

Draft  
Environmental Impact Report - **Appendices**  
Pinole-Hercules Water Pollution  
Control Plant Improvement Project



Prepared for:

City of Pinole  
2131 Pear Street  
Pinole, CA 94564

**AECOM**

March 15, 2010



Draft  
Environmental Impact Report - **Appendices**

## Pinole-Hercules Water Pollution Control Plant Improvement Project



Prepared for:

City of Pinole  
2131 Pear Street  
Pinole, CA 94564

Contact:

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Project Manager  
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**AECOM**

March 15, 2010



# **APPENDIX A**

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Notice of Preparation/Initial Study



# NOTICE OF PREPARATION

## DRAFT ENVIRONMENTAL IMPACT REPORT PINOLE-HERCULES WATER POLLUTION CONTROL PLANT IMPROVEMENT PROJECT Contra Costa County

September 9, 2009

In accordance with the California Environmental Quality Act (CEQA) (Public Resources Code [PRC] Section 21000 et seq.) and the State CEQA Guidelines (California Code of Regulations [CCR] Section 15000 et seq.), the City of Pinole will be preparing an Environmental Impact Report (EIR) to evaluate the environmental effects associated with upgrades to the existing water pollution control plant (WPCP), which treats wastewater generated from both the City of Pinole and the City of Hercules.

In accordance with Section 15082 of the CEQA Guidelines, the City of Pinole has prepared this Notice of Preparation (NOP) as notification that an EIR will be prepared. The purpose of an NOP is to provide sufficient information about the proposed project and its potential environmental impacts to allow the State of California's Office of Planning and Research (OPR), responsible and trustee agencies, and interested parties the opportunity to provide a meaningful response related to the scope and content of the EIR, including the significant environmental issues, reasonable alternatives, and mitigation measures that the responsible or trustee agency, or OPR, will need to explore in the EIR (State CEQA Guidelines, Section 15082[b]).

A brief description of the proposed project and its location, along with a listing of environmental effects that may occur under the proposed project, are contained in the attached materials. An Initial Study, attached hereto, has been prepared pursuant to CEQA Guidelines Section 15063, which identifies the anticipated environmental effects of the project. The Initial Study satisfies the City's obligation under CEQA Guidelines Section 15082, subdivision (a)(1)(C), to identify the "probable environmental effects of the project."

Responses to this NOP must be sent no later than 30 days after receipt of this notice (State CEQA Guidelines, Section 15082 [b]). If you wish to comment on the proposed project or the focus of contents of the upcoming Draft EIR, please send your written comments to the following address, no later than October 8, 2009:

City of Pinole  
2131 Pear Street  
Pinole, CA 94564-1774  
Attention: Dean Allison  
Email: DAllison@ci.pinole.ca.us

A scoping meeting will be held to receive written and oral input on the scope and content of the EIR. The scoping meeting will be held on September 24, 2009 from 6 PM to 8 PM, at the following location:

Pinole City Hall  
2131 Pear Street  
Pinole, CA 94564

## **PROJECT LOCATION**

The Pinole-Hercules WPCP is located along the shoreline of San Pablo Bay, at 11 Tennent Avenue, Pinole, California, within Contra Costa County (see Exhibit 1). The WPCP is bordered by the Union Pacific Railroad tracks to the south; Pinole Creek to the northeast; Bayfront Park to the southwest; and San Pablo Bay to the west (see Exhibit 2). Land east and south of the project site, across the railroad tracks, consists of residential housing and a storage facility.

Regional access to the WPCP is provided from Interstate-80 via San Pablo Avenue. Local access to the plant is provided by Tennent Avenue, adjacent to a parking lot associated with Bayfront Park.

## **PROJECT BACKGROUND AND HISTORY**

The Pinole water pollution control facility began operations in 1956 as a primary treatment facility with discharge into San Pablo Bay. In 1971, the cities of Pinole and Hercules entered into a joint use agreement, which included expansion and upgrades. The plant is currently administered by the Pinole-Hercules WPCP Joint Powers Authority. Currently, the facility treats wastewater from both cities to secondary standards.

The WPCP is permitted to discharge 4.06 million gallons per day (MGD) average dry weather flows, and 10.3 MGD average wet weather flows. Treated effluent from the WPCP is conveyed northeast to the Rodeo Sanitary District Wastewater Treatment Plant (RSD), where flows from the two treatment facilities are combined and discharged into San Pablo Bay through a permitted deep water outfall (Outfall 001). Currently, the WPCP also operates a shallow water discharge outfall (Outfall 002), located at the west side of the WPCP property boundary. This outfall is used when the conveyance pipeline capacity to RSD is exceeded during winter storm events, when influent levels are above the plant's 10.3 MGD permitted capacity. During these high influent flow periods, the excess influent is treated to a primary level and then blended with secondary treated wastewater, disinfected, and then dechlorinated prior to release into San Pablo Bay from this shallow water outfall. The existing facility layout is shown in Exhibit 2.

A corporation yard that is used by the City of Pinole Department of Public Works, Maintenance Division is also located within the Pinole-Hercules WPCP property boundary. It serves as a headquarters, including administration and equipment, from which the City provides streets, parks, sewer, building, and storm drain maintenance. Finally, the Pinole-Hercules WPCP also includes a co-generation plant that has been constructed to take advantage of the methane gas produced as a byproduct during the wastewater treatment process. The co-generation plant provides a portion of the on-site heat and electrical needs.

## **PROJECT DESCRIPTION**

As described above, the WPCP's National Pollutant Discharge and Elimination System (NPDES) permit allows 4.06 MGD dry-weather and 10.3 MGD wet-weather discharge rates. Issuance of the most recent NPDES permit included the stipulation that the City of Pinole must examine and implement alternatives to eliminate the use of the shallow water Outfall 002, and eliminate blending. The Cities of Pinole and Hercules have decided to also implement a solution that would prevent the need for blending of primary and secondary treated wastewater prior to discharge, and are therefore requesting a permit that would increase their wet weather flow rate to 20 MGD. To accomplish this wet weather capacity increase, the City of Pinole originally proposed and evaluated six potential project alternatives. Based upon the results of that analysis, which considered biological resources, cultural resources, land use and planning, water quality, and financial feasibility, the following two options have been selected for detailed analysis in the EIR.





Source: City of Pinole

**Regional Project Location**

**Exhibit 1**

## **OPTION 1: NEW LARGER EFFLUENT PIPE TO RODEO**

The Pinole-Hercules WPCP would undergo various on-site facility improvements, but would remain a secondary treatment plant. Proposed facility improvements include new secondary clarifiers, influent and effluent pump stations, aeration tanks, and other equipment, as shown in Exhibit 3. A new larger capacity pipeline would be installed from the Pinole-Hercules WPCP to the permitted Outfall 001 at the Rodeo Sanitary District, along with improvements to the existing outfall (Exhibit 4). Shallow water Outfall 002 would be abandoned. In addition, the existing corporation yard would be relocated to Pinole Shores Drive, between the Atichson Topeka & Santa Fe Railroad tracks and San Pablo Avenue (Exhibit 5).

Option 1 includes increasing the wet-weather flow capacity of the Pinole-Hercules WPCP to 20 MGD. Effluent water quality is not expected to change because the WPCP would remain a secondary treatment facility. If any inflows greater than 20 MGD occurred, such flows would bypass primary treatment and would be routed directly to the aeration basins for secondary treatment. The wet-weather plant capacity would be sized to accommodate 20 MGD based on the surface overflow capacity of the primary clarifiers, and the secondary treatment system and the disinfection system would be sized to handle wet-weather flows of 20 MGD in case an unusually wet winter should occur.

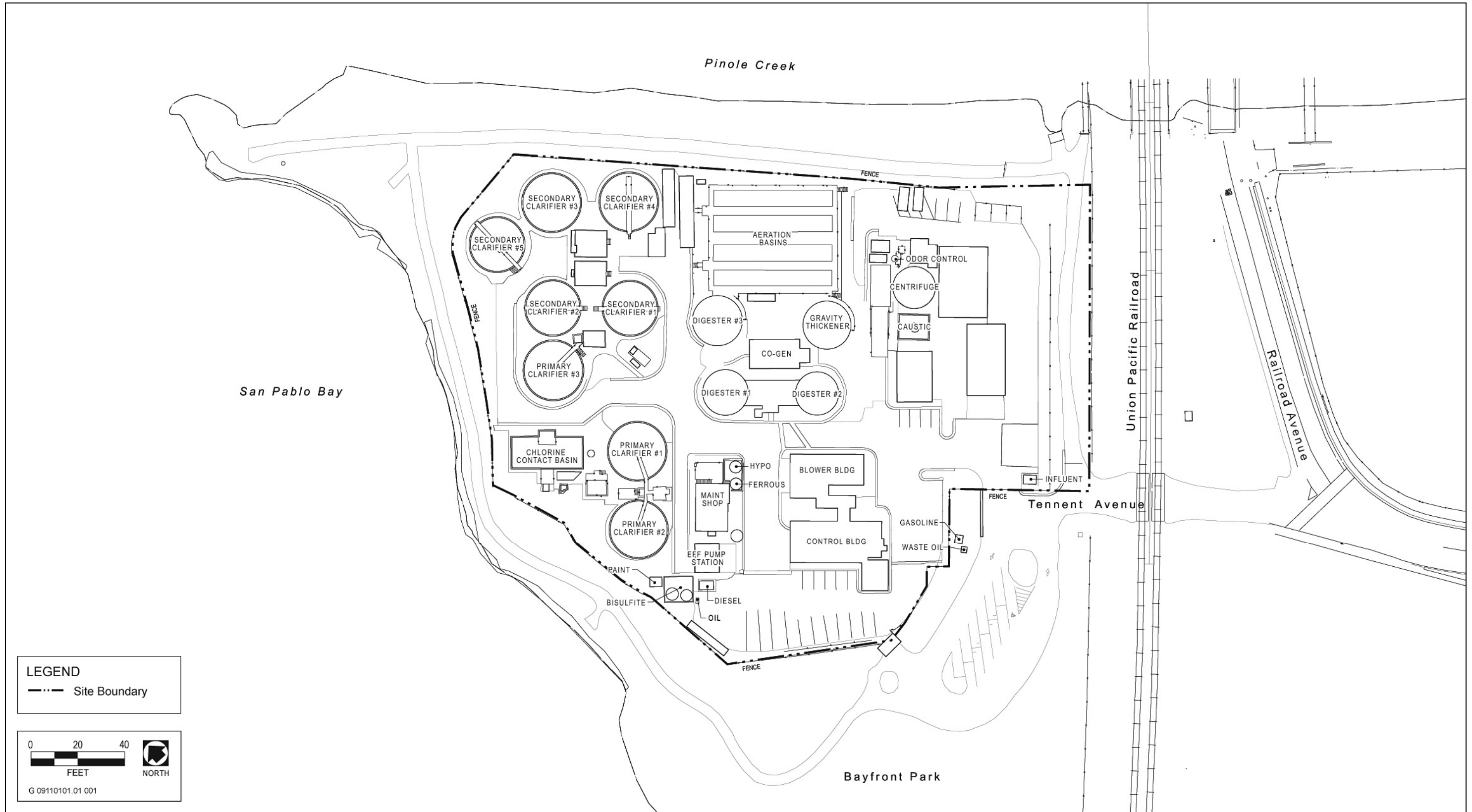
All treated, disinfected wastewater would be discharged to the existing permitted deepwater outfall (Outfall 001) at the Rodeo Sanitary District (RSD). A new forcemain, generally parallel to the existing forcemain route, would be constructed to ensure delivery of 20 MGD secondary treated effluent to RSD (if the need should occur). The diffuser on the exiting outfall would be modified to ensure at least 45:1 dilution at all times.

## **OPTION 2: CITY OF HERCULES ONLY TO WEST COUNTY WASTEWATER DISTRICT FACILITIES**

Under this option, wastewater flows generated by the City of Hercules would be diverted to the West County Wastewater District water pollution control facility (WCWD). Wastewater flows generated by the City of Pinole would continue to be treated at the Pinole-Hercules WPCP, which would undergo various facility upgrades (Exhibit 6). The on-site upgrades would consist of a 450,000-gallon concrete storage tank, diversion box, pumps, 24-inch piping, and associated accessories. The storage tank would be mostly buried, with the base located approximately 28 feet below the ground surface. These upgrades would reduce the peak wet-weather flow at the plant to the capacity of the existing biological process units (10.3 MGD). Any flows above 10.3 MGD would be stored and then returned to the treatment process when flows drop below 10.3 MGD. The storage facility would be empty except during severe storm events. During the peak storm event, the equalizing storage facility would be filled and emptied within a 24-hour period.

A new parallel pipeline to Outfall 001 would also be constructed along the same route to RSD as described for Option 1 above (see Exhibit 4). Option 2 would not include relocation of the corporation yard.

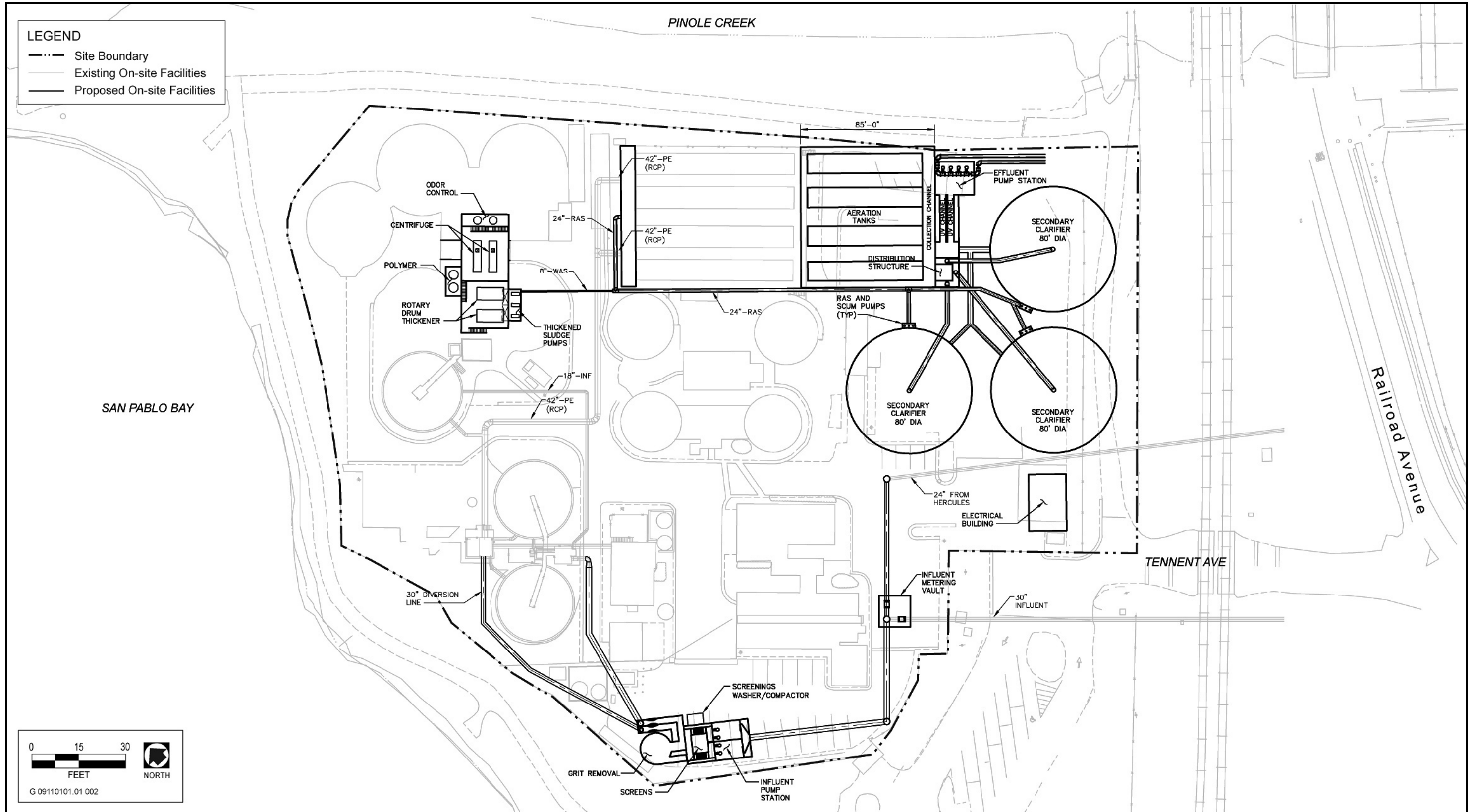
Option 2 would also involve transporting wastewater generated by the City of Hercules to the WCWD water pollution control facility (Exhibit 7). The Pinole-Hercules WPCP would then be operated solely to treat wastewater generated by the City of Pinole. It is expected that wastewater flows from the City of Hercules would consist of 2.25 MGD average dry weather flow and up to 7.0 MGD peak wet weather flow. Wastewater from the City of Hercules would be combined with wastewater from the WCWD service area and undergo secondary treatment by WCWD. It is anticipated that the existing dry weather capacity of the WCWD facilities (12.5 mgd, average dry weather flow) is sufficient to handle the combined flow. The existing wet season capacity (21 mgd, peak wet weather flow) would be expanded to handle up to 96 MGD. The commingled flows would be discharged through a deepwater outfall currently used by WCWD and the City of Richmond and operated by the West County Agency (a joint powers authority between the City of Richmond and the West County Wastewater District). The outfall is located off Port Richmond in the Central San Francisco Bay. The volume of treated wastewater discharged through the WCWD outfall would increase under Option 2.



Source: Dodson-Psomas 2009

**Pinole-Hercules Existing WPCP Facility Layout**

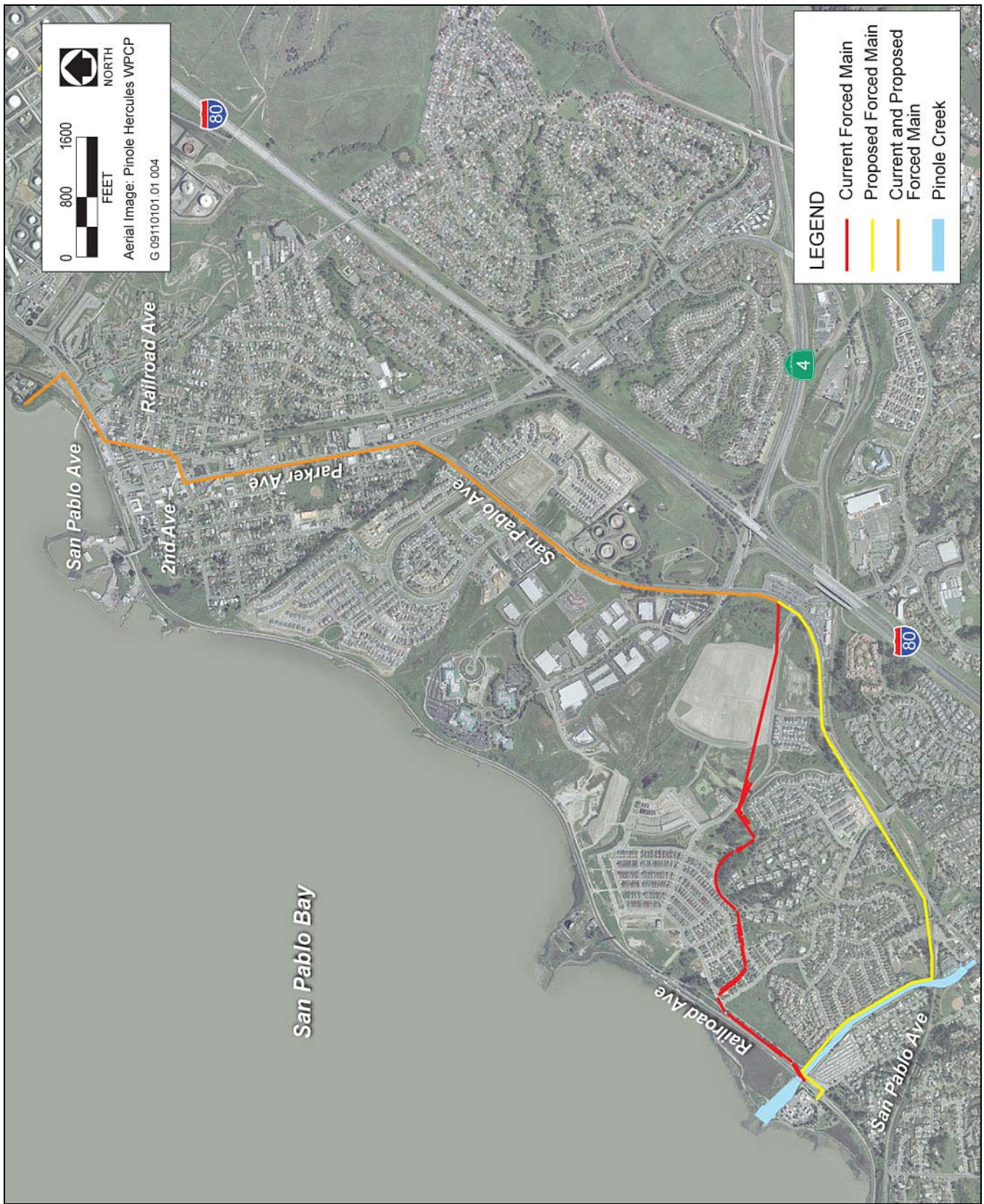
**Exhibit 2**



Source: Dodson-Psomas 2009

**Proposed Pinole-Hercules Facility Improvements – Option 1**

**Exhibit 3**



Source: Carollo Engineers 2008

**Proposed Pipeline Route to Rodeo Sanitary District – Options 1 and 2**

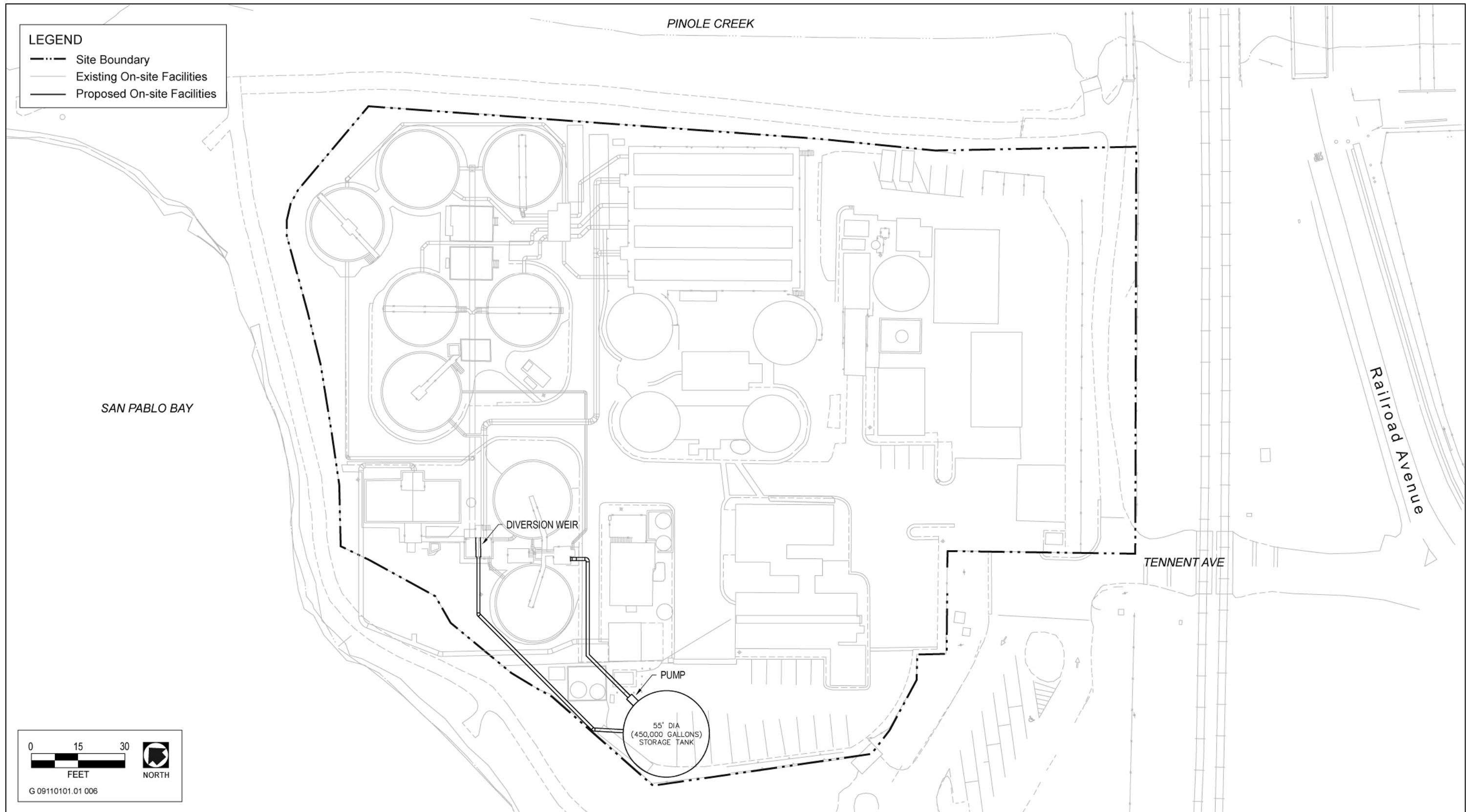
**Exhibit 4**



Source: City of Pinole 2009

**Proposed Corporation Yard Location – Option 1**

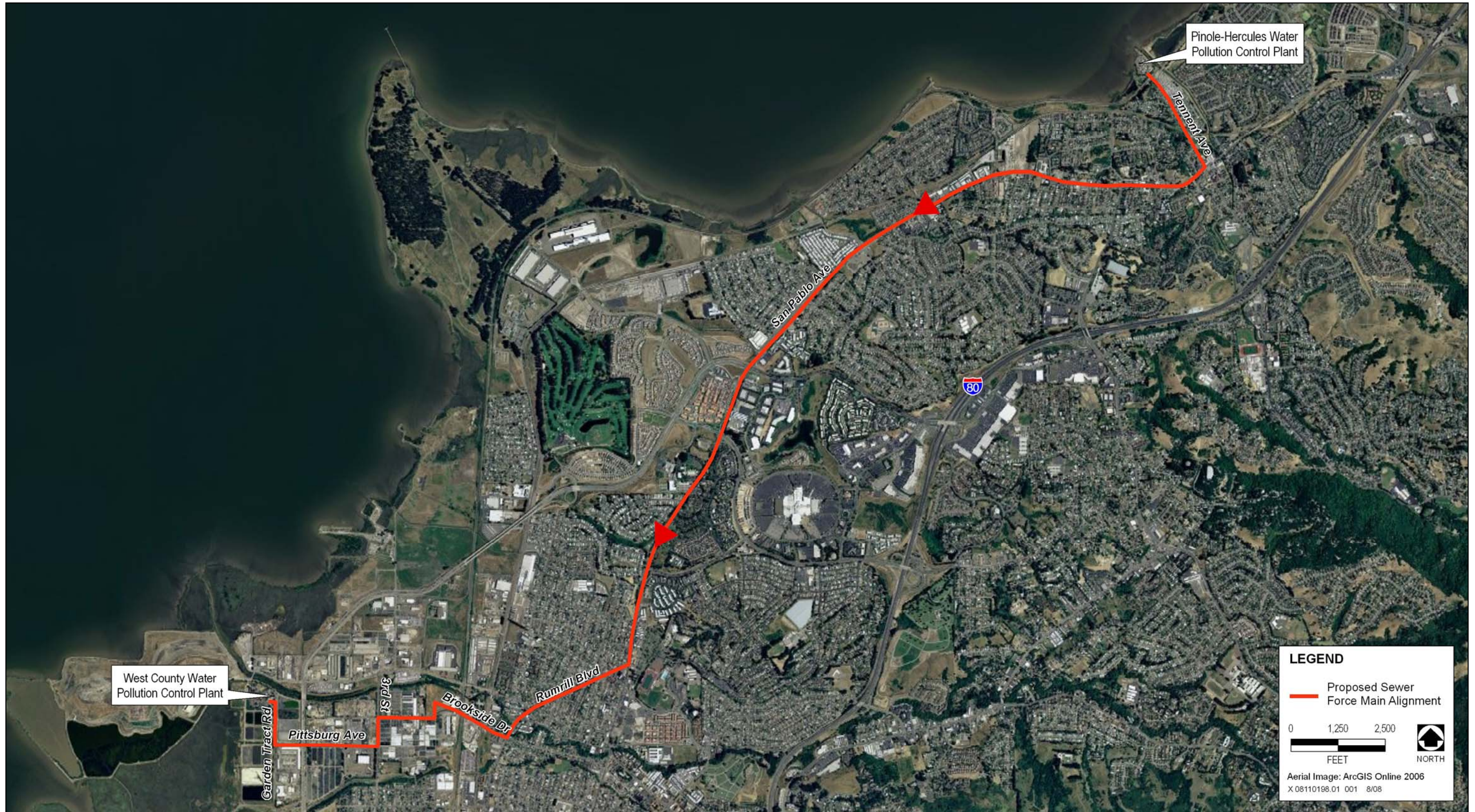
**Exhibit 5**



Source: Dodson- Psomas 2009

**Proposed WPCP Facility Improvements – Option 2**

**Exhibit 6**



Source: Carollo Engineers 2008

**Proposed Pipeline Route to West County Water Pollution Control Plant – Option 2**

**Exhibit 7**



## PROJECT OBJECTIVES

The proposed project is intended to achieve the following primary objectives:

- ▶ construct improvements to eliminate blending and avoid use of the existing shallow water outfall; and
- ▶ comply with conditions set forth in RWQCB Order Number R2-2007-0024.

## TYPE OF ENVIRONMENTAL IMPACT REPORT

This EIR includes a project-level analysis of the following: (a) Option 1 in its entirety, and (b) that portion of Option 2 that would allow the City of Pinole to keep its flows at the existing plant. These alternatives are evaluated at an equal level of detail through both quantitative and qualitative analyses, as appropriate. The EIR will contain enough details regarding Option 1, and the City of Pinole flows under Option 2, for a site-specific, project-level environmental review under CEQA, and will allow the consideration of discretionary approvals and permits required for these alternatives. The City's intention in evaluating Option 1, and the Pinole flows under Option 2, at a project level of detail is that the City may choose to adopt either of the options, and no further EIRs or negative declarations will be required by the City of Pinole for additional regulatory approvals following adoption of the EIR. However, implementation of Option 2 would also entail a second component: the City of Hercules would send its wastewater flows to the WCWD. This alternative, if implemented, would require (1) construction of a raw water conveyance pipeline to WCWD, (2) improvements at the WCWD WPCP, (3) an increase in the amount of permitted effluent discharge into San Pablo Bay, and (4) submittal of an anti-degradation analysis to the RWQCB for approval. This EIR contains a program-level discussion regarding the probable nature of the environmental impacts associated with conveyance of the City of Hercules flows to WCWD, because additional design-level information would be needed to evaluate this option at a project level of detail, and this design-level information does not exist. If Option 2 were selected, the City of Hercules, as lead agency under CEQA, would be required to determine if this EIR sufficiently considers the impacts of sending flows to the WCWD WPCP, and if not, would be required to conduct additional CEQA review.

## POTENTIAL ENVIRONMENTAL IMPACTS

The EIR will be focused on several potentially significant environmental impacts associated with implementation of the Pinole-Hercules WPCP Improvement Project. Mitigation measures will be recommended wherever feasible to reduce potentially significant and significant impacts. The attached initial study checklist also discusses issue areas that will not be carried forward for further analysis in the EIR. Issues to be addressed in the focused EIR include: Land Use and Planning, Geology, Soils and Paleontology, Air Quality and Odors, Terrestrial Biology, Fisheries and Aquatic Resources, Cultural Resources, Hydrology and Water Quality, Noise, and Climate Change, as discussed below.

- ▶ **Land Use and Planning** – The EIR will evaluate the proposed changes to on-site conditions and pipeline installation in terms of potential conflict with applicable land use plans, policies, or regulations of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect. The EIR will also examine the potential for the proposed project to physically divide an established community.
- ▶ **Geology, Soils, and Paleontological Resources** – The EIR will evaluate the potential hazards related to seismic events (including fault ground rupture, strong seismic ground shaking, liquefaction, seiches), unstable soils (including shrink-swell potential), and erosion potential. The EIR will also evaluate the potential for paleontological resources to be damaged by project-related construction activities.
- ▶ **Air Quality and Odors** – The EIR will describe regional and local air quality in the project vicinity and evaluate the potentially significant air quality effects during project construction (temporary, short term) and operation (long term). The estimated air emissions will be modeled and compared to emissions thresholds of

the Bay Area Air Quality Management District. Potential project-generated odorous emissions will also be evaluated.

- ▶ **Terrestrial Biology** – The EIR will describe the existing terrestrial biological resources and will evaluate the potential effects on those biological resources (i.e., terrestrial habitats and species).
- ▶ **Fisheries and Aquatic Resources** – The EIR will evaluate the potential impacts to fisheries and aquatic resources, including impacts to sensitive species and wetland habitats. Impacts to fisheries related to water quality will be compared to existing conditions.
- ▶ **Cultural Resources** – The EIR will include a cultural resource impact assessment. The EIR will describe the existing known cultural resources and the potential presence of unknown resources, and will evaluate the potential for project-related construction activities to damage or destroy both known and unknown resources (including prehistoric sites, historic-era buildings and structures, and human remains).
- ▶ **Hydrology and Water Quality** – The EIR will evaluate potential effects on hydrology and water quality, including alteration of drainage patterns, flooding, erosion, and water quality degradation of existing water bodies such as San Pablo Bay.
- ▶ **Noise** – The EIR will describe the potential construction and operational noise impacts and will compare these impacts to applicable noise thresholds.
- ▶ **Climate Change** – The EIR will evaluate the proposed project’s contribution to global climate change, consistent with Assembly Bill 32 (the California Climate Solutions Act of 2006) and OPR’s Technical Advisory (*CEQA and Climate Change*, June 19, 2008). The focus of the chapter will be to identify, to the extent feasible, the amount of greenhouse gas emissions anticipated to be generated and an assessment of whether the net change, as mitigated to the extent feasible, would constitute a substantial contribution to the significant adverse cumulative impact of global climate change. This assessment will also include an analysis of potential environmental benefits resulting from the use of methane (a wastewater treatment byproduct) in the existing on-site cogeneration plant to generate heat and electricity.

## ALTERNATIVES

Consistent with the requirements of the State CEQA Guidelines Section 15126.6 the EIR will examine a range of reasonable alternatives to the proposed project that are potentially feasible. The alternatives must feasibly attain most of the project objectives of the proposed project while also avoiding or substantially lessening at least one of the significant environmental effects of the proposed project. CEQA does not require alternatives to be evaluated at the same level of detail as the proposed project (State CEQA Guidelines Section 15126.6[d]). As a result of scoping and agency consultation efforts conducted to date, the alternatives currently proposed for evaluation in the EIR include:

- ▶ **No Project Alternative.** State CEQA Guidelines Section 15126.6(e) requires that the Draft EIR include analysis of a “no project” alternative. The purpose of the No Project Alternative is to disclose the reasonably foreseeable environmental impacts that would occur as a result of not approving the project.
- ▶ **Alternative 1: Full Tertiary Facilities.** Alternative 1 would upgrade the entire Pinole-Hercules WPCP from secondary to tertiary treatment. The current effluent discharge pipeline to the Rodeo Sanitary District would be abandoned and Outfall 001 would no longer be used. Instead, a new permitted outfall would be constructed in Pinole Creek for discharge of tertiary-treated effluent into the creek.
- ▶ **Alternative 2: Small Tertiary or Hybrid Solution.** Upgrades at the Pinole-Hercules WPCP would include the addition of a smaller tertiary facility to handle the increased wet weather flows. The existing pipeline to Outfall 001 at RSD would be upgraded and continue to be used. Flows from the new small tertiary or hybrid plant would be conveyed to a new pipeline and new outfall in Pinole Creek.

- ▶ **Alternative 3: All Flows to West County Wastewater District Facilities.** The existing Pinole-Hercules WPCP would be decommissioned and all existing flows would be diverted, via a new pipeline, to the West County Wastewater District facilities. The existing effluent pipeline to Outfall 001 at RSD would be abandoned.

One of the purposes of the NOP is to solicit input from responsible and trustee agencies and the public and interested organizations regarding potential alternatives to the proposed project. Therefore, the City welcomes comments during the public scoping process regarding these alternatives or suggestions for other alternatives to be examined in the EIR.

## **SUBMISSION OF COMMENTS**

To ensure that the full range of project issues of interest to responsible and trustee agencies and the public are addressed, comments and suggestions are invited from all interested parties. Written comments or questions concerning the EIR should be directed to the City at the address provided on the first page of this NOP by **5:00 p.m. on October 8, 2009**. Please provide the name and address of a contact person who should receive future correspondence regarding the project.



# INITIAL STUDY CHECKLIST

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>I. Aesthetics. Would the project:</b>				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## ENVIRONMENTAL SETTING

The Pinole-Hercules Water Pollution Control Plant (WPCP) is located along the shoreline of San Pablo Bay, at 11 Tennent Avenue. The Pinole Bayfront Park is located immediately west of the WPCP. Pinole Creek, a pedestrian and bicycle trail, and the shoreline of San Pablo Bay are located east of the project site. The vicinity south of the WPCP consists of residential housing, a storage facility, and Southern Pacific Railroad tracks that are in active use.

The WPCP site consists of an administrative building, corporation yard, parking areas, and various large industrial buildings that comprise the WPCP (see Exhibit 2). The existing plant facilities block the view of San Pablo Bay from Tennent Avenue and the residences and storage facility looking north, from Pinole Bayfront Park looking east, and from the pedestrian and bicycle trail looking west. The visual character of the WPCP is defined by industrial buildings and paved parking areas and access roads. Because of the industrial nature of the WPCP site, it does not contain scenic features.

The proposed pipeline to the Rodeo Sanitary District (RSD) would be installed adjacent to Pinole Creek between the plant and San Pablo Avenue, a distance of approximately 2,000 feet; Pinole Creek is a scenic resource. The remainder of the pipeline route to RSD, and the pipeline route to the West County Wastewater District Facility (WCWD), are within existing paved streets in an urban, built-up environment consisting of residential housing, public buildings, and commercial centers.

The proposed corporation yard would be located along Pinole Shores Drive immediately south of and adjacent to the Atchison Topeka & Santa Fe railroad tracks. This site is already developed with existing buildings and a paved parking lot. This site is surrounded by developed urban land and does not contain scenic features.

## DISCUSSION

### a) Have a substantial adverse effect on a scenic vista?

#### ***Option 1: New Larger Effluent Pipeline to RSD***

Upgrades at the existing plant and the existing deepwater outfall at RSD would occur within urban settings that are already developed with industrial uses. Views of San Pablo Bay from the surrounding areas are already blocked by the existing facilities, and the proposed upgrades would have no impact on those existing blocked views. The proposed corporation yard is already developed with buildings and a paved parking lot, and does not contain, nor is it adjacent to, any scenic resources. The proposed pipeline to RSD would be constructed underground, within existing urban, developed land, with the exception of the approximately 2,000-foot portion along Pinole Creek. Although Pinole Creek is a scenic resource, the pipeline would be installed underground. At the completion of construction activities, this 2,000-foot area along Pinole Creek would be returned to its current condition. The temporary, short-term disruption of views along the Pinole Creek corridor is considered a less-than-significant impact.

#### ***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) For the Pinole flows, the proposed plant upgrades would be similar to, and the proposed pipeline to RSD would be constructed in the same locations as, those described above under Option 1. Therefore, the same short-term, temporary disruption of views along the Pinole Creek corridor would occur. This impact on a scenic vista is considered less than significant.
- b) For the Hercules flows, because the pipeline would be constructed underground within existing developed urban land, and because WCWD upgrades would be conducted at an existing industrial facility, it is anticipated that the type and level of impact related to substantial adverse effects on a scenic vista under Option 2(b) would likely be similar to that discussed above under Option 1 and would be less than significant.

### b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

#### ***Option 1: New Larger Effluent Pipeline to RSD***

There are no state-designated scenic highways in the vicinity of any of the proposed project components. Therefore, there would be no impact to scenic resources within a state scenic highway.

#### ***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) For the Pinole flows, the proposed plant upgrades would be similar to, and the proposed pipeline to RSD would be constructed in the same locations as, those described above under Option 1 above. Therefore, there would be no impact to scenic resources within a state scenic highway.
- b) For the Hercules flows, because there are no state scenic highways within the vicinity of the pipeline route, and because the pipeline would be installed underground, the types and level of impacts under this option would likely be similar to those described in Option 1 above and would be less than significant.

### c) Substantially degrade the existing visual character or quality of the site and its surroundings?

#### ***Alternative 1: New Larger Effluent Pipeline to RSD***

As discussed above, with the exception of Pinole Creek, all proposed facilities would be constructed within developed urban or industrial land. Installation of the 2,000-foot segment of underground pipeline along Pinole

Creek would result in a short-term, temporary impact on the visual quality of this portion of the creek corridor; however, the construction activities are not considered to result in a substantial degradation of visual quality, and the land adjacent to the creek corridor where construction activities would occur would be returned to pre-project conditions. Therefore, this impact is considered less than significant.

**Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD**

- a) For the Pinole flows, the proposed plant upgrades would be similar to, and the proposed pipeline to RSD would be constructed in the same locations as, those described above under Option 1 above. Therefore, the same less-than-significant impact related to substantial degradation of visual quality would occur.
  - b) For the Hercules flows, because the pipeline route to the WCWD lies within developed and urban land, because the pipeline would be installed underground, and because upgrades to the WCWD plant would occur in an existing industrial setting, the types and level of impacts under this option would likely be less than those described in Option 1 above and would be less than significant.
- d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?**

**Alternative 1: New Larger Effluent Pipeline to RSD**

The proposed project would not require any new substantial lighting sources such as high-mast lighting other than those already present at the existing plant and at the developed site proposed for the corporation yard. Proposed plant upgrade materials would consist primarily of concrete, with some metal surfaces. The only existing residence that could be affected by light or glare is screened from the plant site by several stands of large trees. There are no residences that would be affected by light or glare at the new corporation yard. The pipeline would be constructed underground, and therefore would require no lighting. Therefore, there would be no impact related to adverse effects on day or nighttime views from creation of new sources of light or glare.

**Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD**

- a) For the Pinole flows, the proposed plant upgrades would be similar to, and the proposed pipeline to RSD would be constructed in the same locations as, those described above under Option 1 above. Therefore, there would be no impact related to adverse effects on day or nighttime views from creation of new sources of light or glare.
- b) For the Hercules flows, because the underground pipeline would not create new sources or light or glare, and because substantial upgrades at the existing WCWD that would require new sources of light or install new sources of glare are not anticipated, the type and level of this impact would likely be similar to that discussed above under Option 1 and would be less than significant.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>II. Agricultural Resources.</b>				
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997, as updated) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland.				
Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## ENVIRONMENTAL SETTING

The Department of Conservation, Office of Land Conservation, maintains a statewide inventory of farmlands. These lands are mapped by the Division of Land Resource Protection as part of the Farmland Mapping and Monitoring Program (FMMP). The maps are updated every 2 years with the use of aerial photographs, a computer mapping system, public review, and field reconnaissance. Farmlands are divided into the following five categories based on their suitability for agriculture.

- ▶ **Prime Farmland**—land that has the best combination of physical and chemical characteristics for crop production. It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops when treated and managed appropriately.
- ▶ **Farmland of Statewide Importance**—land other than Prime Farmland that has a good combination of physical and chemical characteristics for crop production.
- ▶ **Unique Farmland**—land that does not meet the criteria for Prime Farmland or Farmland of Statewide Importance but that has been used for the production of specific crops with high economic value.
- ▶ **Farmland of Local Importance**—land that either is currently producing crops or has the capability of production, but that does not meet the criteria of the categories above.
- ▶ **Grazing Land**—land on which the vegetation is suited to the grazing of livestock.

Other categories used in the FMMP mapping system are Urban and Built-Up Lands, Lands Committed to Nonagricultural Use, and Other Lands (land that does not meet the criteria of any of the other categories). According to the Department of Conservation, Farmland Mapping and Monitoring Program, the WPCP site and



proposed pipeline routes are designated as Urban and Built-Up Land (California Department of Conservation 2008).

## **DISCUSSION**

- a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?**

### ***Option 1: New Larger Effluent Pipeline to RSD***

The proposed facility upgrades and proposed pipeline route would not be located on land designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Therefore, project implementation would not convert farmland to a non-agricultural use, and there would be no impact.

### ***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) Upgrades to the WPCP and construction of the new pipeline under Option 2 would occur on land designated by the FMMP to be Urban and Built-Up Land and would therefore not convert Important Farmland to non-agricultural uses. Thus, there would be no impact.
- b) The proposed pipeline to WCWD and WCWD upgrades would be installed within existing roadways and at an existing wastewater treatment plant, and would therefore likely result in similar types and levels of impacts to Important Farmland as discussed above under Option 1 and there would be no impact.

- b) Conflict with existing zoning for agricultural use or a Williamson Act contract?**

### ***Option 1: New Larger Effluent Pipeline to RSD***

The WPCP and proposed pipeline routes are not located on land zoned for agricultural use or subject to a Williamson Act Contract. Therefore, there would be no impact.

### ***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) Upgrades to the WPCP and construction of the proposed pipeline to RDS under Option 2 would not occur on land that is zoned for agricultural use or subject to a Williamson Act contract. Therefore, there would be no impact.
- b) For the Hercules flows, the pipeline to WCWD and the WCWD plant improvements would be installed within existing roadways and at an existing wastewater treatment plant, and not on land zoned for agricultural use or subject to a Williamson Act contract. Therefore, there would be no impact.

- c) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?**

### ***Option 1: New Larger Effluent Pipeline to RSD***

As discussed above, the WPCP upgrades and proposed pipeline route are not located on land zoned for agricultural use nor designated as Farmland by the Department of Conservation. Furthermore, the proposed project would not result in an increase in permitted dry weather capacity, and therefore would have no potential to provide treatment for additional residential or commercial land uses. Thus, the proposed project would not result in or induce conversion of Farmland to a non-agricultural use, and there would be no impact.

**Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD**

- a) Because upgrades to the WPCP and the proposed pipeline would be installed in the same locations as discussed above under Option 1, and because the WPCP's permitted dry weather capacity would not increase under this option, the Pinole flows at the existing plant would not result in or induce conversion of Farmland to a non-agricultural use, and there would be no impact.
- b) The physical installation of a pipeline to convey City of Hercules flows to WCWD, and the improvements at the existing WCWD plant, would have no impact on conversion of Farmland. However, the WCWD facility would require an increased in its permitted dry weather flow capacity under this option. There is a potential that the increase in WCWD treatment capacity could remove an obstacle to growth, indirectly resulting in conversion of farmland within the water district's service area; this will be considered in the growth-inducing analysis of the EIR.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>III. Air Quality.</b>				
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied on to make the following determinations.				
Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Environmental impacts associated with air quality will be discussed in the environmental impact report (EIR).

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>IV. Biological Resources. Would the project:</b>				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Environmental impacts associated with biological resources will be discussed in the EIR.

ENVIRONMENTAL ISSUES		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>V.</b>	<b>Cultural Resources. Would the project:</b>				
	a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	d) Disturb any human remains, including those interred outside of formal cemeteries?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Environmental impacts associated with cultural resources will be discussed in the EIR.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>VI. Geology and Soils. Would the project:</b>				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? (Refer to California Geological Survey Special Publication 42.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii) Strong seismic ground shaking?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating substantial risks to life or property?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Environmental impacts associated with geology and soils will be discussed in the EIR.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>VII. Hazards and Hazardous Materials. Would the project:</b>				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## ENVIRONMENTAL SETTING

A computerized database search of various agency lists was conducted for the WPCP, corporation yard, and pipeline routes to identify any known sites of hazardous material contamination. The results of that database search are listed in Table 1. There are no known hazardous material contamination issues located within the WPCP; however, there are reported leaking underground storage tank (LUST) sites adjacent to the proposed pipeline routes. All but one of LUST sites reported along the proposed pipeline route to RSD have been remediated and therefore are not listed in Table 1 below. In contrast, there are multiple sites in need of remediation along the proposed pipeline route to WCWD. Refer to Table 1 for detailed information.

**Table 1  
Potential Sources of Contamination along the Proposed Pipeline Routes**

Facility Name	Potential Contaminant	Potential Media	Regulatory Status
<b>Pipeline Route to RSD Sanitary District</b>			
TOSCO – Facility #482 401 Parker Avenue RSD, CA	Gasoline	Groundwater	Site Assessment
<b>Pipeline Route to Richmond</b>			
Chevron 550 San Pablo Avenue Pinole, CA	Gasoline	Groundwater	Remediation
Square Deal Garage 2500 San Pablo Avenue Pinole, CA	Gasoline	Aquifer used for Drinking Water	Site Assessment
Sugar City Building Materials Company 800 San Pablo Avenue Pinole, CA	Gasoline	Aquifer used for Drinking Water and Groundwater	Site Assessment
Matlack Inc. 850 Brookside Drive Richmond, CA	Diesel	Groundwater	Verification Monitoring
Shell Pipeline Brookside Drive Contra Costa, CA	Aviation Fuel and other petroleum	Groundwater	Site Assessment
Source: Geotracker 2009; Envirostor 2009			

While no schools are located within one-quarter mile of the WPCP or proposed corporation yard location, the following are found within one-quarter mile of the proposed pipeline route to RSD:

- ▶ A Little World Montessori Academy, 355 Parker Avenue, RSD
- ▶ RSD Hills Elementary School, 545 Garretson Avenue, RSD
- ▶ Saint Patrick School, 907 7<sup>th</sup> Street, RSD

Schools near the proposed pipeline route to WCWD include:

- ▶ La Casita Bilingual Preschool, 592 Tennent Avenue, Pinole
- ▶ Saint Joseph’s Elementary School, 1961 Plum Street, Pinole
- ▶ Shannon Elementary School, 685 Marlesta Road, Pinole
- ▶ Spectrum Center – Tara Hills, 16330 San Pablo Avenue, San Pablo
- ▶ Bayview Elementary School, 3001 16<sup>th</sup> Street, San Pablo
- ▶ Middle College High School, 2600 Mission Bell Drive, San Pablo
- ▶ Lake Elementary School, 2700 11<sup>th</sup> Street, San Pablo
- ▶ Verde Elementary School, 2000 Giaramita Street, Richmond
- ▶ Pacific Academy, 2925 Technology Court, Richmond
- ▶ A Better Chance School, 4138 Lakeside Drive, Richmond
- ▶ La Petite Academy, 1221 Nevin Avenue, Richmond

The Contra Costa Department of Health Services provides incident response for chemical spills, toxic release, and drug lab accidents, which includes: health hazard information, cleanup oversight, community warning system activation, and identification of unknown substances. If a facility discovers an incident, it is required to notify the



Hazardous Materials Incident Response Team, which would follow the Hazardous Materials Incident Notification Policy approved by the Contra Costa County Board of Supervisors. If required, the Hazardous Materials Response Team and Fire Department provides assistance, notification, and evacuation actions (Contra Costa County 2009).

Public Resources Code 4201–4204 and Government Code 51175–51189 require identification of fire hazard severity zones within the state of California. Fire hazard severity zones are measured qualitatively, based on: vegetation, topography, weather, crown fire potential (a fire’s tendency to burn upwards into trees and tall brush), and ember production and movement within the area of question. Fire prevention areas considered to be under state jurisdiction are referred to as “state responsibility area,” whereas “local responsibility areas” are under the jurisdiction of local entities (e.g., cities, counties), are required to only identify very high fire hazard severity zones. The WPCP, proposed corporation yard, and proposed pipeline routes are located in a local responsibility area considered to be a non-very high fire hazard severity zone (CDF 2009).

There are no private or public use airports within 2 miles of the WPCP, proposed corporation yard, or proposed pipeline routes.

## **DISCUSSION**

### **a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials**

#### ***Option 1: New Larger Effluent Pipeline to RSD***

Construction activities associated with the proposed project would involve the routine transport and handling of hazardous substances such as fuels and lubricants. Handling and transport of these materials could result in the exposure of workers to hazardous materials. The proposed project is required by law to comply with applicable federal, state, and local laws pertaining to the handling and transport of hazardous materials, including California Occupational Health and Safety Administration (Cal-OSHA) requirements. Thus, this impact would be less than significant.

#### ***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) As discussed above, while construction activities would involve the routine transport and handling of hazardous substances, contractors would be required to comply with applicable federal state, and local law while upgrading the WPCP plant and installing the pipeline to RSD. Thus, this impact would be less than significant.
- b) For the Hercules flows, hazardous materials used to install the pipeline to WCWD and to construct the WCWD plant improvements would be similar to those discussed above under Option 1 and the impact would be less than significant.

### **b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment**

#### ***Option 1: New Larger Effluent Pipeline to RSD***

As noted above, construction of the proposed project would involve the use of heavy construction equipment, which uses small amounts of hazardous materials such as oils, fuels, and other potentially flammable substances that are typically associated with construction activities. However, the City of Pinole would work with the project contractor to establish a construction staging area where hazardous materials would be stored during construction. Furthermore, the City of Pinole would require the contractor to prepare an accidental spill prevention and response plan. During construction activities, the City of Pinole would employ BMPs for spill control and

prevention as part of the SWPPP, which are required as part of the City of Pinole's NPDES permit (to be discussed further the "Hydrology and Water Quality" section of the EIR). Therefore, because the appropriate prevention and management practices would be in place as required by local and regional regulatory agencies, potential impacts from construction- and maintenance-related accidental spills of hazardous materials would be considered less than significant. (Potential impacts related to the release of hazardous materials from the proposed treatment facility or pipeline related to seismic events will be evaluated in the "Geology, Soils, and Paleontology" section of the EIR.)

**Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD**

- a) For the Pinole flows, the City of Pinole would work with the project contractor to establish a construction staging area where hazardous materials would be stored during construction. Furthermore, the City would require the contractor to prepare an accidental spill prevention and response plan. In addition, implementation of BMPs and preparation of a SWPPP, which are required by the City of Pinole's NPDES permit, would also help to prevent and control hazardous materials spills. Therefore, this impact would be less than significant.
- b) For the Hercules flows, implementation of BMPs, preparation of a SWPPP, and other plans to reduce the potential for accidental spills would be required, and therefore this option would likely result in similar types and levels of impacts related to accidental spills as those described above under Option 1, a less-than-significant impact.
- c) **Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school**

**Option 1: New Larger Effluent Pipeline to RSD**

There are no schools located within ¼ mile of the WPCP or proposed corporation yard; however, multiple schools are located with ¼ mile of the proposed pipeline routes (see the "Environmental Setting" section, above). As described previously, the handling and transport of hazardous materials used during construction would be regulated under applicable federal, state, and local laws. In addition, the proposed pipeline routes are located within major thoroughfares (e.g., San Pablo Avenue) where fuels, lubricants, and other typical construction-related materials are regularly transported. Furthermore, pipeline construction would not result in emissions of hazardous substances. Because the hazardous materials such as equipment lubricants and diesel fuels used during pipeline construction within ¼ mile of an existing or proposed school are considered to be minor and would occur for a short-term, and because use of these materials is regulated by local, state, and federal law, the potential for a spill during pipeline construction that would be of large enough magnitude to adversely affect one of these schools is considered extremely unlikely. Therefore, this impact is considered less than significant.

**Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD**

- a) For the Pinole flows, similar WPCP upgrades and construction of the same proposed pipeline would occur in the same location and require use of the same types of minor amounts of hazardous materials such as lubricants and fuels within ¼ mile of several existing schools, as described above. This impact would be less than significant for the same reasons described in Option 1, above.
- b) For the Hercules flows, numerous schools are located within ¼ mile of the proposed pipeline to WCWD; however, because the use of construction-related hazardous substances would be minor and is regulated by local, state, and federal law, the impact would be less than significant.

- a) **Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment**

***Option 1: New Larger Effluent Pipeline to RSD***

There are no sites within the WPCP boundary or proposed corporation yard included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. While there are numerous hazardous materials sites adjacent to the proposed pipeline route, all but one of the sites has been remediated, and there are no sites reported to be within the existing roadways. Because the proposed pipeline would be constructed within existing roadways, project implementation would not result in construction worker personnel coming into contact with materials from the TOSCO facility LUST, and therefore the proposed project would not create a significant hazard to the public or the environment. There would be no impact.

***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) The WPCP and proposed pipeline route to RSD does not contain any hazardous materials sites compiled pursuant to Government Code Section 65962.5; therefore, there would be no impact.
- b) For the Hercules flows, the proposed pipeline route and the upgrades to the WCWD plant would not be installed within a hazardous material site compiled pursuant to Government Code Section 54962.5; thus, there would be no impact.

- b) **For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area**

***Option 1: New Larger Effluent Pipeline to RSD***

The proposed project is not located within an airport land use plan, nor is it within two miles of a public airport or public use airport. Therefore, there would be no impact.

***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) For the Pinole flows, because there are no airport land use plans, public airports, or public use airports within two miles of the WPCP or proposed pipeline route to RSD, there would be no impact.
- b) For the Hercules flows, no public airports or public use airports are located within 2 miles of the proposed pipeline route or the WCWD plant; therefore, there would be no impact.

- c) **For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area**

***Option 1: New Larger Effluent Pipeline to RSD***

None of the proposed project components would be located within the vicinity of a private airstrip; thus, there would be no impact.

***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) For the Pinole flows, no private airstrips are located within the vicinity of the WPCP or proposed pipeline route to RSD; thus, there would be no impact.

- b) For the Hercules flows, because no airstrips are located in the vicinity of the proposed pipeline route or the WCWD facility, there would be no impact.
- d) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan**

***Option 1: New Larger Effluent Pipeline to RSD***

Implementation of the proposed project would have no impact on emergency ingress and egress at the WPCP. Pipeline construction would require one lane along the affected roadways shown in Exhibit 4 to be closed in a phased manner as construction proceeds along the route. The City of Pinole would comply with ordinances requiring coordination among City departments, public notice of affected roadway closures, and roadway signs and flagman as appropriate. Because all of the affected roadways would remain open, project implementation would not result in substantial interference with an adopted emergency response plan or emergency evacuation plan. Therefore, this impact would be less than significant.

***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) Under Option 2, similar types of improvements at the WPCP, and the same pipeline to RSD, would be installed along the same route. Therefore, for the same reasons discussed above under Option 1, project implementation would not result in substantial interference with an adopted emergency response plan or emergency evacuation plan, and the impact would be less than significant.
- b) For the Hercules flows, because the pipeline would be installed within existing roadways, and because the same type of compliance with roadway lane closure notification, signage, and flagman would occur, it is anticipated that project implementation would not result in substantial interference with an adopted emergency response plan or emergency evacuation plan, and the impact would be less than significant.
- e) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands**

***Option 1: New Larger Effluent Pipeline to RSD***

The upgrades to the WPCP and proposed pipeline to RSD would be located within a developed, urbanized area that does not have a high fire hazard severity rating and is not located adjacent to wildlands. Existing fire services would be sufficient to handle any emergency that arose during project construction activities. Therefore, there would be no impact.

***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) For Pinole flows, upgrades to the WPCP and installation of the proposed pipeline to RSD would be constructed the same locations discussed above under Option 1, on land that does not have a high fire hazard severity rating and is not located adjacent to wildlands. Therefore, there would be no impact.
- b) For Hercules flows, the proposed pipeline route to WCWD would be built within existing roadways, and upgrades would be constructed to an existing wastewater treatment plant, which are not likely to have a high fire hazard severity rating. Therefore, there would be no impact.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>VIII. Hydrology and Water Quality. Would the project:</b>				
a) Violate any water quality standards or waste discharge requirements?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial on- or off-site erosion or siltation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in on- or off-site flooding?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j) Result in inundation by seiche, tsunami, or mudflow?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Environmental impacts associated with hydrology and water quality will be discussed in the EIR.

ENVIRONMENTAL ISSUES		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>IX.</b>	<b>Land Use and Planning. Would the project:</b>				
	a) Physically divide an established community?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Environmental impacts associated with land use and planning will be discussed in the EIR.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>X. Mineral Resources. Would the project:</b>				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## ENVIRONMENTAL SETTING

In compliance with the California Surface Mining and Reclamation Act (SMARA), the California Division of Mines and Geology (CDMG) has established the classification system shown in Table 2 to denote both the location and significance of key extractive resources.

Classification	Description
MRZ-1	Areas where adequate information indicates that no significant mineral deposits are present or where it is judged that little likelihood exists for their presence
MRZ-2	Areas where adequate information indicates that significant mineral deposits are present or where it is judged that a high likelihood for their presence exists
MRZ-3	Areas containing mineral deposits, the significance of which cannot be evaluated from available data
MRZ-4	Areas where available information is inadequate for assignment to any other mineral resource zone

Note: MRZ = Mineral Resource Zone  
Source: Stinson, Manson, and Plappert 1987

Under SMARA, the State Mining and Geology Board may designate certain mineral deposits as being regionally significant to satisfy future needs. The board's decision to designate an area is based on a classification report prepared by CDMG and on input from agencies and the public. The project site lies within the designated South San Francisco Bay Production-Consumption Region, which includes all designated lands within the marketing area of the active aggregate operations supplying the South San Francisco Bay urban center. The WPCP, proposed corporation yard, and WCWD are located on land classified as MRZ-1. The proposed pipeline to RSD would be located within areas classified as MRZ-1 and MRZ-3. The proposed pipeline to WCWD would be located within areas classified as MRZ-4 and MRZ-1.

None of the proposed project components would be located on land that has been designated by the California Division of Mines and Geology as containing known mineral resources (MRZ-2). The areas of known mineral resources in the County are located as follows: (1) Port Costa (clay); Mt. Zion (diabase - an intrusive igneous rock that is used for roadbase and as rip-rap to prevent streambank erosion); and Camino Diablo (domegine sandstone - used in the manufacture of heat-resistant glass). None of these resources are located in the vicinity of the proposed project components. The closest quarry (stone/rock) to the project vicinity was located in Richmond, approximately 4 miles southwest of the WCWD and approximately 8 miles southwest of the Pinole-Hercules WPCP (Larose et al. 1999). This quarry has closed and the land has been reclaimed.

## DISCUSSION

- a) **Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?**

### ***Option 1: New Larger Effluent Pipeline to RSD***

The proposed project components would be located on urban land that is already developed and does not contain known mineral resources that would be of value to the region or the state. Although portions of the proposed pipeline would be installed in areas zoned MRZ-3, where the mineral resource significance cannot be determined based on available data, the proposed pipeline would be installed within existing paved roadways in those areas. Therefore, there would be no impact.

### ***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) For the Pinole flows, the proposed plant upgrades and pipeline to RSD would be constructed in the same locations as those described above under Option 1. Therefore, there would be no impact related to loss of known mineral resources that would be of value to the region or the state.
- b) For the Hercules flows, although portions of the proposed pipeline would be installed in areas zoned MRZ-4, where the mineral resource significance cannot be determined based on available data, the proposed pipeline would be installed within existing paved roadways in those areas. Therefore, there would be no impact related to loss of known mineral resources that would be of value to the region or the state.



ENVIRONMENTAL ISSUES		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XI.</b>	<b>Noise. Would the project result in:</b>				
a)	Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or in other applicable local, state, or federal standards?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b)	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c)	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d)	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f)	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Environmental impacts associated with noise will be discussed in the EIR.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XII. Population and Housing. Would the project:</b>				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing homes, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## ENVIRONMENTAL SETTING

The WPCP service area consists of the municipal boundaries of the Cities of Pinole and Hercules, which have a combined population of approximately 43,000. According to the U.S. Census Bureau, the population of these cities has increased by approximately 9,000 people between 1990 and 2007 (U.S. Census Bureau 2007). In 2008, approximately 19,200 people from the City of Pinole and approximately 23,700 people from the City of Hercules were utilizing the WPCP services. Currently, Pinole and Hercules contribute 1.5 million gallons per day (MGD) and 1.7 MGD dry weather flows, respectively, which is approximately 0.86 MGD less than the permitted flow (Contra Costa County LAFCO 2008).

## DISCUSSION

- a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?**

### ***Option 1: New Larger Effluent Pipeline to RSD***

Improvements to the Pinole-Hercules WPCP are based upon corrective measures required by RWQCB. The proposed project includes an increase in permitted wet-weather capacity only, in order to handle increased influent flow during winter storm events. The plant would not be permitted to treat additional wastewater from any new residential, commercial, or industrial development, if such development were to exceed its current permitted 4.06 MGD average dry weather capacity. Because the proposed permit change would not allow the plant to treat additional wastewater from new development, project implementation would not induce population growth, and there would be no impact.

### ***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) For the Pinole flows, upgrades to the WPCP and installation of the pipeline to RSD would bring the WPCP into compliance with RWQCB discharge requirements and would result only in an increase of permitted wet-weather flow. Because the proposed permit change would not allow the plant to treat additional wastewater from new development, project implementation would not induce population growth, and there would be no impact.
- b) For the Hercules flows, the WCWD would require an increased in permitted dry weather flows, which could result in an indirect impact by providing treatment capacity for increased population growth. The type and

level of this impact could be greater than that discussed above for Option 1, and will be described and evaluated in the growth-inducing impacts analysis of the EIR.

- b) Displace substantial numbers of existing homes, necessitating the construction of replacement housing elsewhere?**

***Option 1: New Larger Effluent Pipeline to RSD***

Construction of the proposed project includes upgrades to the existing WPCP facility and construction of pipelines in existing roadways. Trenches dug for pipeline placement would be backfilled upon installation. Because implementation of the proposed project would not displace existing homes, there would be no impact.

***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) For the same reasons discussed above under Option 1, the proposed construction related to Pinole flows would not displace homes; thus, there would be no impact.
- b) For the Hercules flows, installation of the pipeline to WCWD would occur within existing roadways, and WCWD improvements would be constructed at an existing wastewater treatment plant. No displacement of homes would occur and there would be no impact.

- c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?**

***Option 1: New Larger Effluent Pipeline to RSD***

Construction of improvements at the existing WPCP facility and construction of pipelines in existing roadways would not displace any people and would therefore not necessitate the construction of replacement housing. There would be no impact.

***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) For Pinole flows, construction of improvements at the existing WPCP facility and construction of pipelines in existing roadways would not displace people or necessitate construction of replacement housing; therefore, there would be no impact.
- b) For Hercules flows, construction of a pipeline to WCWD would occur within existing roadways and construction of WCWD improvements would occur at an existing wastewater treatment plan, and would not displace people or necessitate construction of replacement housing; therefore, there would be no impact.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XIII. Public Services. Would the project:</b>				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## ENVIRONMENTAL SETTING

The Pinole Fire Department provides emergency services to the WPCP. Fire Station 73 is the closest fire station and is located approximately 0.7 miles to the southeast at 880 Tennent Avenue. The Pinole Police Department is located within the same complex as the Fire Department.

The proposed project does not involve the construction of new school facilities. As discussed below, in Section 2.14, "Recreation," park facilities near the WPCP and proposed pipeline routes located within the City of Pinole and City of RSD are maintained by the City of Pinole Department of Recreation and the Contra Costa County Department of Recreation, respectively. Recreation facilities near the proposed project include: Bayfront Park and a bicycle trail located adjacent to the WPCP facility, Lefty Gomez Ballfield Complex located along the pipeline route to RSD, and Fernandez Park located adjacent to the pipeline route to the WCWD.

## DISCUSSION

- a) **Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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?**

**Other public facilities?**

### ***Option 1: New Larger Effluent Pipeline to RSD***

The proposed project would not result in the need for any expanded fire or police protection services, nor would it require the construction of any school facilities. Implementation of the proposed project would require one 24–48 hour closure of the pedestrian/bicycle path along Pinole Creek. However, this impact would be short-term and temporary and would not result in any long-term physical adverse impacts. Thus, this impact would be less than significant.

### ***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) Implementation of Option 2(a) would not result in the need for any expanded fire or police protection services, nor would it require the construction of any school facilities. This option would require one 24–48-hour closure of the pedestrian/bicycle path along Pinole Creek; however, because this would be short-term and temporary and would not cause any long-term physical adverse effect, this impact would be less than significant.
- b) Installation of a pipeline to WCWD and WCWD plant upgrades is not anticipated to result in the need for any expanded fire or police protection services, nor would it require the construction of any school facilities. Because the pipeline would be constructed solely within paved streets, no effects to any recreational facilities would be expected. Thus, no impacts related to the effect of provision of governmental facilities on service ratios of public facilities would result and there would be no impact.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XIV. Recreation. Would the project:</b>				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## ENVIRONMENTAL SETTING

Recreational facilities near the WPCP and proposed pipeline routes located within City of Pinole are maintained by the City of Pinole Department of Recreation. Recreational facilities located within the City of Rodeo are maintained by the Contra Costa County Department of Recreation. There are no recreational facilities near the project footprint located within the cities of Hercules, San Pablo, or Richmond.

Recreation facilities near the proposed project include: Bayfront Park, pedestrian/bicycle trails located east and west of the WPCP facility, Lefty Gomez Ballfield Complex located along the pipeline route to RSD, and Fernandez Park located adjacent to the pipeline route to Richmond.

## DISCUSSION

- a) **Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?**

### ***Option 1: New Larger Effluent Pipeline to RSD***

The proposed project would provide improvements at the existing WPCP and installation of an underground forcemain. Therefore, project implementation would have no impact in terms of increasing the use of existing recreational facilities.

### ***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) For Pinole flows, the proposed project would provide improvements at the existing WPCP and installation of an underground forcemain. Therefore, project implementation would have no impact in terms of increasing the use of existing recreational facilities.
- b) Installation of a pipeline to WCWD and upgrades to the existing treatment plant would not result in increased use of existing neighborhood or regional parks; thus there would be no impacts.

- b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?**

***Option 1: New Larger Effluent Pipeline to RSD***

The proposed project does not include construction of new parks and would not require the expansion of existing recreational facilities. Therefore, there would be no impact.

***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) For Pinole flows, the required project improvements would not include construction of new parks and would not require the expansion of existing recreational facilities. Thus, there would be no impact.
- b) For Hercules flows, the required project improvements would not include construction of new parks and would not require the expansion of existing recreational facilities; therefore, there would be no impact.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XV. Transportation/Traffic. Would the project:</b>				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Exceed, individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Result in inadequate parking capacity?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## ENVIRONMENTAL SETTING

Regional access to the WPCP is provided by San Pablo Avenue, which is a four-lane north-south major arterial. Local access is provided primarily by Tennent Avenue. The proposed pipeline route to RSD would be installed in Railroad Avenue, San Pablo Avenue, 2<sup>nd</sup> Street, and Parker Avenue (Exhibit 4); the pipeline to WCWD would be installed in Tennent Avenue, San Pablo Avenue, Rumrill Boulevard, Brookside Drive, 3<sup>rd</sup> Street, Pittsburg Avenue, and Garden Tract Road (Exhibit 7).

The operating conditions of a roadway can be quantitatively described as one of six levels of service (LOS). LOS is influenced by factors including speed, travel time, traffic interruptions, and freedom to maneuver. A LOS level of A is considered to be the most free flowing traffic, and a LOS level of F would indicate very congested, stop-and-go traffic. Table 3 contains LOS and average daily trips for San Pablo Avenue, which is the primary route for both pipelines.

Roadway Segment	Level of Service	Average Daily Trips
San Pablo Avenue West of Del Monte Drive/Belmont Way	C	17,100
San Pablo Avenue West of Appian Way	C	20,600
San Pablo Avenue East of Pinole Valley Road	D	20,900
Source: City of Pinole 1995		



The California Department of Transportation (Caltrans) records ramp volumes for the California State Freeway System. The Pinole Valley Road exit along I-80 is the closest freeway ramp to the WPCP, and provides access to San Pablo Avenue (the primary route for both pipelines). In 2006, Caltrans collected traffic volumes for Pinole Valley Road ramps, as detailed in Table 4.

<b>Table 4</b>	
<b>Average Daily Trips on Pinole Valley Road/Interstate 80 Ramps</b>	
Ramp	Average Daily trips
Eastbound Off-Ramp	10,900
Eastbound On-Ramp	4,500
Westbound Off-Ramp	4,050
Westbound On-Ramp	9,800
Source: Caltrans 2009	

## DISCUSSION

- a) **Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?**

### ***Option 1: New Larger Effluent Pipeline to RSD***

Project implementation would require no more than 8 construction workers at any given time over an approximately 30-month period, which would result in a total increase of approximately 16 daily worker commute trips. While upgrades to the WPCP would not be expected to substantially increase traffic near the project site, installation of the proposed pipelines would require closure of one lane on the roadways shown on Exhibit 4. Road closures would be expected to occur in increments, which would increase traffic and congestion in the immediate vicinity. However, closure of one lane is not expected to substantially increase traffic in relation to the existing traffic load and capacity of the street system because it would occur in phases. In addition, the corporation yard employs 12 workers and receives approximately 15 deliveries per day, which amounts to a total of approximately 27 daily trips. These 27 trips associated with relocation of the corporation yard would not result in any change in the number of vehicles trips, the volume to capacity ratio on roads, or congestions at intersections, because these trips are already occurring; thus, this impact would be less than significant.

### ***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) For Pinole flows, plant upgrades and pipeline installation would occur in the same locations and would require the same number of workers as described in Option 1 above. Therefore, project-related increases traffic in relation to the existing traffic load and capacity of the street system would be considered a less-than-significant impact.
- b) For Hercules flows, construction of a pipeline to WCWD and WCWD plant improvements would likely require approximately the same number of construction workers and road closures as required for Option 1. Therefore, the level and types of impacts associated with traffic load and capacity would likely be similar to those discussed above under Option 1, and there would be a less-than-significant impact.

- b) Exceed, individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?**

***Option 1: New Larger Effluent Pipeline to RSD***

As described above, Option 1 would require no more than 8 construction workers at a given time over an approximately 30-month time period (16 total daily trips), and would require closure of one lane of affected roadways (shown in Exhibit 4) in increments. Relocation of the corporation yard would not result in an increase in trips associated with operation of that facility. The 16 daily construction worker trips would not substantially increase the number of vehicles on nearby roadways and would not exceed, individually or cumulatively, a level of service standard. Thus, this impact would be less than significant.

***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) For Pinole flows, the same number of construction worker commute trips would occur, and the same lane closures along affected roadways would occur. The 16 daily construction worker trips would not substantially increase the number of vehicles on nearby roadways and would not exceed, individually or cumulatively, a level of service standard. Thus, this impact would be less than significant.
- b) For Hercules flows, construction of the pipeline along existing roadways and WCWD plant improvements would result in a similar number of construction worker commute trips and similar lane closures. This low level of daily construction worker trips would not substantially increase the number of vehicles on nearby roadways and is not likely to exceed, individually or cumulatively, a level of service standard. Impacts to level of service would therefore be less than significant.

- c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?**

***Option 1: New Larger Effluent Pipeline to RSD***

The project site is not located within 2 miles of an airport, and project implementation would have no effects on air traffic patterns. There would be no impact.

***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) For Pinole flows, the WPCP and proposed pipeline route to RSD are not located within 2 miles of an airport. Thus, there would be no impact.
- b) For Hercules flows, the WCWD and proposed pipeline route to WCWD are not located within 2 miles of an airport; therefore, this impact related to a change of air traffic patterns is likely to be similar to that described above under Option 1. Thus, there would be no impact.

- d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?**

***Option 1: New Larger Effluent Pipeline to RSD***

The proposed project includes upgrades at an existing wastewater treatment plant and installation of an underground pipeline in existing roadways, in a developed, urbanized area. The proposed project does not include design features such as sharp curves or dangerous intersections that would increase hazards, nor does it require incompatible land uses. Thus, there would be no impact.

**Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD**

- a) For Pinole flows, plant upgrades and pipeline installation would be of a similar nature and occur in the same locations as discussed above under Option 1. Because the proposed project does not include design features such as sharp curves or dangerous intersections that would increase hazards, nor does it require incompatible land uses, there would be no impact.
- b) For Hercules flows, it is anticipated that installation of a pipeline to WCWD within existing paved roadways, and construction of improvements to the existing WCWD plant, would not involve design features such as sharp curves or dangerous intersections that would increase hazards, nor would it require incompatible land uses. Therefore, there would be no impact.

**e) Result in inadequate emergency access?**

**Option 1: New Larger Effluent Pipeline to RSD**

Implementation of the proposed project would require loss of one of four lanes along San Pablo Avenue and other affected roadways shown in Exhibit 4, in phases over approximately 30 months. Traffic would continue to flow in both directions on these roadways, and the City of Pinole would follow ordinances requiring coordination among departments, noticing of lane closures, and appropriate signage and flagmen. Furthermore, construction of improvements at the existing WPCP would not block emergency ingress or egress at the plant. Therefore, project implementation would not result in inadequate emergency access. This impact would be considered less than significant.

**Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD**

- a) For Pinole flows, construction of plant improvements and installation of the pipeline to RSD would be of a similar nature and would occur in the same locations as described in Option 1. Traffic would continue to flow in both directions on the affected roadways, and the City of Pinole would follow ordinances requiring coordination among departments, noticing of lane closures, and appropriate signage and flagmen. Furthermore, construction of improvements at the existing WPCP would not block emergency ingress or egress at the plant. Therefore, project implementation would not result in inadequate emergency access. This impact would be considered less than significant.
- b) For Hercules flows, it is anticipated that traffic would continue to flow in both directions on the affected roadways, and the City of Hercules would follow ordinances requiring coordination among departments, noticing of lane closures, and appropriate signage and flagmen. Furthermore, construction of improvements at the existing WCWD plant is not expected to block emergency ingress or egress at the plant. Impacts to emergency access would therefore be expected to be of similar type and severity as described above under Option 1. This impact would be less than significant.

**f) Result in inadequate parking capacity?**

**Option 1: New Larger Effluent Pipeline to RSD**

Project implementation would not result in alterations to existing parking facilities, nor would it increase the need for parking facilities as a result of operational activities. Adequate parking is available for construction workers. Therefore, there would be no impact.

**Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD**

- a) For Pinole flows, project implementation would not result in alterations to existing parking facilities, nor would it increase the need for parking facilities as a result of operational activities. Adequate parking is available for construction workers. Therefore, there would be no impact.

- b) For Hercules flows, it is unknown whether the increased in treatment capacity would result in the need for additional plant employees, however, any such increase would likely be minor. Similarly, it is expected that construction worker parking would be sufficient. Therefore, there would be no impact.
- g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?**

***Option 1: New Larger Effluent Pipeline to RSD***

The proposed project would require the installation of a pipeline within one lane of existing roadways, which would result in closure of one of four lanes of San Pablo Avenue. Although this may have a minimal effect on traffic flow rate, it would not be substantial, and would not conflict with adopted policies, plans, or programs supporting alternative transportation. During construction, the Pinole Creek bicycle path would be closed once for approximately 24 to 48 hours; however, other bicycle commute routes would be available. Therefore, this impact is considered less than significant.

***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) For the Pinole flows, pipeline installation would require the closure of one lane along San Pablo Avenue. However, this impact would be temporary and minimal and would not conflict with adopted policies, plans, or programs supporting alternative transportation. Therefore, this impact would be less than significant.
- b) For the Hercules flows, pipeline construction within existing roadways would likely require the temporary closure of one lane along affected roadways shown in Exhibit 6. However, this impact would be temporary and minimal and would not conflict with adopted policies, plans, or programs supporting alternative transportation. Therefore, this impact would be less than significant.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XVI. Utilities and Service Systems. Would the project:</b>				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) 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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand, in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## ENVIRONMENTAL SETTING

Natural gas and electricity are provided to the WPCP by Pacific Gas and Electric Company and the Hercules Municipal Utilities Department, respectively. The East Bay Municipal Utilities Department provides potable water. Wastewater and stormwater flows at the WPCP are directed back into the plant for treatment. Dried stockpiled sludge is considered to be a hazardous material and is hauled off site to the Keller Canyon Landfill in Pittsburgh, CA. Recyclable materials removed from the wastewater (e.g., metals) are sold to a contractor, who resells recyclable material.

## DISCUSSION

### a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

#### *Option 1: New Larger Effluent Pipeline to RSD*

Upgrades and improvements to the WPCP infrastructure are proposed in response to waste discharge requirements from RWQCB because the current discharge capacity is not adequate for wet weather flows. The proposed project and project alternative would upgrade and improve facilities so that the plant would be

consistent with discharge requirements discussed in RWQCB Order No R2-2007-0024. Thus, there would be no adverse impact (beneficial impact).

**Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD**

- a) For Pinole flows, the plant upgrades are proposed for the same reasons discussed above in Option 1. Therefore, there would be no adverse impact (beneficial impact).
- b) For Hercules flows, pipeline construction and plant improvements would occur for the same reasons discussed above in Option 1. Therefore, there would be no adverse impact (beneficial impact).
- b) 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?**

**Option 1: New Larger Effluent Pipeline to RSD**

The proposed project consists of an upgrade to the existing WPCP, relocation of the corporation yard, and the addition of a wastewater force main to RSD. Environmental impacts associated with project-related improvements are discussed throughout this Initial Study, and will be further disclosed and analyzed in the EIR, as discussed in the attached Notice of Preparation (NOP). Where potentially significant impacts are identified in the EIR, feasible mitigation measures will be recommended.

**Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD**

- a) For Pinole flows, the proposed project consists of an upgrade to the existing WPCP and the addition of a wastewater force main to RSD. Environmental impacts associated with project-related improvements are discussed through this Initial Study, and will be further disclosed and analyzed in the Environmental Impact Report, as discussed in the attached Notice of Preparation. Where potentially significant impacts are identified in the EIR, feasible mitigation measures will be recommended.
- b) For Hercules flows, the proposed project would consist of upgrades to the existing WCWD (the details of which are currently not known), and installation of an underground pipeline from the Pinole-Hercules WPCP to the WCWD within existing paved roadways. If this option were selected, the City of Hercules, as lead agency, would be required to prepare a separate environmental analysis under CEQA. As discussed in the attached NOP, the types and levels of impacts that could be associated with this option are identified, throughout this Initial Study and in the EIR to be prepared.
- c) 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?**

**Option 1: New Larger Effluent Pipeline to RSD**

The proposed project would require modifications to the existing stormwater drainage system at the WPCP to accommodate additional on-site facilities. This impact will be evaluated further in the “Hydrology and Water Quality” section of the EIR.

**Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD**

- a) For Pinole flows, the proposed project would require modifications to the existing stormwater drainage system at the WPCP to accommodate additional on-site facilities. This impact will be evaluated further in the “Hydrology and Water Quality” section of the EIR.

- b) For Hercules flows, the proposed project would likely require modifications to the existing stormwater drainage system at the WCWD to accommodate additional on-site facilities. This impact will be evaluated further, to the extent details are available, in the “Hydrology and Water Quality” section of the EIR.
- d) **Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?**

***Option 1: New Larger Effluent Pipeline to RSD***

The proposed wastewater treatment plant improvements and pipeline construction would not require new or expanded water supplies or entitlements. Therefore, there would be no impact.

***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) For Pinole flows, proposed WPCP improvements and pipeline construction would not require new or expanded water supplies or entitlements. Therefore, there would be no impact.
- b) For Hercules flows, proposed WCWD treatment plant improvements and pipeline construction would not require new or expanded water supplies or entitlements. Therefore, there would be no impact.

- e) **Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project’s projected demand, in addition to the provider’s existing commitments?**

***Option 1: New Larger Effluent Pipeline to RSD***

As discussed in the NOP, the proposed project consists of upgrades to the existing treatment facility, improvements at the existing deepwater outfall, and construction of a new pipeline to RSD that are necessary to allow the plant to treat increased wet weather flows during winter storm events. Environmental impacts associated with project-related improvements are discussed throughout this Initial Study, and will be further disclosed and analyzed in the EIR, as discussed in the attached NOP. Where potentially significant impacts are identified in the EIR, feasible mitigation measures will be recommended.

***Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD***

- a) For Pinole flows, upgrades to the existing treatment facility and construction of a new pipeline to RSD are necessary to allow the plant to treat increased wet weather flows during winter storm events. Environmental impacts associated with project-related improvements are discussed throughout this Initial Study, and will be further disclosed and analyzed in the EIR, as discussed in the attached NOP. Where potentially significant impacts are identified in the EIR, feasible mitigation measures will be recommended.
- b) For Hercules flows, upgrades to the existing WCWD treatment facility and construction of a new pipeline to WCWD are necessary to allow the increased wet weather flows to be properly treated during winter storm events. As discussed in the attached NOP, the types and levels of impacts that could be associated with this option are identified at a general, program level, throughout this Initial Study and in the EIR to be prepared.

- f) **Be served by a landfill with sufficient permitted capacity to accommodate the project’s solid waste disposal needs?**

***Option 1: New Larger Effluent Pipeline to RSD***

Implementation of the proposed project would not be expected to result in long-term increased generation of solid waste. Currently, all influent is treated and discharged, and the associated solid waste is hauled off site. Because the proposed project would not involve an increase in the permitted volume of dry weather flows, solid waste

associated with the treatment process would not be expected to increase. In addition, no new staff would be required that could increase the amount of administrative waste. The plant has a recycling program, which includes the resale of recyclable material recovered from the wastewater treatment process. Upgrades to the WPCP would result in a short-term increase in solid waste disposal needs associated with construction activities. Because this increase would be easily accommodated by nearby landfills, this impact would be less than significant.

**Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD**

- a) For the Pinole flows, because the project-related improvements would be similar to those description above under Option 1, the solid waste disposal needs would also be similar. Therefore, for the same reasons described above in Option 1, this impact would be less than significant.
- b) For the Hercules flows, it is anticipated that project-related construction and operational activities would result in similar types and levels of impacts related to solid waste disposal needs as those discussed above under Option 1. This impact would be less than significant.

**g) Comply with federal, state, and local statutes and regulations related to solid waste?**

**Option 1: New Larger Effluent Pipeline to RSD**

The proposed project would comply with all federal, state, and local statutes and regulations related to solid waste, including recycling. Currently the WPCP produces non-hazardous waste, hazardous waste, and recyclable materials. Implementation of the Option 1 would not change disposal procedures. There would be no impact.

**Option 2: (a) Pinole Flows at Existing Plant, (b) Hercules Flows to WCWD**

- a) For the Pinole flows, all federal, state, and local statutes and regulations related to solid waste, including recycling would be implemented. Currently the WPCP produces non-hazardous waste, hazardous waste, and recyclable materials. Implementation of Option 2 would not change disposal procedures. There would be no impact.
- b) For the Hercules flows, compliance with statutes and regulations related to solid waste would be expected in a similar manner as discussed above for Pinole flows; there would be no impact.



ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XVII. Mandatory Findings of Significance.</b>				
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<small>Authority: Public Resources Code Sections 21083 and 21087.  Reference: Public Resources Code Sections 21080(c), 21080.1, 21080.3, 21082.1, 21083, 21083.3, 21093, 21094, 21151; <i>Sundstrom v. County of Mendocino</i>, 202 Cal.App.3d 296 (1988); <i>Leonoff v. Monterey Board of Supervisors</i>, 222 Cal.App.3d 1337 (1990).</small>				

## DISCUSSION

- a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory?**

Options 1 and 2 have the potential to result in significant impacts related to biological resources (i.e., wildlife species, wetlands, etc.) and cultural and historical resources. These issues will be addressed in the EIR.

- b) Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)**

Options 1 and 2 could have impacts that are individually limited, but cumulatively considerable. This issue will be addressed in the EIR.

**c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?**

Options 1 and 2 could have impacts related to air quality, water quality, noise, and seismic hazards (geology) that could cause substantial adverse effects on human beings. These impacts will be addressed in the EIR.

## REFERENCES

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# **APPENDIX B**

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Scoping Comments



-----Original Message-----

From: Drew Simpkin [mailto:SimpkiD@slc.ca.gov]  
Sent: Monday, September 21, 2009 12:30 PM  
To: Dean Allison  
Subject: SHC#2009092024 San Pablo Bay

Mr. Allison,

I am with the California State Lands Commission and am reviewing the Pinole-Hercules Water Pollution Plant Improvement Project for possible State Lands interest. After reviewing the proposed project I have determined that the existing outfall at Rodeo Sanitary District has an associated lease (PRC 5398) and was issued in 1977. The NOP also mentions an existing shallow water outfall that will be abandoned. Is this shallow outfall also located at the Rodeo location? Would it be possible to obtain a schematic of this outfall? Any materials you might have in describing where this outfall is would be most helpful.

Materials can be sent electronically via email or mailed to me directly at:

California State Lands Commission  
Attn: Drew Simpkin  
100 Howe Ave Suite 100 South  
Sacramento, CA 95825-8202

Thank you,

Drew Simpkin  
Public Land Management Specialist  
California State Lands Commission  
(916) 574-2275  
simpkid@slc.ca.gov

\* \* \* In response to the Governor's Executive Order S-13-09, the Commission's offices will be closed the first three Fridays of each month beginning July 10, 2009 and ending June 30, 2010. \* \* \*

From: Jeffrey Wisniewski [mailto:jeff3w@gmail.com]  
Sent: Thu 9/24/2009 10:18 AM  
To: Dean Allison  
Subject: Wastewater Improvement Project Draft EIR

Mr. Allison-

I have two comments on the NOP for the Draft EIR:

(1) The proposed pipeline route outlined for Option 2 runs mostly along San Pablo Avenue. A second route, potentially more advantageous with regards to long-term costs of pumping, etc., should be considered, e.g., along the UPRR rail line which is much more flat along its length, which would require a lot less pumping, in addition to not requiring major infrastructure improvements (and re-improvements) along a major arterial route (San Pablo Avenue) for a substantial length of time.

(2) As required by CEQA, and as stated in the NOP, the EIR will include four alternatives (including a "No Project" alternative), although the alternatives will not be evaluated "at the same level of detail as the proposed project." Alternative 3 -- All Flows to West County Wastewater District Facilities -- should be upgraded to a preferred option, and studied thoroughly. This would be the best alternative in the long run. The potential for redevelopment of the existing Pinole wastewater treatment facility, and the value of such property (which would include transit-oriented development), must be considered when deciding on the long-term objectives for the project. Upgrading the plant (either preferred Options 1 or 2) are short-sighted as they will stunt the future growth of Pinole, and in the case of Option 1, Hercules. Alternative 3 -- All Flows to WCWD -- should be evaluated as a third preferred option in the Draft EIR.

Please let me know if you have any questions, or need any additional information, on my comments. I would appreciate if my comments were read into the record at tonight's scoping meeting in the case that I am unavailable to attend.

Thank you.  
-Jeff

Jeffrey Wisniewski  
1102 Avocet Drive  
Hercules  
510-724-6211



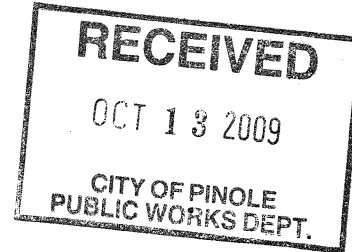


**Contra Costa County  
Flood Control  
& Water Conservation District**

Julia R. Bueren,  
ex officio Chief Engineer  
R. Mitch Avalon,  
Deputy Chief Engineer

October 5, 2009

Dean Allison  
City of Pinole  
2131 Pear Street  
Pinole, CA 94564-1774



RE: Pinole-Hercules Water Pollution Control Plant Improvement Project  
Our Files: 93-69 & 4009-00

Dear Mr. Allison:

We have reviewed the Notice of Preparation (NOP) for the Pinole-Hercules Water Pollution Control Plant (WPCP) Improvement Project Draft Environmental Impact Report (DEIR), which we received on September 10, 2009, and submit the following comments:

**General Project Comments**

1. The proposed option 1 is located in Drainage Areas 69 and 112, unformed drainage areas. Therefore, there are no drainage area fees due at this time.
2. The proposed option 2 is located in unformed Drainage Areas 19, 69, 111, 112, and 127, and formed Drainage Areas 19A and 73. For Drainage Areas 19A and 73, drainage fees are due in accordance with Flood Control Ordinance Number 89-24 and 88-68, respectively, if new impervious surface is proposed.
3. The Contra Costa County Flood Control & Water Conservation District (FC District) has plans to improve both Pinole Creek and San Pablo Creek. The pipeline should cross below the invert of these creeks either by the method of jacked and bored or open trenched. However, if a pipe bridge is necessary, the soffit of the bridge should be above the 100-year water surface level plus 2 feet of freeboard, the abutment should be out of the FC District right of way, and the bridge may not restrict our maintenance access. Please contact the FC District to coordinate the design of proposed pipeline within the FC District right of way.
4. The DEIR should discuss potential environmental impacts from the construction of the proposed facilities for both options.

## Hydrology

1. Option 1 requires crossing Pinole Creek, and Option 2 requires crossing four creeks (Pinole Creek, Garrity Creek, Rheem Creek, and San Pablo Creek). The DEIR Hydrology Section should discuss the construction methods, environmental impacts, and mitigations for all pipeline creek crossings.
2. We request that the DEIR provide a map of the watersheds where the project is located, including watershed boundaries, and also identifying FC District right of way.
3. In the Hydrology Section, please identify and show all existing watercourses, tributaries, and man-made drainage facilities, within the project site and that which could be impacted by this project. The discussion should include an analysis of the capacity of the existing watercourses and additional runoff from the upgrading of WPCP and the proposed corporation yard. Please discuss any proposed on-site and off-site drainage improvements, and include maps or drawings for the improvements.
4. The Hydrology Section should quantify the amount of runoff that would be generated by the project and discuss how the runoff entering and originating from the site would be distributed between the natural watercourses and the man-made drainage facilities.
5. If improvements or work within the natural watercourses are proposed, the DEIR should discuss the scope of improvements. This should include any plans to work within the four creeks during the construction of the pipeline.
6. We recommend that the DEIR address the design and construction of storm drain facilities to adequately collect and convey stormwater entering or originating within the WPCP and corporation yard to the nearest adequate man-made drainage facility or natural watercourse, without diversion of the watershed, per Title 9 of the County Ordinance Code.
7. The DEIR should discuss how the project will comply with the current NPDES (National Pollutant Discharge Elimination System) requirements under the City's Stormwater Management and Discharge Control Ordinances and the C.3 Guidebook.

## **Regulatory Permits**

1. We recommend that the DEIR request the appropriate environmental regulatory agencies, such as the U.S. Army Corps of Engineers, the State Department of Fish and Game and the State Regional Water Quality Control Board, to explore the permits, special conditions, and mitigation that may be necessary for this project.
2. The DEIR should discuss mitigation measures required by the above-mentioned agencies that may be necessary and that would impact any of the creeks under the FC District's jurisdiction. Any mitigation measures (i.e., tree planting) within Pinole Creek and San Pablo Creek will require a separate Flood Control Permit and a County Drainage Permit for any planting within Rheem Creek or Garrity Creek.
3. The DEIR should also say that a Flood Control Permit is required for the construction of the proposed pipeline along and crossing Pinole Creek, outfall into Pine Creek (should Alternative 1 and 2 be considered in the future), and pipeline crossing San Pablo Creek within the FC District right of way, and/or a County Drainage permit for the construction of the proposed pipeline crossing Garrity Creek within the incorporated County.

## **Right of Way Transactions**

1. The DEIR should discuss any right of way transactions (easements or license agreement for the pipeline along and across Pinole Creek and San Pablo Creek, within FC District right of way).
2. We will require payment for the right of way costs (i.e., easement and license agreement), if the proposed force main will be along Pinole Creek within the FC District right of way. The estimated cost for the review and process of a license agreement or easement, along with coordination and inspections, is approximately \$100,000.

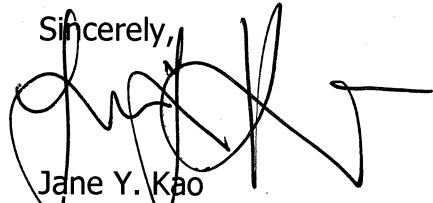
## **Conclusion**

1. Option 1 is the FC District's preferred alternative, with the least impacts to natural water courses. Option 1 requires crossing only Pinole Creek. Option 2 involves transporting wastewater generated by the City of Hercules to the West County Wastewater District, which requires crossing three additional creeks, Garrity Creek, Rheem Creek, and San Pablo Creek. All four creeks currently do not have capacity to accommodate a 100-year event.

2. Our main concern with Option 1 is the pipeline crossing at Pinole Creek. It is unclear how the proposed pipeline will be crossing the creek. The FC District is planning to restore riparian habitat and flood capacity to Pinole Creek, and therefore we prefer the pipeline to cross this creek below the invert of the creek.
3. The existing Railroad Avenue bridge across Pinole Creek, within the Union Pacific Railroad right of way, has been identified as one of the largest impediments to flood capacity in the creek. The cities should consider replacing the existing Railroad Avenue pipe bridge with an underground pipeline, along this new pipe crossing. You may contact us for hydraulic information on Pinole Creek.
4. The FC District should be included in the review of all drainage facilities that have a region-wide benefit, that impact region-wide facilities, or that impact FC District-owned facilities (Pinole Creek and San Pablo Creek). The FC District is available to provide technical assistance during the development of the DEIR, including hydrology and hydraulic information and our HYDRO6 method, under our Fee-for-Service program.

We appreciate the opportunity to comment on the NOP submittal and welcome continued coordination. We look forward to reviewing an Administrative Draft EIR (ADEIR), which should address our comments. If you should have any questions, please call me at (925) 313-2179 or e-mail me at [jkao@pw.cccounty.us](mailto:jkao@pw.cccounty.us); alternately, you may contact Teri Rie at (925) 313-2363 or [trie@pw.cccounty.us](mailto:trie@pw.cccounty.us).

Sincerely,



Jane Y. Kao  
Staff Engineer  
Contra Costa County Flood Control  
& Water Conservation District

JK:cw

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c: G. Connaughton, Flood Control  
P. Detjens, Flood Control  
T. Jensen, Flood Control  
T. Rie, Flood Control  
C. Roner, Flood Control

October 8, 2009

Dean Allison  
City of Pinole  
2131 Pear Street  
Pinole, CA 94564-1774

Re: NOP – Pinole-Hercules Water Pollution  
Control Plan Improvement Project

Dear Mr. Allison:

The **Transportation Engineering Division** of the Contra Costa County Public Works Department has the following comments on the NOP for the Draft Environmental Report (DEIR) for the proposed Water Pollution Control Plant Improvement Project proposed in *West County*.

1. We recommend that the DEIR provide a complete description of easements, franchise agreements, or encroachment permits. The document should indicate that Encroachment Permits from the County's Application and Permit Center will be required for any work proposed within the County Right of Way, and requests for permanent or temporary easements within the County owned property/right-of-way, or franchise agreements, if necessary, shall be coordinated with the Contra Costa County Public Works Department, Real Property Division.
2. Construction of the force main for both Option 1 and Option 2 will take place along County roads. Prior to the start of construction, a Traffic Control Plan (including any temporary lane closure, flagging, haul routes, detour plans, etc.) would be required to be submitted to the Contra Costa County Public Works Department for review and approval. The document must address the impacts of any lane closure.
3. Include a section which will list the portions of County roads where the force main will be constructed, and indentify all temporary and future impacts to County roads as a result of construction of the force main, since a significant portion of the force main will occur in unincorporated Contra Costa County. These impacts must include existing utilities as well as future potential utility projects.

4. A mitigation requirement should be identified in the report to describe a process where a pre-project survey of haul route(s) is conducted, thereafter damaged or deteriorated pavement resulting from the project truck traffic is identified on the haul route(s), and measures are implemented to bring the pavement back to pre-project conditions by the project sponsor at their own cost.
5. A **Transportation/Traffic Impacts** section should be included with a description of the proposed Traffic Control Plan (TCP) that will be submitted to Contra Costa County Public Works for work performed inside County roads. A haul route (or routes) should be detailed and approved by the local jurisdictions with the TCP.
6. The document should include a discussion about providing continuous pedestrian access during construction, especially for all routes to schools impacted by this project.
7. A preliminary Storm Water Control Plan (SWCP) should be included with this project if the project creates or replaces over 10,000 square feet of impervious surface.
8. The document should include proposed cross-sections of the installation of the force main along County roads. The cross-sections should detail the location of the trench for the proposed force main to be installed inside County right-of-way, and identify potential utility conflicts as well as proposed mitigation.
9. The applicant should address the impact of the project on any future road projects in unincorporated Contra Costa County. The applicant should coordinate with this office by providing more detailed exhibits of the force main location, so that we may identify on any future road widening, alignment improvements, bike lanes, etc. in the vicinity of the project.
10. The EIR should document the change in staffing that would result from the proposed project and analyze the trip generation impacts of this change, presumably an increase. The West Contra Costa Action Plan contains the standards with which any impact should be measured against. The Contra Costa Transportation Authority Technical Procedures should be followed in the traffic analysis.
11. Along San Pablo Avenue there is a proposed Class I facility (Sycamore Avenue to Hercules Ave) and a proposed Class II facility (Hercules Avenue to Tennant Avenue). At a minimum the project should not compromise the eventual implementation of these plans. If feasible, the project proponent should work with the cities of Hercules and Pinole to implement these plans as a part of the proposed project. The aforementioned section of roadway is also a part of the

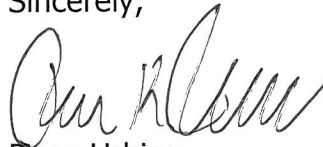
Dean Allison  
October 8, 2009  
Page 3 of 3

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Bay Trail. The project sponsor should contact the Association of Bay Area Governments to ensure this Bay Trail link is not compromised.

We appreciate the opportunity to comment on the NOP submittal and look forward to reviewing the next submittal. Please feel free to contact me at (925) 313-2308 if you have any questions.

Sincerely,



Rene Urbina  
Staff Engineer  
Transportation Engineering

RU: jcw  
G:\transeng\2009\correspondence\CITY OF PINOLE - RESPONSE NOP  
Cc: Lee Huo, ABAG  
Mary Halle  
Monish Sen  
Jane Y. Kao

Untitled

From: Jane Kao [mailto:jkao@pw.cccounty.us]  
Sent: Monday, November 09, 2009 6:02 PM  
To: Dean Allison  
Cc: Tim Jensen; Teri Rie; Greg Connaughton  
Subject: Pinole-Hercules Water Pollution Control Plant

Mr. Allison,

On October 5, 2009, we commented on the Pinole-Hercules Water Pollution Control Plant Improvement project (file # 97-69 & 4009-00). We have additional information regarding Pinole Creek that you may want to consider. Although the plant site is currently NOT within the FEMA floodplain, results from the model we ran for this section of Pinole Creek show that there are few sections of the creek with inadequate capacity to contain a 100-year event. Our model shows that during a 100-year event, Pinole Creek may overtop its south bank by as much as a foot of water in a few places, which may flow onto your project site. We recommend that the proposed upgrades to the project site be designed to accommodate any overflows from the creek. Although not required, you may also want to consider providing flood protection in compliance with FEMA criteria for non-residential buildings within a floodplain.

Please feel free to call if you have any questions or if we can provide any information for your use.

Thanks,

Jane Y. Kao

Flood Control Logo-hoz Med

255 Glacier Drive

Martinez, CA 94553

\* EMAIL: jkao@pw.cccounty.us <mailto:jkao@pw.cccounty.us>

' PHONE: (925) 313-2179

7 FAX: (925) 229-7955



ANA → ER Per PAWT

**DEPARTMENT OF TRANSPORTATION**

111 GRAND AVENUE  
P. O. BOX 23660  
OAKLAND, CA 94623-0660  
PHONE (510) 622-5491  
FAX (510) 286-5559  
TTY 711



*Flex your power!  
Be energy efficient!*

October 14, 2009

CCGEN022  
SCH#2009092024

Mr. Dean Allison  
City of Pinole  
2131 Pear Street  
Pinole, CA 94564-1774

Dear Mr. Allison:

**Pinole-Hercules Water Pollution Control Plant Improvement Project – Notice of Preparation**

Thank you for including the California Department of Transportation (Department) in the environmental review process for the Pinole-Hercules Water Pollution Control Plant Improvement project. The following comments are based on the Notice of Preparation.

***Encroachment Permit***

Any work or traffic control within the State Right-of-Way (ROW) requires an encroachment permit that is issued by the Department. Traffic-related mitigation measures will be incorporated into the construction plans during the encroachment permit process. See the following website link for more information: <http://www.dot.ca.gov/hq/traffops/developserv/permits/>

To apply for an encroachment permit, submit a completed encroachment permit application, environmental documentation, and five (5) sets of plans which clearly indicate State ROW to the address at the top of this letterhead, marked ATTN: Michael Condie, Mail Stop #5E.

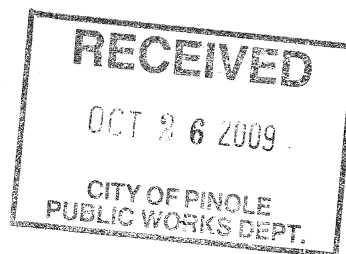
Should you have any questions regarding this letter, please call Yatman Kwan of my staff at (510) 622-1670.

Sincerely,

Handwritten signature of Lisa Carboni in black ink.

LISA CARBONI  
District Branch Chief  
Local Development - Intergovernmental Review

c: State Clearinghouse





# **APPENDIX C**

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Air Quality and Odor Modeling



Combined Summer Emissions Reports (Pounds/Day)

File Name: H:\PROJECTS\Pinole-Hercules WPCP\Project Information\Pinole-Hercules WPCP Corp Yard and On-Site Construction.urb924

Project Name: Pinole-Hercules WPCP Construction Emissions - Corporation Yard and On-Site Upgrades

Project Location: Contra Costa County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2014 TOTALS (lbs/day unmitigated)	3.39	26.57	16.27	0.00	10.00	1.15	2.09	1.06	2.91	4,082.29
2014 TOTALS (lbs/day mitigated)	3.39	26.57	16.27	0.00	4.74	1.15	0.99	1.06	1.81	4,082.29

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
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Time Slice 6/2/2014-6/6/2014 Active Days: 5	2.44	19.12	11.56	<u>0.00</u>	<u>10.00</u>	0.89	<u>10.89</u>	<u>2.09</u>	0.82	<u>2.91</u>	2,349.49
Fine Grading 06/02/2014-06/06/2014	2.44	19.12	11.56	0.00	10.00	0.89	10.89	2.09	0.82	2.91	2,349.49
Fine Grading Dust	0.00	0.00	0.00	0.00	10.00	0.00	10.00	2.09	0.00	2.09	0.00
Fine Grading Off Road Diesel	2.41	19.08	10.74	0.00	0.00	0.89	0.89	0.00	0.82	0.82	2,247.32
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.03	0.04	0.83	0.00	0.00	0.00	0.01	0.00	0.00	0.00	102.17
Time Slice 6/9/2014-12/31/2014 Active Days: 148	<u>3.39</u>	<u>26.57</u>	<u>16.27</u>	0.00	0.00	<u>1.15</u>	1.15	0.00	<u>1.06</u>	1.06	<u>4,082.29</u>
Building 06/09/2014-12/31/2014	3.39	26.57	16.27	0.00	0.00	1.15	1.15	0.00	1.06	1.06	4,082.29
Building Off Road Diesel	3.39	26.57	16.27	0.00	0.00	1.15	1.15	0.00	1.06	1.06	4,082.29
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

- Phase: Fine Grading 6/2/2014 - 6/6/2014 - Site preparation for corporation yard
- Total Acres Disturbed: 1.24
- Maximum Daily Acreage Disturbed: 1
- Fugitive Dust Level of Detail: Default
- 10 lbs per acre-day
- On Road Truck Travel (VMT): 0
- Off-Road Equipment:
  - 1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day
  - 1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day
  - 1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day
  - 1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 6/9/2014 - 12/31/2014 - On-site upgrades

Page: 3

12/10/2009 7:22:46 PM

Off-Road Equipment:

- 1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day
- 1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day
- 1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day
- 1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
Time Slice 6/2/2014-6/6/2014 Active Days: 5	2.44	19.12	11.56	<b>0.00</b>	<u>4.74</u>	0.89	<u>5.62</u>	<u>0.99</u>	0.82	<u>1.81</u>	2,349.49
Fine Grading 06/02/2014-06/06/2014	2.44	19.12	11.56	0.00	4.74	0.89	5.62	0.99	0.82	1.81	2,349.49
Fine Grading Dust	0.00	0.00	0.00	0.00	4.73	0.00	4.73	0.99	0.00	0.99	0.00
Fine Grading Off Road Diesel	2.41	19.08	10.74	0.00	0.00	0.89	0.89	0.00	0.82	0.82	2,247.32
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.03	0.04	0.83	0.00	0.00	0.00	0.01	0.00	0.00	0.00	102.17
Time Slice 6/9/2014-12/31/2014 Active Days: 148	<b>3.39</b>	<b>26.57</b>	<b>16.27</b>	0.00	0.00	<b>1.15</b>	1.15	0.00	<b>1.06</b>	1.06	<b>4,082.29</b>
Building 06/09/2014-12/31/2014	3.39	26.57	16.27	0.00	0.00	1.15	1.15	0.00	1.06	1.06	4,082.29
Building Off Road Diesel	3.39	26.57	16.27	0.00	0.00	1.15	1.15	0.00	1.06	1.06	4,082.29
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/2/2014 - 6/6/2014 - Site preparation for corporation yard For Soil Stabilizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%



## Road Construction Emissions Model, Version 6.3.2

Emission Estimates for -> Option 1 WPCP Pipeline												
Project Phases (English Units)												
	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	CO2 (lbs/day)
Grubbing/Land Clearing	-	-	-	-	-	-	-	-	-	-	-	-
Grading/Excavation	1.7	14.2	11.3	1.7	0.6	1.1	0.6	1.1	0.7	0.5	0.2	2,419.2
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-	-	-
<b>Maximum (pounds/day)</b>	1.7	14.2	11.3	1.7	0.6	1.1	0.6	1.1	0.7	0.5	0.2	2,419.2
<b>Total (tons/construction project)</b>	0.2	1.4	1.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0	239.5
Notes: Project Start Year -> 2014												
Project Length (months) -> 9												
Total Project Area (acres) -> 6												
Maximum Area Disturbed/Day (acres) -> 0												
Total Soil Imported/Exported (yd <sup>3</sup> /day)-> 0												
PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.												
Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.												
Emission Estimates for -> Option 1 WPCP Pipeline												
Project Phases (Metric Units)												
	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	PM10 (kgs/day)	PM2.5 (kgs/day)	Total PM10 (kgs/day)	Exhaust PM10 (kgs/day)	Fugitive Dust PM10 (kgs/day)	Total PM2.5 (kgs/day)	Exhaust PM2.5 (kgs/day)	Fugitive Dust PM2.5 (kgs/day)	CO2 (kgs/day)
Grubbing/Land Clearing	-	-	-	-	-	-	-	-	-	-	-	-
Grading/Excavation	0.8	6.4	5.1	0.8	0.3	0.5	0.3	0.5	0.3	0.2	0.1	1,099.7
Drainage/Utilities/Sub-Grade	-	-	-	-	-	-	-	-	-	-	-	-
Paving	-	-	-	-	-	-	-	-	-	-	-	-
<b>Maximum (kilograms/day)</b>	0.8	6.4	5.1	0.8	0.3	0.5	0.3	0.5	0.3	0.2	0.1	1,099.7
<b>Total (megagrams/construction project)</b>	0.2	1.3	1.0	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	217.2
Notes: Project Start Year -> 2014												
Project Length (months) -> 9												
Total Project Area (hectares) -> 2												
Maximum Area Disturbed/Day (hectares) -> 0												
Total Soil Imported/Exported (meters <sup>3</sup> /day)-> 0												
PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.												
Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.												

# Road Construction Emissions Model Data Entry Worksheet

Version 6.3.2



Note: Required data input sections have a yellow background. Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background. The user is required to enter information in cells C10 through C25.

<b>Input Type</b>	Option 1 WPCP Pipeline
Project Name	2014
Construction Start Year	2
Project Type	9.0
Project Construction Time	1
Predominant Soil/Site Type: Enter 1, 2, or 3	5
Project Length	6.0
Total Project Area	0.1
Maximum Area Disturbed/Day	1
Water Trucks Used?	No
Soil Imported	20.0
Soil Exported	
Average Truck Capacity	

Enter a Year between 2005 and 2025 (inclusive)

1 New Road Construction  
2 Road Widening  
3 Bridge/Overpass Construction

months  
1. Sand Gravel  
2. Weathered Rock-Earth  
3. Blasted Rock

miles  
acres  
acres

1. Yes  
No

yd<sup>3</sup>/day  
yd<sup>3</sup>/day  
yd<sup>3</sup> (assume 20 if unknown)

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

Construction Periods	User Override of		Program Calculated
	Construction Months	Months	
Grubbing/Land Clearing	0.00	0.90	
Grading/Excavation	9.00	3.60	
Drainage/Utilities/Sub-Grade	0.00	3.15	
Paving	0.00	1.35	
<b>Totals</b>	<b>9.00</b>	<b>9.00</b>	

	2005	2006	2007	%
	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00



Water Truck Emissions	User Override of		Program Estimate of		User Override of Truck		Default Values	
	Default # Water Trucks	Number of Water Trucks	Miles Traveled/Day	Miles Traveled/Day	Miles Traveled/Day	Miles Traveled/Day	PM10	CO2
Grubbing/Land Clearing - Exhaust					1		40	
Grading/Excavation - Exhaust					1		40	
Drainage/Utilities/Subgrade					1		40	
		<b>ROG</b>		<b>NOx</b>		<b>CO</b>	<b>PM10</b>	<b>CO2</b>
Emission rate - Grubbing/Land Clearing (grams/mile)		0.00		0.00		0.00	0.00	0.00
Emission rate - Grading/Excavation (grams/mile)		0.76		9.04		4.74	0.36	1880.47
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)		0.00		0.00		0.00	0.00	0.00
Pounds per day - Grubbing/Land Clearing		0.00		0.00		0.00	0.00	0.00
Tons per const. Period - Grub/Land Clear		0.00		0.00		0.00	0.00	0.00
Pound per day - Grading/Excavation		0.07		0.80		0.42	0.03	165.68
Tons per const. Period - Grading/Excavation		0.01		0.08		0.04	0.00	16.40
Pound per day - Drainage/Utilities/Subgrade		0.00		0.00		0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Subgrade		0.00		0.00		0.00	0.00	0.00

Fugitive dust default values can be overridden in cells C110 through C112.

Fugitive Dust	User Override of Max		Default		PM10		PM2.5	
	Acreage Disturbed/Day	Maximum Acreage/Day	pounds/day	tons/per period	pounds/day	tons/per period	pounds/day	tons/per period
Fugitive Dust - Grubbing/Land Clearing			0	0.0	0.0	0.0	0.0	0.0
Fugitive Dust - Grading/Excavation			0.11	1.1	0.0	0.0	0.2	0.0
Fugitive Dust - Drainage/Utilities/Subgrade			0	0.0	0.0	0.0	0.0	0.0

### Off-Road Equipment Emissions

Grubbing/Land Clearing		Default										
Override of Default	Number of Vehicles	Program-estimate	Type	ROG	CO	NOx	PM10	PM2.5	CO2			
Number of Vehicles	Program-estimate	Type	ROG	CO	NOx	PM10	PM2.5	CO2				
Override of Default	Number of Vehicles	Type	ROG	CO	NOx	PM10	PM2.5	CO2				
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	1	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	1	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	10	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		Grubbing/Land Clearing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
		Grubbing/Land Clearing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
			pounds per day									
			tons per phase									

Grading/Excavation Override of Default Number of Vehicles	Default Number of Vehicles Program-estimate	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Excavators	0.55	3.25	4.07	0.22	0.21	547.36
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
	0	Other Construction Equipment	0.00	0.02	0.03	0.00	0.00	3.17
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
	1	Rubber Tired Loaders	0.51	2.70	3.86	0.21	0.19	458.86
	0.00	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
	10	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
	2.00	Tractors/Loaders/Backhoes	0.36	4.28	2.23	0.07	0.06	654.76
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
		Grading/Excavation	1.4	10.2	10.2	0.5	0.5	1664.2
		Grading	0.1	1.0	1.0	0.1	0.0	164.8



Paving	Override of Default Number of Vehicles	Default		Type	ROG	CO	NOx	PM10	PM2.5	CO2
		Number of Vehicles	Program-estimate							
				Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
				Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
				Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
				Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
				Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
				Cranes	0.00	0.00	0.00	0.00	0.00	0.00
				Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
				Excavators	0.00	0.00	0.00	0.00	0.00	0.00
				Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
				Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
				Graders	0.00	0.00	0.00	0.00	0.00	0.00
				Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
				Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
				Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
				Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
				Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		1	Pavers	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		1	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
				Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
				Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
				Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		1	Rollers	0.00	0.00	0.00	0.00	0.00	0.00
				Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
				Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
				Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
				Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		10	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
				Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
				Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
				Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
				Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
				Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
				Welders	0.00	0.00	0.00	0.00	0.00	0.00
				Paving	0.0	0.0	0.0	0.0	0.0	0.0
				Paving	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total Emissions all Phases (tons per construction period) =&gt;</b>					0.1	1.0	1.0	0.1	0.0	164.8



Equipment default values for horsepower, load factor, and hours/day can be overridden in cells C285 through C317, E285 through E317, and G285 through G317.

Equipment	Default Values Horsepower	Default Values Load Factor	Default Values Hours/day
Aerial Lifts	60	0.46	8
Air Compressors	106	0.48	8
Bore/Drill Rigs	291	0.75	8
Cement and Mortar Mixers	10	0.56	8
Concrete/Industrial Saws	19	0.73	8
Cranes	399	0.43	8
Crushing/Proc. Equipment	142	0.78	8
Excavators	168	0.57	8
Forklifts	145	0.90	8
Generator Sets	549	0.74	8
Graders	174	0.61	8
Off-Highway Tractors	267	0.65	8
Off-Highway Trucks	479	0.57	8
Other Construction Equipment	75	0.62	8
Other General Industrial Equipment	238	0.51	8
Other Material Handling Equipment	191	0.59	8
Pavers	100	0.62	8
Paving Equipment	104	0.53	8
Plate Compactors	8	0.43	8
Pressure Washers	1	0.60	8
Pumps	53	0.74	8
Rollers	95	0.56	8
Rough Terrain Forklifts	93	0.60	8
Rubber Tired Dozers	357	0.59	8
Rubber Tired Loaders	157	0.54	8
Scrapers	313	0.72	8
Signal Boards	20	0.78	8
Skid Steer Loaders	44	0.55	8
Surfacing Equipment	362	0.45	8
Sweepers/Scrubbers	91	0.68	8
Tractors/Loaders/Backhoes	108	0.55	8
Trenchers	63	0.75	8
Welders	45	0.45	8

Combined Summer Emissions Reports (Pounds/Day)

File Name: H:\PROJECTS\Pinole-Hercules WPCP\Project Information\Pinole-Hercules WPCP Option 2 Construction.urb924

Project Name: Pinole-Hercules WPCP Construction - Option 2

Project Location: Contra Costa County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2014 TOTALS (lbs/day unmitigated)	5.36	49.32	24.47	0.00	0.00	1.98	1.98	0.00	1.82	1.82	7,394.16

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Time Slice 6/2/2014-12/31/2014 Active Days: 153	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Building 06/02/2014-12/31/2014	5.36	49.32	24.47	0.00	0.00	1.98	1.98	0.00	1.82	1.82	7,394.16
Building Off Road Diesel	5.36	49.32	24.47	0.00	0.00	1.98	1.98	0.00	1.82	1.82	7,394.16
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

Phase: Building Construction 6/2/2014 - 12/31/2014 - Option 2 on-site upgrades

Off-Road Equipment:

- 1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day
- 1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day
- 1 Generator Sets (549 hp) operating at a 0.74 load factor for 8 hours per day
- 1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day
- 1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day
- 1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

**Pinole-Hercules WPCP**  
**Operational Criteria Air Pollutant Emissions**

**Natural Gas Combustion for Digester Heating**

		Emission Factors (lb/MMBtu)					
		VOC	NO <sub>x</sub>	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
<b>Emission Factors</b>		0.118	0.847	0.557	0.000588	0.0000771	0.0000771
Source: U.S. EPA AP-42 Chapter 3.2 Natural Gas-Fire Reciprocating Engines							
		Emissions (lb/day)					
Condition	MMBtu/day	VOC	NO <sub>x</sub>	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Existing	6.17	0.73	5.23	3.44	0.00	0.00	0.00
Option 1	6.17	0.73	5.23	3.44	0.00	0.00	0.00
Option 2	4.12	0.49	3.49	2.29	0.00	0.00	0.00

**Methane Combustion for Digester Heating**

		Emission Factors (lb/MMBtu)					
		VOC	NO <sub>x</sub>	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
<b>Emission Factors</b>		0.118	0.847	0.557	0.000588	0.0000771	0.0000771
Source: U.S. EPA AP-42 Chapter 3.2 Natural Gas-Fire Reciprocating Engines							
		Emissions (lb/day)					
Condition	MMBtu/day	VOC	NO <sub>x</sub>	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Existing	51	6.07	43.58	28.66	0.03	0.00	0.00
Option 1	51	6.07	43.58	28.66	0.03	0.00	0.00
Option 2	51	6.07	43.58	28.66	0.03	0.00	0.00

**Flare Emissions**

		Emission Factors (lb/MDSCF CH <sub>4</sub> )					
		VOC	NO <sub>x</sub>	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
<b>Emission Factors</b>			39	46		15	15
Source: U.S. EPA AP-42 Chapter 2.4 Municipal Solid Waste Landfills							
		Emissions (lb/day)					
Condition	SCF/day	VOC	NO <sub>x</sub>	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Existing	10,000	-	0.39	0.46	-	0.15	0.15
Option 1	30,000	-	1.17	1.38	-	0.45	0.45
Option 2	10,000	-	0.39	0.46	-	0.15	0.15

**Summary Emissions**

		Emissions (lb/day)					
		VOC	NO <sub>x</sub>	CO	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
<b>Operating Scenario</b>							
Existing		6.8	49.2	32.6	0.0	0.2	0.2
Option 1		6.8	50.0	33.5	0.0	0.5	0.5
Option 2		6.6	47.5	31.4	0.0	0.2	0.2
Net Opt 1		0.0	0.8	0.9	0.0	0.3	0.3
Net Opt 2		-0.2	-1.7	-1.1	0.0	0.0	0.0

Notes: lb = pound; MMBtu = million British thermal units; VOC = volatile organic compounds; NO<sub>x</sub> = oxides of nitrogen; CO = carbon monoxide; SO<sub>2</sub> = sulfur dioxide; PM<sub>10</sub> = particulate matter with aerodynamic diameter less than 10 microns; PM<sub>2.5</sub> = particulate matter with aerodynamic diameter less than 2.5 microns; MDSCF = million dry standard cubic feet; SCF = standard cubic feet; CH<sub>4</sub> = methane

## **APPENDIX D**

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Confidential Cultural Resources Inventory and Evaluation Report

*Confidential – Available for Review by Qualified Archaeologists upon Request*



# **APPENDIX E**

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Climate Change Modeling





Combined Annual Emissions Reports (Tons/Year)

File Name: H:\PROJECTS\Pinole-Hercules WPCP\Project Information\Pinole-Hercules WPCP CorpYard and On-Site Construction.urb924

Project Name: Pinole-Hercules WPCP Construction Emissions - Corporation Yard and On-Site Upgrades

Project Location: Contra Costa County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014 TOTALS (tons/year unmitigated)	0.26	2.01	1.23	0.00	0.03	0.09	0.11	0.01	0.08	0.09	307.96
2014 TOTALS (tons/year mitigated)	0.26	2.01	1.23	0.00	0.01	0.09	0.10	0.00	0.08	0.08	307.96
Percent Reduction	0.00	0.00	0.00	0.00	52.66	0.00	11.69	52.64	0.00	3.20	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
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2014	0.26	2.01	1.23	0.00	0.03	0.09	0.11	0.01	0.08	0.09	307.96
Fine Grading 06/02/2014-06/06/2014	0.01	0.05	0.03	0.00	0.03	0.00	0.03	0.01	0.00	0.01	5.87
Fine Grading Dust	0.00	0.00	0.00	0.00	0.03	0.00	0.03	0.01	0.00	0.01	0.00
Fine Grading Off Road Diesel	0.01	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.62
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26
Building 06/09/2014-12/31/2014	0.25	1.97	1.20	0.00	0.00	0.09	0.09	0.00	0.08	0.08	302.09
Building Off Road Diesel	0.25	1.97	1.20	0.00	0.00	0.09	0.09	0.00	0.08	0.08	302.09
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

- Phase: Fine Grading 6/2/2014 - 6/6/2014 - Site preparation for corporation yard
- Total Acres Disturbed: 1.24
- Maximum Daily Acreage Disturbed: 1
- Fugitive Dust Level of Detail: Default
- 10 lbs per acre-day
- On Road Truck Travel (VMT): 0
- Off-Road Equipment:
  - 1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day
  - 1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day
  - 1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day
  - 1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day
- Phase: Building Construction 6/9/2014 - 12/31/2014 - On-site upgrades
- Off-Road Equipment:
  - 1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day

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- 1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day
- 1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day
- 1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOX	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014	0.26	2.01	1.23	0.00	0.01	0.09	0.10	0.00	0.08	0.08	307.96
Fine Grading 06/02/2014-06/06/2014	0.01	0.05	0.03	0.00	0.01	0.00	0.01	0.00	0.00	0.00	5.87
Fine Grading Dust	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.01	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.62
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26
Building 06/09/2014-12/31/2014	0.25	1.97	1.20	0.00	0.00	0.09	0.09	0.00	0.08	0.08	302.09
Building Off Road Diesel	0.25	1.97	1.20	0.00	0.00	0.09	0.09	0.00	0.08	0.08	302.09
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/2/2014 - 6/6/2014 - Site preparation for corporation yard  
 For Soil Stabilizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\luc\Desktop\Pinole-Hercules WPCP\Project Information\Pinole-Hercules WPCP Option 2 Construction.urb924

Project Name: Pinole-Hercules WPCP Construction - Option 2

Project Location: Contra Costa County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014 TOTALS (tons/year unmitigated)	0.41	3.77	1.87	0.00	0.00	0.15	0.15	0.00	0.14	0.14	565.65

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2014	0.41	3.77	1.87	0.00	0.00	0.15	0.15	0.00	0.14	0.14	565.65
Building 06/02/2014-12/31/2014	0.41	3.77	1.87	0.00	0.00	0.15	0.15	0.00	0.14	0.14	565.65
Building Off Road Diesel	0.41	3.77	1.87	0.00	0.00	0.15	0.15	0.00	0.14	0.14	565.65
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

Phase: Building Construction 6/2/2014 - 12/31/2014 - Option 2 on-site upgrades

Off-Road Equipment:

- 1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day
- 1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day
- 1 Generator Sets (549 hp) operating at a 0.74 load factor for 8 hours per day
- 1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day
- 1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day
- 1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day



**Pinole-Hercules WPCP  
Construction and Operational GHG Summary**

**CONSTRUCTION**

**Option 1**

Activity	CO <sub>2</sub> Emissions (lb/day)	Duration (months)	CO <sub>2</sub> Emissions (MT/yr)
On-Site Upgrades	4,082	30	1,222
Pipeline Installation	2,419	9	217
Corporation Yard	2,349	0.25	6
<b>Total Emissions</b>			<b>1,445</b>

**Option 2**

Activity	CO <sub>2</sub> Emissions (lb/day)	Duration (months)	CO <sub>2</sub> Emissions (MT/yr)
On-Site Upgrades	7,394	9	664

**OPERATION**

Scenario	GHG Emissions (MT CO <sub>2</sub> e/yr)					
	Electricity	Natural Gas	Methane Combustion	Methane Incomplete Combustion	Methane Flare	Total
Existing	926	61	546	43	302	1,878
Option 1	1,084	61	546	43	907	2,640
Option 2	602	41	546	43	302	1,534

Notes: CO<sub>2</sub> = carbon dioxide; lb = pound; MT = metric ton; yr = year; CO<sub>2</sub>e = carbon dioxide equivalent

**Pinole-Hercules WPCP**  
**Electricity and Natural Gas Calculations**  
**Existing Conditions**

**Electricity Consumption**

Total KWh	MWh	Region	Emission Factor (lb CO <sub>2</sub> /MWh)	GWP	Emission Factor (lb CH <sub>4</sub> /MWh)	GWP	Emission Factor (lb N <sub>2</sub> O/MWh)	GWP	Total CO <sub>2</sub> e (Metric Tons/year)
2,806,850	2,807	CALI	724.12	1	0.0302	23	0.0081	296	926

**Natural Gas Consumption**  
**Summer**

Btu/hr	Hr/day	Total Btu Needed	Total NG Used (MMBtu)	Emission Factor (kg CO <sub>2</sub> /MMBtu)	GWP	Emission Factor (kg CH <sub>4</sub> /MMBtu)	GWP	Emission Factor (kg N <sub>2</sub> O/MMBtu)	GWP	Total CO <sub>2</sub> e (Metric Tons/year)
300,000	24	7,200,000	0	53.06	1	0	23	0	296	

**Winter**

SCF/day	Hr/day	Total Btu Needed	Total NG Used (MMBtu/yr)	Emission Factor (kg CO <sub>2</sub> /MMBtu)	GWP	Emission Factor (kg CH <sub>4</sub> /MMBtu)	GWP	Emission Factor (kg N <sub>2</sub> O/MMBtu)	GWP	Total CO <sub>2</sub> e (Metric Tons/year)
6,000	24	6,174,000	1,142	53.06	1	0	23	0	296	60.77

**Methane Combustion (Incomplete Combustion of Methane)**

Digester Gas (SCF)	Fraction CH <sub>4</sub>	Density of Methane	1-Destruction Efficiency	Metric tons CH <sub>4</sub>	MT CO <sub>2</sub> e
50,000	0.6	662	0.01	2	43

Source: Local Government Operations Protocol Equation 10.1

**Methane Combustion (Combustion)**

Digester Gas (SCF)	MMBtu/day	MMBtu/year	lb CO <sub>2</sub> /MMBtu	CO <sub>2</sub> GWP	Metric tons CO <sub>2</sub>
50,000	30,000,000	10,950	110	1	546

Note: Natural gas emission factor is used as surrogate for methane combustion.

**Methane Flare Emissions**

MMSCF	Fraction Methane	Destruction Efficiency	Capture Efficiency	Metric tons CH <sub>4</sub>	MT CO <sub>2</sub> e
0.01	0.6	0.99	0.75	14	302

Source: Local Government Operations Protocol Equation 9.1

Notes: kWh = kilowatt-hour; MWh = megawatt-hour; CO<sub>2</sub> = carbon dioxide; GWP = global warming potential; CH<sub>4</sub> = methane; N<sub>2</sub>O = nitrous oxide; CO<sub>2</sub>e = carbon dioxide equivalent; SCF = standard cubic feet; Btu = British thermal unit; MMBtu = million British thermal units; kg = kilogram; MMSCF = million standard cubic feet



**Pinole-Hercules WPCP**  
**Electricity and Natural Gas Calculations**  
**Option 1: Pinole-Hercules New Larger Effluent Pipe to Rodeo**

**Electricity Consumption**

Total KWh	MWh	Region	Emission Factor (lb CO <sub>2</sub> /MWh)	GWP	Emission Factor (lb CH <sub>4</sub> /MWh)	GWP	Emission Factor (lb N <sub>2</sub> O/MWh)	GWP	Total CO <sub>2</sub> e (Metric Tons/year)
3,285,000	3,285	CALI	724.12	1	0.0302	23	0.0081	296	1,084

**Natural Gas Consumption**  
**Summer**

SCF/day	Btu/day	Total MMBtu/summer	Emission Factor (kg CO <sub>2</sub> /MMBtu)	GWP	Emission Factor (kg CH <sub>4</sub> /MMBtu)	GWP	Emission Factor (kg N <sub>2</sub> O/MMBtu)	GWP	Total CO <sub>2</sub> e (Metric Tons/year)
0	0	0	53.06	1	0.0050	23	0.0001	296	0.00

**Winter**

SCF/day	Btu/day	Total MMBtu/winter	Emission Factor (kg CO <sub>2</sub> /MMBtu)	GWP	Emission Factor (kg CH <sub>4</sub> /MMBtu)	GWP	Emission Factor (kg N <sub>2</sub> O/MMBtu)	GWP	Total CO <sub>2</sub> e (Metric Tons/year)
6,000	6,174,000	1,142	53.06	1	0.0050	23	0.0001	296	60.77

**Methane Combustion (Incomplete Combustion of Methane)**

Digester Gas (SCF)	Fraction CH <sub>4</sub>	Density of Methane	1-Destruction Efficiency	Metric tons CH <sub>4</sub>	MT CO <sub>2</sub> e
50,000	0.6	662	0.01	2	43

Source: Local Government Operations Protocol Equation 10.1

**Methane Combustion (Combustion)**

Digester Gas (SCF)	MMBtu/day	MMBtu/year	lb CO <sub>2</sub> /MMBtu	CO <sub>2</sub> GWP	Metric tons CO <sub>2</sub>
50,000	30,000,000	10,950	110	1	546

Note: Natural gas emission factor is used as surrogate for methane combustion.

**Methane Flare Emissions**

MMSCF	Fraction Methane	Destruction Efficiency	Capture Efficiency	Metric tons CH <sub>4</sub>	MT CO <sub>2</sub> e
0.03	0.6	0.99	0.75	43	907

Source: Local Government Operations Protocol Equation 9.1

Notes: kWh = kilowatt-hour; MWh = megawatt-hour; CO<sub>2</sub> = carbon dioxide; GWP = global warming potential; CH<sub>4</sub> = methane; N<sub>2</sub>O = nitrous oxide; CO<sub>2</sub>e = carbon dioxide equivalent; SCF = standard cubic feet; Btu = British thermal unit; MMBtu = million British thermal units; kg = kilogram; MMSCF = million standard cubic feet

Pinole-Hercules WPCP  
 Electricity and Natural Gas Calculations  
 Option 2: Pinole Only Flows at Existing Plant

Electricity Consumption

Total KWh	MWh	Region	Emission Factor (lb CO <sub>2</sub> /MWh)	GWP	Emission Factor (lb CH <sub>4</sub> /MWh)	GWP	Emission Factor (lb N <sub>2</sub> O/MWh)	GWP	Total CO <sub>2</sub> e (Metric Tons/year)
1,825,000	1,825	CALI	724.12	1	0.0302	23	0.0081	296	602

Natural Gas Consumption  
 Summer

SCF/day	Btu/day	Total MMBtu/sumer	Emission Factor (kg CO <sub>2</sub> /MMBtu)	GWP	Emission Factor (kg CH <sub>4</sub> /MMBtu)	GWP	Emission Factor (kg N <sub>2</sub> O/MMBtu)	GWP	Total CO <sub>2</sub> e (Metric Tons/year)
0	0	0	53.06	1	0.0050	23	0.0001	296	0.00

Winter

SCF/day	Btu/day	Total MMBtu/winter	Emission Factor (kg CO <sub>2</sub> /MMBtu)	GWP	Emission Factor (kg CH <sub>4</sub> /MMBtu)	GWP	Emission Factor (kg N <sub>2</sub> O/MMBtu)	GWP	Total CO <sub>2</sub> e (Metric Tons/year)
4,000	4,116,000	761	53.06	1	0.0050	23	0.0001	296	40.51

Methane Combustion (Incomplete Combustion of Methane)

Digester Gas (SCF)	Fraction CH <sub>4</sub>	Density of Methane	1-Destruction Efficiency	Metric tons CH <sub>4</sub>	MT CO <sub>2</sub> e
50,000	0.6	662	0.01	2	43

Source: Local Government Operations Protocol Equation 10.1

Methane Combustion (Combustion)

Digester Gas (SCF)	MMBtu/day	MMBtu/year	lb CO <sub>2</sub> /MMBtu	CO <sub>2</sub> GWP	Metric tons CO <sub>2</sub>
50,000	30,000,000	10,950	110	1	546

Note: Natural gas emission factor is used as surrogate for methane combustion.

Methane Flare Emissions

MMSCF	Fraction Methane	Destruction Efficiency	Capture Efficiency	Metric tons CH <sub>4</sub>	MT CO <sub>2</sub> e
0.01	0.6	0.99	0.75	14	302

Source: Local Government Operations Protocol Equation 9.1

Notes: kWh = kilowatt-hour; MWh = megawatt-hour; CO<sub>2</sub> = carbon dioxide; GWP = global warming potential; CH<sub>4</sub> = methane; N<sub>2</sub>O = nitrous oxide; CO<sub>2</sub>e = carbon dioxide equivalent; SCF = standard cubic feet; Btu = British thermal unit; MMBtu = million British thermal units; kg = kilogram; MMSCF = million standard cubic feet

## **APPENDIX F**

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Near-Field Mixing Zone and Dilution Analysis for the  
Deep Water Outfall Diffuser in San Pablo Bay





# Technical Memorandum

DATE: 1 October 2009

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TO: Dean Allison, City of Pinole  
Ken Coppo, City of Pinole  
Erwin Blancaflor, City of Hercules  
Brent Salmi, City of Hercules

CC: Denise Conners, Larry Walker  
Associates

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SUBJECT: Near-field Mixing Zone and Dilution  
Analysis for the Deep Water Outfall  
Diffuser in San Pablo Bay

**Stephen McCord, Ph.D., P.E.**

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## Overview

The California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board) regulates discharges from the Pinole-Hercules Water Pollution Control Plant (Pinole-Hercules WPCP) under an NPDES permit (CA0037796), which was adopted by the Regional Water Board as Order R2-2007-0024 in March 2007. Secondary-treated effluent from Pinole-Hercules WPCP is pumped to the Rodeo Sanitation District's Water Pollution Control Facility (RSD WPCF). The combined effluent is discharged to San Pablo Bay via a single deep-water outfall (Outfall 001). The current permitted average dry-weather flows (ADWF) from the Pinole-Hercules WPCP and RSD WPCF are 4.06 million gallons per day (MGD) and 1.14 MGD, respectively, resulting in a combined ADWF of 5.2 MGD.

The current permitted wet-weather capacity for the Pinole-Hercules WPCP is 10.3 MGD. The Cities of Pinole and Hercules are designing upgrades to the WPCP and will ask the Regional Water Board to increase the permitted wet-weather flow to 14.59 MGD (daily average). Coupled with RSD WPCF's current wet-weather capacity of 2.5 MGD (daily average), this change would result in an increase from 12.8 MGD to 17.09 MGD maximum daily average flow through Outfall 001. No increase in ADWF for either treatment facility is forecast through 2030 (the design period).

Based on conditions assumed in various simulations, the following dilutions are estimated:

<u>Time Frame</u>	<u>Condition</u>	<u>Dilution Credit</u>
Current	Chronic	279
Current	Acute	43
Future	Chronic	279
Future	Acute	33

1 October 2009

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This memo provides information and analysis to support consideration of these dilution credits for discharges through Outfall 001. This information may be used in the derivation of effluent limitations in the next NPDES permits issued for the Pinole-Hercules WPCP and the RSD WPCF. In addition, diffuser repairs/modifications may occur during the WPCP upgrade, after the next NPDES permit renewal in 2012. Simulation results are also presented for potential future diffuser conditions.

## **Regulatory Guidance**

Guidance on delineating mixing zones and calculating dilution ratios is given in the 1991 USEPA Technical Support Document, or “TSD”<sup>1</sup>. Section 2.2.2 of the TSD suggests that two types of mixing zones may be applied to account for acute and chronic aquatic life criteria. Water quality-based effluent limits would be based on San Francisco Bay Basin Plan objectives specified as annual median<sup>2</sup> and instantaneous maximum concentrations. The Regional Water Board derives effluent limits from both objectives and then selects the lower effluent limits for inclusion in NPDES permits. In accordance with this approach, the following assumptions are considered the most appropriate:

- A dilution credit based on the average dry-weather effluent flow rate and median tidal velocity during moderate Delta outflow conditions is used for calculating average monthly (chronic) effluent ammonia limits;
- A dilution credit based on the maximum design effluent flow rate and average velocity 30 minutes before and after slack tide during moderate Delta outflow conditions is used for calculating maximum daily (acute) effluent ammonia limits.

## **Modeling Tools**

Resource Management Associates, Inc. (RMA) simulated receiving water conditions under a range of Delta outflow conditions<sup>3</sup>. RMA’s modeling work used coupled hydrodynamic-water quality models calibrated to velocity, stage, flow and salinity data, as well as drogoue and dye studies. The coupled models are RMA-2 for hydrodynamics in two dimensions (vertically averaged) and RMA-11 for water quality. RMA-2 output for time-varying current direction and velocity over the outfall diffuser are applied as input for ambient conditions in the near-field model.

The near-field mixing zone model CORMIX was applied to represent dilution of the effluent plume. CORMIX is a USEPA-approved mixing zone model for environmental impact assessment of regulatory mixing zones resulting from continuous point source discharges<sup>4</sup>. Comprehensive models such as CORMIX are effective because they first classify the flow structure in order to determine the appropriate prediction technique. CORMIX Version 5.0GT was applied in this case, including HYDRO2: Version-5.0.2.0 produced in October 2008.

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<sup>1</sup> USEPA (1991). Technical Support Document for Water Quality-based Toxics Control. EPA Number 505290001. 292 pp.

<sup>2</sup> Median is the 50th percentile, which is the value where half the data are below and half are above or equal to this value. Mean and average are synonymous, calculated as the sum of the values divided by the number of values.

<sup>3</sup> Resource Management Associates, Inc. (2009). “Technical Summary Report – Water quality impacts of Pinole-Hercules Water Pollution Control Plant discharge in San Pablo Bay.” Prepared for City of Pinole. May. 81 pp.

<sup>4</sup> See <http://www.cormix.info/index.php>.

1 October 2009

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Near-field mixing processes accounted for, in this case, are buoyant jet mixing (including ambient current effects and merging of individual port's plumes) and boundary interactions (including density gradient effects). Receiving water depth and velocity, outfall configuration, and discharge flow rate are the most important input parameters. For Outfall 001's submerged, multi-port diffuser, the subprogram CORMIX2 was used. CORMIX2 analyzes uni-directional, staged, and alternating designs of multiport diffusers and allows for arbitrary alignment of the diffuser structure within the ambient water body and for arbitrary arrangement and orientation of the individual ports.

Near field re-entrainment is a process where previously discharged fluid from the far field is advected into the vicinity of the outfall and is dynamically re-entrained into the turbulent jet, reducing jet dilution. Because the dilution from turbulent jet mixing, buoyant spreading or ambient diffusion is a cumulative effect which fractionally reduces concentrations in a fluid parcel, any reduction in initial mixing from re-entrainment is carried through the entire plume and results in increased concentrations in the final plume.

Steady-state ambient current is assumed for chronic conditions. However, information on the tidal cycle can be input to account for re-entrainment in an unsteady ambient flow field for acute conditions. Input in the case of modeling conditions around slack tide includes tidal period, maximum tidal velocity, and velocity at any time relative to slack tide. The plume shape is conservatively delineated by the surface area containing one standard deviation (i.e., 68%) of the plume in a Gaussian distribution-shaped cross-section. Initial dilution is assumed to be complete when the plume's discharge momentum and buoyancy dissipate. Although turbulent diffusion subsequently dilutes the effluent plume even more, initial dilution is commonly applied for calculating effluent limitations.

Model results delineate the effluent plume defining the edge of the mixing zone. Dilution in CORMIX is presented as the ratio of initial concentration to concentration at a given location ( $S$ ), which is the inverse of 'fraction of effluent.' Dilution credit, as applied in Bay Area NPDES permits, is calculated from CORMIX output as  $S-1$ .

## Simulation Conditions

The study area is in the vicinity of Outfall 001 in San Pablo Bay (**Figure 1**). The outfall diffuser is described in this section, along with effluent and ambient receiving water conditions that affect mixing characteristics of the effluent plume.



Figure 1. Pinole-Hercules and Rodeo's Outfall 001 study area. Nearby DWR metering stations and RMP monitoring stations are shown.

### ***Diffuser Geometry***

The Outfall 001 diffuser cross-section design is shown in **Figure 2**. The diffuser is located in San Pablo Bay about 3,775 feet from the shoreline, aligned at 25° counter-clockwise from North. The original diffuser design consisted of 15 pairs of diffuser ports (30 ports total) placed 8 feet on center. The ports are sharp-edged and 2.5 inches in diameter. An underwater inspection conducted in Fall 2005 found no damage to the portholes, outfall or diffuser pipeline; however, four ports were partially or totally blocked by sediment or corrosive buildup (Underwater Resources, 2005).

The modeled diffuser in its current condition consists of 26 ports with a diameter of 2.5 inches (0.06 m), 5 inches (0.013 m) from the Bay floor. Ports are set as pairs on either side at 27.5° from horizontal. The total length of the diffuser is 120 feet. The total water depth is 16.7 feet (5.1 m) below Mean Sea Level. Future conditions assume that all 30 ports are open, each fit with 3-inch duckbill valves. The modeled diffuser is visualized using the CORMIX visualization tool CorSpy as shown in **Figure 3**.



1 October 2009

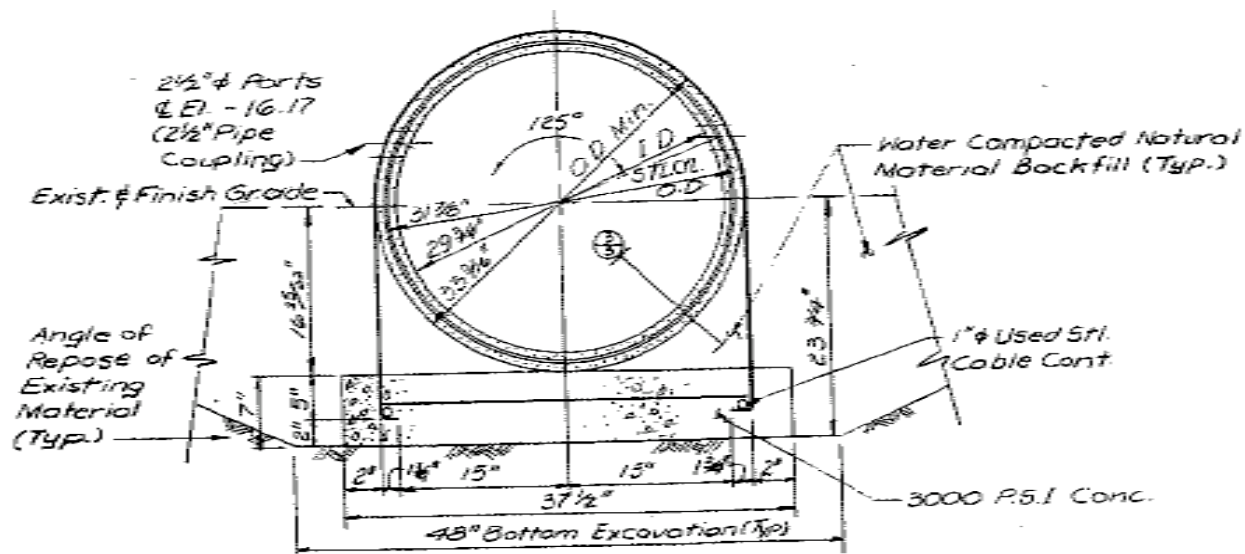


Figure 2. Outfall 001 diffuser cross-section drawing. Source: CDM (1979). "Drawing M-3, Effluent Outfall Diffuser Section Details and Trench Sections".

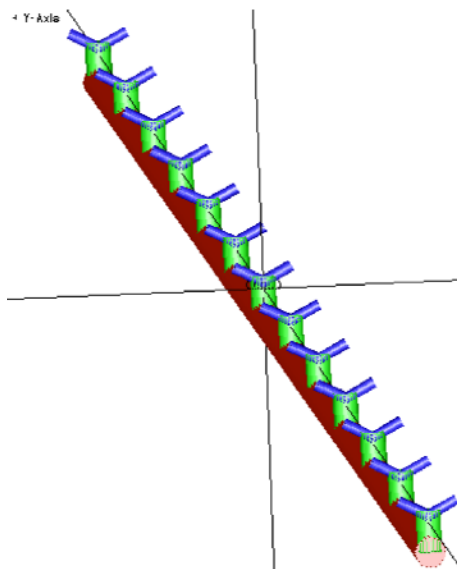


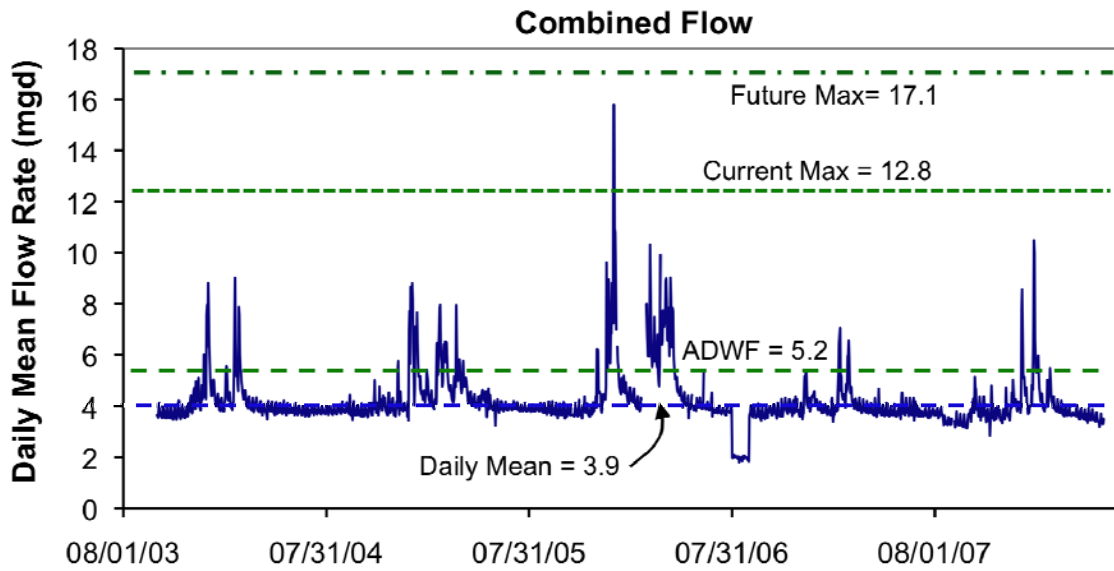
Figure 3. Visualization of Outfall 001 diffuser (current condition) by the CORMIX visualization tool CorSpy.

## Effluent Conditions

The combined effluent flow rates for the available period of record (10/1/2003 – 5/31/2008) is shown in **Figure 4** along with the design flows underlined in the following paragraphs. Effluent conditions assumed for CORMIX simulations are based on facility design information.

The current permitted average dry-weather flows (ADWF) from the Pinole-Hercules WPCP and RSD WPCF are 4.06 million gallons per day (MGD) and 1.14 MGD, respectively, resulting in a combined ADWF of 5.2 MGD. No increase in dry-weather flows for the two treatment facilities is forecast through 2030 (the design period); therefore this flow rate applies to both current and future conditions.

The current permitted wet-weather capacity for the Pinole-Hercules WPCP is 10.3 MGD. Based on planned improvements to the WPCP, the Cities of Pinole and Hercules will request that the Regional Water Board increase the permitted wet-weather flow for Pinole-Hercules to 14.59 MGD (daily average). Coupled with RSD WPCF's current wet-weather capacity of 2.5 MGD (daily average), the maximum daily average flow through Outfall 001 is currently 12.8 MGD, increasing in the future to 17.09 MGD.



**Figure 4. Combined daily mean effluent flow rates for period 10/1/2003 – 5/31/2008, with current daily mean and simulated values indicated.**

Temperature affects the effluent density. The daily flow data for the Pinole-Hercules WPCP and RSD WPCF were added, and temperature data combined as a flow-weighted value for the available period of record (10/1/2003 – 5/31/2008). Paired flow and temperature values are shown in **Figure 5**. Temperature values input to CORMIX for calculating density are 19 °C chronic (current and future), 17 °C acute current, and 16 °C acute future.

1 October 2009

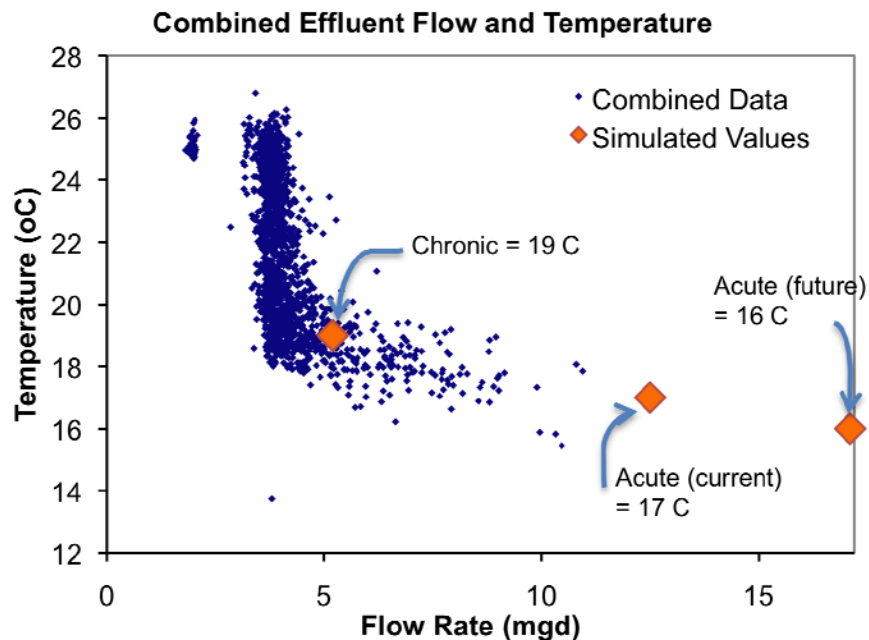


Figure 5. Daily mean effluent flow rates and volume-weighted temperatures during period 10/1/2003 – 5/31/2008, with simulated values indicated.

### Ambient Conditions

San Pablo Bay is a shallow, tidal estuary spanning 68,349 acres. It is defined by the mouth of Carquinez Strait to the east and a border drawn between Point San Pablo and Santa Venicia to the southwest. San Pablo Bay is primarily a flat, mud-bottom bay, reflecting its characteristic as a catchment for fine sediments. Tides typically follow a pattern of episodic Delta outflows to San Pablo Bay in December-March, declining flows in April-May, and low freshwater inflows in July-October. The majority of freshwater inflow to San Pablo Bay is from the Central Valley through the Delta and Suisun Bay, although local rivers and creeks such as the Napa River also provide freshwater inflow. Because the majority of freshwater comes from the Delta, the amount and timing of precipitation events in the Delta watershed can have a major impact on freshwater inflows to and circulation patterns in San Pablo Bay.

Mixing conditions in the vicinity of Outfall 001 are highly dependent on the Delta's hydrodynamics (e.g., San Joaquin and Sacramento River flows, neap/spring tides, upstream dam releases, and water exports). Ambient velocity is driven by Delta outflows from the east and ocean tides from the west.

### Ambient Current Velocity

Hydrodynamic simulations were performed by RMA to provide velocity results for input to the CORMIX plume model. Hydrodynamic simulations were performed for the 29-day period of April 8 through May 6, 2002, which has been identified as representative of moderate Delta outflow<sup>5</sup>.

<sup>5</sup> For years 2000 – 2006, the 29-day running average net Delta outflow is lower than this period approximately 50% of the time.

1 October 2009

Velocities at the midpoint of the rectangular outfall element in the RMA model were computed at 7.5-minute intervals and saved at 15-minute intervals. Although velocities fluctuate according to net Delta outflows, median velocities during low and high net Delta outflows are within 4% of the “moderate outflow” period’s average. For simulating conditions in CORMIX:

- The median velocity was selected to represent chronic conditions and for use in deriving average monthly effluent limitations. The median of flood and ebb tides velocities during moderate Delta outflows is 1.1 ft/s (0.34 m/s).
- The average tidal-period maximum velocity and average velocity 30 minutes after slack tide were selected to represent acute conditions<sup>6</sup> and for use in deriving maximum daily effluent limitations. The average tidal-period maximum ambient velocity is 1.3 ft/s (0.41 m/s) and the average ambient velocity 30 minutes after slack tide during moderate Delta outflows is 0.41 ft/s (0.12 m/s).

### Ambient Current Direction

RMA-2 output includes current velocity vectors at 15-minute intervals. The velocity data were first parsed into ebb and flood tide components. The average ebb and flood tides’ velocity directions were then calculated. For the dominant ebb tide (i.e., net Delta outflow means that the current is more often directed westward), the average angle is 114° counter-clockwise from North. As noted previously in section “Diffuser Geometry”, Outfall 001 is aligned at 25° counter-clockwise from North with ports directing effluent at 90° from the pipe. Thus, the diffuser is aligned approximately 90° (114°-25°=89°) relative to the dominant current direction.

### Ambient Stratification

Salinity data from Department of Water Resources metering stations near the outfall indicates that minor stratification occurs near the Mare Island Jetty (Station C316) under moderate net Delta outflow conditions. The C316 meter is located close to the depth of Outfall 001; however, water circulation at this station probably results in a different salinity response than actually occurs near the outfall. The flood tide waters at C316 have a flow component from the northwest (the shallower northern portion of San Pablo Bay) that would not be present at the outfall. Salinity data from a meter located near the west opening to Carquinez Straits (Station C24) indicates some stratification following high net Delta outflow and during transitional tidal conditions. However, this is a deep-water station with the upper meter placed at approximately 20 ft below Mean Lower Low Water. Outfall 001 is located 17 ft below MLLW, so the C24 results are difficult to extrapolate to the shallower outfall diffuser.

In summary, it is difficult to quantify the density profile at the diffuser site based on the available data. However, any stratification at Outfall 001 will be small and will have only a minor impact on near-field or far-field plume fate. Consequently, ambient temperature and salinity values of 20.0 °C and 20.8 parts per thousand, respectively, constant with water depth are assumed for all simulations. These values are the averages of measurements reported at the nearest Regional Monitoring Program stations in summers of years 2002-2003 and 2005-2007<sup>7</sup>.

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<sup>6</sup> This format represents the minimum dilution owing to re-entrainment. See Nash, J.D., "Buoyant Discharges into Reversing Ambient Currents", MS Thesis, DeFrees Hydraulics Laboratory, Cornell University, Ithaca, NY. 1995.

<sup>7</sup> Results generated by the RMP Web Query [[http://www.sfei.org/rmp/rmp\\_data\\_access.html](http://www.sfei.org/rmp/rmp_data_access.html)], for stations annually closest to Outfall 001.

1 October 2009

## CORMIX Input Values

The complete set of CORMIX input data is shown in **Table 1**. These values were used to simulate the current and future, chronic and acute dilution conditions described previously.

Table 1. CORMIX Input Data Summary

Term	Value	Units	Notes	Ref's
<i>Effluent Data</i>				
Pollutant type	Conservative			
Pollutant concentration	100	mg/L	level above background, use 100 to represent %	1
Flow rate	0.23	m <sup>3</sup> /s	Chronic (current and future conditions): ADWF = 5.2 mgd	
	0.56	m <sup>3</sup> /s	Acute (current): 12.8 MGD maximum daily-average flow	
	0.75	m <sup>3</sup> /s	Acute (future): 17.09 MGD maximum daily-average flow	
Temperature	19	°C	chronic at ADWF (current and future)	2
	17	°C	acute at current maximum daily average flow	2
	16	°C	acute at future maximum daily average flow	2
<i>Ambient Parameters</i>				
Bounded?	Unbounded		Assume no side boundary effects in near field	
Average depth (HA)	5.1	m	16.7 ft below MSL (chronic)	3
Depth at discharge (HD)	5.1	m	uniform within outfall zone: same as avg depth	1
Wind speed	0	m/s	conservatively assume zero	
Ambient velocity	0.34	m/s	chronic: median, moderate Delta outflow (April 8 – May 9, 2002)	4
	12.4	hr	tidal period	4
	0.41	m/s	average of tidal-cycle maximum velocities	4
	0.12	m/s	acute: avg. 30-min after slack tides, moderate Delta outflow (April 8 – May 9, 2002)	4
Manning's n	0.025	–	Earthen bottom with some stones and weeds	1,5
Stratification Type	Non-freshwater, Uniform	–	Generally shallow and fully-mixed vertically	4
Density	20.0	°C	Average temperature, 2002-2003 and 2005-2007 summers	6
	20.8	ppt	Average salinity, 2002-2003 and 2005-2007 summers	6
<i>Discharge Geometry Data</i>				
Submodel	CORMIX2	–	for multi-port diffuser	
Nearest bank	left	–	looking downstream from East	
Diffuser length	120	ft	total length, not adjusted for blocked ports	3
Dist to 1st endpoint	3775	ft	distance from shoreline to nearest port	3
Dist to 2nd endpoint	3895	ft	add length to endpoint 1	3
Port Height	0.127	m	5 inches, per diver inspection	5
Port Diameter	0.06	m	Current: 2.5" diameter	3,5
	0.08	m	Future: 3" diameter	7
Contraction ratio	1	–	Current: well-rounded ports, flush with pipe wall	1
	0.7	–	Future: 3" duckbill valves	1
Number of openings	26	–	Current: 4 closed per diver inspection	3,5
	30	–	Future: All ports open	7
Alignment angle (GAMMA)	90	degrees	Perpendicular to downstream current	3
Port configuration	2 ports/riser, opposing	–	pairs, flush with pipe, 62.5 deg from vertical	3
Vertical angle (THETA)	27.5	degrees	angle from horizontal	3

### REFERENCES:

1 = Doncker, R.L., and G.H. Jirka (2007). "CORMIX User Manual – A Hydrodynamic Mixing Zone Model and Decision Support System for Pollutant Discharges into Surface Waters." EPA-823-K-07-001, 236 pp.

2 = Pinole-Hercules NPDES self-monitoring data

3 = CDM (1979). Drawing M-2 "Rodeo, Pinole, and Hercules Effluent Outfall Plan & Profile"; Drawing M-3 "Effluent Outfall Diffuser Section Details and Trench Sections".

4 = Resource Management Associates, Inc. (2009). "Technical Summary Report – Water quality impacts of Pinole-Hercules Water Pollution Control Plant discharge in San Pablo Bay." Prepared for City of Pinole. May. 81 pp.

5 = Underwater Resources Inc. (2005). Letter Report for Underwater Inspection of Outfall Diffuser Pipeline. October 27. 5

6 = RMP Web Query [[http://www.stel.org/rmp/rmp\\_data\\_access.html](http://www.stel.org/rmp/rmp_data_access.html)]

7 = Email from Nancy Ku [mailto:nancy.ku@psomas.com] to Denise Conners; sent Monday, August 24, 2009 11:08 AM

1 October 2009

## Model Results and Dilution Credits

Session reports for the CORMIX simulations of chronic and acute discharge conditions under the simulated current conditions are provided in **Appendix A**. Values referenced in this section are highlighted in the session reports. In each case, the plume flow class (MU8 in the session report) and flow configuration apply to a layer corresponding to the full water depth at the discharge site. The effluent density is less than the surrounding ambient water density at the discharge level. Therefore, the effluent is positively buoyant and tends to rise towards the surface.

Under both chronic and acute conditions (current and future), the plume becomes vertically fully-mixed over the diffuser, but re-stratifies later and is not mixed in the far-field. Depending on the flow scenario, near-field mixing is complete at a distance of 170-210 ft (50-65 m) from the diffuser centerline. The travel time for the discharge to reach this distance is approximately 2-3 minutes. At that point, the plume covers a surface area of 0.5-0.9 acres and fills a volume of 8-15 acre-ft.

The TSD recommends—but does not require—a minimum exit velocity of 3 m/s (10 ft/s) to provide sufficiently rapid mixing that would minimize organism exposure time to toxic material. Current and future acute conditions, which are of interest for short-term exposure, produce exit velocities greater than 7 m/s. The exposure concern can in many instances also be met by other characteristics, such as high ambient velocity. Median currents of 1.1 ft/sec (0.34 m/s) pass drifting organisms through the mixing zone in approximately 5 minutes.

Initial dilutions estimated by CORMIX are summarized in **Table 2**, showing only the characteristics that vary among the simulated conditions.

**Table 2. Dilution Estimates for Representative Discharge Conditions**

Condition	Effluent		Ambient	Discharge			Dilution (S)
	Flow Rate (m <sup>3</sup> /s)	Temp (°C)	Velocity (m/s)	Port Dia. (m)	Contraction Ratio	# ports	
Chronic Current	0.23	19	0.34	0.08	1.0	26	279
Chronic Future				0.08	0.7	30	279
Acute Current	0.56	17	0.41 max; 0.12 at 30-min after slack	0.08	1.0	26	43
Acute Future	0.75	18		0.08	0.7	30	33

## Appendix A. CORMIX Session Reports

Session reports for current (chronic and acute) conditions only are shown. Highlighted values are referenced in the text.

### Chronic Conditions

CORMIX SESSION REPORT:

XX

CORMIX MIXING ZONE EXPERT SYSTEM  
CORMIX Version 5.0GT  
HYDRO2:Version-5.0.2.0 October,2008

SITE NAME/LABEL: Outfall 001  
DESIGN CASE: Base Case  
FILE NAME: C:\Program Files\CORMIX  
5.0\StephenM\Pinole\MZ Analysis - base case.prd  
Using subsystem CORMIX2: Multiport Diffuser Discharges  
Start of session: 09/16/2009--15:44:31

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SUMMARY OF INPUT DATA:

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AMBIENT PARAMETERS:

Cross-section		= unbounded
Average depth	HA	= 5.1 m
Depth at discharge	HD	= 5.1 m
Ambient velocity	UA	= 0.34 m/s
Darcy-Weisbach friction factor	F	= 0.0285
Calculated from Manning's n		= 0.025
Wind velocity	UW	= 0 m/s
Stratification Type	STRCND	= U
Surface density	RHOAS	= 1013.97 kg/m <sup>3</sup>
Bottom density	RHOAB	= 1013.97 kg/m <sup>3</sup>

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DISCHARGE PARAMETERS:

	Submerged Multiport Diffuser Discharge	
Diffuser type	DITYPE = alternating perpendicular	
Diffuser length	LD	= 36.58 m
Nearest bank		= left
Diffuser endpoints	YB1	= 1150.62 m;      YB2 = 1187.2 m
Number of openings	NOPEN	= 26
Number of Risers	NRISER	= 13
Ports/Nozzles per Riser	NPPERR	= 2
Spacing between risers/openings	SPAC	= 3.05 m
Port/Nozzle diameter	D0	= 0.06 m
with contraction ratio		= 1
Equivalent slot width	B0	= 0.0020 m
Total area of openings	TA0	= 0.0735 m <sup>2</sup>
<b>Discharge velocity</b>	<b>U0</b>	<b>= 3.13 m/s</b>
Total discharge flowrate	Q0	= 0.23 m <sup>3</sup> /s
Discharge port height	H0	= 0.13 m
Nozzle arrangement	BETTYPE	= alternating without fanning
Diffuser alignment angle	GAMMA	= 90 deg
Vertical discharge angle	THETA	= 90 deg
Actual Vertical discharge angle	THEAC	= 27.5 deg
Horizontal discharge angle	SIGMA	= 0 deg
Relative orientation angle	BETA	= 90 deg
Discharge temperature (freshwater)		= 19 degC

1 October 2009

Corresponding density	RHO0	=	998.4063 kg/m <sup>3</sup>
Density difference	DRHO	=	15.5637 kg/m <sup>3</sup>
Buoyant acceleration	GP0	=	0.1505 m/s <sup>2</sup>
Discharge concentration	C0	=	100 mg/l
Surface heat exchange coeff.	KS	=	0 m/s
Coefficient of decay	KD	=	0 /s

## FLUX VARIABLES PER UNIT DIFFUSER LENGTH:

Discharge (volume flux)	q0	=	0.006288 m <sup>2</sup> /s
Momentum flux	m0	=	0.019674 m <sup>3</sup> /s <sup>2</sup>
Buoyancy flux	j0	=	0.000947 m <sup>3</sup> /s <sup>3</sup>

## DISCHARGE/ENVIRONMENT LENGTH SCALES:

LQ = 0.00 m	Lm = 0.17 m	LM = 2.04 m
lm' = 99999 m	Lb' = 99999 m	La = 99999 m

(These refer to the actual discharge/environment length scales.)

## NON-DIMENSIONAL PARAMETERS:

Slot Froude number	FR0	=	179.88
Port/nozzle Froude number	FRD0	=	32.92
Velocity ratio	R	=	9.20

## MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:

Toxic discharge	=	no
Water quality standard specified	=	no
Regulatory mixing zone	=	no
Region of interest	=	260 m downstream

## HYDRODYNAMIC CLASSIFICATION:

\*-----\*

| FLOW CLASS = MU8 |

\*-----\*

This flow configuration applies to a layer corresponding to the full water depth at the discharge site.

Applicable layer depth = water depth = 5.1 m

## MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

## X-Y-Z Coordinate system:

Origin is located at the bottom below the port center:

1168.91 m from the left bank/shore.

Number of display steps NSTEP = 10 per module.

## NEAR-FIELD REGION (NFR) CONDITIONS :

Note: The NFR is the zone of strong initial mixing. It has no regulatory implication. However, this information may be useful for the discharge designer because the mixing in the NFR is usually sensitive to the discharge design conditions.

Pollutant concentration at NFR edge c = 0.3589 mg/l

Dilution at edge of NFR s = 278.6

NFR Location: x = 25.5 m

(centerline coordinates) y = 0 m

z = 5.1 m

NFR plume dimensions: half-width (bh) = 18.48 m

thickness (bv) = 5.1 m

Cumulative travel time: 148.4593 sec.





1 October 2009

Average depth	HA	= 5.1 m
Depth at discharge	HD	= 5.1 m
Darcy-Weisbach friction factor	F	= 0.0285
Calculated from Manning's n		= 0.025
Wind velocity	UW	= 0 m/s
TIDAL SIMULATION at time	Tsim	= 0.5 hours
Instantaneous ambient velocity	UA	= 0.12 m/s
Maximum tidal velocity	UaMAX	= 0.41 m/s
Rate of tidal reversal	dUA/dt	= 0.24 (m/s)/hour
Period of reversal	T	= 12.4 hours
Stratification Type	STRCND	= U
Surface density	RHOAS	= 1013.97 kg/m <sup>3</sup>
Bottom density	RHOAB	= 1013.97 kg/m <sup>3</sup>

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DISCHARGE PARAMETERS:	Submerged Multiport Diffuser Discharge	
Diffuser type	DITYPE = alternating perpendicular	
Diffuser length	LD	= 36.58 m
Nearest bank	= left	
Diffuser endpoints	YB1	= 1150.62 m; YB2 = 1187.2 m
Number of openings	NOOPEN	= 26
Number of Risers	NRISER	= 13
Ports/Nozzles per Riser	NPPERR	= 2
Spacing between risers/openings	SPAC	= 3.05 m
Port/Nozzle diameter	D0	= 0.06 m
with contraction ratio	= 1	
Equivalent slot width	B0	= 0.0020 m
Total area of openings	TA0	= 0.0735 m <sup>2</sup>
Discharge velocity	U0	= 7.62 m/s
Total discharge flowrate	Q0	= 0.56 m <sup>3</sup> /s
Discharge port height	H0	= 0.13 m
Nozzle arrangement	BETTYPE	= alternating without fanning
Diffuser alignment angle	GAMMA	= 90 deg
Vertical discharge angle	THETA	= 90 deg
Actual Vertical discharge angle	THEAC	= 27.5 deg
Horizontal discharge angle	SIGMA	= 0 deg
Relative orientation angle	BETA	= 90 deg
Discharge temperature (freshwater)	= 17 degC	
Corresponding density	RHO0	= 998.7761 kg/m <sup>3</sup>
Density difference	DRHO	= 15.1939 kg/m <sup>3</sup>
Buoyant acceleration	GP0	= 0.1469 m/s <sup>2</sup>
Discharge concentration	C0	= 100 mg/l
Surface heat exchange coeff.	KS	= 0 m/s
Coefficient of decay	KD	= 0 /s

## FLUX VARIABLES PER UNIT DIFFUSER LENGTH:

Discharge (volume flux)	q0	= 0.015311 m <sup>2</sup> /s
Momentum flux	m0	= 0.116631 m <sup>3</sup> /s <sup>2</sup>
Buoyancy flux	j0	= 0.002250 m <sup>3</sup> /s <sup>3</sup>

## DISCHARGE/ENVIRONMENT LENGTH SCALES:

LQ = 0.00 m	Lm = 8.10 m	LM = 6.78 m
lm' = 99999 m	Lb' = 99999 m	La = 99999 m

## UNSTEADY TIDAL SCALES:

Tu = 0.2152 hours	Lu = 40.00 m	Lmin = 5.04 m
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(These refer to the actual discharge/environment length scales.)

## NON-DIMENSIONAL PARAMETERS:

Slot Froude number	FR0	= 443.26
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1 October 2009

Port/nozzle Froude number      FRD0    = 81.13  
 Velocity ratio                    R        = 63.48

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 MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:

Toxic discharge                    = no  
 Water quality standard specified    = no  
 Regulatory mixing zone               = no  
 Region of interest                 = 260 m downstream

\*\*\*\*\*

## HYDRODYNAMIC CLASSIFICATION:

\*-----\*

| FLOW CLASS    = MU8 |

\*-----\*

This flow configuration applies to a layer corresponding to the full water depth at the discharge site.

Applicable layer depth = water depth = 5.1 m

\*\*\*\*\*

## MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

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 X-Y-Z Coordinate system:

Origin is located at the bottom below the port center:

1168.91 m from the left bank/shore.

Number of display steps NSTEP = 10 per module.

---

 NEAR-FIELD REGION (NFR) CONDITIONS :

Note: The NFR is the zone of strong initial mixing. It has no regulatory implication. However, this information may be useful for the discharge designer because the mixing in the NFR is usually sensitive to the discharge design conditions.

Pollutant concentration at NFR edge    c = 2.3473 mg/l

Dilution at edge of NFR                s = 42.6

NFR Location:                            x = 30.12 m

(centerline coordinates)                y = 0 m

z = 5.1 m

NFR plume dimensions:    half-width (bh) = 25.46 m

    thickness (bv) = 4.39 m

Cumulative travel time:                106.1002 sec.

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 Buoyancy assessment:

The effluent density is less than the surrounding ambient water density at the discharge level.

Therefore, the effluent is POSITIVELY BUOYANT and will tend to rise towards the surface.

---

 Near-field instability behavior:

The diffuser flow will experience instabilities with full vertical mixing in the near-field.

There may be benthic impact of high pollutant concentrations.

---

 UPSTREAM INTRUSION SUMMARY:

Plume exhibits upstream intrusion due to low ambient velocity or strong discharge buoyancy.

Intrusion length                        = 4.97 m

Intrusion stagnation point             = 12.42 m

Intrusion thickness                    = 4.33 m

Intrusion half width at impingement   = 25.46 m

Intrusion half thickness at impingement = 4.39 m

1 October 2009

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FAR-FIELD MIXING SUMMARY:

Plume becomes vertically fully mixed WITHIN NEAR-FIELD at 0 m downstream, but RE-STRATIFIES LATER and is not mixed in the far-field.

-----  
PLUME BANK CONTACT SUMMARY:

Plume in unbounded section does not contact bank in this simulation.

-----  
UNSTEADY TIDAL ASSESSMENT:

Because of the unsteadiness of the ambient current during the tidal reversal, CORMIX predictions have been TERMINATED at:

x = 108 m  
y = 0 m  
z = 5.1 m.

For this condition AFTER TIDAL REVERSAL, mixed water from the previous half-cycle becomes re-entrained into the near field of the discharge, increasing pollutant concentrations compared to steady-state predictions. A pool of mixed water formed at slack tide will be advected downstream in this phase.

## \*\*\*\*\* TOXIC DILUTION ZONE SUMMARY \*\*\*\*\*

No TDZ was specified for this simulation.

## \*\*\*\*\* REGULATORY MIXING ZONE SUMMARY \*\*\*\*\*

No RMZ and no ambient water quality standard have been specified.

## \*\*\*\*\* FINAL DESIGN ADVICE AND COMMENTS \*\*\*\*\*

CORMIX2 uses the TWO-DIMENSIONAL SLOT DIFFUSER CONCEPT to represent the actual three-dimensional diffuser geometry. Thus, it approximates the details of the merging process of the individual jets from each port/nozzle.

In the present design, the spacing between adjacent ports/nozzles (or riser assemblies) is of the order of, or less than, the local water depth so that the slot diffuser approximation holds well.

Nevertheless, if this is a final design, the user is advised to use a final CORMIX1 (single port discharge) analysis, with discharge data for an individual diffuser jet/plume, in order to compare to the present near-field prediction.

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DIFFUSER DESIGN DETAILS: Because of the alternating arrangement of the opposing nozzles/ports, the AVERAGE VERTICAL ANGLE (THETA) has been set to 90 deg. This represents a ZERO NET HORIZONTAL MOMENTUM FLUX for the entire diffuser.

# **APPENDIX G**

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Noise Modeling



Appendix G

**Project-Generated Construction Source Noise Prediction Model**

Pinole-Hercules WPCP EIR - WPCP Expansion



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission	
				Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>	Usage Factor <sup>1</sup>
Threshold*	1,647	55.0	Excavator	85	0.4
Nearest Residence	500	65.4	Backhoe	80	0.4
			Grader	85	0.4
			Drill Rig Truck	84	0.2

Ground Type	Hard
Source Height	8
Receiver Height	5
Ground Factor	0.00

Predicted Noise Level <sup>2</sup>	L <sub>eq</sub> dBA at 50 feet <sup>2</sup>
Excavator	81.0
Backhoe	76.0
Grader	81.0
Drill Rig Truck	77.0

**Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)**  
85.4

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 * \log(U.F.) - 20 * \log(D/50) - 10 * G * \log(D/50)$$

Where: E.L. = Emission Level;

U.F. = Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

\*Project specific threshold

Appendix G

**Project-Generated Construction Source Noise Prediction Model**

Pinole-Hercules WPCP EIR - Force Main Installation



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission	
				Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>	Usage Factor <sup>1</sup>
Threshold*	5,537	45.0	Jackhammer	85	0.2
Residence on Railroad Ave	50	85.9	Excavator	85	0.4
Residences on Woodfield Drive	60	84.3	Backhoe	80	0.4
			Paver	85	0.5
			Ground Type	Hard	
			Source Height	8	
			Receiver Height	5	
			Ground Factor	0.00	
			Predicted Noise Level <sup>2</sup>	L <sub>eq</sub> dBA at 50 feet <sup>2</sup>	
			Jackhammer	78.0	
			Excavator	81.0	
			Backhoe	76.0	
			Paver	82.0	
			<b>Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)</b>	<b>85.9</b>	

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 * \log(U.F.) - 20 * \log(D/50) - 10 * G * \log(D/50)$$

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

\*Project specific threshold



Appendix G

Project-Generated Construction Source Noise Prediction Model

Pinole-Hercules WPCP EIR - HDD



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Assumptions:	Reference Emission	
				Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>	Usage Factor <sup>1</sup>
Threshold*	5,424	45.0	Drill Rig Truck	84	0.2
Residence on Railroad Ave	50	85.7	Vibrating Hopper	85	0.5
Residence on Forest Circle	485	66.0	Auger Drill Rig	85	0.2
			Flat Bed Truck	84	0.4

Ground Type	Hard
Source Height	8
Receiver Height	5
Ground Factor	0.00

Predicted Noise Level <sup>2</sup>	L <sub>eq</sub> dBA at 50 feet <sup>2</sup>
Drill Rig Truck	77.0
Vibrating Hopper	82.0
Auger Drill Rig	78.0
Flat Bed Truck	80.0

**Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)**  
85.7

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January, 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 * \log(U.F.) - 20 * \log(D/50) - 10 * G * \log(D/50)$$

Where: E.L. = Emission Level;

U.F. = Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

\*Project specific threshold

Appendix G

**Project-Generated Construction Source Noise Prediction Model**

Pinole-Hercules WPCP EIR - Corporation Yard



Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L <sub>eq</sub> dBA)	Reference Emission		
			Assumptions:	Noise Levels (L <sub>max</sub> ) at 50 feet <sup>1</sup>	Usage Factor <sup>1</sup>
Threshold*	5,797	45.0	Dozer	85	0.4
Residence on Dohrman Lane	250	72.3	Tractor	84	0.4
			Backhoe	80	0.4
			Paver	85	0.5

Ground Type	Hard
Source Height	8
Receiver Height	5
Ground Factor	0.00

Predicted Noise Level <sup>2</sup>	L <sub>eq</sub> dBA at 50 feet <sup>2</sup>
Dozer	81.0
Tractor	80.0
Backhoe	76.0
Paver	82.0

**Combined Predicted Noise Level (L<sub>eq</sub> dBA at 50 feet)**  
86.3

Sources:

<sup>1</sup> Obtained from the FHWA Roadway Construction Noise Model, January, 2006.

<sup>2</sup> Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

$$L_{eq}(\text{equip}) = E.L. + 10 * \log(U.F.) - 20 * \log(D/50) - 10 * G * \log(D/50)$$

Where: E.L. = Emission Level;

U.F. = Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

\*Project specific threshold