 21081, subd. (a)(3).) In making such determinations, the lead agency may weigh and balance various public policy considerations that are served to varying degrees by the available policy options developed in an EIR. Thus, as was noted in *City of Del Mar v. City of San Diego* (1982) 133 Cal.App.3d 401, 417, “‘feasibility’ under CEQA encompasses ‘desirability’ to the extent that desirability is based on a reasonable balancing of the relevant economic, environmental, social, and technological factors.” Moreover, as the California Supreme Court emphasized in *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564, 576, “[t]he wisdom of approving . . . any . . . project, a delicate task which requires a balancing of interests, is necessarily left to the sound discretion of . . . officials and their constituents who are responsible for such decisions.”

ALTERNATIVES CONSIDERED BUT DISMISSED IN THIS EIR

Consistent with CEQA, primary consideration was given to alternatives that could reduce significant impacts, while still meeting most of the project objectives. Those alternatives that would have impacts identical to or more severe than the proposed project, and/or that would not meet any or most of the project objectives were rejected from further consideration. One alternative was considered but dismissed for the Suisun-Gentry project.

Off-Site Alternative

Sites within the City of Suisun, which would be large enough to accommodate the proposed project, are not available. One site that contains 30 acres is located at the intersection of SR 12 and Marina. This site has an application for development already pending, and is too small to accommodate the proposed development.

Two potential alternative annexation locations exist. One is located at Railroad Avenue/Blossom Avenue; however, this property is residentially zoned, only contains 26 acres and currently has an application pending. The second potential annexation site is 20 acres and is located between the Lambrecht Sports Complex and the City’s eastern boundary on the north side of Peterson Road. The northern portion of this property contains a safety zone restriction area from Travis Air Force Base. Because of size and safety restrictions, the second potential annexation site is not adequate for the proposed development.

Alternative site locations may be available outside of the City's Sphere of Influence; however, development of these sites would not meet the project objectives, which include fiscal benefits that would assist the City, which has recently experienced severe budget constraints, in its efforts to attain a stable and viable fiscal condition. Therefore, off-site alternatives are dismissed from further consideration.

ALTERNATIVES CONSIDERED IN THIS EIR

The Draft EIR includes an equal-level analysis of two alternatives along with the Base Project condition (See Chapter 3, *Project Description*, for a more detailed discussion). The components of Alternatives 1 and 2 are summarized below. Refer to each technical chapter for information regarding each Alternative's potential environmental impacts.

Alternative 1

Planning Area 1 is intended primarily for the development of a major retail center and an approximately 120-unit high-density residential component (duet homes) to meet the retail, commercial, and residential needs of residents of Suisun City and the region. Planning Area 1 would have a mix of retail tenants, which may include small shops, general merchandise stores, "big box" establishments such as a supercenter and/or a home improvement center, and service providers.

Planning Area 2 is intended for the development of approximately 196 units of medium- to high-density residential units which would include town homes and duet units. Current development plans for this Planning Area include two- and three-story single family attached and/or detached for sale housing.

Planning Area 3 is intended for the development of approximately 84 medium- to high-density residential units which would include town homes.

Alternative 2

Planning Area 1 is intended for the development of approximately 42.04 acres of retail and commercial space as well as the development of an approximately 147-unit residential component (duet homes) and approximately a 103-unit single-family lot component to meet the retail, commercial, and residential needs of residents of Suisun City and the region. Planning Area 1 would have a mix of retail tenants, which may include small shops, general merchandise stores, a "big box" establishment such as a supercenter and/or a home improvement center, and service providers. In addition, Alternative 2 would add a residential development component as well.

Planning Area 2 is intended for the development of approximately 196 units of medium- to high-density residential units which would include town homes and duet units. Current development plans for this Planning Area include two- and three-story single family attached and/or detached for sale housing.

Planning Area 3 is intended for the development of approximately 84 medium- to high-density residential units which would include town homes. Current plans for this area are similar to those for Planning Area 2.

While the analysis of the potential environmental effects of Alternative 2 are contained in almost all of the chapters of the DEIR, Alternative 2 is not specifically evaluated in Chapter 4.13 – Global Climate Change. Therefore, the following analysis of the potential contribution of Alternative 2 to the cumulatively significant impact to global climate change has been included below.

Global Climate Change

The bulk of new GHG emissions associated with this alternative would be due to transportation and on-site fuel combustion. New emissions from vehicles were estimated using the CARB's EMFAC-2007 model emission factors for CO_2 multiplied by Vehicles Miles Traveled as estimated by the URBEMIS-2002 program. Vehicle emissions for methane and nitrous oxides were based on published emission factors.

Natural gas combustion emissions were estimated using URBEMIS-2002 defaults for natural gas consumption. These usage factors were multiplied by published emissions factors.

Table 5-1
Greenhouse Gas Production for Alternative 2

	Carbon Dioxide (CO_2)	Nitrous Oxide (N_2O)	Methane (CH_4)
Alternative 2			
Tons Per Year	20,080	0.141	0.363
CO_2 Equivalent Tons Per Year	20,080	44	8

Source: Ballanti, 2007.

The estimated GHG emission for this alternative is 20,080 tons per year (CO_2-equivalent), which would be greater than Modified Alternative 1.

It should be noted that Planning Area 4 would remain as an open space / wetland preserve for both Alternatives 1 and 2. Planning Area 5 would also possibly be utilized as a wetland preservation site.

No Project Alternative

CEQA requires the evaluation of the comparative impacts of the "No Project" alternative (CEQA Guidelines Section 15126.6 (e)). Analysis of the No Project Alternative "shall discuss . . . existing conditions . . . as well as what would be reasonably expected to occur

in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services." (*Id.*, subd. (e)(2).) "If the project is other than a land use or regulatory plan, for example a development project on identifiable property, the "no project" alternative is the circumstance under which the project does not proceed. Here the discussion would compare the environmental effects of the property remaining in its existing state against environmental effects which would occur if the project is approved. If disapproval of the project under consideration would result in predictable actions by others, such as the proposal of some other project, this "no project" consequence should be discussed. In certain instances, the no project alternative means "no build" wherein the existing environmental setting is maintained. However, where failure to proceed with the project will not result in preservation of existing environmental conditions, the analysis should identify the practical result of the project's non-approval and not create and analyze a set of artificial assumptions that would be required to preserve the existing physical environment." (*Id.*, subd. (e)(3)(B).)

Here, the City has concluded that a "no development" alternative is the appropriate "no project" alternative in light of the nature of the approvals and entitlements sought by the project as proposed. These include a proposed annexation, which cannot be taken for granted under a "no project" scenario reflecting "current plans." Therefore, under the No Project Alternative, the project site would remain agricultural land and wetlands. Furthermore, because the project site would not be developed, the site would not to be annexed to the City of Suisun.

Environmental Effects

Land Use/Agricultural Resources

The No Project Alternative would result in the project site remaining in agricultural production. Like the proposed project, this alternative would result in a conflict with the existing General Plan designation for the project area. The City of Suisun General Plan currently designates the site as 10 acres of General Commercial and 162 acres of Limited Industrial/Business Park. Additionally, this Alternative would result in the site not being annexed to the City and would therefore remain under the jurisdiction of the Solano County General Plan, which designates the project site as Agriculture. Because development would not occur with this Alternative, impacts related to light and glare would not occur, particularly those associated with the Suisun Marsh to the south. Additionally, the No Project Alternative would not require an amendment to the General Plan as would the proposed project. Overall, this Alternative would have fewer total impacts in regards to land use than the proposed project.

In regards to agricultural resources, the No Project Alternative would not result in the conversion of agricultural land. Although, the Draft EIR determined that the proposed project's impacts to agricultural resources would be considered less-than-significant due to poor on-site soils, the No Project Alternative would further reduce impacts by not resulting in the conversion of any farmland.

Aesthetics

The Draft EIR identified significant and unavoidable project-level and cumulative aesthetics impacts as a result of project implementation for Impacts 4.2-1, 4.2-2 and 4.2-4 respectively. The No Project Alternative would not result in the development of the project site. Therefore, the site would remain agricultural and open views would be preserved on the project site, resulting in no impact. The No Project Alternative would have fewer aesthetic impacts than the proposed project.

Air Quality

The project site is currently vacant land used with some grazing on-site. The No Project Alternative would not result in any additional on-site air pollutants or any increase in traffic-related air pollution and would therefore have no impact to air quality. The proposed project, as noted in the EIR, would have a significant and unavoidable cumulative impact in regard to air quality. Therefore, the No Project Alternative would have fewer impacts related to air quality than the proposed project.

Noise

The project site is currently vacant land used for grazing. A railroad line exists on the project traveling from the west and veering to the northeast. The development of the proposed project would result in an increase in construction-related and operational noise on the project site as a result of the addition of commercial, residential and light industrial land uses. For the proposed project, future residences would be subject to potentially significant exterior noise levels as a result of project traffic. In addition, proposed project construction activities would cause potentially significant short-term noise impacts. Additionally, the proposed project would introduce new sensitive receptors near the existing railroad tracks. Conversely, the No Project Alternative would not result in increased traffic, the placement of sensitive receptors in close proximity to existing railroad lines, or any changes in on-site construction or operational noise generation and, therefore, would have no significant impacts. Implementation of the No Project Alternative would result in fewer noise impacts than would the proposed project.

Traffic and Circulation

The No Project/No Build Alternative would not result in the construction of any residential, commercial, or light industrial uses on the Gentry-Suisun Project site and would consequently not generate additional trips to the existing local roadway traffic volumes and have no impact to traffic and circulation. Conversely, the proposed project would have several potentially significant impacts to intersections that could be reduced to a less-than-significant level through mitigation; and several significant and unavoidable traffic impacts to nearby study intersections. Therefore, the No Project Alternative would not cause a traffic increase in the surrounding area and would have fewer impacts related to traffic and circulation than the proposed project.

Biological Resources

The No Project Alternative would not result in development of the project site with residential, commercial, and light industrial uses. Additionally, much of the proposed project area is identified as wetlands and has the potential to support a number of special-status plant and animal specifies. Therefore, unlike the proposed project, because the No Project Alternative would not result in new development on the site, the Alternative would have no impact on the existing biological resources (e.g., wetlands, burrowing owl, Swainson hawk, etc., See Section 4.6), and would thus have fewer biological impacts than the proposed project.

Hydrology and Water Quality

The No Project Alternative would not result in construction, which could change the existing drainage pattern for the project area and would have no impact to the project site. The No Project Alternative would not generate urban runoff that would affect water quality in the area. The No Project Alterative would not result in the need for the additional treatment of stormwater runoff, and would not place structures and residents in the 100-year floodplain. However, the proposed project would urbanize the project area, altering existing drainage patterns through the increase of impervious surfaces, as well as contributing to the degradation of stormwater quality through urban pollutants and add residential, commercial and business park land uses into a 100-year floodplain area. Therefore, when compared to the proposed project, the No Project Alternative would result in decreased impacts on hydrology and water quality.

Public Services and Utilities

The No Project Alternative would not result in the introduction of new residents and new businesses to the City of Suisun. Therefore, unlike the proposed project, the No Project Alternative would not create an increased need for public services and utilities, such as law enforcement, fire protection, the public school system, parks and recreation facilities, wastewater treatment and disposal, and water supply and delivery and would have no new impacts in regard to public services and utilities. The No Project Alternative would have fewer impacts to public services when compared to the proposed project.

Energy

The No Project Alternative would not result in the introduction of any new energy consumption in the project area and would have no impacts. Therefore, although the EIR determined that the proposed project would not have significant impacts to energy resources, this Alternative would eliminate any impacts to these resources.

Socio-economic

Unlike the proposed project, which would increase residential, commercial, and light industrial activity within the City of Suisun, the No Project Alternative would not create

an increase or decrease in market leakage or absorption for the City of Suisun, nor would it create more employment opportunities or residential units within the City. Therefore, this Alternative would have a decreased impact related to socio-economic conditions.

Hazards

The No Project Alternative would not involve construction on the proposed project site; therefore, the on-site gas pipelines would not be disturbed, businesses would not be placed near high-voltage power lines, and residents would not be place near the land fill site. Therefore, impacts related to hazards would not occur.

Cultural Resources

The No Project Alternative would not involve construction on the proposed project site; therefore, potential on-site cultural resources would not be disturbed. Therefore, impacts related to cultural resources would not occur.

Global Climate Change

The No Project Alternative would not result in the consumption of energy, or create new vehicle trips. The project site would remain in the current condition, and a change in greenhouse gas emissions would not occur.

Buildout Pursuant to Existing City Designations

The Suisun City General Plan designations for the project site include 10 acres of General Commercial and 162 acres of Limited Industrial/Business Park. Based upon an estimated floor area ratio (FAR) of 0.3 for the General Commercial and 0.4 for the Limited Industrial/Business Park, the Alternative would contain 130,680 square feet of commercial area and 2.8 million square feet of business park uses. The FAR assumed (0.4) for the Limited Industrial/Business Park portion of the site is consistent with the FAR specified in the Suisun City General Plan for the Limited Industrial/Business Park land use designation. The Suisun City General Plan states that the average FAR for General Commercial uses is 0.35 FAR. Though the FAR used for this analysis is slightly less at 0.3, an FAR of 0.3 is consistent with what is allowed in the General Plan for the General Commercial designation. Under the Buildout Pursuant to Existing City Designations Alternative, the entire 171.50-acre annexation area would be developed, compared to the proposed project which would result in the development of Planning Areas 1 through 3, which consists of approximately 87.82 acres. As with the project as proposed, annexation to the City is a necessary aspect of this alternative. (See Figure 4.1-1 for land use diagram).

Environmental Effects

Land Use/Agricultural Resources

The Buildout Pursuant to Existing City Designations Alternative would result in the development of the entire project area in accordance with the General Plan. The development would include 162 acres of Limited Industrial/Business Park uses as well as 10 acres of General Commercial. Unlike the proposed project, which would require a General Plan Amendment, this Alternative would be consistent with the General Plan, particularly, Policy 20. Policy 20 states that the project site should be built for business park land uses. (The Alternative does require annexation into the City, however.) In addition, this Alternative would not include a mix of residential and commercial uses as would the proposed project; therefore, incompatibility impacts associated with noise and light and glare would not result. However, light and glare impacts on the Suisun Marsh could still result under this Alternative as the business park and commercial uses would introduce a substantial amount of new lighting sources, resulting in a potentially significant impact. Overall, the land use impacts would be expected to be reduced for the Buildout Pursuant to Existing City Designations Alternative.

In regards to agricultural resources, the Buildout Pursuant to Existing City Designations Alternative would result in the conversion of more agricultural land than the proposed project (approximately 85 more acres). However, none of the farmland that would be converted under the proposed project or this Alternative would be considered prime farmland, farmland of statewide importance, or unique farmland. However, as this Alternative would still result in a greater loss of agricultural land, impacts would be increased as compared to the proposed project.

Aesthetics

The Buildout Pursuant to Existing City Designations Alternative would include the development of the entire 171.50-acre annexation area. This includes the area designated for the proposed project as Planning Area 4, which would be preserved as an open space and wetland reserve. Therefore, because this Alternative would develop the entire project area and would not include any open space reserve, the Alternative would result in a significant and unavoidable impact to the wetlands on the project site, including Planning Area 4. Because this Alternative would develop more vacant area than the proposed project, it would result in increased impacts to aesthetics.

Air Quality

The Buildout Pursuant to Existing City Designations Alternative would develop the entire 171.50-acre annexation area. As noted below in the Traffic and Circulation Discussion, the scale of this buildout would result in a net increase in total daily trips of approximately 9,000 trips per day, or a 30 percent increase, when compared to the proposed project. The EIR notes that the proposed project would be expected to exceed project-level and cumulative air quality standards, resulting in a significant and

unavoidable impact. The buildout of this Alternative would further increase vehicle emissions associated with the project area by approximately 30 percent more than the proposed project. Because of the increased number of trips generated by the Alternative, air quality impacts would be increased compared to the proposed project.

Noise

The No Project/Buildout Pursuant to Existing City Designations would develop the all four sites of the proposed project Area. As noted below in the Traffic and Circulation Discussion, the scale of this buildout would result in a net increase in total daily trips of approximately 9,000 trips per day. This would result in an increase in total traffic noise generation when compared to the proposed project. However, the buildout of this Alternative would be consistent with the General Plan land use designations. Additionally, there are no existing sensitive receptors in the project area, and this Alternative would not include the introduction of residential sensitive receptors in close proximity to the existing railroad lines in the project area. Though traffic-related noise impacts would increase, this Alternative would not place sensitive receptors in close proximity to new and existing noise generators, and would therefore have fewer impacts related to noise than the proposed project.

Traffic and Circulation

In addition to developing the area designated by the proposed project as Planning Areas 1 through 3, the Buildout Pursuant to Existing City Designations Alternative would include the development of Planning Area 4, which the proposed project designates as open space. According to Table 4.5-5A from the Traffic and Circulation Chapter of this EIR, the trip generation rates for the 15,683 square feet of Light Industrial/Business Park land uses in the proposed project would result in 173 estimated total daily trips. Based upon this ratio of 1 trip per 90.6 square feet of business park, this Alternative, which would include an estimated 2.8 million square feet of business park uses, would result in over 30,000 total daily trips. As Table 4.5-5A shows, the proposed project is estimated to generate a total of 21,691 daily trips for all on-site land uses. This would be a total increase of approximately 30 percent more trips generated by this Alternative when compared to the proposed project. Therefore, the buildout of this Alternative would result in substantially more total daily trips than the proposed project and have a greater impact on local traffic and circulation.

Biological Resources

The Buildout Pursuant to Existing City Designations Alternative would result in the development of the entire 171.50-acre annexation area for Commercial and Limited Industrial/Business Park uses. The proposed project would result in the development of approximately 88 acres of land, which includes 35.7 acre of wetlands. The additional acreage included in this Alternative contains wetland areas that would be converted if the Alternative was approved and constructed, resulting in a significant and unavoidable

impact. Therefore, because the Alternative would result in the conversion of additional wetland acreage, the Alternative would have increased impacts to biological resources.

Hydrology and Water Quality

The Buildout Pursuant to Existing City Designations Alternative would result in the development of the entire 171.50-acre annexation area. This Alternative would result in the creation of more impervious surfaces than the proposed project. The addition of impervious surfaces would impact drainage patterns and stormwater runoff quality. This Alternative would have a significant impact to hydrology and water quality. Because this Alternative would develop a larger total area, the impacts related to hydrology and water quality would be expected to be greater than those associated with the proposed project.

Public Services and Utilities

The Buildout Pursuant to Existing City Designations Alternative would necessitate the extension of public services infrastructure (i.e., water and wastewater) to the 171.50-acre annexation area, whereas, the proposed project would necessitate the extension of public services to an 87.82-acre area (Planning Areas 1 through 3). These services would include the onsite sewer network, which, for the proposed project would include an estimated 6,000 feet of on-site piping. Additionally, increased infrastructure for water lines would also be required~~,~~; the Public Services chapter of this Draft EIR estimates that the proposed project would require 14,000 feet of pipe for water access lines, and an additional 6,000 feet of pipe to supply connections to the development. This Alternative would nearly double the total area of the proposed project and would require substantially more infrastructure to support sewage and water systems to the entire development. Regarding water demand, the project engineer has estimated that this Alternative would require approximately 1,000-gpm peak hour demand. This is determined by considering the Suisun Solano Urban Water Management Plan (UWMP), specifically Figure 3 contained at the back of the Plan. The Gentry Project is shown as Area "H" in Figure 3, and is shown as all industrial. Figure 5 of the UWMP lists the project site as having 625,000 sq.ft. retail power center and residential. The projected water demand for buildout pursuant to existing zoning (1,000 gpm) is nearly double the water demand projected for the proposed Modified Alternative 1 (525 gpm; see Section 4.8). As discussed in Section 4.8 of this document, the treatment capacity of the Cement Hill Water Treatment Plant does not have adequate capacity to serve buildout of the SSWA service area, which includes the Modified Alternative 1 version of the project. Therefore, should the Buildout Pursuant to Existing City Designations Alternative be implemented, impacts to water treatment capacity would be further exacerbated.

The buildout of the project area pursuant to existing City land use designations would include light industrial/business park uses totaling approximately 2.8 million square feet. However, the proposed project would include 359 residential units in addition to 719,839 square feet of commercial development. These residential land uses would be expected to be notably more intense in regard to water and wastewater demands than the light industrial/business park land uses proposed for this Alternative.

Demand for police and fire services could also be greater for the proposed project than the Buildout Pursuant to Existing City Designations Alternative, as the commercial and residential uses associated with the proposed project could be expected to generate more incidents requiring these services. The City of Suisun maintains a ratio of one officer for every 1,000 residents. The Buildout Pursuant to Existing City Designations Alternative would not increase the total residents in the City, and, by policy, would not require the addition of any uniformed officers. Additionally, the Buildout Pursuant to Existing City Designations Alternative would be required to pay Public Facilities Fees to the City in accordance with City Council Resolution No. 94-6, which specifies that office developments contribute $234 per 1,000 square feet of development. Under this fee structure, this alternative would contribute approximately $655,000 to the City's public facilities program, which would be expected to offset the needs for additional police and fire infrastructure, reducing the impact to a less-than-significant level.

Because the Buildout Pursuant to Existing City Designations Alternative would not include residential development, other public services, such as libraries and public schools, would not be impacted by the development of the alternative, whereas the development of the proposed project would result in the addition of over 1,000 new residents to the City of Suisun. As a result, the impacts associated with public facilities for this alternative would be significantly less than those associated with the proposed project.

Therefore, though the development of the Alternative would include a larger total area, the total needs associated with public services to the project area would be expected to be similar, if not slightly decreased under this Alternative~~.~~, with the exception of needed water treatment plant capacity.

Energy

The Buildout Pursuant to Existing City Designations Alternative would include the development of approximately 130,680 sq. ft. of commercial and 2.8 million sq. ft. of business park land uses in the proposed project area. This would be a large increase over the total scope of the proposed project, which would include approximately 740,000 sq. ft. of commercial and light industrial development and 359 residential units. Energy uses associated with Light Industrial/Business Parks, which include HVAC units, lighting, and general energy consumption associated with office operations, such as computers, would result in an increased total energy demand when compared to the proposed project.

Socio-economic

The Buildout Pursuant to Existing City Designations Alternative would include 130,680 sq. ft. of commercial development compared to the 719,839 sq. ft. of commercial development associated with the proposed project. As a result of the markedly decreased commercial square footage, the Alternative would result in fewer impacts to existing businesses by not diverting as many sales when compared to the proposed project.

Additionally, the Light Industrial/Business Park uses associated with the Alternative would increase the local employment base and help stimulate economic growth in the area. Therefore, because the Alternative would stimulate employment and be less likely to impact existing businesses in the City of Suisun, the Alternative would be expected to have fewer impacts than the proposed project.

Hazards

The Buildout Pursuant to Existing City Designations Alternative would include 130,680 sq. ft. of commercial development and 2.8 million square feet of business park uses compared to the 719,839 sq. ft. of commercial development associated with the proposed project. Therefore, impacts to the on-site gas pipelines, high-voltage power lines, and the adjacent landfill would be similar to the proposed project.

Cultural Resources

The Buildout Pursuant to Existing City Designations Alternative would include 130,680 sq. ft. of commercial development and 2.8 million square feet of business park uses compared to the 719,839 sq. ft. of commercial development associated with the proposed project. Therefore, impacts to potential on-site cultural resources would be similar to the proposed project.

Global Climate Change

The bulk of new GHG emissions associated with this alternative would be due to transportation and on-site fuel combustion. New emissions from vehicles were estimated using the CARB's EMFAC-2007 model emission factors for CO_2 multiplied by Vehicle Miles Traveled as estimated by the URBEMIS-2002 program. Vehicle emissions for methane and nitrous oxides were based on published emission factors. Natural gas combustion emissions were estimated using URBEMIS-2002 defaults for natural gas consumption. These usage factors were multiplied by published emissions factors. The estimated GHG emission for this Alternative is 27,964 tons per year (CO_2-equivalent), which would be greater than either Modified Alternative 1 (18,120) or Alternative 2 (20,080).

Resource Avoidance Alternative

The Resource Avoidance Alternative would result in a reduced level of development on the project site. More specifically, this Alternative is designed to avoid the wetland habitats located on the 172-acre annexation site. As illustrated in Figure 5-2~~1~~, the buildout under this Alternative would be limited to non-wetland areas on Planning Area 1, Planning Area 2, and Planning Area 3. The total development area consists of 49.61 acres. As indicated in Figure 5-1, a 25-foot buffer would be located around the development area, in order to decrease edge effects associated with the placement of commercial and residential uses in the immediate vicinity of sensitive wetland habitats. For the sake of analysis, this discussion assumes that the buildout of the Alternative

would include a land use ratio similar to that of the proposed project (commercial and residential land uses with a small portion of industrial/business park development.)

Environmental Effects

Land Use/Agricultural Resources

The Resource Avoidance Alternative would result in buildout similar to the proposed project, and would require several portions of the proposed project area (P1, P2 and P3 in Figure 5-1) to be re-designated from Light Industrial/Business Park uses to Commercial and Residential and annex the entire proposed project area into the City of Suisun, resulting in a potentially significant impact. Additionally, under this Alternative a approximately 130 acres of the project site that is currently designated by the General Plan to be Light Industrial/Business Park, would remain vacant, open space, and only 50 acres of the project area would be developed. This would conflict with the current General Plan designation for the area, which designates the entire project area for development, and would result in a potentially significant impact in regard to current land use designations (see Figure 4.1-1 which illustrates the current General Plan land use designations).

Therefore, because this Alternative would be inconsistent with General Plan Land uses and would require the re-designation of land uses on the project site, the Resource Avoidance Alternative would be expected to result in a significant and unavoidable impact. Because the proposed project would require similar re-designations, the proposed project and this alternative would have similar impacts in regard to land use.

In regards to agricultural resources, the Resource Avoidance Alternative would result in the conversion of less agricultural land than the proposed project (approximately 37 fewer acres). Although the on-site soils are not considered prime farmland, this Alternative would still result in a decreased loss of agricultural land.

Aesthetics

The Resource Avoidance Alternative would decrease the total developed area of the proposed project and avoid development on any areas identified as wetlands, resulting in the development of approximately 50 total acres (see Figure 5-1.) Despite this decrease, similar to the proposed project, the Resource Avoidance Alternative would cause a significant impact in regard to changing the visual character of the site. However, the proposed project would develop 87.82 total acres and would therefore develop approximately 37 more acres of open space than the Resource Avoidance Alternative. As a result, the Alternative would have fewer impacts in regard to aesthetics on and surrounding the project area.

Air Quality

The Resource Avoidance Alternative would the development of approximately 50 acres and would result in fewer residential units, commercial and industrial developments than the proposed project, which would occupy approximately 88 acres. The Transportation and Circulation chapter of this Draft EIR found that the proposed project would be expected to produce an estimated 21,691 vehicle trips per day. Using these base projections, the Resource Avoidance Alternative would be expected to produce approximately 12,147 total trips per day. Table 5-2~~1~~ shows the estimated regional emissions for the proposed project in pounds per day.

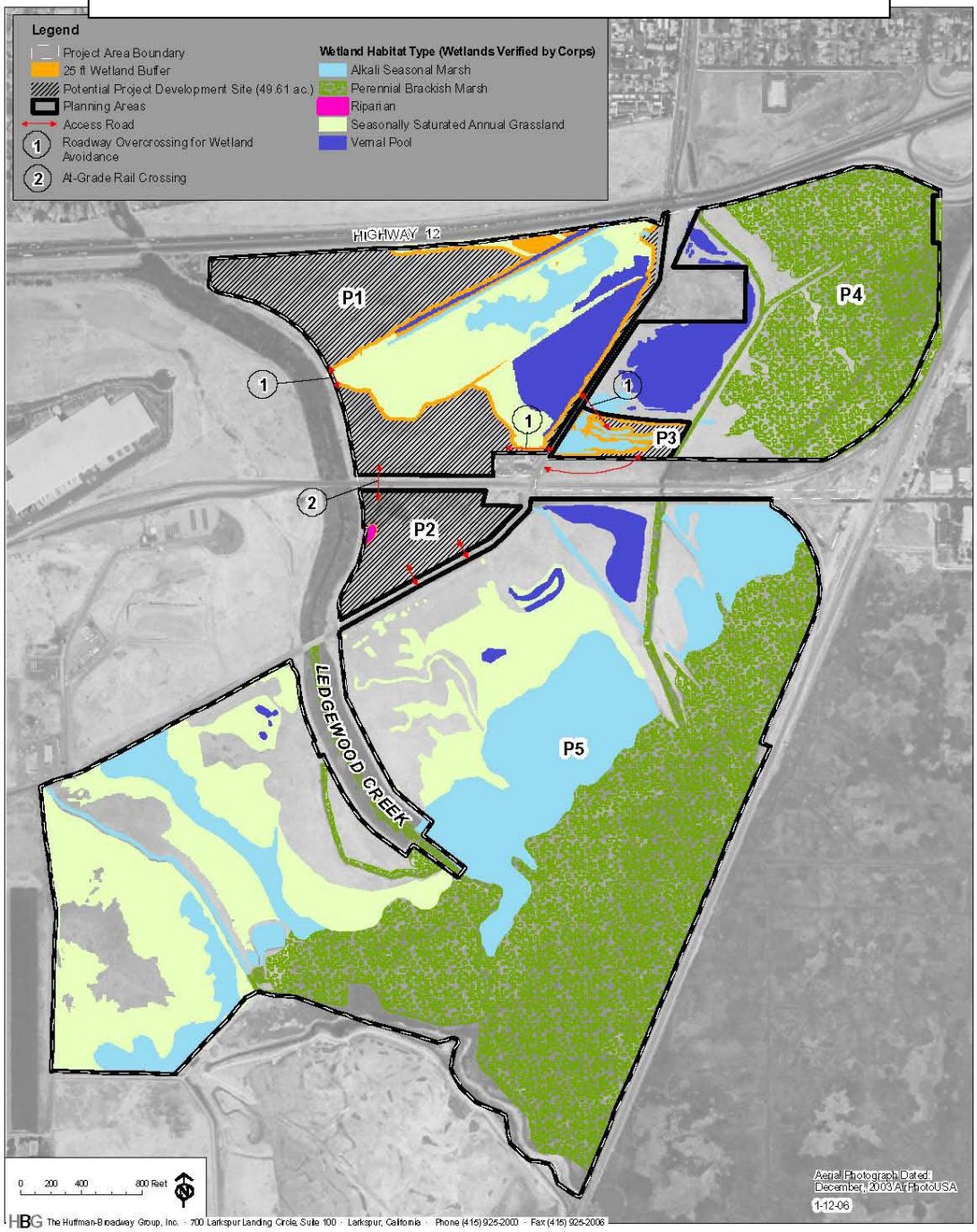
Table 5-2~~1~~
Project Regional Emissions in Pounds Per Day

	ROG	NO_x	PM_{10}
proposed project	166.7	164.8	143.1
BAAQMD Threshold of Significance	**80.0**	**80.0**	**80.0**

Source: Don Ballanti, 2005.

Because of the reduced size of the Resource Avoidance Alternative, the alternative would be expected to result in an estimated 56 percent decrease in total vehicle-based and operational emissions when compared to the proposed project. As a result, the Resource Avoidance Alternative would decrease the ROG and NO_x emissions to approximately 92 pounds per day, and decrease PM_{10} to approximately 82 pounds per day. Though these emissions would remain above the BAAQMD thresholds of significance and therefore be a potentially significant impact, the implementation of the Resource Avoidance Alternative would result in a substantial decrease in total emissions when compared to the proposed project.

Figure 5-1
Resource Avoidance Alternative Diagram



Attachment A. CEQA Analysis, Total Avoidance of Wetlands, Gentry-Suisun Project, Suisun City, CA

Noise

The Resource Avoidance Alternative would result in fewer residential units, commercial and industrial developments than the proposed project. The alternative would result in fewer total trips generated and fewer sensitive receptors introduced to the project site, and a decrease in total noise generation at sensitive receptors when compared to the proposed project. Therefore, though the Alternative would introduce new sensitive receptors to the area and have a potentially significant impact in regard to noise levels, there would be fewer noise related impacts associated with the Resource Avoidance Alternative than the proposed project due to the decreased scale of the Alternative.

Traffic and Circulation

The Resource Avoidance Alternative would result in fewer residential units, commercial, and industrial developments than the proposed project. The Transportation and Circulation chapter of this Draft EIR found that the proposed project would be expected to produce an estimated 21,691 vehicle trips per day. Using these base projections, the Resource Avoidance Alternative would be expected to produce approximately 12,147 total trips per day. This would result in a substantial decrease in total trip generation. However, this Alternative would still be expected to result in significant traffic impacts. Overall, due to the decrease in the total development area associated with the Resource Avoidance Alternative, the Alternative would be expected to have fewer impacts associated with traffic and circulation when compared to the proposed project.

Biological Resources

The Resource Avoidance Alternative would avoid development of wetland areas, decreasing the total development area by over 35 acres. The conservation of existing wetland areas associated with the Resource Avoidance Alternative, which could support special status plants and wildlife, would be expected to have a less-than-significant impact to biological resources. Therefore, because the proposed project would result in the development of a large portion of wetland area, this Alternative would have far fewer impacts than the proposed project in relation to biological resources.

Table 5-3~~2~~
Resource Avoidance Alternative, Gentry-Suisun Project

Potential Project Development Sites With total Wetlands Avoidance	Access Routing Possibilities	Access Limitations If Total Avoidance of Wetland Impacts	Other Significant Constraints On Development
PA1-A (south portion of PA1)	Access from: • Pennsylvania north of auto wrecking yard and railroad. • Access from Cordelia Highway via P2 and an at	1. Total Avoidance of Wetlands 2. Wetlands could be clear spanned or abutment / pier supported (minimum 2 feet	Still have to provide mitigation for Swainson's hawk and indirect impacts to Vernal pool habitat, but all mitigation can be done on Barnfield and Tooby properties. Conservation easement and funding endowment for in perpetuity long-term management/protection

Table 5-~~3~~2
Resource Avoidance Alternative, Gentry-Suisun Project

Potential Project Development Sites With total Wetlands Avoidance	Access Routing Possibilities	Access Limitations If Total Avoidance of Wetland Impacts	Other Significant Constraints On Development
	grade rail crossing. • Access with clear span bridge over creek from the west	high). 3. Minimum 25 foot (average) buffer adjacent to all wetlands.	will be required. Would still have to mitigate for impacts to Contra Costa Goldfields Critical Habitat Unit 10G and initiate consultation with the USFWS through a Section 10 process. Infrastructure costs for drainage, water, sewer and other utilities remains roughly constant while the effective net usable project size is diminished to less than one-half. Irregular configuration of the parcel and the limited access may not be considered commercially viable
PA1-B (northwest portion of PA1)	Access from: • Pennsylvania north of auto wrecking yard and railroad. • Access from Cordelia Highway via PA1-A and an at grade rail crossing and a low over crossing (minimum 2 feet high) over wetlands • Access from HY 12 • Access with clear span bridge over creek from the west	1. Total Avoidance of Wetlands 2. Wetlands could be clear spanned or abutment / pier supported (minimum 2 feet high). 3. Minimum 25 foot (average) buffer adjacent to all wetlands except vernal pool habitat.	Still have to provide mitigation for Swainson's Hawk and indirect impacts to Vernal pool habitat, but all mitigation can be done on Barnfield and Tooby properties. Conservation easement and funding endowment for in perpetuity long-term management/protection will be required. Would still have to mitigate for impacts to Contra Costa Goldfields Critical Habitat Unit 10G and initiate consultation with the USFWS through a Section 10 process. Infrastructure costs for drainage, water, sewer and other utilities remains roughly constant while the effective net usable project size is diminished to less than one-half Access from SR 12 to PA1-B is not feasible. The irregular configuration of the parcel and the limited access is not commercially viable.
PA2	Access from: • Cordelia Highway	1. Total Avoidance of Wetlands 2. Minimum 25 foot (average) buffer adjacent to all wetlands.	Still have to provide mitigation for Swainson's hawk and indirect impacts to Vernal pool habitat, but all mitigation can be done on Barnfield and Tooby properties. Conservation easement and funding endowment for in perpetuity long-term management/protection will be required.

Table 5-~~3~~2
Resource Avoidance Alternative, Gentry-Suisun Project

Potential Project Development Sites With total Wetlands Avoidance	Access Routing Possibilities	Access Limitations If Total Avoidance of Wetland Impacts	Other Significant Constraints On Development
			Would still have to mitigate for impacts to Contra Costa Goldfields Critical Habitat Unit 10G and initiate consultation with the USFWS through a Section 10 process. Infrastructure costs for drainage, water, sewer and other utilities remains roughly constant while the effective net usable overall project size is diminished to less than one-half. Loss of existing low elevation riparian area as a drainage sump will necessitate costly replacement with an alternate facility and concommitent loss of developable land area.
PA3	Access from: • Pennsylvania Avenue entering the property from the northwest over crossing wetlands at narrows point, • via city property to the south.	1. Total Avoidance of Wetlands 2. Wetlands could be clear spanned or abutment / pier supported (minimum 2 feet high. 3. Minimum 25 foot (average) buffer adjacent to all wetlands except vernal pool habitat.	Still have to provide mitigation for Swainson's hawk and indirect impacts to Vernal pool habitat, but all mitigation can be done on Barnfield and Tooby properties. Conservation easement and funding endowment for in perpetuity long-term management/protection will be required. Would still have to mitigate for impacts to Contra Costa Goldfields Critical Habitat Unit 10G and initiate consultation with the USFWS through a Section 10 process. Infrastructure costs for drainage, water, sewer and other utilities remains roughly constant while the effective net usable project size is diminished to less than one-half The irregular configuration of the parcel and the limited access makes development not viable.

Hydrology and Water Quality

The Resource Avoidance Alternative would result in the creation fewer impervious surfaces and a fewer impacts to existing drainage patterns in the project area. Additionally, seasonal marshes and vernal pools, as identified in Figure 5-1, would not be impacted, as the Alternative would avoid development in wetland areas there. The Resource Avoidance Alternative would decrease the total area developed by approximately 37 acres, the impacts associated with hydrology and water quality for this alternative would be expected to be less-than-significant. Therefore, the Alternative

would have fewer impacts to hydrology and water quality when compared to the proposed project.

Public Services and Utilities

The Resource Avoidance Alternative would result in a decrease in the scale of the proposed project, reducing the total number of residential units from 359 to approximately 200, as well as a decrease in commercial uses from 719,839 sq. ft. to 403,110 sq. ft. and light industrial land uses from 15,682 to 8,782 sq. ft. Accordingly, this alternative would decrease the need for water and wastewater infrastructure, including water treatment infrastructure, by approximately 56 percent, as well as decrease the impacts relating to public schools, libraries and fire protection.

Additionally, the Resource Avoidance Alternative would add approximately 640 new residents to the City of Suisun (200 residential units x 3.2 estimated residents per household, as per General Plan standards). The proposed project would be expected to result in an increase in 1,264 residents (395 residential units x 3.2 estimated residents per household, as per General Plan standards). The Suisun Police Department maintains a ration of one officer per every 1,000 residents, given this standard, the Resource Avoidance Alternative would have a smaller impact in regard to the need for increased police services in the City of Suisun.

The Resource Avoidance Alternative would be expected to have a less-than-significant impact in regard to public services and utilities. Therefore, the Resource Avoidance Alternative would result in a decreased need for public services and utilities on the project site when compared to the proposed project.

Energy

The Resource Avoidance Alternative would avoid development on wetland sites within the project area. As a result, the Alternative would result in a decrease in the scale of the proposed project, reducing the total number of residential units from 359 to approximately 200, as well as a decrease in commercial uses from 719,839 sq. ft. to 403,110 sq. ft. and light industrial land uses from 15,682 to 8,782 sq. ft. Therefore, because the Alternative would result in a smaller-scale buildout, the operational and construction related energy needs associated with the site would e expected to be fewer than the proposed project.

Socio-economic

The Resource Avoidance Alternative would result in a decrease in the scale of the proposed project, creating fewer commercial, industrial and residential sites than the proposed project. As a result, the Alternative would introduce fewer new sources of commercial competition, which could in turn create an increase in urban decay. Additionally, this Alternative would decrease the number of new residents introduced to the site, which would decrease any impacts associated with the current employment base

in and surrounding the City of Suisun. Therefore, impacts related to the Resource Avoidance Alternative would be fewer than the proposed project.

Hazards

The Resource Avoidance Alternative would result in a decrease in the scale of the proposed project, creating fewer commercial and residential sites than the proposed project. The areas avoided for preservation of wetlands substantially includes those areas which contain the high-voltage powerlines and gas pipelines. In addition, development around the landfill site would be reduced. Therefore, impacts related to hazards under the Resource Avoidance Alternative would be fewer than the proposed project.

Cultural Resources

The Resource Avoidance Alternative would result in a decrease in the scale of the proposed project, creating fewer commercial and residential sites than the proposed project. The reduction in total developed area would reduce the potential to disturb unknown cultural resources. Therefore, impacts related to cultural resources under the Resource Avoidance Alternative would be fewer than the proposed project.

Global Climate Change

The bulk of new GHG emissions associated with this alternative would be due to transportation and on-site fuel combustion. New emissions from vehicles were estimated using the CARB's EMFAC-2007 model emission factors for CO_2 multiplied by Vehicles Miles Traveled as estimated by the URBEMIS-2002 program. Vehicle emissions for methane and nitrous oxides were based on published emission factors. Natural gas combustion emissions were estimated using URBEMIS-2002 defaults for natural gas consumption. These usage factors were multiplied by published emissions factors. The estimated GHG emission for this alternative is 18,873 tons per year (CO_2-equivalent). The projected emissions would be higher than Modified Alternative 1. Generally, the reason why emissions would be slightly higher for this Alternative is two-fold: 1) for this Alternative, some level of development is anticipated on PA 3; and 2) higher residential densities have been assumed for this Alternative on both PA 2 and PA 3. It should be noted that the residential densities assumed for PA 2 and PA 3 are the same densities assumed for the Base Project (see Table 3-3 of the original DEIR). More specifically, the following assumptions were used in calculating the carbon emissions estimate for the Resource Avoidance Alternative:

- Total development acreage = 49.61 acres
- PA 3 consists of 4 acres of total area (total development area minus on-site wetlands is 2.2 acres) 2.2 acres x 21 du/acre = 46 du's
- PA 2 consists of 13.11 acres; 13.11 acres x 21du/acre = 275 du's
- PA 1 consists of 32.5 acres; 32.5 acres x 0.3 FAR = 424,710 square feet of retail uses.

Environmentally Superior Alternative

An EIR is required to identify the environmentally superior alternative from among the range of reasonable alternatives that are evaluated. Section 15126(d)(2) of the CEQA Guidelines requires that an environmentally superior alternative be designated and states that "if the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives." Generally, the environmentally superior alternative is the one that would result in the fewest unmitigable impacts or less environmental impact overall.

The CEQA Guidelines (Section 15126.6(e)(2)) further state that if the environmentally superior alternative is the "No Project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. For the Suisun-Gentry Project, aside from the No Project Alternative, the Resource Avoidance Alternative would be considered the environmentally superior alternative. Although the Resource Avoidance Alternative would not achieve all of the applicant's project objectives (in particular, Objectives C-1, D-1 and D-5 listed at the beginning of the Alternatives section), the Resource Avoidance Alternative would result in fewer environmental impacts than the proposed project while still providing some commercial, residential and industrial land uses consistent with the goals of the applicant.

The Resource Avoidance Alternative would avoid construction on parts of the project area identified as wetland resources. This would reduce the total development area to areas P1, P2 and P3 in Figure 5-1. As a result, the Resource Avoidance Alternative would not result in significant and unavoidable impacts related to the loss of wetland habitat that has the potential to support special-status species plants and animals. However, this Alternative would require the applicant to greatly reduce the scale of the proposed project to levels that may not allow for all of the project objectives to be adequately met.

In addition, the Resource Avoidance Alternative would not place as many sensitive receptors in close proximity with existing railroad lines as well as decreasing the total number of vehicle trips generated by the project. As a result impacts related to traffic, air quality and noise would all be decreased by this Alternative.

Because the Resource Avoidance Alternative would result in the construction of fewer residential, commercial and business land uses than the proposed project, this Alternative would also have create fewer impervious surfaces, require fewer public services, utilities and energy, have fewer impacts related to the socio-economic climate of the City of Suisun, reduce impacts related to hazards, reduce the potential for impacts to cultural resources, and reduce the total amount of greenhouse gases produced by the project.

APPENDIX L

DRAFT

Suisun – Solano Water Authority

WATER SUPPLY OPTIONS TO MEET FUTURE DEMANDS

July 3, 2007

Summers Engineering, Inc.
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Suisun – Solano Water Authority

Water Supply Options
To Meet Future Demands

July 3, 2007

Summers Engineering, Inc.
Consulting Engineers
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INTRODUCTION

The population and development within the Suisun-Solano Water Authority (SSWA) service area continues to increase and grow. The preparation of the Water Supply Assessment for the Gentry Gateway Project, March 2004, determined the estimated peak water demand in the SSWA service area at eventual buildout would exceed the water production capability of the existing Cement Hill Water Treatment Plant. Buildout is defined as the ultimate development of all undeveloped commercial and residential properties within the SSWA service area. This report describes the existing SSWA water supply capability, estimates the future water supply requirements, summarizes the water supply options reviewed in the last few years, and then updates the SSWA preferred and recommended options and costs to meet the future demand requirements.

WATER SUPPLY

The growth in the service area and ultimate buildout water demands for SSWA were reviewed with Suisun City staff and updated. The estimated ultimate buildout water demands for SSWA are attached in Appendix A. This demand projection was based on a review of the existing and future proposed or anticipated development within the service area. Table 1 summarizes the estimated ultimate maximum day water demand at 11.08 million gallons per day (mgd) in the service area or 7,691 gallons per minute (gpm). Water treatment facilities within the service area are designed to meet the maximum day demand. Water storage tanks provide additional water supplies which are utilized to meet the peak hour demands during the maximum day. Listed in Table 1 is the existing Cement Hill Water Treatment Plant (CHWTP) maximum day capacity, estimated at 8.5 million mgd. Staff testing confirms CHWTP can sustain a flow rate of 8.5 mgd and would likely be able to maintain a one day peak flow of 9.0 mgd. This flow, however, could not be maintained over a several day period. Subtracting the existing production capacity from the ultimate maximum day water demand indicates an additional water supply demand of approximately 1,788 gpm (2.57 mgd) is required.

Summarized in Table 2 is a tabulation listing the past, present and projected population for Suisun City through 2020. The 2020 projected population at buildout, estimated at 33,000, was confirmed with Suisun City staff in the Fall of 2006. Growth is continuing throughout the SSWA service area. Table 2 indicates the present population is nearing the ultimate buildout. Also listed in Table 2 is the projected maximum day water demands for the respective future population. It is assumed the ultimate buildout of the service area will occur by 2020, however, this population is based on the ultimate development of the remaining buildable lots. The projected maximum day demand, therefore, is dependant on the ongoing, reasonable development within the service area. The actual projected maximum day demand should not occur until the population reaches the amount listed.

Actual historic peak flows for 1996, 1997, 2004, 2005, and 2006 are also listed at the bottom of Table 2. The projected maximum day demands were developed using a water system model which calculates a water demand based on the residential population and the acreage of commercial development. The actual maximum peak day experienced in a given year does not always match up with the projected maximum peak day flow calculated by the model. The historical perspective indicates temperatures over 100 degrees for several consecutive days are required to create the water demands in the service area assumed by the model. Therefore, if a given year does not have several consecutive days of hot weather, as described above, the actual maximum peak day demand would be less than projected by the model.

WATER SUPPLY OPTIONS CONSIDERED

Future Water Supply from City of Fairfield to Meet Increased Demand

Water supply discussions with City of Fairfield staff during 2004 -05 indicated the City of Fairfield could provide the additional peak demand requirements of SSWA. The supply options discussed included (1) connecting into a City of Fairfield water main adjacent to the existing Gregory Hill Water Treatment Plant site on Waterman Boulevard below the

2 million gallon Gregory Hill Water Storage Tank, and (2) connecting into the Fairfield distribution system along the alinement of the SSWA 20" water transmission pipeline running from the Gregory Hill Water Storage Tank to Suisun City. There is an existing intertie from Fairfield into this pipeline at Pennsylvania Avenue and Ohio Street and the suggestion was to just increase the size of the connection to meet the demand requirements. SSWA requested the City of Fairfield conduct a hydraulic analysis to verify the feasibility of the suggested options. Appendix B summarizes the results of the hydraulic analyses, the construction issues, and the connection and construction costs if the City of Fairfield was to provide the additional supplies needed to meet the peak water demand for SSWA.

Modify Clarification System at Cement Hill Water Treatment Plant No. 1 to Increase Water Supply

The original design capacity of the Cement Hill Water Treatment Plants (CHWTPs) 1 and 2 was 10 million gallons per day (mgd). The Enhanced Surface Water Treatment Rules reduction in the allowable maximum contaminant level (MCL) for turbidity and an emphasis to further improve the quality of treated water altered operation at the plant. The percentage of time filter backwashing occurs has been increased resulting in a reduced filter effluent maximum contaminant level for turbidity. However, this has also resulted in a reduction in the original treatment plant design capacity. As stated in Table 1, "Based on testing during the summer of 2004, staff believes the CHWTP could maintain a treatment capacity flow rate of 8.5 mgd …" Treatment Plant No. 1 was constructed in the late 1970's. Treatment Plant No. 2 constructed in the early 1990's is still able to meet its design capacity. Options were reviewed to determine what further improvements could be made at Treatment Plant No. 1 to increase the treatment capacity back to its original flow rate. Testing was undertaken during 2004 to determine what options might be available to further improve the clarification process and reduce the turbidity in the raw water supply. One option to increase the treatment capacity was to improve the clarification process by constructing an additional water clarification system at Treatment Plant No. 1. Table 3 is the cost estimate prepared in

2005 for the installation of a new clarification system which would reduce the raw water turbidity and thus reduce the amount of backwashing required. The estimated construction cost was $1,140,000.

Construct New Gregory Hill Water Treatment Plant

Another option to meet the ultimate peak demand for SSWA was to construct a new water treatment plant at the existing Gregory Hill Water Treatment Plant (GHWTP) site to meet the previously estimated additional maximum day demand of 2,250 gpm or a smaller GHWTP (1,400 gpm) together with modifications at Cement Hill Water Treatment Plant No. 1 to meet the ultimate maximum day demand of the SSWA service area. A Location Map for this option showing the proposed raw water pipeline from the Putah South Canal to the treatment plant site and a treated water pipeline up to the Gregory Hill Water Storage Tank is shown in Figure 1.

The original treatment plant constructed by the City of Suisun is located on the South side of Waterman Boulevard at the base of Gregory Hill. The original treatment plant was a diatomaceous earth filtration plant with a capacity of approximately 400 gpm. It has not been operated since 1989 and would require extensive renovation to utilize at the present time. The water supply for the existing site is from the Putah South Canal. Figure 1 shows an existing 12" pipeline running southerly from the Putah South Canal to the treatment plant site. The pipe alinement is between existing homes and the pipeline is not readily accessible for operation and maintenance purposes. The construction of a new treatment plant would include the installation of a new raw water pipeline running from the Putah South Canal down Capitola Way and then running westerly along Waterman Boulevard to the treatment plant site. A new 2,250 gpm treatment plant would require a 16" raw water pipeline while a 1,400 gpm treatment plant would require a 12” raw water pipeline. Estimates of cost for constructing a membrane water treatment facility at the current Gregory Hill site for either option were prepared in 2005 and are included in Tables 4 and 5. The estimated construction costs

were $5,310,000 for a 2,250 gpm treatment plant, and $3,760,000 for a 1,400 gpm treatment plant.

FALL 2005 - SSWA BOARD REVIEW OF OPTIONS

Water supply options to meet the future SSWA demands were presented to the SSWA Board in a draft April 2005 report. The SSWA Board requested further review and analysis of the following four water supply options:

1. Connect to the City of Fairfield to provide a peak supply of 2,250 gpm.
2. Construct an additional clarifier at CHWTP and connect to the City of Fairfield to provide a combined capacity of 2,250 gpm.
3. Construct a new Gregory Hill Water Treatment Plant capable of treating 2,250 gpm.
4. Construct an additional clarifier at CHWTP and construct a new Gregory Hill Water Treatment Plant to provide a combined capacity of 2,250 gpm.

All options include specific capital or connection fee costs and annual operation and maintenance costs for the facilities needed to meet the ultimate maximum day water supply demands of SSWA. Included in Appendix C is the financial analysis prepared in August 2005 for the primary options listed above. For capital expenditures it was assumed the project cost would be financed over 20 years with an interest rate of 6%. The various annual operation and maintenance charges from both the City of Fairfield and operation and maintenance charges for treating water at the Cement Hill Water Treatment Plant and the proposed Gregory Hill Water Treatment Plant are listed along with a Fairfield Suisun Sewer District volume charge for discharging into the sewer system. The financial analysis summarizes the capital costs, the estimated annual costs, and the cost per acre foot for each of the options described above.

The additional review of water supply options was presented to the Board in September 2005. The review updated the construction costs and provided a summary of the pros and cons for each of the above options, included in Table 6.

The analysis showed the construction of a new Gregory Hill Water Treatment Plant and modifications or upgrades to CHWTP would have the lowest annual capital and operation and maintenance costs. Board members expressed the opinion it would be preferable for SSWA to develop their own water supply rather than being dependent on the City of Fairfield. The Board also indicated it would be preferable to develop a water supply exceeding the estimated peak day demand. The general recommendation was SSWA should construct a new Gregory Hill Water Treatment Plant with a capacity of 2,250 gpm and also construct or modify the clarification system at CHWTP to provide additional treatment capability over and above the projected ultimate maximum day water demand.

Questions were also raised regarding the high Total Trihalomethane (TTHM) levels occurring in Suisun Valley and how SSWA was planning to address the EPA Stage 2 Disinfection Byproducts Rule in the future. The primary question which needed to be addressed was whether or not the proposed water supply options would be able to meet the Stage 2 Disinfection Byproducts rule.

FURTHER REVIEW OF TRIHALOMETHANES AND HALOACETIC ACIDS ISSUES

During 2006 an outside consultant was asked to review the water supply options under consideration and provide recommendations on treatment options which would be able to meet the EPA Stage 2 Disinfection Byproducts (DBPS) Rule and the Long Term 2 Enhanced Surface Water Treatment Rule.

The major concern in this area was the high TTHM levels occurring in Suisun Valley. Would the new water supply options be able to address this issue? What alternatives should be considered? The best way to address high disinfection byproduct levels is to provide treatment facilities capable of removing a greater percentage of organic material from the water before any chlorine is added. Water treatment recommendations included variations of treatment technologies which would improve the removal of organic material. Currently conventional treatment is being used by the majority of all other Solano Project water agencies. Solano Irrigation District is also using membrane treatment for a small treatment plant in Gibson Canyon. All of the existing systems are able to address the disinfection byproducts rules. Although other treatment options are available to further improve the removal of disinfection byproduct precursors, conventional or membrane treatment with pre-treatment options are currently successful in addressing the problems for other Solano Project water users and will be the basis for recommended treatment options to serve SSWA.

During the past year Solano Irrigation staff have eliminated pre-chlorination at the CHWTP. This has reduced the formation of DPBS in the treated water supply. DBPS, primarily TTHMs, have been an increasing problem in the Suisun Valley area. TTHMs are high because of the long residence time in the transmission pipeline to Gregory Hill Water Storage Tank (GHWST) and in the GHWST itself. TTHMs are classified as semi-volatiles. Solano Irrigation District staff conducted a study to determine if aeration could be used to volatilize and remove the TTHMs. Following a pilot study which showed successful removal of TTHMs, a recirculation pump was installed to draw water from the bottom of the GHWST and discharge a 65 gpm flow via a spray nozzle above the water line. This operation has resulted in a significant reduction in TTHMs levels both in the GHWST and in the Suisun Valley pipeline. During 2007 both the first and second quarter water quality testing for the SSWA system have been in full compliance with the EPA Stage 2 DBPS Rule. This indicates that Putah South Canal water treated at the new Gregory Hill Water Treatment Plant and delivered directly to the GHWST will

meet the EPA Stage 2 DBPS requirements in Suisun Valley and throughout the SSWA distribution system.

SSWA OPERATIONAL BENEFITS

Implementation of any option to meet the ultimate peak demand for the SSWA service area will significantly benefit SSWA system operations. At the present time, the full capacity of the 2 million gallon Gregory Hill Water Storage Tank is not being utilized. By providing a water supply from either the City of Fairfield or a new Gregory Hill Water Treatment Plant, a continual supply of water would be provided to the tank for delivery into the 20" pipeline to Suisun City or for delivery in the 6" pipeline to Suisun Valley. The option with even the lowest supply to the Gregory Hill tank, a 1,400 gpm connection to the City of Fairfield or a new treatment plant, would provide a daily turnover of the entire 2 million gallons of storage in the existing Gregory Hill Tank. A water supply into the SSWA service area from Gregory Hill, in addition to the primary water supply currently provided through the Tolenas Lateral from the Cement Hill Water Treatment Plant, would provide a secondary or supplemental water supply to meet water needs of the service area.

Utilization of the total Gregory Hill Tank storage under the options discussed above would increase the quantity of stored water available to SSWA to help meet system peaking demands, fire flow, and emergency operations. Under present operations, the Tolenas Lateral from the Cement Hill Water Treatment Plant to the service area is the sole source of supply to SSWA. Presently SSWA does not have operational flexibility to maintain a full water supply to the service area under emergency operations if any damage occurs to the Tolenas Lateral pipeline. Although SSWA has three interties with the City of Fairfield and the peak supply available from those sources would be around 2,000 gpm, this flow is less than the average annual demand in the service area.

RECOMMENDED WATER SUPPLY OPTIONS

Modify Cement Hill Water Treatment Plant No. 1 to Increase Water Supply

A further review of Treatment Plant No. 1 clarification operations was made to consider if the proposed installation of one smaller clarifier was the best option to increase the treatment plant's capacity. Treatment Plant No. 1 has a large clarifier and during hot days during peak flow conditions it experiences upwelling of its sludge blanket , which hampers efficient operation. This increases filter backwash requirements and reduces treatment capacity. One option to improve operations includes constructing an additional water clarification system at Treatment Plant No. 1. Another option is to remove the existing large clarifier and install two smaller clarifiers similar to the configuration which is working efficiently for Treatment Plant No. 2. New clarification processes are being developed, but it appears more prudent for operations staff and SSWA to construct at Treatment Plant No. 1 a clarification process identical to Treatment Plant No. 2 which has proven effective and efficient over the last 15 years. Two equal clarification processes at CHWTP would simplify the water treatment process and improve ongoing operation and maintenance by staff. Figure 2 is a Site Plan of the existing CHWTP showing where new Treatment Plant No. 1 clarifiers could be installed along with the additional piping required. Treatment Plant No. 1 has been in operation for nearly 30 years. To further improve the water treatment capacity it is also recommended the pressure filters be replaced. A gradual replacement of the pressure filters could be implemented over the next 6 years. Table 7 indicates an updated cost of $2,000,000 for the installation of two new clarifiers and the initial replacement of two pressure filters at Treatment Plant No. 1. The other three pressure filters for Plant No. 1 could be replaced during the next 6 years. Improved clarification would reduce the raw water turbidity and the amount of backwashing required. Coupled with the gradual replacement of the existing pressure filters, the changes at Treatment Plant No. 1 should increase the overall CHWTP capacity from 8.5 MGD to at least 9.75 MGD.

Construct New Gregory Hill Water Treatment Plant

Following additional review of water treatment plant options, it is recommended a water treatment plant with a capacity of 2,250 gpm be constructed at the existing Gregory Hill Water Treatment Plant site on Waterman Boulevard below Gregory Hill. Figure 3 is a Conceptual Site Plan for the proposed treatment plant. As indicated in Figure 3, there is a significant elevation difference across the site affecting the ability to construct sludge ponds to allow for full recovery of the water rejected during treatment. Backwash recovery tanks are proposed, and it has been assumed one-half of the reject or backwash water would need to be discharged to the local sewer system. A description of the proposed water treatment plant is included in Appendix D. Further discussions will be needed to clarify the costs, but initial contacts with the Fairfield Suisun Sewer District (FSSD) indicate the anticipated connection charge may be approximately $1,100,000. The updated estimated construction cost for a 2,250 gpm water treatment plant, including the sewer connection fees is $6,800,000 (Table 8).

Concluding Recommendation

Based on the Board's Fall 2005 review of water supply options and subsequent engineering analyses, it is recommended SSWA proceed with the construction of both a new 2,250 gpm (3.24 mgd) Gregory Hill Water Treatment Plant and improvements to the existing Cement Hill Water Treatment Plant to increase its capacity to 9.75 mgd. Implementation of both water supply options would provide a maximum day treatment capacity of approximately 13.0 mgd. This treatment capacity would provide a safety factor of nearly 17% over the estimated Ultimate Maximum Day Water Demand of 11.08 mgd per Table 1.

Table 1

SUISUN-SOLANO WATER AUTHORITY
Estimated Ultimate Water Demand At Buildout & Additional Water Supply Required

Description of Data	Flow	
	(GPM)	(MGD)
1. Estimated Ultimate Maximum Day Water Demand[1]	7,691	11.08
2. Existing Cement Hill Water Treatment Plant Maximum Day Capacity (8.5 MGD)[2]	5,903	8.50
3. Additional Maximum Day Capacity Required to Meet Ultimate Demand	**1,788**	**2.57**

[1] Based on SSWA Water Supply Assessment for Gentry Gateway Project, February 2004. See Appendix "A".

[2] Based on testing during the summer of 2004, staff believes the CHWTP could maintain a flow rate of 8.5 MGD and possibly could maintain a one-day peak flow of 9 MGD.

Table 2
Population Projections & Maximum Day Demand

		Projected Maximum Day Demand	
Year	Population	(Gallons Per Minute)	(Million Gallons Per Day)
1990	22,686 [1]	-	-
2000	26,118 [2]	-	-
2003	26,900 [2]	5,928 [6]	8.54
2004	27,400 [2]	6,100 [4]	8.78
2007	29,000 [4]		
2010 est.	31,900 [3]	7,750 [4]	11.16
2015 est.	32,500 [4]	7,950 [4]	11.45
2020 est.	33,000 [5]	8,137 [6]	11.72

[1] 1990 Census, Suisun City Demographics

[2] Data from California Department of Finance, Demographic Research Unit

[3] Data from Association Bay Area of Governments Projections

[4] Estimated

[5] Estimated Build Out

[6] Water Supply Assessment for the Gentry Gateway Project (2004)

Historic Peak Flows

	Treated Supply Flows	
Year	(Gallons Per Minute)	(Million Gallons Per Day)
1996	5,000	7.20
1997	4,479	6.45
2004	5,111	7.36
2005	5,479	7.89
2006	5,555	8.00

Table 3
Install Additional Clarifier At Cement Hill Water Treatment Plant No. 1
Estimate of Cost

Item No.	Work or Material	Quantity	Unit	Unit Cost	Amount
1	Furnish additional water clarification system			Lump Sum	$690,000
2	Install Clarifier			Lump Sum	$30,000
3	Furnish and Install (F&I) Reinforced Concrete	20	CY	$900	$18,000
4	Site Excavation	650	CY	$10	$6,500
5	F&I 10 inch Supply Pipe	130	LF	$130	$16,900
6	F&I 10 inch Spill Pipe			Lump Sum	$10,000
7	F&I 12 inch Outlet Pipe	125	LF	$130	$16,250
8	F&I 10" Butterfly Valves	2	EA	$4,500	$9,000
9	F&I 12 inch MOV @ Outlet			Lump Sum	$8,000
10	F&I 10" Flowmeter on Supply Pipeline			Lump Sum	$4,000
11	F&I Relocated 8 inch Wash Water Line	75	LF	$100	$7,500
12	F&I Miscellaneous Drainage Changes			Lump Sum	$15,000
13	F&I Aggregate Base	40	CY	$75	$3,000
14	F&I Additional Electrical Controls & Lighting			Lump Sum	$40,000
		Estimated Construction Cost			$874,150
		30% Contingencies & Incidentals			$265,850
		Estimated Total Cost			**$1,140,000**

Table 4
Construct 2,250 GPM Gregory Hill Water Treatment Plant
Estimate of Cost

Item No.	Work or Material	Quantity	Unit	Unit Cost	Amount
1	Furnish Membrane Water Treatment Plant			Lump Sum	$1,100,000
2	Site Piping, Earthwork, Tank, & Misc. Facilities			Lump Sum	$2,000,000
3	Remove Old Building			Lump Sum	$25,000
4	Furnish and Install (F&I) New Block Bldg.			Lump Sum	$430,000
5	F&I Pond Lining			Lump Sum	$80,000
6	F&I 16" Raw Water Pipeline From PSC	1880	LF	$150	$282,000
7	F&I PSC Inlet Structure			Lump Sum	$20,000
8	F&I Raw Water Pumps			Lump Sum	$48,000
9	F&I Treated Water Pumps			Lump Sum	$48,000
10	F&I 16" Treated Water Pipeline to Tank	600	LF	$85	$51,000
		Estimated Construction Cost			$4,084,000
		30% Contingencies & Incident			$1,226,000
		Total Cost			**$5,310,000**

Table 5
Construct 1,400 GPM Gregory Hill Water Treatment Plant
Estimate of Cost

Item No.	Work or Material	Quantity	Unit	Unit Cost	Amount
1	Furnish Membrane Water Treatment Plant			Lump Sum	$700,000
2	Site Piping, Earthwork, Tank, & Misc. Facilities			Lump Sum	$1,250,000
3	Remove Old Building			Lump Sum	$25,000
4	Furnish and Install (F&I) New Block Bldg.			Lump Sum	$430,000
5	F&I Pond Lining			Lump Sum	$80,000
6	F&I 12" Raw Water Pipeline From PSC	1880	LF	$140	$263,200
7	F&I PSC Inlet Structure			Lump Sum	$20,000
8	F&I Raw Water Pumps			Lump Sum	$41,000
9	F&I Treated Water Pumps			Lump Sum	$41,000
10	F&I 12" Treated Water Pipeline to Tank	600	LF	$70	$42,000
		Estimated Construction Cost			$2,892,200
		30% Contingencies & Incident			$867,800
		Total Cost			**$3,760,000**

Table 6

Water Supply Options - Pros and Cons

Options	Pros	Cons
1. Make connection with City of Fairfield to provide required supply of 2,250 gpm.	a. All water supply provided by City of Fairfield. b. With a supply to the Gregory Hill Tank the storage capacity can be fully utilized. c. TTHMs problems will be reduced.	a. High annual Capital and O&M costs b. High daily water volume fee - $784/AF c. Water user fees inflated annually. d. Pumping plant required to supply tank. e. Pipeline installation in Waterman Blvd. (L = 800 ft)
2. Construct an additional clarifier at CHWTP and make a connection with the City of Fairfield to provide a combined 2,250 gpm capacity.	a. Additional clarifier will improve overall efficiency of CHWTP. b. With a supply to the Gregory Hill Tank the storage capacity can be fully utilized. c. TTHMs problems will be reduced.	a. High annual Capital and O&M costs b. High daily water volume fee - $784/AF c. Water user fees inflated annually. d. Pumping plant required to supply tank. e. Pipeline installation in Waterman Blvd. (L = 800 ft)
3. Construct a Gregory Hill Water Treatment Plant capable of treating 2,250 gpm.	a. SSWA will be able to manage their own water treatment plant costs. b. With a supply to the Gregory Hill Tank the storage capacity can be fully utilized. c. TTHMs problems will be reduced.	a. Pipeline will need to be constructed from PSC along Capitola Way and Waterman Blvd. (L = 1,880 ft) b. Existing treatment plant site is small and there may be a need to drain a portion of filter backwash to the sewer. Large connection fee for this. c. Additional water treatment plant operator will likely be required.
4. Construct an additional clarifier at CHWTP and construct a Gregory Hill Water Treatment Plant to provide a combined capacity of 2,250 gpm.	a. SSWA will be able to manage their own water treatment plant costs. b. With a supply to the Gregory Hill Tank the storage capacity can be fully utilized. c. TTHMs problems will be reduced.	a. Pipeline will need to be constructed from PSC along Capitola Way and Waterman Blvd. (L = 1,880 ft) b. Existing treatment plant site is small and there may be a need to drain a portion of filter backwash to the sewer. Large connection fee for this. c. Additional water treatment plant operator will likely be required.

Table 7

Cement Hill Water Treatment Plant

Recommended Modifications at Treatment Plant No. 1

Estimate of Cost (Updated May 2007)

Item No.	Work or Material	Quantity	Unit	Unit Cost	Amount
1	Remove Existing 72' Clarifier		Lump Sum		$75,000
2	Furnish and Install (F&I) 55' Clarifiers	2	Each	$220,000	$440,000
3	F&I Pressure Filters	2	Each	$200,000	$400,000
4	F&I Reinforced Concrete	200	Cubic Yard	$1,100	$220,000
5	F&I New Manifolds		Lump Sum		$160,000
6	F&I Miscellaneous Metal	1400	Pounds	$15	$21,000
7	F&I Miscellaneous Piping		Lump Sum		$35,000
8	Excavation	1000	Cubic Yards	$20	$20,000
9	F&I Relocated 8" Washwater Line	75	Feet	$60	$4,500
10	F&I Miscellaneous Drainage Changes		Lump Sum		$20,000
11	F&I Aggregate Base	50	Cubic Yards	$60	$3,000
12	F&I Electrical Controls		Lump Sum		$125,000
		Estimated Construction Cost			$1,523,500
		30% Contingencies & Incidentals			$476,500
		Estimated Total Cost			**$2,000,000**

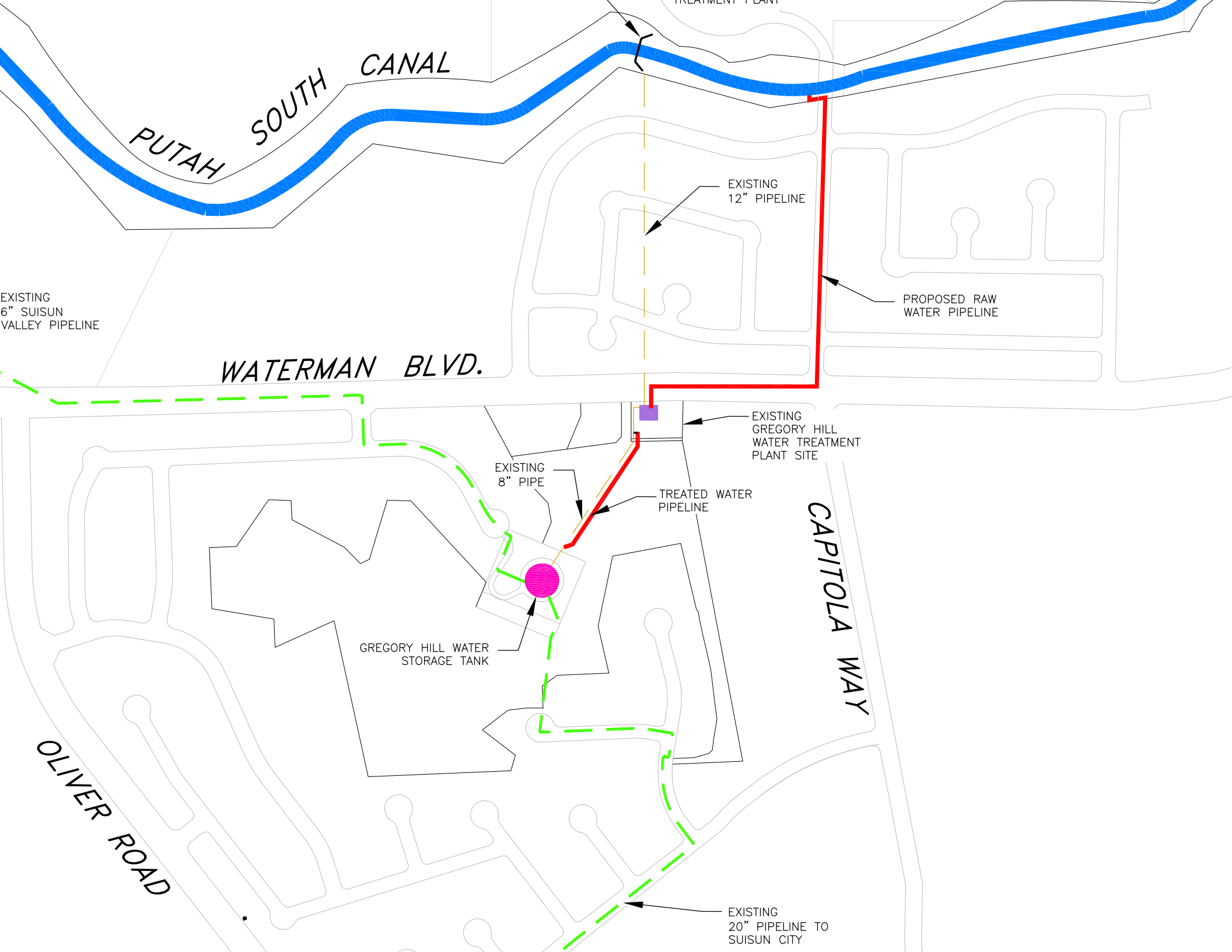
Additional Cost to Replace Remaining Pressure Filters Over Next 6 Years

Item No.	Work or Material	Quantity	Unit	Unit Cost	Amount
1	F&I Pressure Filters	3	Each	$200,000	$600,000
		Estimated Construction Cost			$600,000
		30% Contingencies & Incidentals			$180,000
		Estimated Total Cost			**$780,000**

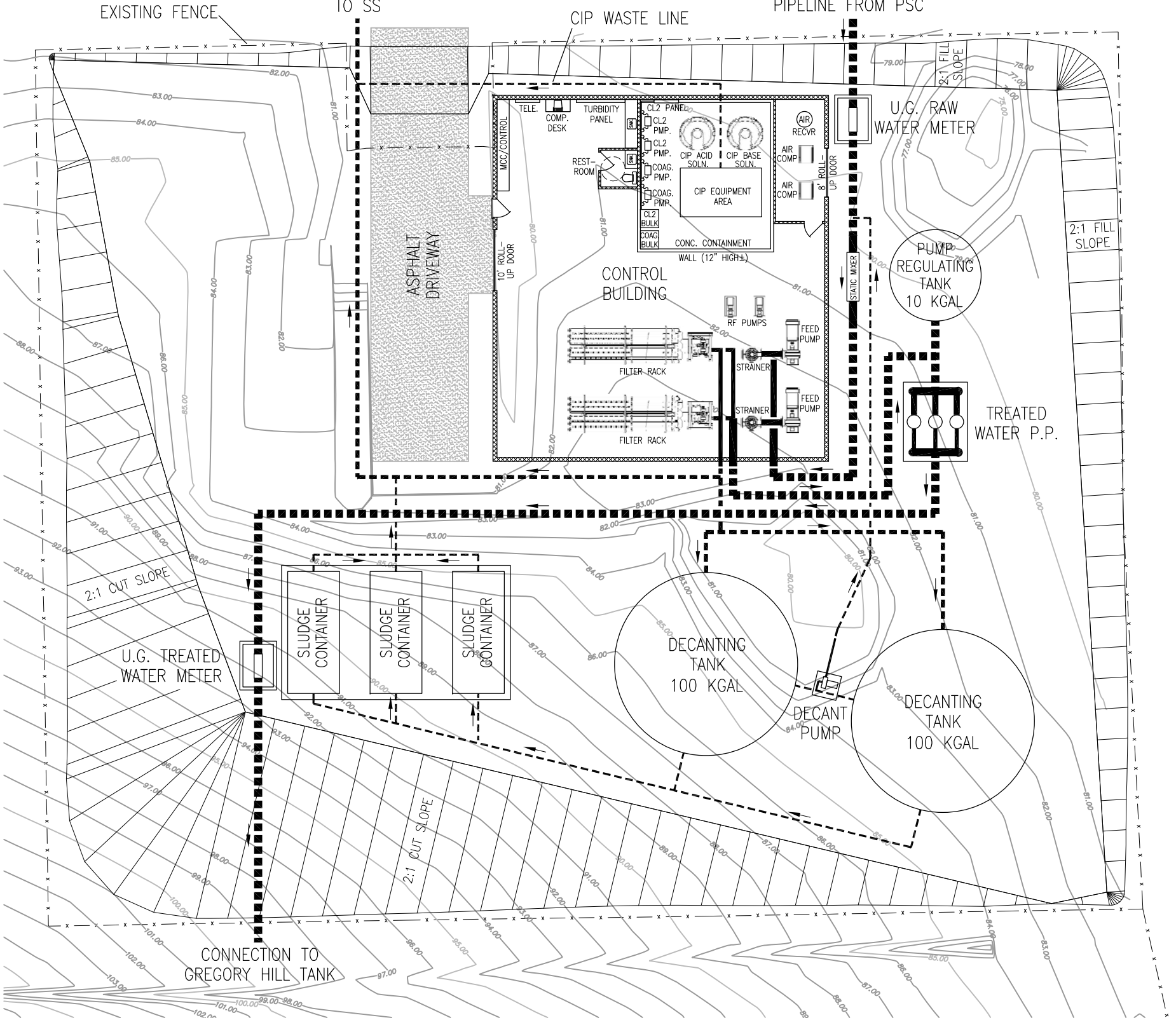
Table 8

Gregory Hill Water Treatment Plant
Recommended 2,250 GPM Capacity
Estimate of Cost (Updated May 2007)

Item No.	Work or Material	Quantity	Unit	Unit Cost	Amount
1	Furnish Membrane Water Treatment Plant		Lump Sum		$1,200,000
2	Site Piping, Manifolds, Earthwork, Tanks, Asphalt, Aggregate Base, & Miscelaneous Facilities		Lump Sum		$1,540,000
9	Remove Old Building		Lump Sum		$50,000
10	Furnish and Install (F&I) New Block Bldg.		Lump Sum		$500,000
11	F&I 16" Raw Water Pipeline From PSC	1835	Linear Feet	$180	$330,300
12	F&I PSC Inlet Structure		Lump Sum		$40,000
13	F&I Raw Water Pumps		Lump Sum		$75,000
14	F&I Treated Water Pumps		Lump Sum		$90,000
15	F&I 16" Treated Water Pipeline to Tank	600	Linear Feet	$120	$72,000
16	F&I Concrete Masonry Fencing	178	Linear Feet	$180	$32,040
17	F&I Chain Link Fencing	290	Linear Feet	$35	$10,150
18	F&I Automatic Rolling Gate with Keypad and Opener		Lump Sum		$13,000
19	F&I Electrical Equipment		Lump Sum		$400,000
		Construction Cost			$4,352,490
		30% Contingencies & Incidentals			$1,347,510
		Estimated Total Construction Cost			**$5,700,000**
		FSSD Sewer Connection Fee			$1,100,000
		Estimated Total Cost			**$6,800,000**


PUTAH SOUTH CANAL
EXISTING 12" PIPELINE
PROPOSED RAW WATER PIPELINE
EXISTING 6" SUISUN VALLEY PIPELINE
WATERMAN BLVD.
EXISTING GREGORY HILL WATER TREATMENT PLANT SITE
EXISTING 8" PIPE
TREATED WATER PIPELINE
CAPITOLA WAY
GREGORY HILL WATER STORAGE TANK
OLIVER ROAD
EXISTING 20" PIPELINE TO SUISUN CITY


EXISTING 24" PIPELINE
CLARIFIER NO.2
SPILL PIPELINE
PROPOSED
NEW CLARIFIER
SPILL PIPELINE
PROPOSED
NEW CLARIFIER
RELOCATE WASHWATER
RETURN LINE
REMOVE EXISTING
CLARIFIER
PLANT NO.2
PLANT NO.1


EXISTING FENCE
TO SS
CIP WASTE LINE
PIPELINE FROM PSC
2:1 FILL SLOPE
U.G. RAW WATER METER
TELE.
COMP. DESK
TURBIDITY PANEL
CL2 PANEL
CL2 PMP.
CL2 PMP.
COAG. PMP.
COAG. PMP.
MCC/CONTROL
REST-ROOM
CIP ACID SOLN.
CIP BASE SOLN.
CIP EQUIPMENT AREA
AIR RECVR
AIR COMP
AIR COMP
8' ROLL-UP DOOR
CL2 BULK
COAG. BULK
CONC. CONTAINMENT WALL (12" HIGH±)
10' ROLL-UP DOOR
ASPHALT DRIVEWAY
CONTROL BUILDING
STATIC MIXER
PUMP REGULATING TANK 10 KGAL
RF PUMPS
FEED PUMP
STRAINER
FILTER RACK
FEED PUMP
STRAINER
FILTER RACK
TREATED WATER P.P.
2:1 CUT SLOPE
SLUDGE CONTAINER
SLUDGE CONTAINER
SLUDGE CONTAINER
U.G. TREATED WATER METER
DECANTING TANK 100 KGAL
DECANT PUMP
DECANTING TANK 100 KGAL
2:1 CUT SLOPE
CONNECTION TO GREGORY HILL TANK

Appendix A

SSWA

Estimated Ultimate Water Demand

At Buildout

SUISUN - SOLANO WATER AUTHORITY

Estimated Ultimate Water Demand At Buildout
w/ Gentry Gateway Project

RESIDENTIAL USAGE				**SCHOOL & PUBLIC FACILITIES USAGE**	
Low Density (LD) Units/Acre		5.50	units/acre	AAWC	1.1 gpm/acre
Medium Density (MD) Units/Acre		10.50	units/acre	**PARK & SPORT COMPLEX USAGE**	
Multi-Family (MF) Units/Acre		15.00	units/acre	AAWC	1.3 gpm/acre
Persons/Unit		3.26	persons/unit	**COMMERCIAL USAGE**	
Annual Aver. Water Consumption (AAWC)		120.0	gpcd	AAWC	1.7 gpm/acre
APARTMENT USAGE -	AAWC	85.0	gpcd		
High Density (HD) Units/Acre		22.00	units/acre		
TOLENAS AREA USAGE -	AAWC	160.0	gpcd		
SUISUN VALLEY AREA USAGE -	AAWC	220.0	gpcd		
	ANNUAL AVERAGE			1.0	
	MAXIMUM MONTH			1.6	
	MAXIMUM DAY			2.1	
	MAXIMUM HOUR			3.4	

AREA NAME OR NUMBER	ACREAGE (acres)	UNITS (lots)	POPULATION	ANNUAL AVERAGE (gpm)	MAXIMUM MONTH (gpm)	MAXIMUM DAY (gpm)	MAXIMUM HOUR (gpm)
Montebella Vista		685	2,233	186	298	391	633
1. Existing Park	5.87			8	12	16	26
Area A - East and South of Montebella Vista							
1. Existing Commercial Area	1.59			3	4	6	9
2. Future Commercial Area	49.14			84	134	175	284
3. Future Sports Complex Area	39.01			51	81	106	172
4. Existing Sports Complex	40.00			52	83	109	177
Area B - South of Scandia Road and North of Hwy 12							
1. Future Commercial Area	23.88			41	65	85	138
Lawler Ranch		1,199	3,909	326	521	684	1,108
1. Existing Parks	14.00			18	29	38	62
Peterson Ranch		613	1,998	167	266	350	566
1. Future Residential Area (MF)	5	75	245	20	33	43	69
2. Future Commercial Area	3.58			6	10	13	21
NW Tolenas Area							
1. Future Residential		147	479	40	64	84	136
2. Existing Commercial	3.9			7	11	14	23
Area C - South of Bella Vista Drive, West of Walters Road, East of Drainage, & North of Hwy 12		1,973	6,432	536	858	1,126	1,822
1. Existing Dan O'Root School	6.6			7	12	15	25
2. Existing Park near School	5.0			7	10	14	22
Area D - North of Bella Vista Drive Alinement, South of Southern Pacific Railroad, & West of Storm Drain near Humphrey Drive		680	2,217	185	296	388	628
1. Existing Apartments		113	368	22	35	46	74
2. Existing Commercial Area	28.50			48	78	102	165
3. Future Commercial Area	12.10			21	33	43	70
Area E - South of Bella Vista Drive Alinement, South of Drainage Channel, North of Hwy 12, & East of Sunset Avenue		1,085	3,537	295	472	619	1,002
1. Existing Apartments		475	1,549	91	146	192	311
2. Existing Commercial Area	18.3			31	50	65	106

SUISUN - SOLANO WATER AUTHORITY

Estimated Ultimate Water Demand At Buildout
w/ Gentry Gateway Project

RESIDENTIAL USAGE				**SCHOOL & PUBLIC FACILITIES USAGE**		
Low Density (LD) Units/Acre		5.50	units/acre	AAWC	1.1	gpm/acre
Medium Density (MD) Units/Acre		10.50	units/acre	**PARK & SPORT COMPLEX USAGE**		
Multi-Family (MF) Units/Acre		15.00	units/acre	AAWC	1.3	gpm/acre
Persons/Unit		3.26	persons/unit	**COMMERCIAL USAGE**		
Annual Aver. Water Consumption (AAWC)		120.0	gpcd	AAWC	1.7	gpm/acre
APARTMENT USAGE -	AAWC	85.0	gpcd			
High Density (HD) Units/Acre		22.00	units/acre			
TOLENAS AREA USAGE -	AAWC	160.0	gpcd			
SUISUN VALLEY AREA USAGE -	AAWC	220.0	gpcd			
	ANNUAL AVERAGE			1.0		
	MAXIMUM MONTH			1.6		
	MAXIMUM DAY			2.1		
	MAXIMUM HOUR			3.4		

AREA NAME OR NUMBER	ACREAGE (acres)	UNITS (lots)	POPULATION	ANNUAL AVERAGE (gpm)	MAXIMUM MONTH (gpm)	MAXIMUM DAY (gpm)	MAXIMUM HOUR (gpm)
3. Future/Existing Apartments	4.0	88	287	17	27	36	58
4. Future Commercial	4.0			7	11	14	23
5. Existing Suisun Elementary School	7.4			8	13	17	28
6. Existing Park near School	9.8			13	20	27	43
Area F - South of Hwy 12, West of Drainage Channel, & East of Grizzly Island Road							
1. Existing Residential Area		87	284	24	38	50	80
2. Existing Commercial	5.0			9	14	18	29
3. Existing School	5.5			6	10	13	21
4. Future Office / Commercial	20.5			35	56	73	118
Area G - North of Hwy 12, West of Sunset Drive, & South of Southern Pacific Railroad		1,227	4,000	333	533	700	1,133
1. Future Apartments		94	306	18	29	38	61
2. Existing Commercial Area	25.13			43	68	90	145
3. Future Commercial Area	34.97			59	95	125	202
4. Existing Park along Village Drive	10.01			13	21	27	44
Area H - Old Town Suisun Area		448	1,460	122	195	256	414
		161	525	44	70	92	149
1. Future Residential Area (LD)	10.82	60	194	16	26	34	55
2. Future Residential (MD)	7.44	78	255	21	34	45	72
3. Existing Residential Area (MD)	66.84	702	2,288	191	305	400	648
4. Existing Commercial Area	40.02			68	109	143	231
5. Future Commercial Area	12.20			21	33	44	71
6. Existing Schools & Civic Center	27.24			30	48	63	102
7. Existing & Future Park	16.56			22	34	45	73
8. Existing Apartments		286	932	55	88	116	187
9. Proposed Gentry Gateway Project							
a. Commercial	54.00			92	147	193	312
b. Residential		231	753	63	100	132	213
TOTAL FOR SUISUN CITY		10,506	34,251	3,577	5,723	7,511	12,161
Tolenas Area		200	652	72	116	152	246
Suisun Valley Area		26	85	13	21	27	44
TOTAL FOR SUISUN - SOLANO WATER AUTHORITY (SSWA)		**10,732**	**34,988**	**3,662**	**5,860**	**7,691**	**12,452**

ESTIMATED ANNUAL AVERAGE FLOW = 3,662 gpm = 5,907AF Annual Demand

SAY REQUIRED ANNUAL DEMAND = 6,000 AF

Appendix B

Hydraulic Analyses and Review of City of Fairfield Options to Provide Increased SSWA Water Supply

Hydraulic Analyses

Summarized in Table B-1 is the City of Fairfield model analysis for making a connection to supply water to the Gregory Hill Water Storage Tank. Run 1 shows the pressure at the proposed intertie location under different operating conditions of the City of Fairfield distribution system when no water is delivered to SSWA. Run 3 summarizes the pressure that would be available if a peak flow of 2,400 gpm was made available to meet SSWA demands at a connection point on Waterman Boulevard below the Gregory Hill Tank. The analysis determined the City of Fairfield had the ability to provide the additional ultimate peak demand flow (2,250 gpm) to SSWA; however, the pressure that would be available, based on peak hour operating conditions with Fairfield's reservoirs half full, would be a pressure of 54 pounds per square inch (psi). When this pressure is reduced by the headloss through the meter, pipeline, and backflow preventer it was determined the pressure would not be adequate to fill the Gregory Hill Water Storage Tank. Therefore, under this option a pump station would be required to supply the water to the tank.

Fairfield also ran a hydraulic analysis to determine if they could provide the SSWA peak day maximum flow at Ohio Street and Pennsylvania Avenue. SSWA already has an intertie with Fairfield at this location. The results are listed in Table B-2. As in the previous analysis, Run 1 shows the pressure at the proposed intertie location under different operating conditions of the City of Fairfield distribution system when no water is delivered to SSWA. The peak hour analysis with all of Fairfield reservoirs full and providing a peak flow to SSWA of 2,400 gpm at the intertie point indicates an available pressure of 51 psi. The analysis determined the existing Fairfield distribution system would not be able to provide the required flow at a minimum pressure of 65 psi. This pressure is required to maintain delivery of the water into the SSWA distribution system in Old Town Suisun. Pumps could be installed, but without a storage tank to meet the peak hour flow requirements, the pumps would have to be sized to provide an even higher flow than analyzed. Fairfield indicated they would be unable to meet this

demand at the proposed location until their future cross-town pipeline project is completed.

City of Fairfield Connection Fees for Permanent Supply to Gregory Hill Tank

Table B-3 (obtained in 2005) summarizes the various Contract Options available with the City of Fairfield for water supply connections to meet the SSWA design flows reviewed in this report. Discussions were also held with Fairfield staff to review the intertie options available. As listed in Table 1, the additional maximum day capacity required to meet SSWA's ultimate demand is estimated at 2,234 gpm. As mentioned, the peak flows listed are projections of the anticipated ultimate demand requirements. Reviewing City of Fairfield connection costs in Table B-3 indicates an 8" turbine meter, having a peak capacity of 3,500 gpm, would allow SSWA to meet the ultimate maximum day demand. However, there is a significant increase in cost for the installation of an 8" turbine meter versus a 6" meter. Another option would be to consider a parallel installation of a 6" turbine meter and a 4" compound meter. This would provide a peak supply of 2,250 gpm and allow SSWA to meet the ultimate maximum day demand. Discussions with Fairfield staff indicated the City would allow SSWA to install a smaller meter initially with the option to upsize the meter connection in the future if required or needed.

Table B-4 summarizes the estimated costs (prepared in 2005) to connect into the City of Fairfield with a 2,250 gpm maximum flow connection, and to deliver this water supply up to the Gregory Hill Water Storage Tank. As previously mentioned, a pumping plant would be required to allow delivery of that peak flow to the maximum water surface elevation of the tank. A new 16" pipeline connection would be made to the City of Fairfield pipeline, a pumping plant installed at the site of the existing Gregory Hill Water Treatment Plant, and then the 16" pipeline extended up to the tank. The delivery of the 2,250 gpm supply to the existing storage tank would allow the peak hourly flows on the maximum day to be met by storage, providing a much needed

increase in usable storage capacity for the SSWA water system. The water supplies delivered into the tank would supply both the existing 20" pipeline to Suisun City and the 6" pipeline serving Suisun Valley. Included in Table B-4 is the estimated 2005 cost to connect to the City of Fairfield with parallel 6" and 4" meter connections which would be capable of delivering a peak demand supply of 2,250 gpm to the Gregory Hill Water Storage Tank. The estimated capital cost for this option was $2,975,000.

Table B-5 summarizes the estimated costs (also prepared in 2005) to connect into the City of Fairfield with a 1,400 gpm maximum flow connection, and to deliver this water supply up to the Gregory Hill Water Storage Tank. This option includes a 6" meter connection. The construction of this 12" connection to the city of Fairfield will also require installing a pumping plant and extending the new 12" pipeline from the connection up to the existing Gregory Hill Water Storage Tank. This option, in conjunction with modifications made to the Cement Hill Water Treatment Plant, would also provide an additional water supply of 2,250 gpm to SSWA.

The cost estimates for City of Fairfield water supply options to Gregory Hill Water Storage Tank were not updated to 2007. However, for information purposes, included in Table B-6 is the current City of Fairfield Contract Options for water connection fees and water use charges.

Table B - 1

Zone I Modeling Results from SSWA Water Demands for a Connection to the Gregory Hill Reservoir Pressures Modeled at NODE 609*

Operating Condition	RUN 1 Gregory Hill Reservoir w/ no flow demand (psi)	RUN 3 Gregory Hill Reservoir 2,400 GPM (psi)
1. Max. Day w/ all WTP's On; All Reservoirs Full	65	61
2. Peak Hour w/ all WTP's On; All Reservoirs Full	63	58
3. Peak Hour w/ all WTP's On; All Reservoirs 1/2 Full	59	54
4. Peak Hour w/ all WTP's On; All Reservoirs 1/2 Full, w/ Fire	57	50
5. Peak Hour w/ all WTP's Off; All Reservoirs 1/2 Full, w/ Fire	56	49

* Node 609 is located at the intersection of Waterman Blvd. and Waterman Court just to the East of the existing Gregory Hill Water Treatment Plant site.

Source: Creegan + D'Angelo analysis for City of Fairfield

Table B - 2

Zone II Modeling Results from SSWA Water Demands for a Cross-Connection at Ohio St. and Pennsylvania Ave

Operating Condition	RUN 1 at Gregory Hill Reservoir w/ no flow demand (psi)	RUN 4 at Ohio Street and Pennsylvania Avenue 2,400 GPM (psi)
1. Max. Day w/ all WTP's On; All Reservoirs Full	78	68
2. Peak Hour w/ all WTP's On; All Reservoirs Full	65	51
3. Peak Hour w/ all WTP's On; All Reservoirs 1/2 Full	62	48
4. Peak Hour w/ all WTP's On; All Reservoirs 1/2 Full, w/ Fire	61	39
5. Peak Hour w/ all WTP's Off; All Reservoirs 1/2 Full, w/ Fire	54	30

Source: Creegan + D'Angelo analysis for City of Fairfield

Table B - 3

2005 City of Fairfield Water Supply
Contract Options
Connection Cost & Water Use Charges

Meter Size (Inches)	Type	Peak Capacity (GPM)	Connection Cost *	Daily User Charge[1]
4	Compound	250	$212,168 [2]	$25.40
4	Compound	250	$152,135 [3]	$25.40
4	Turbine	1,000	$836,740 [3]	$136.07
6	Turbine	2,000	$1,947,320 [3]	$314.69
8	Turbine	3,500	$3,803,360 [3]	$619.57

[1] In addition to daily user charge there is a volume use charge of $1.80/hundred cubic feet ($784.08/AF). The user charge is adjusted for inflation on January 1 of each year. The minimum is set by statute. Over the last few years the minimum increase has been 4% per year.

[2] Zone 2 Connection Fee with SSWA providing raw water

[3] Zone 1 Connection Fee with SSWA providing raw water

* Note: Connection Fee Costs as of 4/01/05. The costs are adjusted each year on April 1 in accordance with a San Francisco Bay Area construction cost index.

Table B - 4
Water Supply from City of Fairfield to Gregory Hill Tank
2,250 GPM Maximum Flow Connection
Estimate of Cost Summary

Item No.	Work or Material	Quantity	Unit	Unit Cost	Amount
1	F&I 16" Pipe Connection in Waterman Blvd			Lump Sum	$30,000
2	F&I 16" Pipeline to Pumping Plant	800	L.F.	$150	$120,000
3	F&I Connection to Booster Pump Manifold			Lump Sum	$12,000
4	F&I 16" Pipeline from Pumping Plant to Tank	600	L.F.	$85	$51,000
5	F&I Booster Pump Manifold			Lump Sum	$130,000
6	F&I Concrete Block Building			Lump Sum	$160,000
7	Pumps and Electrical Controls			Lump Sum	$148,000
8	Air Chamber			Lump Sum	$20,000
9	F&I 16" Pipe Connection to 12" Pipe at Tank			Lump Sum	$5,000
		Estimated Construction Cost			$676,000
		30% Contingencies & Incidentals			$204,000
		Total Construction Cost			**$880,000**
10	City of Fairfield 6-inch Meter Connection Fee			Lump Sum	$1,947,320
11	City of Fairfield 4-inch Meter Connection Fee			Lump Sum	$144,067
		Total Cost			$2,971,387
				Say	**$2,975,000**

Table B - 5
Water Supply from City of Fairfield to Gregory Hill Tank
1,400 GPM Maximum Flow Connection
Estimate of Cost Summary

Item No.	Work or Material	Quantity	Unit	Unit Cost	Amount
1	F&I 12" Pipe Connection in Waterman Blvd			Lump Sum	$30,000
2	F&I 12" Pipeline to Pumping Plant	800	L.F.	$140	$112,000
3	F&I Connection to Booster Pump Manifold			Lump Sum	$10,000
4	F&I Booster Pump Manifold			Lump Sum	$105,000
5	F&I Concrete Block Building			Lump Sum	$160,000
6	Pumps and Electrical Controls			Lump Sum	$141,000
7	Air Chamber			Lump Sum	$20,000
		Estimated Construction Cost			$578,000
		30% Contingencies & Incidentals			$172,000
		Total Construction Cost			**$750,000**
8	City of Fairfield 6 inch Meter Connection Fee			Lump Sum	$1,947,320
		Total Cost			$2,697,320
				Say	**$2,700,000**

Table B - 6

2007 City of Fairfield Water Supply
Contract Options
Connection Cost & Water Use Charges

Meter Size (Inches)	Type	Peak Capacity (GPM)	Connection Cost *	Daily User Charge[1]
4	Compound	250	$234,750 [2]	$27.90
4	Compound	250	$168,300 [3]	$27.90
4	Turbine	1,000	$925,650 [3]	$149.41
6	Turbine	2,000	$2,154,240 [3]	$345.55
8	Turbine	3,500	$4,207,500 [3]	$680.43

[1] In addition to daily user charge there is a volume use charge of $1.98/hundred cubic feet ($862.49/AF). The user charge is adjusted for inflation on January 1 of each year. The minimum is set by statute. Over the last few years the minimum increase has been 5% per year.

[2] Zone 2 Connection Fee with SSWA providing raw water

[3] Zone 1 Connection Fee with SSWA providing raw water

* Note: Connection Fee Costs as of 4/01/07. The costs are adjusted each year on April 1 in accordance with a San Francisco Bay Area construction cost index.

Appendix C

Financial Analysis of Options

Table C - 1
Financial Analysis of Options (August 2005)

DATA:

For Capital Expenditures, assume 6% interest, 20 years, Capital Recovery Factor	=	0.08718	
City of Fairfield User Charge for 4" Compound Meter	=	$25.40	per day
City of Fairfield User Charge for 4" Turbine Meter	=	$136.07	per day
City of Fairfield User Charge for 6" Meter	=	$314.69	per day
City of Fairfield User Charge for 8" Meter	=	$619.57	per day
City of Fairfield Volume Charge	=	$784.08	per AF
CHWTP O&M Charge	=	$225.00	per AF
Estimated GHWTP O&M Charge	=	$400.00	per AF
Fairfield Suisun Sewer District Volume Charge	=	$605.48	per AF

Options

1. City of Fairfield Provides Supply to Meet Maximum Flow of 2,250 gpm at Gregory Hill Tank. Estimated Annual Useage = 1750 AF

Capital Cost (Table 6) = **$2,975,000**

Annual Costs	**Amount**
a. Capital Cost	$259,361
b. Fairfield User Fee for 6" Meter	$114,862
c. Fairfield User Fee for 4" Meter	$9,271
d. Fairfield Volume Charge	$1,372,140
e. Estimated Energy Charge	$32,000
Total Annual Cost	**$1,787,633**

Cost/AF = $1,022

2. City of Fairfield Provides Supply to Meet Maximum Flow of 1,400 gpm at Gregory Hill Tank. Estimated Annual Useage = 1075 AF.
Construct Additional Clarifier at CHWTP. Estimated Treated Water = 675 AF.
Total 1750 AF.

Capital Costs - Fairfield Supply (Table 8)	=	$2,700,000
- Additional CHWTP Clarifier (Table 7)	=	$1,140,000
Total Capital Cost		**$3,840,000**

Annual Costs	**Amount**
a. Capital Cost	$334,771
b. Fairfield User Fee for 6" Meter	$114,862
c. Fairfield Volume Charge	$842,886
d. Estimated Energy Charge	$20,000
e. Estimated CHWTP O&M Charge	$151,875
Total Annual Cost	**$1,464,394**

Cost/AF = $837

Table C - 1 (Cont.)

Options

3. Construct New Gregory Hill Water Treatment Plant to Provide Peak Demand Flow of 2,250 GPM. Annual Treated Water = 1750 AF

Capital Costs - GHWTP (Table 9)	=	$5,310,000
- Sewer Connection Fee	=	$950,000
Total Capital Cost		**$6,260,000**

Annual Costs	**Amount**
a. Capital Cost	$545,747
b. GHWTP Operation & Maintenance	$700,000
c. Sewer	$32,000

Total Annual Cost	**$1,277,747 Cost/AF = $730**

4. **Construct New Gregory Hill Water Treatment Plant to Provide Peak Demand Flow of 1,400 GPM. Estimated Annual Treated Water =** 1075 AF.
Construct Additional Clarifier at CHWTP. Annual Treated Water = 675 AF.
Total 1750 AF.

Capital Costs - GHWTP (Table 10)	=	$3,760,000
- Additional CHWTP Clarifier (Table 7)	=	$1,140,000
- Sewer Connection Fee	=	$240,000
Total Capital Cost		**$5,140,000**

Annual Costs	**Amount**
a. Capital Cost	$448,105
b. GHWTP Operation & Maintenance	$430,000
c. CHWTP Operation & Maintenance	$151,875
d. Sewer	$7,811

Total Annual Cost	**$1,037,791 Cost/AF = $593**

Table C - 2
Summary
Water Supply Options (August 2005)

Option		Capital Cost	Annual Capital and O&M Cost	Cost Per AF	Ranking*
1	City of Fairfield provides maximum flow of 2,250 gpm at Gregory Hill Tank.	**$2,975,000**	**$1,787,633**	**$1,022**	**4**
2	City of Fairfield provides maximum flow of 1,400 gpm at Gregory Hill Tank & an additional clarifier is constructed at Cement Hill Water Treatment Plant to provide a combined capacity of 2,250 gpm.	**$3,840,000**	**$1,464,394**	**$837**	**3**
3	A new Gregory Hill Water Treatment Plant is constructed to provide a maximum flow of 2,250 gpm.	**$6,260,000**	**$1,277,747**	**$730**	**2**
4	An additional clarifier is constructed at the Cement Hill Water Treatment Plant and a new Gregory Hill Water Treatment Plant is constructed to provide a a combined capacity of 2,250 gpm.	**$5,140,000**	**$1,037,791**	**$593**	**1**

* Ranking is based on the least Annual Cost being ranked No. 1. The Original Ranking included all of the options. The Update Ranking only includes the four options reevaluated.

APPENDIX D

Gregory Hill Water Treatment Plant

Gregory Hill Water Treatment Plant (GHWTP)

The existing Suisun City Water Treatment Plant site is approximately 0.6 of an acre in size with a significant elevation difference across the site. Waterman Boulevard borders the site on the North, existing homes border it on the East, and construction of new homes is planned to the West. The plan would be to excavate and fill the existing site with a balanced cut and fill to provide a level area which gradually slopes toward Waterman Boulevard for drainage purposes. South of the site is open space extending up to Gregory Hill. The existing and final topography will limit the space which can be utilized for the treatment plant.

The treatment option considered most suitable for the capacity requirements and available space is membrane filtration with chlorine disinfection. Figure 3 (in report) is a Conceptual Site Plan for a membrane treatment plant at the Gregory Hill site.

A membrane plant would be a modular package plant that is procured from an approved supplier. The primary equipment supplied with the plant would include filter racks, clean in place (CIP) tanks and pumps, backwash pumps, a membrane air scrubbing system, a Programmable Logic Controller (PLC) based control panel, interconnection piping and manifolds for the equipment, control valves, and a valve actuator system.

A coagulant pre treatment system is recommended to reduce total organic carbon (TOC) and subsequently reduce the amount of disinfection byproducts that are formed with the addition of chlorine. Bench tests performed by Pall Corporation on raw water collected from the Solano Irrigation District's Gibson Canyon treatment plant (which uses the same source water as GHWTP would use) showed significant reduction in organics (30 - 40%) could be achieved by adding polyaluminum chloride (PACl) prior to membrane filtration. The tests did not indicate any change in pH after the addition of the PACl.

The addition of a coagulant would increase the volume of sludge that is generated. The current sludge pond configuration and the lack of coagulant pre treatment at Gibson Canyon results in almost no sludge accumulation in the ponds. For GHWTP it is estimated that a maximum volume of 5 cubic feet of sludge per day would be generated, based on a 20 mg/L dosage of PACl and maximum water production with a 2,250 gpm treatment plant. Settling sludge will be difficult on the small site. To effectively manage the backwash water and sludge, it is recommended that two 100,000 gallon backwash recovery tanks be constructed along with a sludge dewatering and storage system. The sludge withdrawn from the recovery tanks would be stored in on-site containers with a drainage system to reduce the overall volume of sludge. The containers would be trucked off-site for disposal and replaced with empty containers. The backwash recovery tanks would be provided with a floating decanter that removes clearwater from the surface of the tanks. Backwash reclaim pumps would pump the decanted water from the backwash tanks back to the raw water inflow of the treatment plant. A direct connection from the tanks to the Fairfield sewer system would also be made to provide the ability to discharge approximately one-half the peak day backwash flow. Department of Health Services regulations allow a maximum of 10% of the feed flow to be return water, provided the return water turbidity is less than 2 NTU. Gibson Canyon records indicate that typical daily backwash volumes are less than 5% of the daily treated water production, so all backwash water could potentially be returned to the feed stream at GHWTP.

The main reason for the sewer connection is that there is limited site space available for the volume of backwash recovery tanks needed at peak conditions. The sewer connection would allow approximately half of the maximum daily backwash water to be recovered while the other half was discharged to the sewer. The sewer connection would also provide direct disposal of the used membrane cleaning chemicals and rinse water that are generated, versus storing these liquids on site and then trucking them to the sewage treatment plant.

Based on the experience of the Gibson Canyon Water Treatment plant, a conservatively high backwash rate of 6% (135 gpm) of the 2,250 gpm peak flow was assumed. Assuming half of this flow would be discharged directly to the sewer, a 100,000 gallon recovery storage tank would be needed for the peak daily backwash volume. The two 100,000 gallon tanks would be cycled on and off line so that one tank could be filled while the other was allowed to settle and decant with no inflow for at least one day. Three (3) sludge collection containers are also proposed. Settled sludge from the recovery tanks would be pumped to the sludge containers. The sludge capacity of one container would be approximately 16 cubic yards. The containers would be a roll off design which could be disconnected and hauled off when full. The containers would be operated so at least two containers are always operational and ready to receive sludge pumped from the backwash recovery tanks. At the estimated sludge production rate of 5 cubic feet per peak day, a sludge container would only need to be removed once every 3 months. Three sludge containers should be sufficient to address the sludge requirements. The filter aid coagulant used for pre-treatment reduces the time required to settle the sludge. If a filter aid coagulant was not used, more than two days of settling might be needed due to the colloidal nature of the particles. This would require a larger volume of backwash recovery tanks and more site space.

The coagulation bench tests for Gibson Canyon also showed an improvement in membrane filter performance because the floc that is collected on the membranes reduces the amount of fouling that is caused by organics. This floc is easily removed by backwashing and does not reduce the flux rate of the membranes.

Additional pre treatment equipment is not recommended for a GHWTP membrane plant. The membrane cleaning system will include an enhanced flux maintenance (EFM) system that automatically cleans the membranes with a chlorine solution approximately monthly in between the full CIP's that utilize caustic and acid solutions. Thus far, the addition of EFM at the Solano Irrigation District Gibson Canyon Plant has been effective in preventing the rapid fouling problem that occurred during the Summer of 2005. It

has been theorized that the Gibson Canyon fouling problem may have been related to a particular variety of algae that was observed in the Putah South Canal during 2005, but that was not as prevalent (or was absent) during 2006. Pre treatment equipment such as sand filters or a dissolved air floatation (DAF) system could be effective in removing algae prior to membrane filtration. However, with no definitive indication that algae caused the rapid fouling at Gibson Canyon, it is difficult to justify additional pre treatment equipment to remove it. It is recommended that the treatment plant design include space provisions and plumbing stub outs for additional pre treatment equipment, but that the actual equipment be specified and added to the plant in the future, if a membrane fouling problem occurs and its cause can be more definitively studied. Other possible sedimentation equipment prior to membrane filtration is also not recommended, given the relatively good source water quality that is currently maintained to meet the requirements of Fairfield's nearby Waterman Water Treatment Plant, and the space limitations at GHWTP.

APPENDIX M

GREENHOUSE GAS EVALUATION FOR GENTRY/SUISUN ANNEXATION PROJECT, SUISUN CITY

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June 2007

GLOBAL WARMING GASES

Setting

The greenhouse effect is a natural process by which some of the radiant heat from the sun is captured in the lower atmosphere of the earth. The gases that help capture the heat are called greenhouse gases. While greenhouse gases are not normally considered air pollutants, all of these gases have been identified as forcing the earth's atmosphere and oceans to warm above naturally occurring temperatures. Some greenhouse gases occur naturally in the atmosphere, while others result from human activities. Naturally occurring greenhouse gases include water vapor, carbon dioxide, methane, nitrous oxide and ozone. Certain human activities add to the levels of most of these natural occurring gases.

According to the 2006 California Climate Action Team Report (CCAT, 2006) the following climate change effects are predicted in California over the course of the next century:

- A diminishing Sierra snowpack declining by 70% to 90%, threatening the state's water supply.
- Increasing temperatures from 8 to 10.4 degrees F under the higher emission scenarios, leading to a 25 to 35% increase in the number of days ozone pollution levels are exceeded in most urban areas.
- Coastal erosion along the length of California and sea water intrusion into the Delta from a 4- to 33-inch rise in sea level. This would exacerbate flooding in already vulnerable regions.
- Increased vulnerability of forests due to pest infestation and increased temperatures.
- Increased challenges for the state's important agriculture industry from limited water shortage, increasing temperatures, and saltwater intrusion into the Delta.
- Increased electricity demand, particularly in the hot summer months.

In September 2006, the California legislature passed the California Global Warming Solutions Act (CGWSA), which was added to Health and Safety Code Section 38500 (also commonly referred to as AB32). The CGWSA states that global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. Many scientists believe that anthropogenic emissions of greenhouse gases (GHG) (defined as carbon dioxide [CO_2], methane [CH_4], nitrous oxide [N_2O], hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) are having a significant impact on the global environment by accelerating or even causing global warming.

The CGWSA requires that the state reduce emissions of GHG to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased-in starting in 2012. To effectively implement the cap, CGWSA directs CARB to develop appropriate regulations and establish a mandatory reporting system to track and monitor GHG emission levels.

The CGWSA mandates that by January 1, 2008, CARB must determine what the statewide GHG emissions level was in 1990 and approve a statewide GHG emissions limit that is equivalent to the level to be achieved by 2020. On or before January 1, 2011, CARB must adopt GHG

emission limits and emission reduction measures by regulation to achieve the maximum technologically feasible and cost-effective reductions in GHG emissions in furtherance of achieving the statewide GHG emissions limit, to become operative beginning on January 1, 2012.

The BAAQMD has prepared a GHG emissions inventory using 2002 as the base year. The BAAQMD estimated that 85.4 million tons of CO_2-equivalent[1] GHG gases were emitted from anthropogenic sources in the Bay Area in 2002 (BAAQMD, 2006). Fossil fuel consumption in the transportation sector (on-road motor vehicles) accounted for approximately 43 percent (BAAQMD, 2006). Stationary sources, including industrial and commercial sources, power plants, oil refineries, and landfills were responsible for approximately 49 percent (BAAQMD, 2006). Construction and mining equipment was estimated to account for approximately two percent (or about 1.7 million tons) of the total anthropogenic GHG emissions (BAAQMD, 2006).

Impacts

SIGNIFICANCE CRITERIA

No air district in California, including the Bay Area Air Quality Management District, has identified a significance threshold for GHG emissions or a methodology for analyzing air quality impacts related to greenhouse gas emissions. The state has identified 1990 emission levels as a goal through adoption of AB 32. To meet this goal, California would need to generate lower levels of GHG emissions than current levels. However, no standards have yet been adopted quantifying 1990 emission targets. It is recognized that for most projects there is no simple metric available to determine if a single project would help or hinder meeting the AB 32 emission goals. In addition, at this time AB 32 only applies to stationary source emissions. Consumption of fossil fuels in the transportation sector accounted for over 40% of the total GHG emissions in California in 2004. Current standards for reducing vehicle emissions considered under AB 1493 call for "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks and other vehicles," and do not provide a quantified target for GHG emissions reductions for vehicles.

Emitting CO_2 into the atmosphere is not itself an adverse environmental affect. It is the increased concentration of CO_2 in the atmosphere resulting in global climate change and the associated consequences of climate change that results in adverse environmental affects (e.g., sea level rise, loss of snowpack, severe weather events). Although it is possible to generally estimate a project's incremental contribution of CO_2 into the atmosphere, it is typically not possible to determine whether or how an individual project's relatively small incremental contribution might translate into physical effects on the environment. Given the complex interactions between various global and regional-scale physical, chemical, atmospheric, terrestrial, and aquatic systems that result in the physical expressions of global climate change, it is impossible to

[1] Greenhouse gases are converted into CO_2-equivalent values based on their potential to absorb heat in the atmosphere. For instance, CH_4 traps 21 times more heat per molecule than CO_2 and, therefore, one pound of CH_4 has a CO_2-equivalent value of 21 pounds.

discern whether the presence or absence of CO_2 emitted by the project would result in any altered conditions.

Given the challenges associated with determining a project-level significance criterion for GHG emissions when the issue must be viewed on a global scale, a quantitative significance criteria is not proposed for the project. For this analysis, a project's incremental contribution to global climate change would be considered significant if due to the size or nature of the project it would generate a substantial increase in GHG emissions relative to existing conditions.

PROJECT GHG EMISSIONS

The bulk of new GHG emissions associated with the project would be due to transportation and on-site fuel combustion. New emissions from vehicles were estimated using the CARB's EMFAC-2007 model emission factors for CO_2 multiplied by Vehicles Miles Traveled as estimated by the URBEMIS-2002 program. Vehicle emissions for methane and nitrous oxides were based on published emission factors (BAAQMD, 2006).

Natural gas combustion emissions were estimated using URBEMIS-2002 defaults for natural gas consumption. These usage factors were multiplied by published emissions factors (BAAQMD, 2006). The resulting estimated annual emissions of greenhouse gases associated with the project alternatives are shown in Table 1.

Emissions are expressed both as tons per year and CO_2-equivalent tons per year. Expressing emission in CO_2-equivalent tons per year accounts for the greater global warming potential of methane and nitrous oxide. Methane has a global warming potential 21 times that of carbon dioxide, while nitrous oxide is 310 times that of the same amount of carbon dioxide.

IMPACT ASSESSMENT

The cumulative increase in GHG concentrations in the atmosphere has resulted in and will continue to result in increases in global average temperature and associated shifts in climatic and environmental conditions. Multiple adverse environmental effects are attributable to global climate change, such as sea level rise, increased incidence and intensity of severe weather events (e.g., heavy rainfall, droughts), and extirpation or extinction of plant and wildlife species. Given the significant adverse environmental effects linked to global climate change induced by GHGs, the emission of GHGs is considered a significant cumulative impact. Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors (California Energy Commission 2006a). Therefore, the cumulative global emissions of GHGs contributing to global climate change can be attributed to every nation, region, and city, and virtually every individual on Earth. The challenge in assessing the significance of an individual project's contribution to global GHG emissions and associated global climate change impacts is to determine whether a project's GHG emissions—which, it can be argued, are at a micro-scale relative to global emissions—result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact.

Table 1: Project Greenhouse Gas Emissions in Tons/Year

	Carbon Dioxide (CO_2)	Nitrous Oxide (N_2O)	Methane (CH_4)
Modified Alternative 1			
Tons Per Year	18,120	0.143	0.378
CO_2 Equivalent Tons Per Year	18,120	45	8
Alternative 2			
Tons Per Year	20,080	0.141	0.363
CO_2 Equivalent Tons Per Year	20,080	44	8

CO_2 emissions in California totaled approximately 391 million tons in 2004 (California Energy Commission 2006). Project total CO_2 emissions, as estimated above, would be 0.0046% to 0.0051% of this statewide total.

GHG emission estimates from an individual project have a relatively high uncertainty. In addition, it is uncertain how current regulations might affect CO_2 emissions attributable to the project and cumulative CO_2 emissions from other sources in the state. It cannot be determined how CO_2 emissions associated with the project might or might not influence actual physical effects of global climate change. For these reasons, it is uncertain whether the project would generate a substantial increase in GHG emissions relative to existing conditions, and whether emissions from the project would make a cumulatively considerable incremental contribution to the significant cumulative impact of global climate change.

For this analysis, a conservative approach is taken and the project is considered to potentially make a cumulatively considerable incremental contribution to the significant cumulative impact of global climate change.

Mitigation Measures

Measures to reduce greenhouse gas emissions are equivalent to measures to reduce energy consumption and air pollutant emissions. Therefore, GHG emission mitigation measures are identify in Section__ Energy and Section __ Air Quality. These mitigation measures would

reduce project GHG impacts, but not to a level that is less than significant. GHG emission impacts would be *significant and unavoidable*.

Bay Area Air Quality Management District, 2006, *Source Inventory of Bay Area Greenhouse Gas Emissions*.

California Climate Action Team, 2006, http:// www.climatechange

California Energy Commission. 2006. *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004*. (Staff Final Report). Publication CEC-600-2006-013-SF. Available: http://www.energy.ca.gov/2006publications/CEC-600-2006-013/CEC-600-2006-013-SF.PDF. Accessed in June 2007.

GHG Alternatives Discussion

Buildout Pursuant to Existing City Designations

The bulk of new GHG emissions associated with this alternative would be due to transportation and on-site fuel combustion. New emissions from vehicles were estimated using the CARB's EMFAC-2007 model emission factors for CO_2 multiplied by Vehicles Miles Traveled as estimated by the URBEMIS-2002 program. Vehicle emissions for methane and nitrous oxides were based on published emission factors.

Natural gas combustion emissions were estimated using URBEMIS-2002 defaults for natural gas consumption. These usage factors were multiplied by published emissions factors.

The estimated GHG emission for this alternative is 27,964 tons per year (CO_2-equivalent). This emission would represent a *significant and unavoidable* impact.

Resource Avoidance Alternative

The bulk of new GHG emissions associated with this alternative would be due to transportation and on-site fuel combustion. New emissions from vehicles were estimated using the CARB's EMFAC-2007 model emission factors for CO_2 multiplied by Vehicles Miles Traveled as estimated by the URBEMIS-2002 program. Vehicle emissions for methane and nitrous oxides were based on published emission factors.

Natural gas combustion emissions were estimated using URBEMIS-2002 defaults for natural gas consumption. These usage factors were multiplied by published emissions factors.

The estimated GHG emission for this alternative is 18,873 tons per year (CO_2-equivalent). This emission would represent a *significant and unavoidable* impact.